

**Comments on the Waste Confidence
Draft Generic Environmental Impact Statement
and Proposed Rule**

ML14154A175

Comments on the Waste Confidence Draft Generic Environmental Impact Statement and Proposed Rule

This document accompanies Appendix D of NUREG–2157, *Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel* (ADAMS Accession No. ML14198A440). Appendix D of the Generic Environmental Impact Statement (GEIS) includes summaries of comments received on the draft GEIS and proposed Rule, and responses to those comments. This document contains the text of the identified unique comments summarized in Appendix D of the GEIS.

Approximately 32,000 of the written submissions were form letters. The U.S. Nuclear Regulatory Commission (NRC) identified 12 form letter templates (see Table 1). The majority of the form letters were sponsored by the Sierra Club (ML13269A279) and Nuclear Information and Resource Service (ML13330A726). Identical comments contained in form letters were captured only once; however, any additional comments contained in form letters were treated as unique comments.

Table 1. Form Letter Identification Numbers

Correspondence Identifier	ADAMS Accession No.	Table of Author Names
WC-R-DR-00002	ML13269A282	Table 3
WC-R-DR-00003	ML13269A279	Table 4
WC-R-DR-00465	ML13326B058	Table 5
WC-R-DR-00491	ML13330A726	Table 6
WC-R-DR-00537	ML14055A035	Table 7
WC-R-DR-00555	ML13354C040	Table 8
WC-R-DR-00946	ML14027A510	Table 9
WC-R-DR-00947	ML14027A588	Table 10
WC-R-DR-00948	ML14027A612	Table 11
WC-R-DR-00949	ML14027A632	Table 12
WC-R-DR-00950	ML14043A331	Table 13
WC-R-DR-00951	ML14027A648	Table 14

Table 2, which follows the comments, provides a list of commenters who provided unique comment submissions (i.e., non-form letter submissions). The form letters are also included in Table 2, and the authors are noted as “Commenters, Multiple”. Authors and ADAMS accession numbers for form letter submissions are identified in Tables 3 through 14, one table per form letter, following the comments. The comments in Table 7 and Tables 9 through 14 were bundled and assigned a single ADAMS accession number for all authors.

Comment excerpts are listed below by category. Comments are identified by the comment identification number (correspondence number-comment number) and the name of the commenter at the end of each excerpt. The NRC categorized and consolidated comments according to subject area. The list of the 55 comment categories (i.e., subject areas) and the page where each category begins are provided below.

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1. Comments Concerning Rule Questions

Comment: Specific issues Commission seeks comments from public on: Issue 1. As outlined above, the statement in 51.23 regarding repository availability is not supported by App. B or the history of trying to site a repository in the U.S. (0027-2 [Vandenbosch, Robert])

Comment: Issue 2. To say in the rule 51.23(a)(2)(i) that the analysis in NUREG-2157 supports the determination that it is feasible to safely store" is a bit of a stretch in view of the statement in C3-b of the request for comments "Although the DGEIS does not primarily evaluate safety". (0027-3 [Vandenbosch, Robert])

Comment: Issue 3. You should not remove content as the public comments you are receiving are based on current text. (0027-4 [Vandenbosch, Robert])

Comment: I object to the way this Commission defines "waste confidence" in Discussion Section 3, Answer A2, in the September 13 waste confidence Federal Register Notice and on the waste confidence website that the Commission maintains today. The current Commission mischaracterizes waste confidence by defining it solely as a storage issue. From its inception, waste confidence has been, and continues to be, about confidence in the eventuality of deep geologic disposal. And, yes, it is also secondarily about the safety and availability of storage until offsite disposal or storage comes online. (0030-1-1 [Kotra, Janet])

Comment: For myself and for many members of the lay public, the waste confidence decision and rule touch on a most basic question. How can the Commission continue to allow a generation of spent nuclear fuel or permit operation of new generators unless it is confident that there will be permanent disposal of that waste? Contrary to how it is defined in the current regulatory notice, the original Federal Register Notice announcing the first waste confidence decision in 1984, the Commission stated and I quote, "The purpose of this proceeding is solely to assess the degree of assurance now available that radioactive waste can be safely disposed of." Unfortunately, today's rulemaking -- it went on to say other things, but it said up front that waste confidence was about the availability of disposal. Unfortunately, today's rulemaking in effect fails to answer this most important question by stating in effect, "We have confidence in disposal because we have confidence in the safety of long-term storage." I'm sorry. No matter how well technically justified that may be, this logic simply breaks down. NRC is dodging the question the public most cares about when it says disposal will become available when necessary. Deep geologic disposal is, and remains our nation's policy codified in U.S. law. The public deserves an answer to the question, is the Nuclear Regulatory Commission confident that the United States will implement a disposal solution for spent nuclear fuel in a reasonable and realistic timeframe? (0030-1-4 [Kotra, Janet])

Comment: It is important to recall, however, that the Commission also founded its confidence, both in 1984 and again in 1990, on confidence in the existence of a statutory framework enacted by a bipartisan Congress setting forth a process or a path forward for the development of repositories. At no time did the respective commissions involved contemplate that the process itself laid out in statute would become corrupted and unworkable. Nor did those commissions anticipate that subsequent commissioners would later be unable or unwilling to carry out their statutory obligations. Yet, as documented in the recent ruling of the second highest court in the land, this is precisely what has happened. The Commission must, therefore, as a result, declare that there no longer exists a basis for waste confidence. Such a bold declaration would not only be honest, it would address forthrightly the fundamental question undergirding the original purpose of the waste confidence policy. Recognizing the lack of waste

confidence would generate significant attention from both pro and anti-nuclear interests and provide NRC an opportunity to submit a substantive legislative proposal to the U.S. Congress to suggest amendments to existing legislation to amend or replace the Nuclear Waste Policy Act. (0030-1-7 [Kotra, Janet])

Comment: If we could get the definitions commonly found in the dictionary for "waste" and "confidence," I think we could get to the root of the matter here that we're dealing with, because there's a lot of words going around that a lot of meaning is getting lost. And the stories that we're going to script through this public comment time is very important. (0030-11-1 [Vandel, Niki])

Comment: I think the assumption is being made that if something can be found, that's it, we're done. I don't think so. I think that needs to be analyzed as well. Putting it down, you know, in various places for tens of thousands of years. All the places we've found so far have not passed muster. What is the muster? So I don't think this assumption that some day we might be able to find that is confidence-producing at all. It's like a pig in a poke. It's like jumping with no place to land. And another aspect is that there doesn't seem to be a way to currently isolate radioactive waste from effects on life, on the biosphere. So it's not confidence-producing to say they will find one. I think it's a false premise in the EIS to base the future on something we don't have yet. (0030-13-3 [Sondheim, Steven])

Comment: [W]e [Sierra Club] have no real confidence in waste confidence (0030-21-10 [Carberry, Mike])

Comment: [W]aste confidence did initially used to be about primarily geologic disposal. But over time our system has given us delays in geologic disposal, and now it has also become about storage, which is why in pools and in casks our ability to safely store it is indeed something that we can have confidence in. And we will continue to provide this confidence. (0030-6-4 [McCullum, Rod])

Comment: My first recommendation is to remove the misleading title of Waste Confidence. Waste Confidence simply does not exist in the public, nor the nuclear industry, and probably not even at NRC. (0045-6-3 [Andrews, Richard])

Comment: My first recommendation is to remove the misleading title of "Waste Confidence". Waste Confidence simply does not exist in the public, nor the nuclear industry, and probably not even at NRC. (0059-3 [Andrews, Richard])

Comment: It is telling that the NRC uses the term confidence when talking about safeguarding nuclear waste. That you dare use the word confidence when talking about safeguarding rad waste for hundreds of times longer than the entire Christian era is preposterous. (0112-11-2 [Agnew, David])

Comment: For a hazard that will last for thousands of years, Waste Confidence is an oxymoron. For a hazard that will last for hundreds of thousands of years, use of the word confidence is simply moronic. (0112-11-8 [Agnew, David])

Comment: I remember when the Waste Confidence rule came out in the 80s. And it's basically a way for the DOE and the industry to cover, to cover themselves for not coming up with a solution to the back end of the nuclear production cycle for commercial electric plants. (0112-15-1 [Williams, Chris])

Comment: We abhor the continued arrogance of the NRC to claim that they have confidence in dealing with this issue when they've clearly just been putting it off for future generations to deal with. (0112-5-7 [Bogen, Doug])

Comment: The problem I think the public has with this Waste Confidence rule is the word confidence. And I was talking to a fellow who worked for the NRC outside the room who was sort of nodding along with me and saying you should give that feedback. And I think the word confidence to the public really means it's somewhat of a cocky statement. In my mind it's like saying we have the utmost confidence that everything will be fine. Now, you know, the Japanese people were promised this as well in Fukushima and look what happened. So maybe a better use of the word -- a different word would be good in this position. So something like waste estimation rule, waste assumption rule. I think confidence is really going beyond what you can possibly, possibly believe in. So I think that that word is pitting the public against the NRC. And I think we need to work together here as NRC's supposed to represent the public and not the industry. (0112-9-3 [Baker, Anna])

Comment: Lastly, I wonder if there are NRC staffers who deduce that, given the problems at Fukushima and given all the problems with the waste that's building up at a lot of the sites, if the NRC staff deduces that there is no -- that they don't have confidence that the waste will be stored safely is there a way, an outlet for these people to give anonymous feedback? Maybe there is no such thing as confidence to some of the staffers that work at the NRC and maybe they're too afraid to speak up to their higher ups or to the government because they work for the NRC. Is there a way for people to give feedback to the NRC who work within the NRC that maybe there is no confidence that this waste plan is a good one? And I truly believe that a lot of people who work at the NRC are now starting to rethink whether or not confidence or this Waste Confidence rule is something that they should back. (0112-9-4 [Baker, Anna])

Comment: On behalf of UA Local 131 we agree with the removal of a timeline for the repository in the rule. Due to political and social constraints the proposed Yucca Mountain repository has withdrawn its application. Currently United States law supports the timely disposal of spent nuclear fuel in a geological repository. The inclusion of a timeline puts an undue burden on the commercial power producers while the Federal Government looks to site and build a repository. (0152-1 [Pelletier, David A.])

Comment: Because I am an English teacher, I can say with total certainty that the phrase "Nuclear Waste Confidence" is the biggest oxymoron ever uttered or appended in human history....And I can't believe that the NRC folks don't know that. And it was really smart word-smithing to come up with that one. You should pay those people a lot of money, whoever thought that up. (0163-14-1 [Schepart, Margot])

Comment: I didn't even get to the GEIS. I didn't get to anything. All I got to was "Waste Confidence." And that stopped me right there. I have to ask the NRC members who are here and the ones who are not here, whose confidence are we talking about? Are we talking about your confidence? Because you're not talking about our confidence. (0163-24-1 [Allen, Judy])

Comment: We in New Jersey join you in saying "No confidence." (0163-36-5 [Brown, Jeffrey])

Comment: I'm here to say "No confidence." (0163-49-1 [Evans, Laurie])

Comment: I have absolutely no confidence in the NRC. (0163-51-1 [DeCrescenzo, Jocelyn])

Comment: [T]he answer to the other one is "No."...Having a mined geological generic repository within 60 years following the license reactor is impossible....The only thing that's been allowed is a burial system, and there's been no investigation in reverse engineering. (0163-7-11 [Shapiro, Susan])

Comment: I just want to say that I vote No Confidence. (0163-9-4 [Gerard, Daniele])

Comment: For a hazard that will last for thousands of years, 'waste confidence' is an oxymoron. For a hazard that will last hundreds of thousands of years, use of the word 'confidence' is an unacceptable leap of faith. We are seven decades into 'too cheap to meter' and no one knows what to do with the industry's toxic waste. Whether the problem is NIMBY or scientific, the result is the same: no one has figured out what to do with the industry's toxic waste. (0230-2 [Garb, James])

Comment: Waste confidence, I have no waste confidence. (0245-35-3 [Seastrom, Tina])

Comment: Confidence, we all know, is in the eye of the beholder. So, sitting here tonight, people have different expectations of what confidence means. Certainly, when the NRC -- limited. We heard about maybe only two, the spent nuclear fuel and the generating site, but spent nuclear fuel goes well beyond that. And there's just a disparity of expectations because, as we know, until and unless the spent nuclear fuel becomes eligible to be put in the ground in a repository, I'm not too sure how much confidence the public is going to have. Certainly it is not within the scope of the GEIS but, however, they're interconnected. At some point, I think that in a large part either as a constraint or something, the EIS really has to mention automatically the interconnection with the repository which isn't available and we don't even see anything in sight. So, this is just an observation I have is that what kind of confidence do you have? And what expectations do you come to the public to say I have this confidence, what do you mean by that? (0245-5-1 [Chen, S.Y.])

Comment: I also personally think that the title of this, Waste Confidence, is very misleading. That's kind of an Orwellian title so that nobody really can understand what's happening right here. We're talking about nuclear waste dumping. If you're not putting that in the terms of this, no one is going to know what you're talking about and people aren't going to come out and express themselves. So, I think that just the title itself shows a certain lack of transparency that we need to look at. How can we have confidence in the system when they keep using words like Waste Confidence? We need to have a very descriptive title of what's going on so people can have a real understanding, and then we can have an honest debate. (0245-52-2 [Kalas, Mike])

Comment: I would first like to address the NRC's question in the Federal Register notice about whether the title of the Rule should be changed. NEI [Nuclear Energy Institute] strongly supports discontinuing using the term Waste Confidence. It is a historical artifact and it doesn't provide any useful description of the Agency's analysis and conclusions on repository availability and the continued safe and environmentally sound storage of used fuel. In fact, the term "Waste Confidence" simply derives from the Commission's statement dating from the late 1970s, that as a matter of policy, the NRC would not continue to license reactors if it did not have a reasonable confidence that waste can and will, in due course, be disposed of safely. Although the record amply supports a continued finding of reasonable confidence that safe disposal will become available, there is much confusion about that to which the term refers. To avoid the confusion and the mischaracterizations that the term "Waste Confidence" seems to engender, we strongly recommend that the Rule be retitled something along the lines "Storage of Spent Nuclear Fuel

for the Period After License Term of Reactor Operation." Simple, straightforward, and descriptive. The GEIS should be similarly renamed. (0246-14-1 [Ginsberg, Ellen])

Comment: I have no confidence in your Waste Confidence, (0250-11-3 [Kerr, Julius])

Comment: Some of the specifics that you wanted comments on, as far as time line for repository availability, I don't believe that there should be reference to a repository made in the Rule, because that will unintentionally tie us to that as part of the waste solution for perpetuity. There are other methods for taking care of nuclear waste other than spent fuel through reprocessing, through other utilizations and mentioning it in the Rule will only hamper those developments in the future. (0250-14-5 [Brookhart, Ryan])

Comment: Second, information from the Generic Environmental Impact Statement should be referenced but not repeated in the text of the Rule. Again, those crossing of references in federal regulations only makes it more complicated for people to understand what's really going on. (0250-14-6 [Brookhart, Ryan])

Comment: Third, streamlining of clarity is always an improvement to any regulation. So on the third question of whether you should streamline the text in the ruling, I certainly encourage you to do that. Again, for the reasons stated before, government regulations are complicated enough to understand. If you can do anything to streamline it, I would encourage it. (0250-14-7 [Brookhart, Ryan])

Comment: Regarding Issue 4 on the title of the rule - We provide no comment. (0262-10 [Patterson, Karen])

Comment: Regarding Issue 1 to remove the timeline for the availability of a disposal repository from the rule - We believe that the timeline for the availability of a repository should be removed from the rule. The draft GEIS analyzed several scenarios including never developing a repository, and concluded that the environmental impacts of spent fuel storage would be the same regardless of the length of storage. The obligation and responsibility to develop and implement a plan to site, construct, and operate a repository does not reside with the NRC. Indeed, the Department of Energy has the statutory obligation to develop a national spent nuclear fuel/high level waste disposal program. Although the likelihood of the federal government foregoing this obligation may be considered remote, an expansive NEPA analysis should consider (as this one does) the highly improbable scenario of no repository. Moreover, for NRC to include a time table for repository development could be imprecise or misleading to the public as the time tables in the Nuclear Waste Policy Act and others have demonstrated. (0262-3 [Patterson, Karen])

Comment: Regarding Issue 2 to include a statement in the rule related to the safety of continued spent fuel storage. We believe that such a validated statement related to the safety of continued spent fuel storage should be included. (0262-7 [Patterson, Karen])

Comment: In 2012, the U.S. District Court for the District of Columbia ruled that the waste confidence rulemaking is a major federal action requiring an EIS or an EA, and that the NEPA document should address specifically the impacts of potential fires and leaks in fuel pools. The NRC broadened its analyses to include additional considerations. The advantage of the larger scope in the EIS is that the expanded analyses validate the previous findings of the Commission regarding spent fuel storage and allow the Commission to conclude that used/spent fuel storage as practiced in this country is without significant adverse effects on the environment. We believe

that the record of previous spent fuel storage also leaves little room to argue that spent fuel storage is not safe. Because safety, more than environmental, considerations may drive spent fuel decisions, and are of the greatest concern to the public, we believe it is appropriate to summarize the NRC's views on the safety of interim and extended spent fuel storage. In other words, the GEIS is an environmental assessment under NEPA that examines the environmental impacts of continued spent fuel storage. While its primary purpose is NEPA-driven and therefore environmentally focused, the public should have the benefit of the NRC's determination that spent fuel may be stored for extended periods with reasonable assurance of safety. (0262-8 [Patterson, Karen])

Comment: Regarding Issue 3 to remove information that is redundant with information provided in the GEIS from the Discussion portion of the Statement of Consideration that will accompany the final rule's publication in the Federal Register. We believe the information should be published with the rule, thus ensuring that supporting information for the NRC's decision to amend the rule is maintained with the rule. Furthermore, the Discussion portion of the Statement of Considerations has "plain language" content that should increase public understanding of NRC's basis for its conclusions. (0262-9 [Patterson, Karen])

Comment: I do not share your Waste Confidence. (0277-8 [Pierman, Bette])

Comment: Confidence is generally described as a state of being. Certain either that a hypothesis or a prediction is correct, or that a chosen course of action is the best and most effective. Arrogance in this comparison is having unmerited confidence, believing something or someone is capable or correct when they are not. Time will determine whether the NRC's proposed waste plan is confident or arrogant. (0325-3-1 [Becker, Rochelle])

Comment: Number three, the Commission seeks public comment on whether the discussion portion, Section 3 of the Federal Register Notice of the Statement of Considerations, should be streamlined by removing content that is repeated from the DGEIS, in order to improve clarity of the discussion, now that the NRC has prepared an Environmental Impact Statement to support the Rule. I agree, because all of this should have been streamlined. I think we had about 17 people say the same thing. (0326-36-1 [Vandel, Nikohl])

Comment: Number four, the Commission seeks public comment on whether the title of the Rule should be changed in light of a GEIS being issued instead of a separate Waste Confidence decision. Absolutely. How the hell is the NRC going to make any kind of statement on Waste Confidence with Fukushima still uncontained[.] (0326-36-2 [Vandel, Nikohl])

Comment: And I believe that we're here to talk about this, which has nothing to do with Diablo Canyon. This is what the policy that is going to affect 103 communities that live with nuclear power. When I asked my friend, Liz Apfelberg, one of the founding members of Mothers for Peace, what Waste Confidence is she says well, they're confident that they're going to make waste, and they don't know what to do with it. (0326-56-1 [Homick, Nick])

Comment: In the morphic field of resonance, quantum physics, we all remain connected, and Michael, thank you for reminding us of that. And I think if the people from the NRC felt that connectedness, they wouldn't come here with the oxymoronic phrases like Waste Confidence. It's like having confidence in Bernie Madoff and the Ponzi scheme, or waste -- you know, using the term spent fuel, another oxymoron, and depleted uranium, another one. (0326-6-1 [Walking Turtle, Willow])

Comment: The State Building Trades supports the inclusion of a specific policy statement regarding the safety of the continued spent fuel storage of the Waste Confidence Rule. As previously detailed, these storage methods have been proven to be safe and, therefore, the Proposed Rule should reflect those findings. (0327-12-3 [Knisley, Mike])

Comment: First, regarding the additional issue number 4, I believe the term "Waste Confidence Rule" is a poor choice of words, and should be changed. It is an inelegant and anachronistic nomenclature from the 1980s based on predictions and assumptions which have proved to be erroneous and absurd. Thus, subjecting the Rule, the Proposed Rule to well-deserved mockery, derision, and ridicule. (0327-17-3 [Schonberger, David])

Comment: Secondly, regarding supplemental additional issue number 3, I believe that it is a good idea to streamline the Federal Register to remove redundancies and anachronisms. Conversely, I also believe that the NRC should increase and maximize redundancies in the "real world." In other words, generally speaking, the NRC should not be in the business of eliminating redundancies, redundancies should be augmented. (0327-18-2 [Schonberger, David])

Comment: First, with issue one, I think it's important to maintain discussion of timeline for a repository. I see that as a contract that we initiated with the nuclear industry, and it should be repeated throughout. (0327-28-2 [Greenwood, John])

Comment: Issue two, the safety of continued spent fuel storage to be made in the real text, I also support this. I believe it should be within the text, again, to, well, give people that are opposed to industry basis to make opposition. (0327-28-3 [Greenwood, John])

Comment: Issue three, streamline of the Federal Register. I am in high support of that because I search the Federal Register quite often, and when you dump extra explanation into it, it makes it a burden to search. (0327-28-4 [Greenwood, John])

Comment: The two types of storage facilities for spent nuclear fuel have been designed to withstand natural disasters and terrorist attacks. Both fuel pools and dry storage systems have never allowed the release of radioactive material. ACT Ohio [Affiliated Construction Trades Foundation of Ohio] also supports the inclusion of a specific policy statement regarding the safety of these storage methods. (0327-31-2 [Dorans, Rob])

Comment: Additionally, ACT Ohio [Affiliated Construction Trades Foundation of Ohio] supports streamlining the statement of considerations by removing the content repeated in the Generic Environmental Impact Statement, which will provide additional clarity to the nuclear industry and the public on the Proposed Rule. (0327-31-3 [Dorans, Rob])

Comment: I think the first thing to say to the NRC to this topic with the word confidence that you have used and I think maybe you were forced to use it by the courts. (0327-36-1 [Lamberger, Paul])

Comment: If there is one thing that we all know regardless of what side of the issue we're on, regardless of whether we think the issues are primarily technical or primarily political, we all know that we can't have any confidence in effective management of nuclear waste, particularly spent nuclear fuel rods. We all know that. (0328-11-3 [Muller, Alan])

Comment: On issue number three that we're working on in this particular focus, according to the documents anyway, related to the streamlining, I think footnotes with links so that both are connected in truth. (0329-6-3 [Vandel, Niki])

Comment: Yes, I do believe that we need to make this dialogue very understandable to a first grader because waste confidence, and this gets to issue four, should not be the title because, as we all know, all we have right now is shoulds, coulds. We don't have confidence. And if we go forward with this rule, with this illusion, lie, deviance from our reality, one, our NRC is going to look like a joke in the history book. And we don't need that. We don't want that. We want to be smart, and we want to look smart, so let's be smart. (0329-6-4 [Vandel, Niki])

Comment: For a hazard that will last for thousands of years, 'waste confidence' is an oxymoron. For a hazard that will last hundreds of thousands of years, use of the word 'confidence' is simply moronic. (0419-7 [Agnew, David])

Comment: My first recommendation is to remove the misleading title of "Waste Confidence". Waste Confidence simply does not exist in the public, nor the nuclear industry, and probably not even at NRC. This title is merely a buzz word phrase, deceptive at best, and clearly designed to mislead the public...and perhaps even to get NRC and nuclear industry personnel to believe their own propaganda of misinformation, to create a false sense of security and safety, and to duck responsibility for proper management and prompt disposal of these very dangerous man-made materials. (0447-1-3 [Andrews, Richard])

Comment: Are you serious? (0470-1 [Moran, Aliese])

Comment: Issue 1. Issue 1 contains a request for comment on whether the Commission should remove the timeline for repository availability from the rule. This question refers to the finding in the proposed 10 C.F.R. § 51.23(a)(2)(ii) that "it is feasible to have a mined geologic repository within 60 years following the licensed life for operation of a reactor." The sentence should be removed from the rule. The Commission is correct when, in the Federal Register notice accompanying the rule, it states that "there are national policy decisions, and societal and political factors that can significantly influence the actual timing of the availability of mined geologic repository, and these policy decisions are outside the Commission's control." As the D.C. Circuit has observed, the Commission has not been successful to date in estimating the timeframe by which a repository will be available. NRC asserts in the DGEIS that the "most likely, timeframe [for a permanent waste repository] is the short-term timeframe, which analyzes 60 years of continued storage after the end of a reactor's licensed life for operation." DGEIS at xxvii. This statement ignores the long history of NRC's failure to ever predict this date and the well-considered comments of Commissioner Svinicki (Notation Vote, September 2009 Response Sheets of Commissioner Svinicki at 2 (publicly released on September 25 and 28, 2009))("this is a particularly difficult time to be in the prediction business") that NRC is not able to make such predictions with any accuracy. Rather the Commission should remove from the DGEIS any prediction of the "likely" date when a permanent repository would be in existence, since it has no basis for that statement in the DGEIS, and should recognize in the final rule that while it is technologically feasible to have a mined geologic repository within 60 years following the licensed life for operation of a reactor, the Commission does not have a rational basis to predict when, if ever, the political and social factors the Commission has already acknowledged will be resolved such that a repository will actually exist. (0473-18-2 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Issue 2. Issue 2 contains a request for comment on whether the finding in the proposed 10 C.F.R. § 51.23(a)(2)(i) that "it is feasible to safely store spent nuclear fuel following the licensed life for operation of a reactor" should be included in the rule. The States, the Commonwealth, and the Tribe support removing this text from the rule. In the Federal Register notice accompanying the rule, the Commission states that "the policy statement on safety is not related to, or necessary for, the generic determination on environmental impacts of continued storage, nor does it provide the safety analysis for storage in a particular dry cask or storage at a particular site: A safety evaluation is still required to support a site-specific license for dry storage, or to store spent fuel in a spent fuel pool." Insofar as this statement is not necessary to the rule, the States, the Commonwealth, and the Tribe submits that it should be stricken. (0473-18-3 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Issue 3. Issue 3 contains a request for comment on whether the Discussion portion (Section III of this document) of the Statement of Considerations should be streamlined by removing content that is repeated from the DGEIS in order to improve clarity of the discussion. The States, the Commonwealth, and the Tribe take no position on Issue 3. (0473-18-4 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Issue 4. In Issue 4, the Commission is seeking specific comment on whether the title of the rule should be changed in light of a DGEIS being issued instead of a separate Waste Confidence Decision. The States, the Commonwealth, and the Tribe are in favor of removing any reference to "Waste Confidence" from the title of the rule, as the D.C. Circuit invalidated the premise of "confidence" as the basis for NRC decisionmaking. NRC should adopt a title that more accurately reflects the true federal action--i.e., licensing and relicensing of reactors and storage installations. (0473-18-5 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The Commission has incompletely, and as a result, incorrectly defined Waste Confidence in Discussion Section IV answer, A2 in the September 13, 2013 Federal Register Notice. This misrepresentation also appears on the Commission's website in response to the FAQ "What is Waste Confidence?" The Commission mischaracterizes Waste Confidence by representing it solely as a waste storage issue. From its inception, Waste Confidence has been and continues to be about confidence in the feasibility and availability of geologic disposal. It is also, secondarily, about the safety and availability of storage until offsite disposal or storage sited and designed specifically for the safety of that disposal or storage comes on line. (0532-1 [Kotra, Janet])

Comment: The Commission should acknowledge that there no longer exists a reliable basis for Waste Confidence. Such a bold declaration would not only be honest, it would also forthrightly address the fundamental question undergirding the original purpose of the Waste Confidence Policy. As I stated earlier, confidence in the technical feasibility of disposal has increased, but the governmental and societal structures upon which Americans (including Commissioners) must rely for implementing nuclear waste disposal policy under existing law are in turmoil. Failing to acknowledge that reality, while at the same time doing everything possible to assert a "false confidence" to justify the authorization of more and more waste generation, clearly harms NRC's reputation as an independent safety authority. Many may conclude that NRC cares more about the economic viability of its licensees than it does about protection of public health and safety or sound national energy and waste policy. Recognizing the all too obvious lack of Waste Confidence provides the Commission an opportunity to submit a legislative proposal to amend or replace the Nuclear Waste Policy Act. I respectfully and earnestly urge the Commission to reassert its role as a truly independent safety authority for the Nation and do just that. (0532-10 [Kotra, Janet])

Comment: Issue 1: I do not agree that NRC should remove discussion and time estimates for repository availability. (0532-11 [Kotra, Janet])

Comment: Issue 2: I do not agree that NRC should remove discussion of the safety of continued spent fuel storage from the rule. (0532-12 [Kotra, Janet])

Comment: Issue 3: I do not believe that the understanding of the public would be enhanced by the proposed "streamlining." Further, more plain language explanation may be warranted, but assuming that because "it's in the GEIS, it doesn't need to be in the SOC for the rule" is not appropriate. (0532-13 [Kotra, Janet])

Comment: Issue 4: For reasons discussed in my specific comments, I strenuously object to changing the title of the rule. (0532-14 [Kotra, Janet])

Comment: The Waste Confidence decision and rule came about to address a most fundamental question: "How can the Commission continue to allow the generation of spent nuclear fuel or (by implication) permit the operation of new generators of this material unless it has confidence that there is a solution to the permanent disposal of that waste?" Contrary to how it has been misapplied in the current Federal Register Notice, the original Federal Register Notice announcing the first Waste Confidence Decision, in 1984, the Commission stated, "The purpose of this proceeding is solely to assess the degree of assurance now available that radioactive waste can be safely disposed of, to determine when such disposal will be available and to determine whether radioactive waste can be safely stored past the expiration of existing...licenses until...disposal or storage...is available." Unfortunately, today's rulemaking in effect fails in its answer to this most important question by stating that "We have confidence in disposal because we have confidence in the safety of longterm storage," No matter how well technically justified such assertion may be, the logic simply does not follow. NRC is avoiding the question the public most cares about when it says, "Disposal will become available when necessary." This despite the fact that deep geologic disposal is and remains the Nation's policy codified in statute. The public deserves an answer to the question, "Is the Nuclear Regulatory Commission confident that the United States will implement a disposal solution for spent nuclear fuel in a realistic time frame?" (0532-2 [Kotra, Janet])

Comment: Just recently a representative of the nuclear industry asserted that the very term "Waste Confidence" is now nothing more than an historical artifact. This is an astonishingly short sighted and self-serving declaration. To jettison the need for establishing this basic confidence in waste disposal, as opposed to indefinite storage, disregards NRC's obligation to the longterm public health and safety and common defense and security and, ignores even the industry's long-term best interest. By the same token, certain irresponsible, self-described environmental advocates also seek to change the subject of Waste Confidence away from ultimate disposal. They would instead hawk indefinite so-called onsite "hardened storage," while at the same time sabotaging the NWPA and all serious attempts at locating and licensing a safe geologic repository. The motives of industry are fairly obvious-keep the kilowatts flowing and the ratepayers paying. Those of certain irresponsible, self-described environmentalists are only slightly less so (and by no means do all or even a majority of environmentalists fall in this category). Efforts of these select groups to downplay and discredit geologic disposal allow them to continue to argue that nuclear power should not be included as a carbon-free alternative in a rational long-term energy future for the U.S. because the "waste disposal problem can't be solved." (0532-3 [Kotra, Janet])

Comment: Rule Package, FR 56799, middle column, Issue 1. NWRPO believes the rule should not include a statement about the timeline for repository availability. As stated in the FR text. "Although conclusions about repository availability have been included in Waste Confidence proceedings since 1984, these statements are not necessary to the environmental review or for fulfilling the NRC's NEPA obligations." More importantly, because all phases of continued storage are shown to have small environmental impacts, no statement regarding repository availability within any particular timeline should be included. (0544-18 [Enriquez, Elizabeth])

Comment: Rule Package, FR 56799, last column, Issue 3. NWRPO believes the discussion section of the rule package should contain enough information that it can be used as a stand-alone document. The technical analysis from the GEIS should be included in the rule package to the extent necessary to provide a complete picture of waste confidence. (0544-19 [Enriquez, Elizabeth])

Comment: Issue #1: Recommended Action: Remove any and all specific Policy Statements regarding the timeline for mined geologic repository availability from the proposed revised text of the Waste Confidence Rule (10 CFR 51.23, Paragraph (a), Section (2)). Reasons: First, the NRC acknowledges that such statements (which have historically been "included" in "Waste Confidence proceedings since 1984") are "not necessary to the environmental review or for fulfilling the NRC's NEPA obligations," and the NRC has failed to make a compelling and convincing argument that the continuation of historical tradition is either justified on its own merits or appropriate in this case. Furthermore, I believe that it is more than a little duplicitous, deceptive and disingenuous -- possibly bordering on rogue -- for the NRC to brazenly include, inside an official CFR Rule, Policy Statements and language revisions which are beyond the scope and authority of the Agency to guarantee, implement, administer or enforce. I contend that such proposed language is an agency overreach and out-of-bounds of the force-of-law by definition, as the NRC itself admits that its own proclamations are independently and wholly unenforceable. The NRC concedes that "national policy decisions" as well as various "societal and political factors," all of which are "outside" the NRC's "control," "can significantly influence the actual timing of the availability of [a] mined geologic repository." (0603-15 [Schonberger, David])

Comment: Issue #2: Recommended Action: Remove any and all specific Policy Statements regarding the safety of spent nuclear fuel storage from the proposed revised text of the Waste Confidence Rule (10 CFR 51.23, Paragraph (a), Section (2)). Reasons: First, similarly as with Issue #1 above, the NRC acknowledges that such statements (which have historically been "included" in "Waste Confidence proceedings since 1984") are "not necessary to the environmental review or for fulfilling the NRC's NEPA obligations," and the NRC has failed to make a compelling and convincing argument that the continuation of historical tradition is either justified on its own merits or appropriate in this case. Furthermore, I believe that such proposed Policy Statements and language revisions represent the embodiment of hubris and bravado applied to a subject that calls for extreme caution and risk aversion, given the gravity of the potential consequences of both reasonably-foreseeable and unforeseeable occurrences. I believe that recent global events have demonstrated that it is not possible to effectively extrapolate safety calculations for the consideration of every possible circumstance or for an indefinite timeframe. Finally, I believe that the proposed Policy Statements regarding the safety of spent nuclear fuel storage are entirely unrelated and unnecessary to the intended purpose of the proposed Rule, that is, to improve the efficiency of the NRC's licensing process by serving and enabling the facilitation and expedition of major licensing decisions through the application of generic criteria. Ironically, the NRC appears to agree and fully concur with this assessment. Perhaps institutional complacency or inertia can explain the incongruity. (0603-16 [Schonberger, David])

Comment: Issue #3: I believe that it is a good idea to streamline the Federal Register to remove redundancies and anachronisms. Conversely, I also believe that the NRC should increase and maximize redundancies in the "real world." In other words, generally speaking, the NRC should NOT be in the business of eliminating redundancies. Redundancies should be augmented, and cost-benefit analyses should more effectively prioritize public interests over private profits. (0603-17 [Schonberger, David])

Comment: Issue #4: I believe the term "Waste Confidence Rule" is a poor choice of words and should be changed. It is an inelegant and anachronistic nomenclature from the 1980's based on predictions and assumptions which have proved to be erroneous and absurd, thus subjecting the proposed Rule to well-deserved mockery, derision and ridicule. Furthermore, the provenance of the proposed Rule is unusual in that it has emerged in response to and as a direct result of the unanimous decision of a Federal Court of Appeals, which vacated and remanded the previous incarnation of the so-called NRC Waste Confidence Rule. Another unusual aspect of the genesis of the current proposed Rule is described in the Federal Register (78 FR 56782, Section III, A12): "Preparation and reliance upon a GEIS is a fundamental departure from the approach used in past Waste Confidence proceedings. . . .Because a GEIS [Appendix B] is being issued, [the historical five "Findings"] are no longer necessary." Thus, as there is no separate Waste Confidence Decision document, I believe that the title (name) of the proposed Rule should be changed in order to reflect the evolving rulemaking process. In the Executive Summary of the DGEIS (p. xxiii), the NRC explains that the term "Waste Confidence applies to the storage of spent fuel after the end of the licensed life for operations of a nuclear reactor and before final disposal in a permanent repository. This timeframe is referred to as "continued storage" throughout this draft GEIS." I contend that there are two fundamental contradictions embedded in that language. First, there can be no genuine "confidence" until such time as "continued storage" has a defined and available endpoint with no ambiguity or open-endedness. Second, there can be no genuine "confidence" until such time as the NRC initiates regulatory action to require licensees to expedite the transfer of spent nuclear fuel from active wet storage (pools) to passively-safe dry storage systems with the ultimate goal of a complete phase-out of any nuclear reactor located in or near a seismically-active zone and any nuclear reactor of the U.S. GE Mark I and II BWR design, such as Fermi, Unit 2 in Southeast Michigan. Such regulatory actions would be very politically viable in the wake of the ongoing, horrific tragedy of Fukushima Dai-ichi and would demonstrate that a reexamination of bogus generic reactor and storage design criteria could realistically initiate at the NRC headquarters without the pretext of pressure, intervention or imposition from exogenous quarters. (0603-18 [Schonberger, David])

Comment: These shifting dates and timeframes have not inspired confidence that a national repository will become available, and have done much to frustrate host communities. While having a date included in 10 CFR 51.23 might be a reflection of current thinking of whether a repository might be available, it adds nothing. We do not believe that the final rule should include a timeframe by which a repository will become available. Instead we believe that the NRC should include a plan for updating the Waste Confidence GEIS that would be reflective of the current status of a repository. (0619-1-5 [Mahowald, Philip R.])

Comment: Issue 1 asks whether the specific policy statements regarding the timeline for repository availability should be removed from the rule text. The shifting dates and timeframes in previous update to the rule have not inspired confidence that a national repository will become available and in fact, have done much to frustrate host communities. While having a date included in 10 CFR 51.23 might be a reflection of current thinking of whether a repository might be available, it adds nothing. We do not believe that the final rule should include a timeframe by

which a repository will become available. Instead we believe that the NRC should include a plan for updating the GEIS that would be reflective of the current status of a repository. (0619-2-7 [Mahowald, Philip R.])

Comment: Issue 2 asks whether specific policy statements regarding the safety of continued spent fuel storage should be included in the rule, given the expansive and detailed information in the draft GEIS. In May 2012, the NRC issued the draft report "Identification and Prioritization of the Technical Information Needs Affecting Potential Regulation of Extended Storage and Transportation of Spent Nuclear Fuel." Our understanding was that this technical report was related to the NRC's Long-Term Waste Confidence Update, initiated in 2011. The "Extended Storage" technical report identified a number of technical issues related to long-term storage of spent nuclear fuel, such as the lack of monitoring or inspection capability for cladding, fuel cladding interactions, fuel assembly hardware and damaged fuel cans, fuel baskets, stainless steel canister, stainless steel canister, stainless steel canister and steel/cast iron and seals, polymer seals, neutron absorbers, and neutron shielding. These technical issues must be resolved. The Tribe recommends that the NRC finalize the "Extended Storage" technical report before issuing the final Waste Confidence GEIS. The information and conclusions in a final Extended Storage report would certainly help the public understand whether spent nuclear fuel for can be stored on-site for the long-term or indefinitely. Our comment letter to the NRC can be found in ADAMS (ML12191A218). (0619-2-8 [Mahowald, Philip R.])

Comment: I must say first of all that the term "confidence" when used to refer to nuclear waste is an oxymoron. To pretend that nuclear 'waste confidence' can be handled as a public relations/ terminology issue is to deny reality. (0640-1 [Geary, B.])

Comment: It is at least implicitly required because if there is no waste confidence, it is immoral to continue making nuclear waste, especially because much of that waste remains extremely dangerous for centuries and, in the cases of some radioisotopes, for millennia. (0679-2 [Sorgen, Phoebe])

Comment: The comedy of still including the 60 year mined geologic repository is lessened by the court's ruling on Yucca Mountain this past summer, but I do not think that the NRC does itself nor instills confidence by including this language and even idea when no determination to create such a site has been fully implemented. (0703-10 [Vandel, Nikohl] [Vandenberg Clermont, Elaine])

Comment: AREVA endorses revising the names of the proposed rule and draft GEIS and to discontinue the "Waste Confidence" and "Temporary storage of spent fuel after cessation of reactor operation-generic determination of no significant environmental impact" terms to a more effective title that defines the contents of the rule and GEIS in general words. Moreover, "Waste Confidence" is a historic artifact that does not stand alone without a technical explanation of how the title originated. The names fail to clearly convey the intent of the proposed rule, which details the safe storage of spent fuel after the end of a reactor's operating life. AREVA supports the following NEI suggestions of new titles for the proposed rule and draft GEIS: "Storage of Spent Nuclear Fuel after Licensed Term of Operation" and "Generic Environmental Impact Statement for the Storage of Spent Nuclear Fuel after Licensed Term of Operation." These suggested titles, or similar revisions, would better state the purpose of the rule and GEIS. (0745-4 [Kelley, Devin])

Comment: The term "Waste Confidence" is a historical artifact from the NRC's policy determination addressed in the NRDC petition for rulemaking and the subsequent court

decision. The term fails to transparently capture the purpose of the proposed rule, which relates primarily to the storage of spent fuel after the end of a reactor's operating life. For that reason, as will be discussed further below, NEI encourages the NRC to discontinue the use of "Waste Confidence" to describe the environmental impacts of interim storage. (0827-1-2 [Ginsberg, Ellen])

Comment: Similarly, NEI believes that the title of the current proposed rule, "Environmental Impacts of Storage of Spent Nuclear Fuel Beyond the Licensed Life for Operation of a Reactor," should be changed. As discussed further below, NEI supports a rule title such as the "Storage of Spent Nuclear Fuel After Licensed Term of Operation." Similarly, the GEIS could be named the "Generic Environmental Impact Statement for the Storage of Spent Nuclear Fuel After Licensed Term of Operation." These titles would more clearly articulate the purpose and substance of the rule and GEIS. (0827-1-3 [Ginsberg, Ellen])

Comment: NEI does not believe that streamlining of the statements of consideration and rule is necessary or advantageous. Summarizing the content in the SOC that is also contained in the GEIS will only enhance public understanding of the relationship between the GEIS and rulemaking package. The GEIS achieves a slightly different purpose than the prior WCD Findings. Therefore, it would be logical to address the traditional WCD Findings and the relevant information contained in the GEIS in either the rule or the SOC for the rule, rather than including that information only in the GEIS. The SOC should address the bases for the rule, including a discussion of the feasibility and reasonable assurance of safe spent fuel storage and repository availability. (0827-6-10 [Ginsberg, Ellen])

Comment: NEI supports changing the name of the rule and GEIS. We recommend the NRC to discontinue using "Waste Confidence" and "Temporary storage of spent fuel after cessation of reactor operation--generic determination of no significant environmental impact" and adopt a title that better describes the contents of the rule and GEIS. Moreover, by adopting a clearer title, the purpose and limited application of the rule will be more evident to members of the public who are not aware of the historical basis for the "Waste Confidence" term. NEI supports a rule title such as the "Storage of Spent Nuclear Fuel After Licensed Term of Operation." Similarly, the GEIS could be named the "Generic Environmental Impact Statement for the Storage of Spent Nuclear Fuel After Licensed Term of Operation." (0827-6-11 [Ginsberg, Ellen])

Comment: The SOC for the revised TSR should explain the basis for the rule, retaining much of the discussion in current Section C. It would make clear that the rule preserves and updates the previous WCD Findings - supplemented and supported by the GEIS. However, there would be no need to label them as specific "Findings" as done in the past. Additionally, the GEIS assesses the environmental impacts of interim spent fuel storage, including the issues remanded by the D.C. Circuit, and summarizes the record supporting the rule. Presenting all necessary elements in the rule would be the simplest and most straightforward approach. The SOC would explain the basis for the rule and include "Conclusions" (as it does now) that support the rule. (0827-6-3 [Ginsberg, Ellen])

Comment: The revised rule text need not articulate specific timelines for repository availability in order to capture the Commission's essential finding that a repository can be available when necessary. NEI believes that a more general, "when necessary" finding is appropriate in the rule text. The robust discussion of specific timeframes for repository availability contained in the SOC and GEIS - including the Commission's conclusion that it is feasible to have a mined geologic repository within 60 years of licensed life for operation of a reactor - would support such a finding. Thus, NEI's proposed rule language provided above would not include a specific timeline for, or prediction regarding, repository availability. There is no legal requirement that the

rule include such a timeline or prediction. Nonetheless, the Commission's more specific predictive findings regarding repository availability should be maintained - whether in the SOC, the GEIS, or both - because such findings are useful in framing the agency's assessment of the safety and environmental impacts of continued spent fuel storage. Although the GEIS examines very long time periods, the Commission's specific conclusion regarding repository availability is that "a reasonable timeframe for repository availability is within 60 years beyond the licensed life for operation of a reactor."¹¹⁷ [footnote 117 text: 78 Fed. Reg. 56794.] The Commission also finds that it is "technically feasible to safely and securely store spent fuel in either wet or dry storage for *at least* 60 years beyond a reactor's licensed life for operation with only routine maintenance" and "that spent nuclear fuel can be safely managed in spent fuel pools in the short-term timeframe and dry casks during the short-term, long-term, and indefinite timeframes evaluated in the DGEIS."¹¹⁸ [footnote 118 text: *Id.* at 56799 (emphasis added).] So, the Commission's more specific predictive conclusions regarding repository availability (and the supporting analysis) provide both a basis for more general "when necessary" rule language, and context for more general safety conclusions regarding continued storage. Thus, NEI's proposed rule language discussed above would continue to include "when necessary" as the timeframe for repository availability. (0827-6-8 [Ginsberg, Ellen])

Comment: Specific statements capturing the Commission's conclusions regarding the safety of spent fuel storage during the continued storage period should be included in the rule text. This approach is simple and transparent; appropriately addresses the issues raised in *Minnesota v. NRC*, as well as *New York v. NRC*; and is consistent with the agency's long-standing approach to addressing continued storage. Thus, NEI's proposed rule language would include a specific policy statement regarding the safety of continued storage. Although policy statements regarding the safety of continued spent fuel storage need not be included in the rule text *per se*, such statements (whether in a rule, a Finding, a Conclusion, or in a GEIS) are necessary to resolve issues raised in both *Minnesota v. NRC* and *New York v. NRC*. NEI believes that the rule should capture the essential finding, backed up by more specific Conclusions in the SOC, which are, in turn, consistent with the record summarized in the draft GEIS and prior WCD Findings. Although the GEIS includes comprehensive information regarding safe spent fuel storage, the GEIS itself is an environmental document assessing the environmental impacts of continued spent fuel storage. The GEIS supports conclusions regarding safe spent fuel storage, but its primary purpose is to satisfy the agency's environmental obligations under NEPA. To directly address the showing suggested in *Minnesota v. NRC*, NEI encourages the Commission to retain determinations regarding the safety of continued spent fuel storage in the rule, supported by similar "Conclusions" in the SOC. (0827-6-9 [Ginsberg, Ellen])

Comment: For Additional Issue 1, I do not support the inclusion of timelines on the availability of a future geologic repository in the final rule. The history of the development of a permanent repository, since the passing of the NWPA, is replete with missed timelines. No guarantee is available that future performance in developing, licensing, and constructing a repository will be any better. Therefore, to simplify the final rule, I would remove language dealing with repository timelines. However, I would retain any statements providing a duration on how long spent fuel can be safely stored, especially in dry storage systems (casks). (0841-3 [Corrino, G])

Comment: For Additional Issue 2, I support inclusion of policy statements within the rule text. Purpose, scope, and objective language is found in many other places in 10 CFR Chapter 1. Its inclusion here would be consistent with the Commission's openness and transparency goals. (0841-4 [Corrino, G])

Comment: For Additional Issue 3, I support inclusion of additional details within the final rule FRN's preamble. The FRN is more readily available and searchable to the public, than is an NRC NUREG GEIS. Therefore, it will be more helpful to future users to have this critical information in searchable location. (0841-5 [Corrino, G])

Comment: For Additional Issue 4, I support revising the title of the final rule. (0841-6 [Corrino, G])

Comment: Disavow "Waste Confidence" when it is impossible to guarantee the safe future of nuclear waste[.] (0890-6 [Arnason, Deb])

Comment: As a private citizen long concerned about nuclear power, particularly in Michigan but worldwide also, I have searched the "Waste Confidence Generic Environmental Impact Statement Draft Report for Comment" in vain for a simple, straight forward definition. Now I recall being at the NRC meeting long ago in Lansing, Michigan, where their discussion led to the decision to eliminate definitions as the most inexpensive and most effective [least responsible?] pathway to proceed in the development of nuclear power. Therefore, my major comments will be on a seeming obfuscation via use of terms in a specific NRC fashion, in employing language all too often twisted from its normal uses. (0910-1 [Carey, Corinne])

Comment: On page xxiii ESI is titled "What is Waste Confidence?" gives NO definition, only "determination" and other references to the misleading "confidence". Included is "before final disposal in a permanent repository", and "continued storage", a situation proving impossible in the history of nuclear power. (0910-5 [Carey, Corinne])

Comment: Issue 1. The Department believes the specific policy statements regarding the timeline for repository availability should remain in the rule because the availability of a repository is the most critical issue affecting long term dry cask storage at-reactor or away-from reactor. The inclusion of the statements in the rule indicates the importance the Commission places on this key assumption of the GEIS. As reflected in the above comments, the Department believes geologic repository disposal provides permanency, control, and overall radiation safety. (0913-12 [Bevill, Bernard])

Comment: Issue 2. The Department does not believe it is necessary to include specific policy statements in the rule addressing continued spent fuel storage, given the proposed wording of Paragraph 51.23(a)(2). sufficiently states the Commission's "policy" storage. It seems this wording on continued spent fuel[.] (0913-13 [Bevill, Bernard])

Comment: Issue 3. The Department agrees the Discussion portion of the Statement of Consideration should be "streamlined" to avoid unnecessary duplication. (0913-14 [Bevill, Bernard])

Comment: Issue 4. The Department believes the title of the rule should be changed to accurately reflect the purpose of the analysis, evaluation, and conclusions of the study of continued storage of spent nuclear fuel. It is no longer a Waste Confidence Decision. (0913-15 [Bevill, Bernard])

Comment: The very first time I ever heard the phrase "Nuclear Waste Confidence" was in March 2003 - right around the time the George W. Bush administration launched the invasion of Iraq --at an Early Site Permit public meeting held at the public library in Clinton, IL, having to do with a proposed new Exelon reactor targeted at that town (since cancelled, thankfully!). An elder

local farmer, sitting in the front row, raised his hand early on in the meeting. He asked how Exelon and NRC could even be considering building a new reactor in Clinton, IL, when the high-level radioactive waste from the first reactor already operating in Clinton had nowhere to go, and no solution in sight. One after another, several NRC staff persons attempted an answer, all to no avail. Each punted to his or her NRC co-worker around the room. After a number of such punts, the last NRC staff person was about to punt the question to Exelon officials, several of whom were also in attendance. At this point, the NRC facilitator - Chip Cameron, who has also facilitated numerous of the WC DGEIS public comment meetings of recent months - intervened. "What about the Nuclear Waste Confidence Rule," Chip Cameron - who has also long worked for NRC's Office of General Counsel, in addition to its Office of Public Affairs --prompted his colleagues, who then, having remembered their lines, cheerfully informed the concerned local resident that NRC has "Confidence" that a repository will be opened somewhere, somehow, someday, by someone, and in the meantime, the highly radioactive wastes are safe and sound right where they are in Clinton, IL. The farmer seemed a little less than convinced. I also did not share NRC's "confidence." It seemed very much a con game. (0919-1-5 [Kamps, Kevin])

Comment: To begin with, the use of the word confidence is to imbed the notion that there might be any *confidence* in the draft statement. There could be none because of the history of the NRC faulty assumptions and its actions. (0933-1 [Anonymous, Janet])

Comment: The term "Waste Confidence" is a meaningless term -- other than the clear fact that I have 100% confidence that radioactive waste from nuclear power facilities will exist somewhere for many millenia to come. It is appalling that the NRC has been playing this word game of charades with the public ever since 1983 with this term. They clearly want to help the industry so are "kicking the ball down the field" to hopefully (in the industry perspective) do many more favors for the nuclear industry before finally getting to seriously addressing threatening radioactive waste issues. (0937-15 [Campbell, Bruce])

Comment: Admission from both the nuclear industry and young nuclear engineers IS that the safe waste storage issue has not yet been solved. They promise to work on it with earnest. The public and the NRC can NOT go forward with CONFIDENCE. {deleted text: until s}Solutions MUST BE SOUGHT {deleted text: are found and verified} AND IMPLEMENTED FOR THE WASTE ALREADY PRODUCED. This is a reason for a generic finding of NO CONFIDENCE. (0938-13 [Sondheim, Steven])

Comment: Finally, Exelon is in favor of changing the name of this rulemaking from Waste Confidence to a more factual name such as "Storage of Spent Fuel after Licensed Term of Operation." The term "waste confidence" now fails to transparently capture the purpose of the proposed rule, which relates primarily to the storage of spent fuel after the end of a reactor's operating life. (0942-11 [Helker, David P.])

2. Comments Concerning the Rulemaking Process

Comment: The Commission has the legal authority to supervise the activities of the Regulatory Staff (Reorganization Plan No. 1 of 1980, 5 USC App. I, Section 1), including supervision over any rulemaking proceeding. *Private Fuel Storage L.L.C.* (Independent Spent Fuel Storage Installation), CLI-02-11, 55 N.R.C. 260 (2002) (Commission chose to "exercise ... [its] inherent supervisory authority over adjudications and rulemakings"). Thus, it has the legal authority to review and reverse decisions of the Regulatory Staff, particularly ones related to the ongoing - waste confidence and temporary storage rule proceedings and the accompanying GEIS, which

have been initiated as a direct result of the Commission's decisions in Staff Requirements - COMSECY-12-0016-Approach For Addressing Policy Issues Resulting from Court Decision to Vacate Waste Confidence Decision and Rule (Sept. 6, 2012), ML12250A132 ("Staff Requirements-COMSECY-12-0016"). (0001-5 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: In addition, the Commission has set forth standards for when it would consider reviewing an order issued by an Atomic Safety and Licensing Board. The Staff Scoping Decision, although not issued in a licensing proceeding within the meaning of 10 C.F.R. Part 2 and not subject to the rights and obligations of that Part 2, nonetheless meets the standards established for interlocutory review by the Commission under the provisions of 10 C.F.R. § 2.341(f)(2). (0001-6 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: In addition, the proceedings in which the Staff Scoping Decision was issued should be considered adjudications within the meaning of 5 U.S.C. § 551(7), given that the result of these proceedings will be an Order by the Commission that directly affects ongoing licensing proceedings and future licensing proceedings. See *Calvert Cliffs Nuclear Project, L.L.C.* (Calvert Cliffs Nuclear Power Plant, Unit 3), *et. al.*, CLI-12-16, _N.R.C._, slip op. at 4 (Aug. 7, 2012) ("Waste confidence undergirds certain agency licensing decisions, in particular new reactor licensing and reactor license renewal [I]n recognition of our duties under the law, we will not issue licenses dependent upon the Waste Confidence Decision or the Temporary Storage Rule until the court's remand is appropriately addressed.").¹ [Footnote 1 text: Although the scoping process is not where the ultimate application of the waste confidence GEIS conclusions and the rulemaking outcomes will be determined, Petitioners believe it is important that modifications to the Commission's prior conclusions regarding the environmental impacts of spent fuel storage following plant shutdown, particularly previously unexamined impacts associated with long-term storage of spent fuel at reactor sites, and alternatives that can mitigate those impacts, should be applied at least to those facilities that received operating licenses or license extensions on or after December 23, 2010, when the Commission formally abandoned the position that it could establish a date by which a permanent nuclear waste repository would be available. 75 Fed. Reg. 81032 (Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation) (Dec. 23, 2010). While this right should exist regardless of whether such issues were sought to be raised at the time of the previous licensing action and should not be limited to contested licenses or previously admitted parties, it is notable that at least two of the Commenters in the waste confidence GEIS proceedings, the State of Vermont and the Commonwealth of Massachusetts, attempted to raise similar issues in license renewal proceedings for Vermont Yankee and Pilgrim, but were prevented from doing so by application of the limitations imposed by 10 C.F.R. §§ 51.23(b), 51.53(c)(2), and 51.95(c)(2). See *Entergy Nuclear Vt. Yankee, LLC* (Vermont Yankee Nuclear Power Station), LBP-06-20, 64 N.R.C. 131, 170 (Sept. 22, 2006); *Entergy Nuclear Generation Co.* (Pilgrim Nuclear Power Station), LBP06-23, 64 N.R.C. 257,280-81 (Oct. 16, 2006); *Commonwealth of Massachusetts v. NRC*, 522 F.3d 115, 124-26 (1st Cir. 2008) (Pilgrim and Vermont Yankee facilities).] (0001-7 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: "The Commission may, in its discretion, grant interlocutory review at the request of a party." *Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3), CLI-09-06, 69 N.R.C. 128, 132-33 (Mar. 5, 2009). Such petitions are granted under 10 C.F.R. § 2.341(f)(2) when the party demonstrates that the issue: (i) Threatens the party adversely affected by it with immediate and serious irreparable impact which, as a practical matter, could not be alleviated through a petition for review of the presiding officer's final decision; or (ii) Affects the basic structure of the proceeding in a pervasive or unusual manner. *Id.* While the

Commission grants such petitions only in "extraordinary circumstances," *id.*, the situation presented here involves extraordinary circumstances that "[a]ffect[] the basic structure of the proceeding in a pervasive or unusual manner." *Id.* (0001-8 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: I'm very concerned about the entire process of this EIS. The NRC seems to be in a hurry to proceed to the end of the process without giving it careful review. (0030-12-1 [March, Leslie])

Comment: The timely resolution of this rulemaking is important for long-term power planning. This issue is directly affecting relicensing of nuclear plants and approval of pending construction applications for new reactors, which are vital if we are serious about our commitment to a reliable, safe, and secure source of electricity. (0030-20-4 [Lapiska, Evan])

Comment: I applaud the courts. I applaud them for making -- having the industry. And if you're truly a responsible industry and if the NRC is truly responsible to the American electorate that it serves, then it behooves you take this time, I've read the potential of seven years to study this. I don't care how long it takes. It could take 10 years. It can take 20. That's a drop in the bucket to the life of these radioisotopes. It deserves it. Do not rush this through. Do not do it generically. Consider places like Illinois where we are relying on you. And I thank you for your time. (0030-22-6 [Headington, Maureen])

Comment: With respect to waste confidence, the NRC encourages the Nuclear Regulatory Commission to complete the Waste Confidence EIS rulemaking in a timely manner. (0030-23-3 [Blee, David])

Comment: Completing this rulemaking will allow the NRC to resume issuing licenses and license renewals for nuclear power plants and independent spent fuel storage installations and effectively end the moratorium that is currently impacting those procedures. (0030-23-5 [Blee, David])

Comment: I'd like to highlight the importance of a timely resolution of these waste confidence issues. We strongly support maintaining this rulemaking as a priority. (0030-3-2 [Ginsberg, Ellen])

Comment: I think in terms of the Nuclear Regulatory Commission, the only reason we are having this exercise, and the public is having the opportunity to comment, is it took a Federal court ruling to vacate the Nuclear Regulatory Commission's Waste Confidence rule. It had been challenged internally by people concerned that it made no sense, that it was circular thinking with no base in reality, and it took a Federal court to require the reconsideration. (0030-5-3 [Safer, Don])

Comment: We commend the agency's efforts that have brought us this far, and encourage the continued engagement of the Commissioners, senior NRC management, and the technical staff to complete the rulemaking in a timely manner. Timely resolution is critically important. The Commission has suspended a number of licensing decisions pending resolution of this issue. Deferral of these decisions has impacts with the organizations affected. Licensing decisions are essential for the long-term power planning and other business decisions, such as schedules for capital improvements. This essential decision-making will remain disrupted and inefficient until licensing decisions resume. (0030-7-1 [Matthews, Tim])

Comment: Timely completion of the draft GEIS demonstrates what the NRC staff can accomplish when given clear Commission direction, management engagement, and adequate

resources. This rulemaking should serve as a benchmark for other significant NRC activities, such as licensing and design certification reviews, extended schedules for which seem to have become accepted in some corners as a new norm. The example demonstrates conclusively that the agency -- what the agency can do. (0030-7-2 [Matthews, Tim])

Comment: While many safety reviews of licensing actions have continued on schedule, in some cases the parallel environmental review schedules have slipped as resources have become diverted to support this GEIS effort. The staff should promptly return those -- to those environmental reviews and prioritize review resources so that further delay in adjudicatory proceedings or licensing issuances is avoided. (0030-7-3 [Matthews, Tim])

Comment: In the fall of 2012, the Commission ordered that consideration of waste confidence contentions in adjudicatory proceedings before the Atomic Safety and Licensing Board be held in abeyance while the agency determined how it would address the issues remanded by the D.C. Circuit. The agency has now established a clear path and is well along the way to generic resolution of the remanded issues. Accordingly, the staff should promptly recommend to the Commission options for resumption of adjudicatory reviews, and specifically, the exclusion of waste confidence-related issues from review in individual licensing proceedings, absent the grant of a case-specific waiver to challenge a matter that is the subject of an ongoing generic rulemaking. (0030-7-4 [Matthews, Tim])

Comment: Timely completion of the draft GEIS demonstrates what the NRC staff can accomplish when given clear Commission direction, management engagement, and adequate resources. This rulemaking should serve as a benchmark for other significant NRC activities, such as licensing and design certification reviews, extended schedules for which seem to have become accepted in some corners as a new norm. The example demonstrates conclusively that the agency -- what the agency can do. I would like to touch briefly on the impact of the waste confidence decision in individual licensing actions. While many safety reviews of licensing actions have continued on schedule, in some cases the parallel environmental review schedules have slipped as resources have become diverted to support this GEIS effort. The staff should promptly return those -- to those environmental reviews and prioritize review resources so that further delay in adjudicatory proceedings or licensing issuances is avoided. (0030-7-9 [Matthews, Tim])

Comment: I am very concerned about the entire process of this EIS. The NRC seemed to be in a hurry to proceed to the end of the process without giving any part of it careful review. (0045-11-1 [March, Leslie])

Comment: Our statement today focuses on encouraging the NRC to complete the Waste Confidence Environmental Impact Statement and Rulemaking in a timely fashion. Nuclear energy is an important part of America's energy security providing two-thirds of the Nation's emission-free electricity 24 hours a day. Given these stakes, prompt completion of the Rulemaking is critical to ending the current moratoria on a wide range of final nuclear energy licensing, including issuance of operating licenses for new plants, license renewals for operating nuclear plants, and extension of licenses for independent spent fuel storage facilities. (0045-14-1 [Frankland, Chris])

Comment: [ConverDyn] encourage[s] the NRC to proceed promptly with this Rulemaking. (0045-15-3 [Sandos, Theann])

Comment: CA [Consumer Energy Alliance] strongly supports the NRC's efforts to keep nuclear facilities safe and reliable. And as you continue in the waste confidence rulemaking, we urge you to proceed efficiently and quickly. A timely resolution on this matter is essential. And existing and future nuclear facilities need greater certainties about licensing time-lines and decisions, in order to maintain and expand this vital part of the U.S. energy portfolio. (0045-4-4 [Martini, Shawn])

Comment: The timely resolution of this rulemaking is important for long-term power planning. This issue is directly affecting relicensing of nuclear plants and approval of pending construction applications for new reactors -- which are vital if we are serious about our commitment to a reliable, safe and secure source of electricity. (0060-4 [Lapiska, Evan])

Comment: [T]imely resolution of this rulemaking is important for long-term power planning. This issue halts the building of new reactors and ultimately puts a delay on our energy efficiency. (0112-21-4 [Morris, Kelsi])

Comment: Second, NRC's rulemaking process is vague. And I say this because it's like very, you know, complex terminology that the average person can't understand. That experts and lawyers spend a very long time researching and pouring over. And it's contradictory. It's kind of obtuse. It's like almost like church or something. Not in a bad way. I don't intend to insult any church. But if you make comments or criticisms, technical arguments, you point out design flaws, you point out things like the underground pipes at Vermont Yankee that weren't disclosed, your comments disappear into the rulemaking process. And it could be years before NRC turns around with a real solution. Cite specific arguments and move to rulemaking and address basically after years of study. So nothing is done quickly. (0112-31-3 [Johanson, Birgit])

Comment: So on any given day in the normal day in the life of the NRC there's no transparency and no real opportunity for the public to have any meaningful input into how the reactors are run, how they operate, and certainly no real opportunity input into the best available methods for managing the spent fuel. And because of the sort of the nature of the dialogue itself the way the rulemaking is set up, you're only allowed to address certain specific issues. Anything that falls outside of the question being asked is not considered. So the nature of the dialogue itself limits inquiry and intelligent discussion. To close, rulemaking that's vague and has, I guess, many holes in it --It's more of an obstacle to real solution than a help. The guidelines are in principle founded upon assumptions formed in the 1950s and before in the war time era. To continue to build on such an outdated foundation is a hazard. To stay in rigid compliance with its own rules NRC has, in effect, bound its own hands and put the public at enormous risk. I support redesigning the entire legal basis for the NRC's regulatory enforcement. (0112-31-6 [Johanson, Birgit])

Comment: While it is the federal government's responsibility to remove used fuel from nuclear plants, the federal government has not moved a single used fuel assembly. As such, it is important for the NRC to continue transparent and efficient efforts to maintain its 24-month schedule for the current waste confidence proceedings so that progress on both plant licensing and used fuel management can continue. (0115-2 [Salley, Lawrence])

Comment: The US Nuclear Regulatory Commission has always applied due diligence and demonstrated its dedication to public safety. The rule-making process currently underway for used fuel management is another example of the NRC's commitment to safety and transparency. (0118-2 [Westchester, Business Council of])

Comment: [W]e urge you to stick with the 24-month review period to eliminate uncertainty in the decision making process. In this regard, the NRC is taking the appropriate steps toward avoiding costly, inefficient and unnecessary case-by-case reviews of the issue. (0118-5 [Westchester, Business Council of])

Comment: We have two choices. As a human race, AND as corporate utility decision makers. To become more conscious in our decisions. Or to become more Unconscious in our decisions. There is no longer an in-between place to dwell in. To date, the NRC decision makers have been hiding in the in-between places. Hiding inside the anonymity of the commission process. In this way each decision maker participates knowingly in the issuance of harm-making decisions, the same way the members of a firing squad each agree to pull the trigger, knowing they will never be held personally accountable. And they are paid too. It's quite the same. (0120-5 [Seeman, Laurie])

Comment: We [NAYGN] believe it is important for the NRC to continue its transparent and efficient efforts to maintain its 24-month schedule for the current Waste Confidence proceedings so that progress on both plant licensing and used fuel management can continue. (0163-17-3 [Schepperly, David])

Comment: The timely resolution of this rulemaking is important for long-term power planning. This issue is directly affecting re-licensing of nuclear plants and approval of pending instruction applications for new reactors which are vital if we are serious about our commitment to reliable, safe, and secure source of electricity that will help combat climate change. (0163-18-5 [Lapiska, Evan])

Comment: I would like to thank the NRC for having us and Attorney General Schneiderman for making this issue come to the courts. (0163-48-1 [Meyer, Bill])

Comment: I urge the NRC to approve the Waste Confidence Rule as soon as possible in its current proposed state (or similar), so that we, as a country, can resume licensing/relicensing clean, safe, carbon-free nuclear power plants such as we are accustomed to here in the Carolinas. (0179-1 [Graham, Susan])

Comment: Accordingly, timely resolution to the issue of waste confidence plays an important part of meeting this strategic need, and we join the rest of the industry in strongly supporting making this rulemaking a high priority. Not only is resumption of ongoing licensing activities essential for long-term power planning decisions, but it is also important to reestablish confidence in the nation's ability to conduct new licensing proceedings. (0182-3 [Vytlačil, Gordon])

Comment: I look forward to a timely resolution of this rulemaking so that the NRC can get back to some of the important tasks they handle each and every day that have been placed on hold while this plays out, including the relicensing of nuclear plants and approval of pending construction applications for new reactors. (0212-5 [Lapiska, Evan])

Comment: The timely resolution of this rulemaking is important for long-term power planning. This issue is directly affecting relicensing of nuclear plants and approval of pending construction applications for new reactors -which are vital if we are serious about our commitment to a reliable, safe and secure source of electricity. (0213-5 [Coalition, Clean and Safe Energy])

Comment: The proposed rule is essential to the NRC. The continued licensing of nuclear energy facilities cannot continue without the rule change. The absence of a rule change would be a serious burden on the nuclear energy industry and their production of 20% of the nation's electricity. (0219-3 [Olmstead, Stan])

Comment: In the proposed rule that accompanies the draft GEIS, the NRC also proposes to incorporate into every reactor license the Draft GEIS' conclusion that spent fuel can be safely stored above ground forever. Thus, the NRC would forbid any further public discussion, in individual reactor licensing actions, of the serious question of whether generation of additional spent fuel is justifiable in light of the absence of any means of safe disposal. (0221-2 [Ferguson, Tom])

Comment: In sum, we recommend that the Commission heed the advice of those who estimate that the waste confidence rule should take three to four times as long as what the Commission has ordained. (0222-10 [Zeller, Lou])

Comment: The NRC is rushing the process. NRC must resolve many technical issues including long-term waste integrity, vulnerability, deterioration and accidents. For example, the nuclear waste stored at Fukushima is still being evaluated. According to an NRC staff plan, a long-term waste confidence update was expected to take eight years⁸ [Footnote 8 text: "Waste Confidence Decision: Background," Christine Pineda, NRC Office of Nuclear Material Safety and Safeguards, October 4, 2011, <http://www.nrc.gov/waste/spent-fuel-storage/christine-pineda-10-04-2011.pdf>] Yet the NRC has set a deadline of September 2014 to finalize the new rule. The agency's two-year deadline is rushing the process and the public will suffer if the NRC persists in pleasing the industry at the expense of public safety. (0222-6 [Zeller, Lou])

Comment: This is the fourth one of these meetings that I've attended, and they continue to be, what I would consider, a shining example of the way our regulatory processes work. It is a very rigorous process, it is very open, it is very transparent. It is a very necessary process. The rulings of the Court do need to be responded to and this is an issue we should weigh very seriously. It also is being conducted on schedule, and this is very important that you continue to be conducted on schedule. (0244-11-1 [McCullum, Rod])

Comment: We believe that is important that the NRC continue its transparent and efficient efforts to maintain this 24-month schedule for the current Waste Confidence proceedings so that progress on both licensing and spent nuclear fuel disposal can continue. (0244-2-4 [Knowles, Berdell])

Comment: The NRC must now revise these -- review these transcripts and then complete the edits of the Environmental Impact Statement called for by the Court, and publish the EIS and the revised Rule, and it should not take a year to do it. (0244-4-5 [Rossin, A. David])

Comment: We believe that the NRC should move promptly to finalize the Waste Confidence Generic Environmental Impact Statement. A delay in this process is detrimental to the future of our state's long-term energy portfolio. (0244-7-4 [Kuntawala, Jitesh])

Comment: The Proposed Rule simply clarifies the issues and processes surrounding the safe and secure storage of spent nuclear fuel. It does not authorize individual licenses. It is only one step in the Commission's National Environmental Policy Act review. And hence, the clarity of this policy will lead to a more efficient licensing process which would benefit consumers throughout our region. In addition, the NRC rulemaking process is the kind of open and

transparent process that should take place in all aspects of government regulation, especially the widespread participation of all aspects of government, industry, and the public in order to ensure that all viewpoints are considered. A total of 12 public meetings will take place, and members of the public will have the opportunity to submit comments to the Commission through December 20th of 2013. Upon the completion of this process, it is my hope that NRC will complete this rulemaking in an expeditious manner. (0245-1-2 [Wilson, Reed])

Comment: The Federal courts have said NRC must have a valid and realistic assessment of the environmental impact of long-term storage of spent nuclear fuel. In response, the NRC plans to take only two years for the EIS, and more correctly, the environmental review. NRC's own staff says it will take seven years to do an EIS. The two-year time frame NRC is using has been only enough time to summarize the currently available information about the risks of long-term storage and the existing information is inadequate. One study that's looking at the long-term storage has been started but it will take until 2019 to finish. (0245-15-1 [McComb, Sandy])

Comment: I urge you to finalize the Waste Confidence Rule in a timely manner to help our company work to its best. (0245-18-4 [Stenson, Amanda])

Comment: We encourage you to carefully consider the economic impact of regulations governing the transportation and storage of spent nuclear fuel. (0245-9-2 [Peck, Jerry])

Comment: [W]e believe it is important for the NRC to continue its efforts and to maintain its current schedule for Waste Confidence proceedings, so that progress on both plant licensing and used fuel management can continue. Again, thank you to the NRC for hosting this public meeting and providing the opportunity for comments. (0246-1-4 [Husch, Ben])

Comment: We compliment the Directorate's outreach efforts, as well as their ability to adhere to the schedule laid out by the Commission. We underscore the importance of maintaining the schedule so the NRC licensing decisions will not be unduly delayed. (0246-12-2 [McMurrian, Katrina])

Comment: From the documents, the very thorough, extensive documents that NRC has provided for comment, all the way through these meetings, this has and continues to be a shining example of the rigor with which the regulatory processes that govern the nuclear industry work. (0246-19-1 [McCullum, Rod])

Comment: I look forward to a timely resolution of this rulemaking so that the NRC can get back to some of the important tasks they handle each and every day that have been placed on hold while this plays out, including the relicensing of nuclear plants and approval of pending construction applications for new reactors. (0246-20-5 [Lapiska, Evan])

Comment: I would like to take my three minutes to set a couple three things straight on the record about some misleading statements that NRC has made in this draft Generic Environmental Impact Statement and at the hearings that have taken place. So, I would like to go back to a New York Times article in February of 2010 about the lawsuit brought by several states and several environmental groups that led to the Court ruling in June of 2012, that ordered NRC to undertake this EIS proceeding. And in that article, a top spokesman for the Office of Public Affairs at NRC made the statement that the Nuclear Waste Confidence Rule has nothing to do with licensing at NRC. And this statement, this idea has been carried into this document itself at various places. I would like to read from Section 7.3 on page 78, just the first paragraph. And I quote: "In the proposed action, the NRC implements a regulatory approach

that includes an update to the Waste Confidence Rule, 10 CFR 51.23, that codifies the results of this draft GEIS. The update would clarify that. Because the impacts of continued storage have been generically assessed in the GEIs and codified in a Rule, the NEPA analyses for future reactor and spent fuel storage facility licensing actions would not need to independently consider the environmental impacts of continued storage. The Rule also serves to preclude any challenge to the NRC's assessment of the environmental impacts of continued storage in the site-specific licensing action. Unless a petitioner can show that sufficient 'special circumstances' exist to justify waiving 10 CFR 51.23 in a particular proceeding." And they cite 10 CFR 2.335. And I end quote. So, the statement that has been made is that this Nuclear Waste Confidence Rule has nothing to do with licensing new reactors or extending the licenses of old reactors. And this is very misleading. This is deceptive. In fact, the Nuclear Waste Confidence Rule lays the basis for that licensing. As I just quoted, it would bar public intervention in the future. It would lock the public out as much as we have been locked out for decades on raising the issue of high-level radioactive waste generation in licensing proceedings. And I can personally attest to that from the license extension proceeding at Palisades in Michigan where we raised this issue, as well as the new reactor licensing proceeding at Fermi 3. This absolutely has to do with licensing. It lays the groundwork. It greases the skids. So, NRC statements to the contrary in this document, at these public hearings, are quite misleading, actually. (0246-32-1 [Kamps, Kevin])

Comment: The timely resolution of this rulemaking is important for long-term power planning. This issue is directly affecting relicensing of nuclear plants and approval of pending construction applications for new reactors, which are vital if we are serious about our commitment to reliable, safe, and secure source of electricity. (0246-8-3 [Vince, Jenny])

Comment: So I encourage the NRC to complete the Waste Confidence EIS rulemaking. This is an important part of our future for nuclear power[.] (0250-14-2 [Brookhart, Ryan])

Comment: The NRC is reviewing this Waste Confidence Rule, and I again encourage them to complete the rulemaking, to allow them to resume issuing licenses and continuing to process installations. (0250-14-4 [Brookhart, Ryan])

Comment: I urge the NRC to continue on a priority basis with this rulemaking process. (0250-15-5 [Rodack, Tom])

Comment: We urge the Commission to complete the Waste Confidence rulemaking, and move forward with licensing of renewed, operating licensing for existing plants and new units to come. (0250-21-2 [Gunn, George])

Comment: Due to nuclear energy's crucial role in our nation's diversified portfolio, it is essential that the NRC complete the Waste Confidence rulemaking and resume issuing new operating licenses and license renewals for nuclear plants. (0250-24-3 [Rogers, Tim])

Comment: We believe it is important for the NRC to continue its transparent and efficient efforts and to maintain its 24-month schedule for the current Waste Confidence proceedings so that progress on both plant licensing and used fuel management can continue. (0250-32-4 [Wesley, Ashleigh])

Comment: Finally, I must emphasize how important it is the NRC completes this rulemaking in a timely manner. The Court remand of the Waste Confidence Rule led to a suspension of NRC licensing activities. (0250-6-6 [Nesbit, Steve])

Comment: Completing the Waste Confidence rulemaking will allow the NRC to fulfill its obligation to license and oversee nuclear facilities. (0250-6-8 [Nesbit, Steve])

Comment: And I think, lastly, the most important thing is meeting commitments. So I think we have got to resolve this issue in a timely basis to remove not only that uncertainty but provide some surety going forward in this process so we can address these issues in a safe, dependable, and economic fashion going forward. (0250-61-5 [Little, Jim])

Comment: I do request the NRC to bring this to closure and to continue these public meetings and get the comments and the dialogue going but close the issue and get it to the commissioners so we can make a decision and move on. It is really important. (0250-62-3 [Fregonese, Vic])

Comment: Accordingly, timely resolution to the issue of Waste Confidence plays an important part of meeting the strategic need. And we join the rest of the industry in strongly supporting making this rulemaking a high priority. Not only is resumption of ongoing licensing activities essential for long-term power-planning decisions, but it is also important to reestablish confidence in the nation's ability to conduct new licensing proceedings. (0250-65-3 [Vytlačil, Gordon])

Comment: I would just like to say that we don't think this is a streamlining process. We're afraid this is a steam-rolling process. (0250-7-6 [Corbett, Susan])

Comment: It is important for the NRC to continue its efforts and maintain its 24-month schedule for the current waste confidence proceedings - as this will help to ensure that the industry can continue to move forward with both plant licensing and used fuel management. I would like to thank the NRC for hosting this public meeting and providing an opportunity for comments. (0253-7 [Avilla, Karen])

Comment: Following the completion of this process, it is my hope that the NRC will complete this rulemaking in an expeditious manner. (0273-4 [Kinzinger, Adam])

Comment: We urge the Nuclear Regulatory Commission to complete the waste confidence rulemaking and move forward with issuing renewed operating licenses for existing nuclear plants and licenses to build and operate new plants. (0307-5 [Fuentes, Julio])

Comment: I strongly urge members of the Nuclear Regulatory Commission to complete the waste confidence rulemaking so that progress on both plant licensing and used-fuel management can continue. (0308-3 [Weinberg, Luz])

Comment: I believe it's important for the NRC to continue its practice of conducting regulatory, licensing, and oversight activities in an open and transparent manner. Equally important is the need for the NRC to maintain its 24-month schedule for the current Waste Confidence proceedings to properly inform the process leading to the development of a Final Generic Environmental Impact Statement and Proposed Rule so that the progress on both nuclear plant licensing and used fuel management can continue. (0325-13-7 [Wicks, Tonja])

Comment: The timely resolution of this rulemaking is important for the long-term planning of our nation's electricity infrastructure. This issue directly impacts the relicensing of nuclear plants and approval of pending construction applications for new reactors, both of which are vital if we

are serious about our commitment to fighting climate change and insuring a reliable, affordable source of electricity for all Americans. (0325-16-4 [Bailey, Savannah])

Comment: I urge the NRC to enhance its priority on the oversight role for the management, transportation, and disposal of used nuclear fuel. This work must be done in an expedited manner. It's critical the NRC press on with transparency, while staying true to the 24-month schedule for its current Waste Confidence proceedings. Staying on track and staying on schedule will help ensure that plant licensing and used fuel management efforts can continue while allowing people like those in this room to have their voices heard. The NRC mission is safety. We need to have safe, reliable nuclear energy to produce carbon-free energy. (0325-4-4 [Quinn, Ted])

Comment: The timely resolution of this rulemaking is important for the long-term planning of our nation's electricity infrastructure and meeting our country's ambitious goals for greenhouse gas reduction. This issue directly impacts the re-licensing of nuclear plants and approval of pending construction applications, both of which are vital if we are serious about our commitment to slowing climate change and ensuring a reliable, affordable source of electricity for all Americans. (0326-25-4 [Bailey, Savannah])

Comment: 10 CFR 51.23, it's a lot of gobbledygook, that refers to the proposed regulation that was mentioned at the outset. That regulation effectively accepts onsite storage forever if that becomes necessary. The NRC has very craftily used this court remand that was won by the hard fought environmental warriors that took them. The NRC is using the rulemaking as a means of cutting out the public. Generic Environmental Impact Statement means here in 2013-2014 they're making a decision and, essentially, forever. Let's say if forever only means a couple of hundred years, so long after we're dead, no one will be able to challenge the environmental effects as these casks deteriorate, have to be replaced, are bombed, are destroyed by elements, are flooded. No one will be able from the public to meaningfully question and legally attack the sufficiency of the storage scheme. (0327-13-3 [Lodge, Terry])

Comment: Furthermore, the provenance of the revised rule is unusual in that it has emerged in response to, and as a result of, the unanimous decision of a Federal Court of Appeals which vacated and remanded the previous 2010 version of the NRC Waste Confidence Rule. (0327-18-1 [Schonberger, David])

Comment: First backed by the courts to do an environmental impact statement process, which generally takes seven years, is now jammed into two years. We have a series of meetings across the country perfunctorily manufacturing consent that it's okay to go on generating more and more of this. This is a confidence scheme. This is a fraud perpetrated on the taxpayers and the rate payers; a scam. (0327-2-2 [Keegan, Michael])

Comment: I find this whole process to be extremely demoralizing and futile. I've been through it many times on the protesting side, or on the conciliatory just testifying without making a ruckus sort of thing. I think the whole -- this whole process is a sham and a fraud. (0327-6-1 [Leonardi, Michael])

Comment: So, you know, my recommendation to you would be that you extend the time line of this process, and that you go away and you involve an appropriate spectrum of stakeholders in developing a GEIS that has some meaning and some substance to it, and addresses the issue that preoccupy us in connection with the nuclear industry. (0328-11-4 [Muller, Alan])

Comment: I'm concerned about a number of things. We have this additional issues for public comment where there are four issues laid out, and this is, as others have said, this is very circular. And if you look at issue 1, and issue 2, or issue 3, the NRC has prepared an Environmental Impact Statement to support the Rule. Well, that's not, like, how you prepare an environmental impact statement. You don't prepare it to support the rule. No. You do the environmental impact statement, you know, and see what it says, see what issues are raised, not to support the rule. You're going about this backwards. It's not going to work, it's backwards engineered. (0328-14-1 [Overland, Carol])

Comment: I feel as if it's being rushed through, and storing waste which is going into infinity is not something you just do lightly[.] (0329-15-2 [Star, Priscilla])

Comment: [O]ne of the reasons I think this process is being rushed is because the Watts Bar 2 operating license for the new reactor may be the first one that is effective by any delay in having a waste confidence regulation, which would allow that license to be issued. If I were the NRC, I wouldn't worry about TVA and Watts Bar 2. TVA already finally admitted that it was going to take more than two more years and another billion dollars, more than a billion dollars, to build that. So, like every reactor ever built in the United States, it did not come in on time and on budget. And a delay to get the issue of licensing right is perfectly appropriate. (0329-25-4 [Paddock, Brian])

Comment: I also have serious doubts and concerns about the integrity and independence of the NRC's administrative rulemaking process. (0329-7-3 [Schonberger, David])

Comment: THE OUTCOME OF NRC'S COURT-ORDERED HIGH-LEVEL RADIOACTIVE WASTE STUDY MUST BE INCORPORATED INTO LIMERICK'S FINAL EIS, REGARDLESS OF THE LENGTH OF TIME REQUIRED (0377-5-10 [Cuthbert, Lewis])

Comment: 2 YEARS IS NOT ADEQUATE FOR A VALID RELIABLE RADIOACTIVE WASTE STUDY! NOTE: NRC'S own technical staff estimated it would take until 2019 for data collection and analysis of impacts of long-term storage of spent fuel. That is 6 years, not 2 years as currently planned in NRC's rushed study. NOTE: Dr. Makhijani, an independent expert, and others said: NRC will not be able to gather information within 2 years. THE BODY OF EVIDENCE ACE PROVIDED IN THESE COMMENTS REVEALS A LONG LIST OF UNANSWERED RADIOACTIVE WASTE QUESTIONS, ISSUES, AND CONCERNS. THE CONSEQUENCES OF NRC'S REGULATORY NEGLIGENCE CONCERNING HIGH-LEVEL RADIOACTIVE WASTES COULD HAVE DEVASTATING CONSEQUENCES TO OUR REGION, OUR NATION, AND THE WORLD. A 6-YEAR RADIOACTIVE WASTE STUDY SHOULD BE IMPERATIVE IF IMMEDIATE PRECAUTIONARY ACTIONS RECOMMENDED IN THIS REPORT ARE NOT TAKEN (0377-5-11 [Cuthbert, Lewis])

Comment: The rushed two-year timeframe for environmental review falls far short of the 2019 estimate of NRC's own technical staff for data collecting and analysis on the impacts of long-term storage of spent nuclear fuel; NRC currently lacks sufficient information to reach scientifically, well-founded conclusions about the impacts of such storage; NRC also lacks information regarding the impacts associated with the eventual disposal of spent nuclear fuel; According to Dr. Makhijani, the NRC will not be able to gather this information within its truncated, self-imposed two-year timeframe; The short timeframe provided for environmental review will also not permit post-Fukushima information about U.S. reactors to be fully collected and evaluated; Current federal law requires that the NRC conduct a comprehensive environmental impact statement (EIS) study before issuing a revised Waste Confidence

Decision; ACE concurs with the 24 groups that on January 3, 2013, requested a full review of the three issues outlined in June 2012 by the U.S. Court of Appeals for the D.C. Circuit that would take at least seven years. This was originally projected by the NRC staff, and likely considerably longer. 1. long-term storage risks for spent nuclear fuel; 2. spent fuel pool fire risks; 3. spent fuel pool leakage risks; ACE agrees that: 1. NRC is unnecessarily rushing the Nuclear "Waste Confidence" process and NOT satisfying court-ordered requirements; 2. NRC's incomplete process should trigger continued suspension of all reactor licensing and re-licensing (0377-5-13 [Cuthbert, Lewis])

Comment: Spent fuel storage should have brought about a two-year relicensing delay by NRC; Until the recent challenge in court, NRC took the negligent position that spent fuel was so safe, it was not to be considered in re-licensing, but a court decision overturned NRC's irrational conclusion[.] (0377-5-7 [Cuthbert, Lewis])

Comment: I believe it is important for the NRC to continue its transparent and efficient efforts to issue the current waste confidence proceedings so that progress on both plant licensing and used fuel management can continue. (0398-3 [Helsel, Adam])

Comment: I believe it is important for the NRC to continue its transparent and efficient efforts to issue the current waste confidence proceedings so that progress on both plant licensing and used fuel management can continue. (0399-3 [Sylvester, Richard])

Comment: I believe it is important for the NRC to continue its transparent and efficient efforts to issue the current waste confidence proceedings so that progress on both plant licensing and used fuel management can continue. (0400-3 [Blankenmyer, Eric])

Comment: It is obvious the NRC has hastily put together a document in the wake of last summer's federal court take-down of the "waste confidence" principle. It is also crystal clear that the NRC wants to overturn the agency's forced moratorium on reactor licensing and renewal procedures. (0443-4 [Sabo, Betty])

Comment: The proposed rule, relying on the findings in NUREG-2157, provides that "no discussion of environmental impacts of spent nuclear fuel storage in reactor facility storage pool or an independent spent fuel storage installations (ISFSI) for the period following the term of the reactor operating license or amendment, reactor combined license or amendment, or ISFSI license, renewal, or amendment for which application is made" is required. 75 Fed. Reg. at 56804. Thus, any possible environmental consequences or alternatives to mitigate those consequences, whether applicable to all plants - i.e., generic - or applicable only to a one or a few plants - i.e., site-specific - that is related to allowing the generation of additional spent fuel by any reactor, or related to the manner in which spent fuel is stored at a reactor site, or related to the duration of the time such storage is allowed at any reactor, may not be considered in deciding whether to allow such spent fuel generation or storage to occur. (0473-6-1 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: NAYGN commends the NRC for assigning a high priority to completing this rulemaking on a planned 24-month schedule, staffing the matter with knowledgeable and experienced personnel, and permitting broad public participation. (0535-2 [Damratoski, Katie] [Thornton, Adam])

Comment: NAYGN encourages the NRC to continue its excellent work and maintain the schedule for completing this rulemaking. The Commission has suspended licensing decisions

until it completes this rulemaking. Therefore, it remains critically important for the NRC to complete this rulemaking on a planned 24-month schedule. (0535-5 [Damratoski, Katie] [Thornton, Adam])

Comment: It is essential for the Nuclear Regulatory Commission to complete the waste confidence rulemaking and move forward with issuing renewed operating licenses for existing nuclear plants and with issuing licenses to build and operate new plants. The proposed rulemaking will enhance efficiency in individual licensing reviews by utilizing the Waste Confidence Generic Environmental Impact Statement to satisfy the requirements of the National Environmental Policy Act with regards to continued storage of spent nuclear fuel, which are the same or largely similar at each nuclear site. (0549-1 [Williams, Robert])

Comment: I believe it is important for the NRC to continue its transparent and efficient efforts to issue the current waste confidence proceedings so that progress on both plant licensing and used fuel management can continue. (0549-4 [Williams, Robert])

Comment: A timely resolution on this matter is essential. Existing and future nuclear facilities need greater certainty about licensing timelines and decisions in order to maintain and expand this vital part of the U.S. energy portfolio. (0555-2 [Contreras, Raquel])

Comment: Finally, the Proposed Rule and supporting documents are premature. The National Academies were asked by Congress to determine the adequacy of NRC's safety regulations in light of Fukushima, with specific emphasis on the advisability of spent fuel pool storage. PW believes NRC's fast moving train relative to continuing high density storage should be halted until NAS finishes its quality assurance review. (0556-1-7 [Lampert, Mary])

Comment: I believe it is important for the NRC to continue its practice of conducting regulatory, licensing and oversight activities in an open and transparent manner. Equally important is the need for the NRC to maintain its 24-month schedule for the current waste confidence proceedings to properly inform the process leading to the development of the Generic Environmental Impact Statement and Proposed Rule, so that progress on both nuclear plant licensing and used fuel management can continue. (0598-7 [Wicks, Tonja])

Comment: It is essential that the Nuclear Regulatory Commission complete the waste confidence rulemaking and move forward with issuing renewed operating licenses for existing nuclear plants...and licenses to build and operate new plants. The proposed rulemaking will enhance efficiency in individual licensing reviews by utilizing the Waste Confidence Generic Environmental Impact Statement to satisfy the requirements of the National Environmental Policy Act with regards to continued storage of spent nuclear fuel, which are the same or largely similar at each nuclear site. (0601-1 [Manfredi, Timonhy])

Comment: I believe it is important for the NRC to continue its transparent and efficient efforts to issue the current waste confidence proceedings so that progress on both plant licensing and used fuel management can continue. (0601-4 [Manfredi, Timonhy])

Comment: I also have serious doubts and concerns about the integrity and independence of the NRC's administrative rulemaking process as well as concerns about NRC compliance with the intention and spirit of relevant federal laws governing the processes of regulatory agencies, including the National Environmental Policy Act (NEPA) and the Administrative Procedures Act (5 U.S.C. Chapters 5 through 8), as I have personally witnessed the "revolving door" operating between the nuclear industry, the regulatory agency and the pro-nuclear academic departments

and institutions -- thus leading me to believe that the NRC is an "industry-captured," biased regulator with a reassuring front-end (website) and a structurally-compromised back-end. (0603-3 [Schonberger, David])

Comment: The two-year period for an environmental review is far short of the period of time needed to do a comprehensive review of the impacts of storing spent fuel from this nation's commercial nuclear reactors. (0610-1 [Brechin, Vernon])

Comment: The NRC comment reviewers should take into account the thousands of people who have commented opposing the two-year EIS preparation period. It may be easy to dismiss the input of many commenters due to their lack of technical qualifications but their voices still should count. (0610-12 [Brechin, Vernon])

Comment: The Draft GEIS fails to provide the necessary environmental analysis sufficient to justify eliminating consideration of spent fuel disposal impacts or storage impacts from every licensing proceeding, as proposed in 10 C.F.R § 51.23. (0611-15 [Shapiro, Susan])

Comment: The schedule set forth by the NRC to conduct and complete its EIS review is unrealistic, imprudent and arbitrary. The issues related to storing for thousand of tons of nuclear waste produced by the United States over the past 50 years is one of the most important long term environmental and fiscal decisions this nation must face now, and for the future. The NRC's plan to rush the EIS to be able to grant new licenses and license extensions fly in the face of the D.C. Court's decision that held the NRC's Waste Confidence rule was arbitrary and inadequate. In the case New York, et al v. NRC, the Court ordered NRC to conduct a "full analysis" of "the potential environmental effects" of storing spent fuel onsite at nuclear plants "on a permanent basis." 681 F.3d at 479. (0611-8 [Shapiro, Susan])

Comment: While we do recognize that the Waste Confidence Rule does not explicitly authorize individual licensing actions (i.e., reactor and ISFSI), it is important to note that the Waste Confidence Rule allows for indefinite on-site storage of spent nuclear fuel by stating that on-site storage is safe for 60 to 160 years, or even indefinitely. It is because of the Waste Confidence Rule that the Administration can state that we can do better than Yucca Mountain and Congress has lost any sense of urgency in solving the nation's nuclear waste issues. (0619-1-4 [Mahowald, Philip R.])

Comment: The Waste Confidence final GEIS, when adopted, will provide the regulatory basis for the proposed amendment to the 10 CFR 51.23 (the Waste Confidence Decision and Temporary Storage Rule). The effect of 10 CFR 51.23 is that the public is prevented from raising (or litigating) issues regarding the environmental impacts of continued storage of spent nuclear fuel during licensing actions (either reactor or spent fuel storage installations). (0619-1-9 [Mahowald, Philip R.])

Comment: We encourage the Commission and staff to complete the Waste Confidence review and rulemaking on the planned 24 month schedule. (0638-2 [Glass, Peter])

Comment: I strongly support the NRC's efforts to keep our nuclear facilities safe and reliable. As the NRC continues its Waste Confidence rule making, I urge the NRC to proceed efficiently. A timely resolution on this matter is essential. Existing and future nuclear facilities need greater certainty about licensing timelines and decisions in order to maintain and expand this vital part of the U.S. energy portfolio. (0642-1 [Picking, Brian])

Comment: The proposed Waste Confidence Rule would effectively exclude public comments on nuclear waste production as part of future reactor licensing procedures. Because the rule would incorporate the draft GEIS's assumption that nuclear waste can and will be safely stored indefinitely, discussion about waste storage would not be up for public discourse, a vital element of a publically accepted nuclear waste program. (0646-22 [Hanson, Courtney])

Comment: Duke Energy encourages the NRC to continue to adhere to its schedule to complete the rulemaking by August 2014. Given the substantial experience base associated with on-site used fuel storage and extensive environmental analyses performed by federal agencies in the past, the remaining time should be sufficient for completing the EIS and finalizing the Waste Confidence rule. (0672-4 [Jamil, Dhiaa])

Comment: I recognize that "efficiency" and "timeliness" are defined as priorities in the regulatory process; however, it is essential that these terms be understood appropriately. Efficiency needs to involve more than speed or cost-containment; it also requires that institutional goals are met adequately. In the case of the NRC, those goals are to protect people and the environment. Those goals may prove inconsistent with goals of promoting nuclear energy production or ensuring its profitability, but the latter are not part of the NRC mandate. Timeliness does not necessarily mean promptness; it means accomplishing the task in the time frame the task requires, as long as that might be. (0684-6 [Kinsella, William])

Comment: Given that the NRC has announced it does not plan to issue new licenses or renewals until the Court of Appeals' remand on the waste confidence proceeding has been addressed satisfactorily, the need for urgent action is clear. (0685-2 [Davis, Ed])

Comment: NIC strongly encourages the NRC to continue to adhere to its schedule to complete the rulemaking by no later than August 2014. Given the substantial experience base associated with on-site used fuel storage and extensive environmental analyses performed by federal agencies in the past, the remaining time should be sufficient for completing the EIS and finalizing the Waste Confidence rule. (0685-5 [Davis, Ed])

Comment: The Waste Confidence Decision and Rule have their genesis in a federal court decision in 1979, *Minnesota v. NRC*, 602 F.2d 412 (D.C. Cir. 1979). That case arose from requests by reactor licensees for license amendments to permit expansion of on-site spent fuel storage capacity. In evaluating these license amendment requests, the NRC failed to consider the implications arising from the possibility that a permanent repository for the radioactive waste might never be found and thus, the reactor sites would become permanent storage facilities. The court held, therefore, that the NRC must "consider the safety and environmental implications of indefinite storage on-site after decommissioning of the reactor." *Id.* at 415. In order to comply with the *Minnesota* case, the NRC promulgated its Waste Confidence Decision and Rule in 1984. The Waste Confidence Decision purported to be an environmental assessment with a finding of no significant impact. The subsequent history of the Waste Confidence Decision and Rule is recited in *New York v. NRC*, 681 F.3d 471 (D.C. Cir. 1012). The important point to be understood is that the Waste Confidence Decision and Rule are an integral part of the licensing process for nuclear reactors. (0688-3 [Taylor, Wallace])

Comment: In addition, the NWSC recognizes the Directorate's ability to adhere to the schedule laid out by the Commission. We underscore the importance of maintaining the schedule so that NRC licensing decisions will not be unduly delayed. (0689-2 [Boyd, David])

Comment: The current Waste Confidence Decision and rulemaking seek to obfuscate and circumvent the public's due process in addressing the adverse environmental impacts created and compounded by the expansion and extension of a larger radioactive waste burden without a scientifically proven and societal accepted radioactive waste management facility. The public reasonably recognizes that the newly licensed and relicensed nuclear facilities themselves then become the de facto permanent nuclear waste storage facilities and, as proposed, without the site-specific environmental impact statement review and public hearing rights required by National Environmental Policy Acts. (0691-5 [Gunter, Paul])

Comment: In summary, the NRC has conducted the waste confidence rulemaking in accordance with NEPA requirements in an open and transparent manner and with numerous opportunities for public involvement. (0694-1-13 [Shea, Joseph])

Comment: TVA notes that the NRC placed a high priority on the review and analysis of the rulemaking and that it was performed in an open and transparent manner appropriate for this issue. TVA urges the Commission to complete the rulemaking in a timely manner and on the original schedule. This action is vital to timely completion of ongoing licensing activities, including the pending operating license application for Watts Bar Unit 2. (0694-1-4 [Shea, Joseph])

Comment: TVA fully supports the comments of the Nuclear Energy Institute ("NEI") that were submitted on behalf of the U.S. nuclear power industry. In particular, TVA agrees that the NRC's use of a generic rulemaking is appropriate; the NRC's rulemaking process has fostered considerable transparency and public participation; the Proposed Rule and the DGEIS specifically address the issues identified by the D.C. Circuit as requiring further evaluation in an Environmental Impact Statement ("EIS"); and the Proposed Rule and DGEIS consider appropriate timeframes for continued SNF storage. NEI's comments demonstrate that the NRC should proceed with timely issuance of the Final Rule. (0694-1-8 [Shea, Joseph])

Comment: In summary, the NRC has conducted the waste confidence rulemaking fully in accordance with NEPA requirements in an open and transparent manner and with numerous opportunities for substantial public involvement. (0697-1-17 [Bessette, Paul] [Kuyler, Raphael])

Comment: Entergy notes that the NRC placed a high priority on the review and analysis of the rulemaking and that it is being performed in an open and transparent manner. Entergy urges the Commission to complete the rulemaking in a timely manner and on the original schedule. This action is vital to completion of ongoing licensing activities, including the renewal of the Indian Point operating licenses. (0697-1-5 [Bessette, Paul] [Kuyler, Raphael])

Comment: Entergy fully supports the comments of the Nuclear Energy Institute ("NEI") that were submitted on behalf of the U.S. nuclear power industry. In particular, Entergy agrees that the NRC's use of a generic rulemaking is appropriate; the NRC's rulemaking process has fostered considerable transparency and public participation; the Proposed Rule and the DGEIS specifically address the issues identified by the D.C. Circuit as requiring further evaluation in an Environmental Impact Statement ("EIS"); and the Proposed Rule and DGEIS consider appropriate timeframes for continued SNF storage. NEI's comments demonstrate that the NRC should proceed with timely issuance of the Final Rule. (0697-1-8 [Bessette, Paul] [Kuyler, Raphael])

Comment: The proposed Waste Confidence Rule would effectively exclude public comments on nuclear waste production as part of future reactor licensing procedures. Because the rule would incorporate the draft GEIS's assumption that nuclear waste can and will be safely stored

indefinitely, discussion about waste storage would not be up for public discourse. (0700-6 [Women's Action for New Direction, Georgia])

Comment: If the Commission desires to promote nuclear energy, the responsible approach would be to strengthen, not weaken, the requirements for the prompt and safe disposal of SNF. Instead of accommodating the detachment of SNF disposal responsibilities from nuclear energy generation and development, the Commission should instead maintain the integral connection between the generation of SNF and the ensuring proper and timely SNF disposal. Unfortunately, the Commission's DGEIS and proposed rule may serve to facilitate, accommodate, and encourage continued delays toward SNF disposal. (0704-10 [Callen, Ronald C.] [Keskey, Donald L.])

Comment: NRC's response signified notable problems for this EIS process at the outset, for the following reasons. First, the agency's grasp of its NEPA obligation conflicts with the holding of the D.C. Circuit that vacated the Waste Confidence Determination and remanded this matter to the agency. The Court squarely addressed this matter in its opinion and we, again, include the entirety of its discussion so there is no mistaking the Court's meaning: Under NEPA, each federal agency must prepare an Environmental Impact Statement ("EIS") before taking a "major Federal action significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C). ... *The issuance or reissuance of a reactor license is a major federal action affecting the quality of the human environment...**** The parties here dispute whether the Waste Confidence Determination ["WCD"] itself constitutes a major federal action. To petitioners, the WCD is a major federal action because it is a predicate to every decision to license or relicense a nuclear plant, and the findings made in the WCD are not challengeable at the time a plant seeks licensure. *The Commission contends that because the WCD does not authorize the licensing of any nuclear reactor or storage facility, and because a site-specific EIS will be conducted for each facility at the time it seeks licensure, the WCD is not a major federal action.* To the Commission, the WCD is simply an answer to this court's mandate in *Minnesota* to ensure that plants are only licensed while the NRC has reasonable assurance that permanent disposal of the resulting waste will be available. The Commission also contends that the WCD constitutes an EA supporting the revision of 10 C.F.R. § 51.23(a), and because the EA found no significant environmental impact, an EIS is not required. *** We agree with petitioners that the WCD rulemaking is a major federal action requiring either a FONSI or an EIS. *The Commission's contrary argument treating the WCD as separate from the individual licensing decisions it enables fails under controlling precedent.* *** It is not only reasonably foreseeable but eminently clear *that the WCD will be used to enable licensing decisions based on its findings.* The Commission and the intervenors contend that the site-specific factors that differ from plant to plant can be challenged at the time of a specific plant's licensing, *but the WCD nonetheless renders uncontestable general conclusions about the environmental effects of plant licensure that will apply in every licensing decision.* *New York et al.* at 476-477 (explanatory brackets inserted, emphasis added, citations omitted). The D.C. Circuit has heard the argument the Waste Confidence Determination is not a licensing action and rejected it. NRC's adherence to this position mere months after the decision demonstrates an inclination to flout NEPA and the Court's decision. (0706-1-5 [Fettus, Geoffrey])

Comment: There is no doubt that the environmental impacts of irradiated fuel storage must be addressed in all NRC reactor licensing decisions. The courts have held that the waste confidence decision ("WCD") is a "predicate" to every licensing decision.³ [footnote 3 text: *Id.* at 8] On June 8, 2012, the DC Circuit Court held that: The WCD makes generic findings that have a preclusive effect in all future licensing decisions—it is a pre-determined "stage" of each licensing decision.⁴ [footnote 4 text: *Id.* at 8] And further, It is not only reasonably foreseeable but

eminently clear that the WCD will be used to enable licensing decisions based on its findings. The Commission and the intervenors contend that the site-specific factors that differ from plant to plant can be challenged at the time of a specific plant's licensing, but the WCD nonetheless renders uncontested general conclusions about the environmental effects of plant licensure that will apply in every licensing decision. See 10 C.F.R. § 51.23(b).⁵ [footnote 5 text: *Id.* at 9] For over a decade, the Blue Ridge Environmental Defense League and its chapters have opposed nuclear reactors in part because there was no place for the high-level nuclear waste produced by them to go. That is the reason why on February 10, 2011 we joined with others to bring the original action against the waste confidence rule, 10 CFR § 51.23. The rule presumed that waste stored at the nation's nuclear power plants would go to a waste dump someday. Our lawsuit said that the end of DOE's pursuit of a dump in Nevada invalidated this presumption. The court agreed. (0720-1 [Zeller, Louis])

Comment: *It is certainly an extraordinary situation that the well-being of so many generations to come are to some significant degree held in the hands of a few individuals before whom they cannot appear to plead their case and yet on whom their lives may depend.* Indeed, even members of today's public, concerned about the implications for those not yet born, have long been barred from raising the issue of waste disposal in the licensing proceedings for nuclear power plants, one of the most important questions that should lie at the heart of decisions whether to grant licenses that would produce more waste for which there is no disposal solution. The U.S. Nuclear Regulatory Commission (NRC) has by rule—a kind of nuclear gag rule, some observers have called it—prohibited perhaps the most critical issue about whether the license should issue from being raised. NRC has done so by its "waste confidence rule," in which it expressed confidence that a solution will soon be found and therefore barred consideration of what would happen if their confidence were misplaced. (0738-4 [Hirsch, Daniel])

Comment: Please put public safety ahead of profit for the industry in considering this ruling. (0754-1 [Individual, Anonymous])

Comment: The draft regulations' attempt to bar public comments on waste disposal in license extension proceedings reinforces public suspicion that the NRC is untrustworthy in its alleged commitment to transparency and to public health and safety. (0821-5 [Paddock, Brian])

Comment: The NRC's response fully satisfies the Court's remand, as the agency has produced its most comprehensive analysis of the safety and environmental impacts of post-licensed-life used fuel storage to date. The agency has a long history of evaluating continued storage, and appropriately incorporated its previous work in addressing the Court's concerns. Further, the NRC staff has maintained the aggressive 24-month schedule set by the Commission, despite a government shutdown and while maintaining extremely high levels of transparency and public participation. NEI's enclosed comments support the NRC's work and suggest a number of changes that would more clearly articulate the agency's conclusions that used nuclear fuel can continue to be stored in a safe and environmentally sound manner. Notably, our comments recommend changes to the title of the rule and GEIS, as well as the proposed rule language, which we believe will more clearly and directly capture the nature of the NRC's work in this area and the conclusions reached by the agency. Finally, NEI commends the Commission for assigning a high priority to completing the draft GEIS and rulemaking, staffing the matter with knowledgeable and experienced personnel, and permitting broad public participation. The process has been a model of transparency in agency action. NEI encourages the Commission and NRC staff to continue the excellent work and to maintain the schedule to completion of the rulemaking. (0827-1-1 [Ginsberg, Ellen])

Comment: Adopting this GEIS at any existing NWO [nuclear waste operation] should require a LICENSE AMENDMENT process, because the original license did not include the notion that the NWO may exist on the site for an indefinite period. It seems this GEIS is a sneaky way to expand the license term to an indefinite period. This circumvents the oversight process that is necessary to ensure appropriate actions by the industry and regulatory agencies. (0836-13 [Davis, Anonymous])

Comment: You say on Page 1-5 that this only modifies 10 CFR 51.23, and "This draft GEIS does not authorize issuance of any NRC license." But it does expand SIGNIFICANTLY the licenses that were previously granted, and therefore is a sneaky and disgusting attempt to work around the normal license amendment procedures. THIS CHANGE DOES CHANGE THE LICENSES THAT DO EXIST AND THEREFORE EACH MUST BE SUBJECTED TO A LICENSE AMENDMENT PROCESS, which includes the opportunity to intervene and request a hearing by members of the public. (0836-24 [Davis, Anonymous])

Comment: We are extremely disappointed that the NRC is proposing to process these changes using a NRC policy statement. You say it is not a licensing action, yet when combined with the policy statement, as you propose, it has the effect of granting indefinite approval to store nuclear waste at every operating nuclear plant without any time limit, and without any further processing, hearings, intervention, or critical site-specific review. You therefore propose circumventing all opportunities for the public and others to intervene in this process and request a hearing, which would normally be the case if each license were processed individually. By handling it as one big policy statement and a "Generic" EIS, then you circumvent the oversight that would otherwise occur. (0836-9 [Davis, Anonymous])

Comment: We believe it is essential to proceed on schedule with development and implementation of the updated Waste Confidence Rule system, so that applications for licenses for new nuclear power plants may proceed. (0863-2 [Brinton, Samuel] [Curtis, Daniel])

Comment: The NRC should consider its own staff recommendations of a seven year process and take the time and exert the effort to analyze the issues in a more robust manner. (0867-3-34 [Griffin, William])

Comment: Actually, it is the Commissioners who must compile evidence and make decisions. Then tell the public what the decisions are and why they were made. It is much more important that we hear from you. (we pay you to do this, you do not pay us. (0889-4 [Rossin, A. David])

Comment: The DGEIS acknowledges that the proposed rule is a major federal action. *Id.* at 1-3. But NRC denies that by generically resolving environmental issues with respect to reactor licensing, the proposed rule constitutes a licensing action: (0897-2-1 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: THE PROPOSED RULE HAS SIGNIFICANT ENVIRONMENTAL IMPACTS THAT MUST BE PLUGGED INTO INDIVIDUAL REACTOR LICENSING DECISIONS[.] As the Supreme Court observed in *Baltimore Gas and Electric Co.*: Congress did not enact NEPA . . . so that an agency would contemplate the environmental impact of an action as an abstract exercise. Rather, Congress intended that the 'hard look' be incorporated as part of the agency's process of deciding whether to pursue a particular federal action. It was on this ground that the Court of Appeals faulted the Commission's action, for failing to allow the uncertainties potentially to 'tip the balance' in a particular licensing decision. As a general proposition, we can agree with

the Court of Appeals' determination that an agency must allow all significant environmental risks to be factored into the decision whether to undertake a proposed action. 462 U.S. at 101. Here, the environmental impacts of the spent fuel to be generated by new or re-licensed reactors, and the costs of avoiding or mitigating those impacts, are potentially enormous. Yet, in violation of NEPA, the DGEIS provides no mechanism for integrating those costs and impacts back into individual licensing decisions. (0897-7-1 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In order to bring the NRC's disjointed regulatory program for safety and environmental analysis of spent fuel management and disposal risks into compliance with NEPA, the Organizations respectfully request the NRC to revise and integrate its disparate and inconsistent regulations regarding spent fuel storage and disposal in a cohesive and consistent whole. The NRC should prepare a programmatic EIS to ensure that the cumulative nature of the impacts covered by these balkanized regulations are considered. The regulations that must be revised and integrated are: Table S-3. As discussed above and in the Makhijani Declaration, the basis for Table S-3 has been repudiated. It is also inconsistent with Table B-1. Table B-1 is inconsistent with Table S-3. For one thing, Table B-1 does not include a finding as to whether the impacts of spent fuel disposal are significant or not. Instead, it states that the impacts are not large enough to change a license renewal decision. This suggests that the impacts *would* be large enough to change an initial licensing decision (which is covered by Table S-3). The inconsistencies and questions raised by comparing Table S-3 and Table B-1 are unacceptable under NEPA's standard for clarity and rigor of scientific analysis. 10 C.F.R. §§ 51.53(c) and 51.71(d). These regulations excuse license renewal applicants and the NRC from addressing spent fuel storage impacts in license renewal cases. They also excuse any discussion of need for power. As demonstrated above, it is essential to incorporate the economic costs of spent fuel storage and disposal in reactor cost-benefit analyses. In addition, as Dr. Thompson points out, by excluding need for power from consideration in re-licensing decisions, the DGEIS cripples its ability to assess the environmental impacts of storing spent fuel. Thompson Declaration, par. IX-2. This results in an "unbounded" analysis of radiological risk from spent fuel fires. Thompson Declaration, par. IX-3. (0897-7-20 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Thus, it is deceptive and misleading for NRC to claim that "The Waste Confidence rulemaking is not a licensing action." Not only was "Waste Confidence" invoked to silence the concerned local farmer's very legitimate, fundamental question at the Clinton, IL Early Site Permit public meeting in March 2003, it was also invoked by an NRC ASLB - backed by the NRC Commission itself - to reject irradiated nuclear fuel-related contentions in a legal proceeding regarding the 20-year license extension at Palisades atomic reactor. The "Waste Confidence Rule" was used to reject our official legal contentions, and instead rubberstamp a 20-year license extension at Palisades. (0919-1-18 [Kamps, Kevin])

Comment: For example, on Page xxvi in section ES.7 of the Executive Summary (lines 12-20, inset box), NRC states: "The Waste Confidence rulemaking is *not* a licensing action. It does not permit a nuclear power plant or any other facility to operate or store spent fuel. Every nuclear power plant or specifically licensed spent fuel storage facility must undergo an environmental review as part of its site-specific licensing process." (emphasis in original) This is very deceptive and misleading on NRC's part. Obviously, if this WC DGEIS is finalized into a WC FGEIS (Final Generic EIS), and a Record of Decision is issued, then that would serve as a pre-ordained license approval for all future licensing actions, at least insofar as the generation of irradiated nuclear fuel, its storage, and its ultimate disposition is concerned. (0919-1-2 [Kamps, Kevin])

Comment: NRC admits as much, in Section 1.5, "Purpose of and Need for the Proposed Action," on Page 1-6, lines 2 to 10. NRC states: "The purpose and need for the proposed action are threefold: (1) to improve the efficiency of the NRC's licensing process by generically addressing the environmental impacts of continued storage; (2) to prepare a single document that reflects the NRC's current understanding of these environmental impact statements; and (3) to respond to the issues identified in the remand by the Court in the New York v. NRC decision. The NRC intends to codify the results of its analyses in this draft GEIS at 10 CFR 51.23. NRC licensing proceedings for nuclear reactors and ISFSIs will continue to rely on the generic determination in 10 CFR 51.23 to satisfy obligations under NEPA with respect to the environmental impacts of continued storage." Thus, NRC would effectively block any future public or state government interventions, against old reactor license extensions, or new reactor combined license applications, raising challenges regarding the safety, security, cost, risk, etc. implications of the generation, storage or disposal of irradiated nuclear fuel. (0919-1-3 [Kamps, Kevin])

Comment: While typos and grammatical errors are very minor in significance, compared to the radiological risks to people and environment of irradiated nuclear fuel, which should be the focus of this DGEIS comment and discussion, such errors are an indication of the rush NRC has displayed in racing through this EIS proceeding. NRC staff had previously indicated it would take 7 years to carry out such an EIS. Instead, a mere two years has been allotted. (0919-4-14 [Kamps, Kevin])

Comment: You say on Page 1-5 that this only modifies 10 CFR 51.23, and "This draft GEIS does not authorize issuance of any NRC license." But it does expand SIGNIFICANTLY the licenses that were previously granted, and therefore is a sneaky and disgusting attempt to work around the normal license amendment procedures. THIS CHANGE DOES CHANGE THE LICENSES THAT DO E.I.S.T AND THEREFORE EACH MUST BE SUBJECTED TO A LICENSE AMENDMENT PROCESS, which includes the opportunity to intervene and request a hearing by members of the public. (0930-1-17 [Lutz, Ray])

Comment: We are extremely disappointed that the NRC is proposing to process these changes using a NRC policy statement. You say it is not a licensing action, yet when combined with the policy statement, as you propose, it has the effect of granting indefinite approval to store nuclear waste at every operating nuclear plant without any time limit, and without any further processing, hearings, intervention, or critical site-specific review. You therefore propose circumventing all opportunities for the public and others to intervene in this process and request a hearing, which would normally be the case if each license were processed individually. By handling it as one big policy statement and a "Generic" EIS, then you circumvent the oversight that would otherwise occur. (0930-1-2 [Lutz, Ray])

Comment: Adopting this GEIS at any existing NWO should require a LICENSE AMENDMENT process, because the original license did not include the notion that the NWO may exist on the site for an indefinite period. It seems this GEIS is a sneaky way to expand the license term to an indefinite period. This circumvents the oversight process that is necessary to ensure appropriate actions by the industry and regulatory agencies. (0930-1-6 [Lutz, Ray])

Comment: Although this rule, Docket ID NRC-2012-0246, applies to nuclear power spent fuel, it is of the same mindset which since the inception of the Manhattan Project has poisoned so many lives with the exposure and impending exposure of burgeoning radioactivity at fuel and waste sites. There is no conscionable choice when there is no actual scientific solution. I applaud the Federal judge who has questioned the NRC's legal maneuvering, and the intention

to force a solution by requiring one for spent fuel. Without nuclear waste and spent fuel storage options that are protective of, at least, human life and genetic diversity, there should never be a temporary arrangement for the nuclear industry watchdog, the NRC. (0935-2 [Uhlis, Agnes])

Comment: NAYGN commends the NRC for assigning a high priority to completing this rulemaking on a planned 24-month schedule, staffing the matter with knowledgeable and experienced personnel, and permitting broad public participation. (0948-2 [Commenters, Multiple])

Comment: NAYGN encourages the NRC to continue its excellent work and maintain the schedule for completing this rulemaking. The Commission has suspended licensing decisions until it completes this rulemaking. Therefore, it remains critically important for NRC to complete this rulemaking on a planned 24-month schedule. (0948-5 [Commenters, Multiple])

3. Comments Concerning the Rule Language

Comment: The Staff also failed to propose amendments to 10 C.F.R. §§ 51.23(b), 51.53(c)(2), and 51.95(c)(2) to clarify that certain spent fuel issues not addressed in the GEIS may be addressed in individual licensing decisions. This has placed the GEIS on a path which is substantially narrower than required by law. If these errors are not corrected now, they can only be corrected following completion of the GEIS process and will necessarily require the issuance of a supplemental draft GEIS. See 10 C.F.R. § 51.92(a)(2); *Marsh v. Or. Natural Res. Council*, 490 U.S. 360, 372 (1989) (agency shall supplement a final EIS if "[t]here are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts"). That will add significant time to the resolution of these proceedings. In *Hydro Resources, Inc.* (2929 Coors Road, Suite 101, Albuquerque, NM 87120), CLI-99-22, 50 N.R.C. 3 (1999), the Commission articulated its test for when a supplemental environmental impact statement is required: As a general matter, the agency must consider whether the new information is significant enough to require preparation of a supplement. The new information must present a seriously different picture of the environmental impact of the proposed project from what was previously envisioned. *Id.* at 14 (footnote and quotation omitted). (0001-10 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: The Staff Scoping Decision fails to include any consideration of any amendments to 10 C.F.R. §§ 51.23(b), 51.53(c)(2), or 51.95(c)(2). This is problematic because those provisions currently preclude parties from raising important site-specific issues in licensing proceedings: Accordingly, as provided in §§ 51.30(b), 51.53, 51.61, 51.80(b), 51.95, and 51.97(a), and within the scope of the generic determination in paragraph (a) of this section, no discussion of any environmental impact of spent fuel storage in reactor facility storage pools or independent spent fuel storage installations (ISFSI) for the period following the term of the reactor operating license or amendment, reactor combined license or amendment, or initial ISFSI license or amendment for which application is made, is required in any environmental report, environmental impact statement, environmental assessment, or other analysis prepared in connection with the issuance or amendment of an operating license for a nuclear power reactor under parts 50 and 54 of this chapter, or issuance or amendment of a combined license for a nuclear power reactor under parts 52 and 54 of this chapter, or the issuance of an initial license for storage of spent fuel at an ISFSI, or any amendment thereto. 10 C.F.R. § 51.23(b); see also *id.* § 51.53(c)(2) (license applicant's "environmental report need not discuss any aspect of the storage of spent fuel for the facility within the scope of the generic determination in § 51.23(a) and in accordance with § 51.23(b)"); *id.* § 51.95(c)(2) ("[T]he supplemental environmental impact statement prepared at the license renewal stage need not discuss ... any aspect of the storage of spent

fuel for the facility within the scope of the generic determination in § 51.23(a) and in accordance with § 51.23(b)."). (0001-26 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: [T]he Staff has consistently taken the position in the past that so long as § 51.23(b) exists, no effort to discuss any aspect of spent fuel storage after operations have ceased is permitted, regardless of whether the matter was specifically addressed in § 51.23(a). See, e.g., *Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3), NRC Staff's Response to Intervenor (1) Joint Motion For Leave to File a New Contention Concerning the Onsite Storage of Nuclear Waste at Indian Point And (2) Joint Contention NYS-39/RK-EC9/CW-EC-10, at 8 (Aug. 2, 2012), ML12215A565. In light of the broad language of 10 C.F.R. §§ 51.23(b), 51.53(c)(2), and 51.95(c)(2), and in light of the Staff's past interpretation of these provisions, the Staff Scoping Decision errs by failing to identify the need to amend these provisions to ensure that matters that are clearly site-specific and not appropriate for generic treatment can be raised in individual licensing proceedings. (0001-27 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: Assuming that some impacts will be identified in the GEIS as appropriate for-review in site-specific proceedings, the Staff Scoping Decision must be altered to ensure that the scope of the GEIS will be expanded to consider amendments to 10 C.F.R. §§ 51.23(b), 51.53(c)(2), and 51.95(c)(2). (0001-29 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: Assuming that some impacts will be identified in the GEIS as appropriate for-review in site-specific proceedings, the Staff Scoping Decision must be altered to ensure that the scope of the current proceedings will be expanded to include guidance on which issues will be allowed to be considered on a site-specific basis following issuance of the GEIS, and to consider amendments to 10 C.F.R. §§ 51.23(b), 51.53(c)(2), and 51.95(c)(2). (0001-30 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: Petitioners [The State of Vermont with the Vermont Department of Public Service, the State of Connecticut, the State of New York, and the Commonwealth of Massachusetts] request that the Commission reverse the following errors that were made in the Staff Scoping Decision: Failing to provide any guidance on which issues will be allowed to be considered on a site-specific basis following issuance of the GEIS, including failure to consider amendments to 10 C.F.R. §§ 51.23(b), 51.53(c)(2), and 51.95(c)(2) to allow consideration of site-specific spent fuel related issues for the period after plant shutdown. (0001-4 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: My greatest concern with the draft Waste Confidence Generic Environmental Impact Statement (DGEIS) and proposed Rule is with the assertion on when a geological repository will be available. The proposed rule says at 51.23 (a)(1) feasible to... (ii) have a mined geologic repository within 60 years following the licensed operation of a reactor". Only App. B of the DGEIS addresses repository availability. On line 5 of p. B-6 it says "In recognition of the uncertainty in reaching a national consensus on repository selection, the third timeframe assumes that a repository never becomes available and the spent fuel needs to be stored indefinitely". The above statement in the proposed Rule is not consistent with or justified in App. B of the DGEIS. The draft environmental impact statement deals primarily with technical feasibility, not social or political feasibility. (0027-1 [Vandenbosch, Robert])

Comment: But one of the particulars is that in the assessment, the Proposed Rule would make amendments --.

The Proposed Rule would also clarify that the generic determination applies to the license renewal for independent spent fuel storage installation (0250-1-5 [Zeller, Lou])

Comment: And then, to the NRC, I would like to specifically recommend, and this has to do with the rulemaking, that in light of the fact that nuclear energy is the most dangerous substance known to man in the universe, that they should require that nuclear waste be handled and stored using these absolute safest methods available no matter what, not the method that their cost benefit/risk analysis shows to be the best, but the safest no matter what. That just makes the most sense to me. (0326-60-2 [Spooner, Rena])

Comment: I also, let's see, in reference to their Proposed Rule on this little paper here I, let's see, my other recommendation to the NRC is to require that all spent fuel rods be transferred to dry casks as soon as possible, way sooner than 60 years after the nuclear power plant is decommissioned. I also recommend that they discontinue the authorization of the use of pools out in the open for long-term storage or temporary storage as soon as possible. (0326-60-3 [Spooner, Rena])

Comment: Rather, I suggest that the Commission substitute for it's proposed rule the following language: The Commission will ensure that an environmental impact statement be developed analyzing the environmental impacts of storage of spent nuclear fuel beyond the licensed life for operation of a reactor jointly and cooperatively with those state, regional and municipal agencies situated in the area where the reactor is sited and which are charged with land use and environmental and socioeconomic concerns. (0354-2 [Oeser, Robert])

Comment: Recommend NRC add the below wording to the proposed rule: 1) Nuclear storage casks, nuclear storage/pools, and storage areas will be able to withstand 11.0 Earthquakes. 2: Nuclear storage casks, nuclear storage/pools and storage areas will be able to withstand a total lack of cooling capabilities /electricity for 60 years proposed for future containment in a mined geologic repository. 3) Currently property owners are not protected financially in case of a nuclear fuel storage accident. Private homeowners Insurances do not cover this type of event. The insurance coverage for a facility, 300 Million USD, can not cover damages at current cost structures. To protect US citizens from nuclear fuel storage damages, NRC must will develop a program for low rate, property insurance to cover private citizens from radiation and nuclear damages from NRC's storage of nuclear fuel. NRC funded Insurance subsidies for homeowners must/will be provided to cover the actual cost of this insurance plan. Insurance must be similar to current US flood insurance. 4) NRC must/will provide full health and medical care to all persons damaged by accidental release of radiation from spent fuel storage. This will include in home health care, daily transportation, all medical treatments and will cover all medical costs to include medical deductables and insurance costs. Most if not all insurance companies do not cover illnesses caused by nuclear damage. NRC must add the wording to Affordable Care Act for this coverage. 5) NRC must/will make "whole" all persons and properties damaged by nuclear spent fuel accidents. This is to include property buy out at full value, plus funding all relocation costs (both for personal property and business property). 6) NRC will keep manual and automatic radiation monitoring devices at all nuclear spent fuel storage locations on a minute by minute basis, provide full public release of the data from those devices on a accessible monitoring system via the internet, provide 24X7 human monitoring of each fuel storage location with hourly logging of events, and 24X7 video recording. Video will be available for viewing by the public via internet access. This will be provided for the 60 year storage plan for all spent fuel continued storage. 7) Relocation of all spent fuel will be done with full knowledge and agreement of all communities the spent fuel will transit through, PRIOR to said transit. (0517-3 [Anonymous, JEC])

Comment: Please rewrite the plan to say the following: (1) All waste currently in transportable casks should be moved to the designated temporary site within one year. (2) All waste which is safe to remove from pools should be done so immediately with a high-priority accelerated schedule. Once in casks, it should be moved quickly to the temporary storage area. (3) All remaining fuel in the pools should be removed and casked and sent to the site as soon as the fuel is cool enough to place in dry casks. (4) All fuel pools at closed plants should be emptied ASAP. (0618-9 [Johnson, Roger])

Comment: CCNR [Canadian Coalition for Nuclear Responsibility] recommends that NRC elaborate a set of rules and policies predicated on the possibility that no safe permanent solution to the problem of high-level nuclear waste will be demonstrated and/or available in the foreseeable future. In particular, CCNR urges the NRC to rule that high-level nuclear waste must not be subject to abandonment under any circumstances, but must be fully retrievable and subject to continual monitoring at all times, until such time as a scientifically verifiable safe permanent solution to the nuclear waste problem has been demonstrated beyond doubt. (0714-1-3 [Edwards, Gordon])

Comment: The Proposed Rule itself does not specifically mention ESP applications in any manner. Nonetheless, the language of the Proposed Rule and its Statement of Considerations (SOC) support the conclusion that the Proposed Rule, and waste confidence issues more generally, do not apply to ESP applications. These statements confirm that the waste confidence issues apply to applications for operating licenses, COLs, and ISFSIs. There is no mention of ESP applications. (0810-3 [Mallon, James])

Comment: Comment No. 1 - The rulemaking documents for the waste confidence rulemaking should include an affirmative statement that waste confidence issues do not apply to ESP applications. PSEG's position that the waste confidence issues do not apply to ESP applications is supported by a number of different justifications: • The Waste Confidence Decision and the Temporary Storage Rule at 10 CFR § 51.23 that are at issue in the D.C. Circuit decision do not mention ESP applications, but appropriately only refer to applications for operating licenses, COLs, and ISFSIs. As discussed above, the proposed 10 CFR § 51.23 and the SOC for the Proposed Rule also do not encompass ESP applications. • This is consistent with 10 CFR § 51.75, which specifically requires a Draft Environmental Impact Statement (EIS) for COL applications to address spent fuel storage and 10 CFR § 51.23, but does not include a similar requirement for a Draft EIS for ESP applications. (0810-6 [Mallon, James])

Comment: Because 10 CFR § 51.23 has never encompassed construction permits¹ [footnote 1 text: The original 10 CFR § 51.23(b) stated that no discussion of any environmental impact of spent fuel storage for the period following the term of the license "is required in any environmental report, environmental impact statement, environmental assessment or other analysis prepared in connection with the issuance or amendment of an operating license for a nuclear reactor or in connection with the issuance of an initial license for storage of spent fuel at an ISFSI, or any amendment thereto." Requirements for Licensee Actions Regarding the Disposition of Spent Fuel Upon Expiration of Reactor Operating Licenses, 49 Fed. Reg. 34,688, 34,694 (Aug. 31, 1984).], it also should not encompass ESPs, which are considered partial construction permits. See 10 CFR § 52.1 (definition of Early Site Permit). (0810-7 [Mallon, James])

Comment: For the above reasons, and the fact that an approved ESP does not allow the ESP holder to generate any spent nuclear fuel governed by the ESP, PSEG concludes that ESP applications are unaffected by the Commission's statement in CLI-12-16 that it "will not issue licenses dependent upon the Waste Confidence Decision or the Temporary Storage Rule until

the court's remand is appropriately addressed," because, as a legal matter, these waste confidence issues do not apply to ESP applications. The rulemaking documents for the waste confidence rulemaking should make this clear in order to prevent any unnecessary confusion or resource expenditures during ESP application reviews. (0810-8 [Mallon, James])

Comment: For these reasons, PSEG requests that the NRC Staff include an affirmative statement in the rulemaking documents for the waste confidence rulemaking that waste confidence issues do not apply to ESP applications. PSEG proposes the following statement, or its equivalent: "The issues encompassed by 10 CFR § 51.23 and NUREG-2157 do not apply to ESP applications. Because ESPs do not authorize their holders to generate or store spent nuclear fuel, the NEPA analysis for ESP applications does not need to consider the environmental impacts of continued storage of spent nuclear fuel beyond a reactor's licensed life for operation and prior to ultimate disposal." (0810-9 [Mallon, James])

Comment: NEI's modified language incorporates language from the 2010 TSR regarding the timeframe by which the Commission has reasonable assurance that a repository can be available. Although Waste Confidence case law does not require the Commission to put forth a timeframe for repository availability, the prior WCDs and TSRs have included a timeframe, which has guided the assessment of the safety and environmental impacts of continued spent fuel storage. NEI agrees with the Commission that it is reasonable to assume that a repository will be available within 60 years beyond a reactor's operating life. This assumption is well-supported in the record and should continue to be emphasized in the SOC and draft GEIS. However, given the societal and political uncertainties surrounding the establishment of a repository, NEI's suggested rule language expresses the Commission's reasonable assurance that a mined geologic repository can be available "when necessary." This approach would acknowledge the inherent nature of conclusions regarding repository availability: as the Court in *Minnesota v. NRC* stated, "...the ultimate determination can never rise above a prediction..."¹¹⁵ [footnote 115 text: 602 F.2d at 417.] It is also consistent with the description of the Commission's repository availability finding provided in *NRDC v. NRC* (see language quoted above). Furthermore, continuing to find reasonable assurance that a repository will be available "when necessary" would not run afoul of the 2012 remand. Although the D.C. Circuit invalidated elements of the 2010 rule and WCD that relied on the "when necessary" timeframe, it did so on the basis that for NEPA purposes the agency had failed to adequately assess the environmental impacts of a failure to establish a repository. The agency has now fully met its NEPA obligations by assessing those impacts the draft GEIS, and can continue to find (based on its expert evaluation) that a repository will be available when necessary. (0827-6-2 [Ginsberg, Ellen])

Comment: In the revision to Table B-1 (in Appendix B to Subpart A), middle paragraph, the NRC's proposed language specified "a dose limit of 15 millirem (0.15 mSv) per year for the first 10,000 years and 100 millirem (1.0 mSv) per year between 10,000 years and 1 million years". While I have no objection to these values, they are not presented in a manner consistent with the Commission's Policy statement on conversion to the metric system (see 61 FR 31169; 19 Jun 1996). In the third paragraph of this statement of metric policy, the Commission stated that "In dual unit documents, the first unit presented will be in the International System of Units with the English units shown [thereafter] in brackets." This standard was not met in the proposed rule text. Consequently, these dose limits should be changed to "0.15 mSv [15 millirem]" and "1.0 mSv [100 millirem]". (0841-2 [Corrino, G])

Comment: Third, the NRC again fails to consider the impacts of additional storage time, as required by the Court. See *id.* (The NRC "must actually concern itself with the extra years of storage."). This shortfall is even more concerning because the DGEIS contemplates indefinite

storage – and not merely storage for an additional 30 years. The proposed rule also lacks any time limit for environmental and safety findings regarding pool storage of spent fuel. (0897-4-22 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Therefore, NRC's own documents demonstrate that there is a reasonably foreseeable potential that spent fuel will be stored in reactor pools for more than 60 years. The DGEIS should account for this potentially extended time frame for pool storage. If it does not, the proposed rule should be changed to limit the prediction of environmental impacts to only 60 years. (0897-6-12 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: First, the language of the proposed rule itself is not limited to 60 years of storage in pools. The new proposed 10 C.F.R. § 51.23(a)(2) puts no time limit on the NRC's finding that it is feasible to safely store spent fuel. (*Compare* the proposed 10 C.F.R. § 51.23(a)(2) "it is feasible to safely store spent nuclear fuel following the licensed life for operation of a reactor" *with* the 2010 regulation, "spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 60 years beyond the licensed life for operation."). The time period for storage contemplated by the proposed regulation is therefore indefinite. Given the indefinite time period of the safety finding in proposed 10 C.F.R. § 51.23(a)(2), the DGEIS wrongly assumes that spent fuel will be stored in pools for only 60 years. (0897-6-9 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Further, the NRC has no valid environmental analysis on which it can rely for an evaluation of spent fuel disposal impacts. Table B-1 depends on the EPA standard for Yucca Mountain.¹⁷ [footnote 17 text: The Yucca Mountain standard at 40 CFR 197] The proposed rule simply asserts that because the Yucca Mountain rule limits radiation doses in principle, "that the impacts would not be sufficiently large to require the NEPA conclusion, for any plant, that the option of extended operation under 10 CFR part 54 should be eliminated."¹⁸ [footnote 18 text: NRC 2013b] This is like saying that the existence of a law against drunken driving allows society to conclude that the impacts of drunken driving would in fact not be large enough to worry about. In addition, the licensing proceeding for Yucca Mountain is far from complete (if it is ever completed); so it is not clear that Yucca Mountain would meet the required performance specified in 40 CFR 197. (0898-1-8 [Curran, Diane] [Makhijani, Arjun])

Comment: The proposed changes to 10 CFR 51, Table B-1, make reference to the Yucca Mountain standards as follows: For the high-level waste and spent-fuel disposal component of the fuel cycle, the EPA established a dose limit of 15 millirem (0.15 mSv) per year for the first 10,000 years and 100 millirem (1.0 mSv) per year between 10,000 years and million years for offsite releases of radionuclides at the proposed repository at Yucca Mountain, Nevada. The Commission concludes that the impacts would not be sufficiently large to require the NEPA conclusion, for any plant, that the option of extended operation under 10 CFR part 54 should be eliminated. Accordingly, while the Commission has not assigned a single level of significance for the impacts of spent fuel and high level waste disposal, this issue is considered Category 1. 8.10. The second paragraph in the quote from Table B-1 above does not follow the first. The existence of a standard does not provide any assurance or even any indication of the actual performance of the site. Indeed, it is a *non sequitur*. (0898-4-18 [Curran, Diane] [Makhijani, Arjun])

Comment: The NRC has no valid environmental analysis on which it can rely for an evaluation of spent fuel disposal impacts. Table B-1 cites the EPA Yucca Mountain standard, which does not apply to any other repository. Moreover, since the licensing proceeding for Yucca Mountain is far from complete (if it is ever completed); so it is not clear that Yucca Mountain would meet the required performance specified in 40 CFR 197. The proposed rule simply refers to the rule

and asserts "that the impacts would not be sufficiently large to require the NEPA conclusion, for any plant, that the option of extended operation under 10 CFR part 54 should be eliminated."¹³⁹ [footnote 139 text: NRC 2013b, p. 56805] This is a non sequitur. It is much like saying that the existence of a law against drunken driving allows one to conclude that the impacts of drunken driving would in fact not be large enough to worry about. (0898-5-21 [Curran, Diane] [Makhijani, Arjun])

4. Comments Concerning Miscellaneous Issues

Comment: [T]he Staff Scoping Decision cannot be reconciled with the history and legal status of the waste confidence issue. This issue was first presented in *Minnesota v. NRC*, 602 F.2d 412 (D.C. Cir. 1979), where the Court described the central issue: "The crux of the case is current uncertainty about the prospects for developing and implementing safe methods for the ultimate disposal or even long-term storage of the highly toxic radioactive wastes created in the process of nuclear power generation." *Id.* at 413. The Court concluded that the case must be remanded to the NRC for a serious consideration of those issues, noting the following: *Cf. NRDC v. NRC*, 178 U.S.App.D.C. 336,361,547 F.2d 633,658 (1976) (Tamm, J., concurring in result) ("*NEPA requires the Commission fully to assure itself that safe and adequate storage methods are technologically and economically feasible. It forbids reckless decisions to mortgage the future for the present, glibly assuring critics that technological advancement can be counted upon to save us from the consequences of our decisions*"). As appears below, the Supreme Court, in *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, (1978), reversed the ruling of the majority opinion requiring further procedures but remanded for the kind of inquiry called for in Judge Tamm's concurring opinion. *Id.* at 417 n.6 (emphasis added to identify the portion of Judge Tamm's concurrence in *NRDC v. NRC* cited with approval by Commissioner Svinicki at the time of her vote on the now-voided version of the waste confidence rule (Notation Vote, Response Sheet, Sept. 24, 2009 at 3)). In the *Minnesota* case, Judge Tamm also concurred, concluding that: if the Commission determines it is not reasonably probable that an offsite waste disposal solution will be available when the licenses of the plants in question expire, it then must determine whether it is reasonably probable that the spent fuel can be stored safely onsite for an indefinite period. Answers to these inquiries are essential for adequate consideration of the safety and environmental standards of the relevant statutes. It is undisputed that questions involving storage and disposal of nuclear waste pose serious concerns for health and the environment. See *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 538-39, 98 S. Ct. 1197, 1208-09, 55 L. Ed. 2d 460, 475-76 (1978); ***, Our opinion merely remands this case to the Commission for such proceedings as it deems appropriate to determine whether there is reasonable assurance that an offsite storage solution will be available when needed in this case, by the years 2007-2009. *Id.* 602 F.2d at 419-20 (Tamm, J., concurring) (footnotes omitted). In short, the Commission was given a clear mandate to use the NEPA process to evaluate the question of when and whether nuclear wastes would be permanently disposed, including looking into all of the environmental implications of those issues. *Id.* at 417 (majority opinion). (0001-14 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: The NRC came forward saying that they don't believe the Federal Courts have a right to rule on what the NRC decides. That was this year, 2013. I'd like someone to respond to that[.] (0112-1-5 [Sachs, Gary])

Comment: While the NRC mentions its role under the Atomic Energy Act to establish criteria for licensing power plants, it fails to acknowledge that it "would not continue to license reactors if

it did not have reasonable confidence that the wastes can and will in due course be disposed of safely." 78 Fed. Reg. 56776, 56778 (Sept. 13, 2013), quoting 42 Fed. Reg. 34391, 34391; July 5, 1977, pet for rev. dismissed sub nom., *NRDC v. NRC*, 582 F.2d 166 (2d Cir. 1978). Thus, the NRC appears to have abandoned this rational policy as it now states that "without Congressional direction to do so, the NRC may not deny a reactor license unless it determines that a license applicant has not met the NRC's regulatory standards for issuance of a license." DGEIS at 1-9. In other words, the Commission is now taking the irrational position here that it would continue to license nuclear power plants even if there is no place to safely store the waste and even if it concluded that continuing to license the plants to produce additional nuclear wastes would cause substantial adverse environmental consequences. See IE report, Ex. E. (0473-11-4 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: ²⁴ [footnote 24 text: NRC may believe that the provision of 10 C.F.R. § 2.335, allowing for waiver of regulations, could be used in such cases. However, the DGEIS description of purpose and need for the proposed 10 C.F.R. § 51.23 makes that impossible. Because the asserted purpose and need is to develop a generic analysis of impacts, no waiver can be obtained because no one will be able to show that the purpose and need of the rule will not be served unless a site-specific analysis is conducted. Exelon Generation Company, LLC (Limerick Generating Station, Units 1 and 2), CLI-13-07, 2013 NRC LEXIS 7 (Oct. 31, 2013).] (0473-13-11 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: As the Waste Confidence Decision Update was vacated wholesale as being arbitrary and capricious, reliance on statements therein is per se arbitrary. Statements supported by reference to the Waste Confidence Decision Update are therefore unsupported, and cannot form the basis for conclusions regarding the safe storage of nuclear waste or the basis for the promulgation of 10 C.F.R. § 51.23 (especially when the statements in the Waste Confidence Decision Update are themselves uncited and unsubstantiated, as discussed above). (0473-17-7 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The promulgation of the proposed 10 C.F.R. § 51.23 is not lawful based on the D.C. Circuit's ruling, which conditioned the NRC's generic analysis of the impacts of long-term nuclear waste storage on the "Commission's use of conservative bounding assumptions and the opportunity for concerned parties to raise site-specific differences at the time of a specific site's licensing." *New York v. NRC*, 681 F.3d 471, 480 (D.C. Cir. 2012). The regulation as proposed reads as follows: (b) As provided in §§ 51.30(b), 51.53, 51.61, 51.80(b), 51.95, and 51.97(a), and within the scope of the generic determinations in paragraph (a) of this section, no discussion of environmental impacts of spent nuclear fuel storage in reactor facility storage pool or an independent spent fuel storage installations (ISFSI) for the period following the term of the reactor operating license or amendment, reactor combined license or amendment, or ISFSI license, renewal, or amendment for which application is made, is required in any environmental report, environmental impact statement, environmental assessment, or other analysis prepared in connection with the issuance or amendment of an operating license for a nuclear power reactor under parts 50 and 54 of this chapter, or issuance or amendment of a combined license for a nuclear power reactor under parts 52 and 54 of this chapter, or the issuance of a license for storage of spent nuclear fuel at an ISFSI, or any amendment thereto. Proposed 10 C.F.R. § 51.23(b); 78 Fed. Reg. 56804 (Sept. 13, 2013). The NRC argued in *New York v. NRC* that the NRC's waiver provision provided for this site-specific review. Brief for Respondents at 40-41, *New York v. NRC*, 681 F.3d 471 (No.11-1045). But as the States argued to the D.C. Circuit, the NRC has never granted a waiver petition (Final Brief for States of New York, Vermont, Connecticut, and New Jersey, and the Prairie Island Community at 30-31, *New York v. NRC*, 681 F.3d 471 (No.11-1045)), and based on a recent NRC ruling, it appears NRC will never find

that the requirements for waiver will be met. Exelon Generation Company, LLC (Limerick Generating Station, Units 1 and 2), CLI-13-07, 2013 NRC LEXIS 7 (Oct. 31, 2013). The provision found at 10 C.F.R. § 2.335 does not afford a meaningful opportunity for site-specific analysis in licensing proceedings, where NRC routinely denies requests for waivers. NRC's burden-shifting proposal is necessarily ineffective for identifying all relevant environmental risks. Unlike NRC, the States and other affected parties do not have full access to nuclear reactor sites, nor do they have NRC's ability to request data from plant operators. As the primary federal regulator, NRC cannot shed its NEPA responsibilities by asking affected parties to compile site-specific data and independently evaluate environmental risks and impacts, obligations that NEPA imposes on NRC alone. (0473-18-1 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Through this DGEIS and rulemaking process, the NRC once again seeks to address the issues associated with the continued production of nuclear wastes when there is not a permanent, safe, and secure facility for the disposal of such wastes and when NRC has finally acknowledged that it does not have confidence that such a facility will be available by any specific date, if ever. (0473-5-1 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The NRC stated in 1977 that it "would not continue to license reactors if it did not have reasonable confidence that the wastes can and will in due course be disposed of safely." 42 Fed. Reg. 34391. The Waste Confidence process was the mechanism adopted by NRC to fulfill that obligation (see Final Waste Confidence Decision, Statement of Consideration (49 Fed. Reg. 34658 (Aug. 31, 1984)) and the DGEIS is the NEPA-mandated analysis that NRC must complete before it can make that determination. (0473-9-15 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The proposed rule finds that sufficient mined geologic repository capacity will be available "when necessary", and that "continued storage" can be safely provided (under NRC regulation) until permanent disposal is available, or even (in "indefinite storage") if it is not provided. This is the latest revision of a rule in which NRC has concluded that its regulation can assure safe storage (and safe subsequent transportation) in a repeatedly extended (and now indefinite) interim period. Such a conclusion requires increasingly heavy reliance on the capabilities of current technology and the persistence of current institutional controls. To the D.C. Circuit Court's challenge that the NRC must address whether SNF will be managed safely if a federal repository is not made available, the NRC might respond that its "hard look" does not provide assurance that SNF can be managed safely into the indefinite future, and that NRC cannot solve this problem for Congress and other federal agencies. (0505-9 [Williams, Jim])

Comment: The draft GEIS fails to address the full range of risks associated with spent fuel pools in terms of fires and leaks, and thus fails to provide adequate protection for public health and safety. Spent fuel pools in the US are currently packed beyond their originally engineered capacity, in some cases up to nine times beyond capacity.ⁱ [footnote i text: See Lochbaum, David, Director, Nuclear Safety Project, Union of Concerned Scientists, testimony before the Senate Committee on energy and Natural Resources, July 20, 2013. http://www.energy.senate.gov/public/index.cfm/files/serve?File_id=89dbc888-171c-4f77-8ecf-83a0055fcfb9] (0646-19 [Hanson, Courtney])

Comment: During the summer of 2013, the NRC held public meetings on the scope of the GEIS. At one of those meetings, the NRC refused to discuss their safety analysis, which supposedly fed into the regulatory analysis. We now understand why. NRC did NO safety analysis. (0693-1-7 [Warren, Barbara])

Comment: We present several concerns for the Commission's consideration. One concern is that the commission's DGEIS and proposed rule again signal a retreat by the Commission from its Waste Confidence Decisions issued decades ago. (0704-1 [Callen, Ronald C.] [Keskey, Donald L.])

Comment: Nor does NRC have a sufficient technical understanding of the risks of extended spent fuel storage to support a safety-related reasonable assurance finding. No existing environmental or other study has attempted to predict the environmental impacts of storing spent fuel on site for hundreds of years, or perhaps indefinitely (and the Draft GEIS certainly does not, as our comments detail). Indeed, all NRC's previous Waste Confidence iterations and associated studies were premised on the opposite conclusion -a repository will be available in the near future. NRC has commenced a study of the issue: the "Long-Term Waste Confidence Update Project," where NRC proposes to assess the environmental impacts of storing spent fuel for 200 years after cessation of licensing. See the WCD, 75 Fed. Reg. at 81,040.¹¹ [footnote 11 text: As the Court observed in *State of New York*, that rulemaking may address "some or all of the problems" that it remanded to the agency. 681 F.3d at 483.] But work on the Long-Term Waste Confidence Update Project had only just begun at the time of the D.C. Circuit's decision, and it is far from complete. NRC currently has no sound footing for its necessary safety findings under the AEA. (0706-1-10 [Fettus, Geoffrey])

Comment: Further, we request NRC withdraw the proposed rule until it has substantially improved evidentiary basis upon which to base a reasonable assurance finding about the safety of extended spent fuel storage[.] (0706-1-13 [Fettus, Geoffrey])

Comment: Page 1-5. "This draft GEIS assesses the environmental impacts of continued storage and, if adopted, would provide a regulatory basis for the NRC's proposed amendment to 10 CFR 51.23...This draft GEIS does not authorize issuance of any NRC license, but rather discloses the environmental impacts associated with the continued storage of spent fuel. In addition, this draft GEIS considers alternative approaches to assessing the environmental impacts of continued storage (see Section 1.6)." NRDC Comment[:] As NRDC details below, this Draft GEIS fails to assess key aspects of the environmental impacts of continued storage and would thus fail to provide a regulatory basis for an amended TSR or even new Waste Confidence Rule. Further, this description of purpose is a fundamental departure from the Waste Confidence Findings of the past and should be explained as such. Specifically, there will no longer be waste confidence findings. Rather, there will be a rule supported by a Generic EIS. In contrast to the previous findings, the proposed rule finds only that it is "feasible" to "safely store spent nuclear fuel following the licensed life for operation of a reactor" and that it is "feasible" to "have a mined geologic repository within 60 years following the licensed life for operation of a reactor." 78 Fed. Reg. at 56,804. (0706-1-16 [Fettus, Geoffrey])

Comment: In contrast to previous Waste Confidence Findings that ignored NEPA obligations, the agency has now ignored its AEA responsibilities by eliminating any "reasonable assurance" safety findings regarding the safety of spent fuel storage or the availability of spent fuel disposal capacity. The only safety finding in the proposed rule is a statement in the preamble that the NRC lacks confidence to make a reasonable assurance finding regarding the availability of a "disposal solution" at "the end of a reactor's licensed life for operation." 78 Fed. Reg. at 56,784.

Further, NRC acknowledges "reasonable assurance" findings regarding an "offsite storage solution" and interim storage are required by law (78 Fed. Reg. at 56,778 n. 1 (citing *Minnesota*, 602 F.2d at 418)), NRC asserts the proposed rule's purpose is to codify the results of a NEPA analysis. See 78 Fed Reg. 56,783-84. (0706-1-8 [Fettus, Geoffrey])

Comment: The proposed rule and the Draft GEIS do not address why NRC no longer makes a safety finding under the AEA and nor does it answer the question of whether the NRC has a reasonable basis for confidence in the availability of sufficient repository capacity when it is needed. The only place NRDC could identify where NRC approaches the issue is Appendix B, Technical Feasibility of Continued Storage and Repository Availability. Draft GEIS, Appendix B. But in *B.2 Repository Capacity will be Available to Dispose of Spent Fuel*, NRC makes no assertion it has a technical or evidentiary basis for a finding of reasonable assurance that sufficient repository capacity will be available when it is necessary (much less by any date certain). And as our comments will detail, nor does the Draft GEIS contain meaningful analysis of the safety or environmental risks should sufficient repository capacity not become available when it is needed. (0706-1-9 [Fettus, Geoffrey])

Comment: The Nuclear Waste Confidence Decision was first executed in response to state challenges to the Federal Government, to ensure that waste would not be left indefinitely on site. Minnesota is part of this history. Minnesota's state legislature, citizens, environmental organizations, state agencies, and host communities, including the Prairie Island Indian Community have participated in many proceedings at state and federal level. From all perspectives, Minnesota has produced thousands of pages of testimony, briefs, analysis and decision making documents. (0820-2 [Eide-Tollefson, Kristen])

Comment: The NRC's proposed rule language for 10 C.F.R. § 51.23(a) summarizes and streamlines the Conclusions into two statements: • The GEIS addresses the environmental impacts of storage of spent nuclear fuel beyond the licensed operating life of a reactor; and • It "is feasible" to safely store spent nuclear fuel following the license life for operations of a reactor and to have a mined geologic repository within 60 years following the licensed life for operation of a reactor. The NRC's proposal differs from the language in the 2010 TSR and WCD. The most notable difference is the Commission's conclusion that it is feasible to store spent fuel safely. Although the prior TSR also concluded that spent fuel can be stored safely, the prior WCD Finding stated that the Commission has reasonable assurance that spent fuel will be managed safely until sufficient geologic repository capacity is made available. Thus, the proposed rule and associated Conclusions do not express precisely the same determination regarding the safety of spent fuel storage as the prior rule and Findings. The prior rule and predictive Findings, based on "reasonable assurance," better reflect the showing suggested in *Minnesota v. NRC* and the discussion of the Commission's repository availability finding in *NRDC v. NRC*. These reasonable assurance findings are amply supported by the draft GEIS and SOC published with the proposed rule. (0827-5-10 [Ginsberg, Ellen])

Comment: Additionally, the SOC and draft GEIS explain that the agency has already established criteria through its existing regulatory framework that provide reasonable assurance of public health and safety of continued spent fuel storage. However, NEI believes that the statement "regulatory oversight has been shown to enhance safety designs and operations"¹¹ [footnote 111 text: *Id* at 56,788.] represents a significant understatement of the basis for continued safe spent fuel storage. Regulatory oversight assures compliance with NRC's regulations, but compliance is only the minimal standard of safety. Industry's commitment to safe operations goes far beyond this and industry has consistently demonstrated a level of performance that not only meets, but exceeds regulatory requirements by a wide margin.

Finally, in the area of dry storage it should be noted that, currently in the US, dry storage systems are manufactured by three highly competitive suppliers. This competition drives a continuous cycle of innovation which leads to technological advances that result in improved systems capable of providing ever increasing safety margins. We encourage the agency to further explain this Conclusion and reflect it in the SOC and rule, to ensure that the essential elements of the WCD Findings are adequately addressed. (0827-5-11 [Ginsberg, Ellen])

Comment: In the rulemaking amending the TSR, 10 C.F.R. § 51.23, the NRC proposes new rule language and a new approach to summarizing its conclusions with respect to continued storage. NEI believes the NRC should clarify its approach to ensure that the essential elements of the traditional WCD Findings are preserved, either in the TSR, the Statements of Consideration (SOC), or as conclusions in the GEIS. NEI does not advocate retaining a separate WCD document containing Findings. Instead, the rule, the SOC, and the GEIS should consistently include the requisite determinations. (0827-5-2 [Ginsberg, Ellen])

Comment: The draft GEIS and supporting record is entirely consistent with Findings 1, 3, and 5. The draft GEIS clearly revises and appropriately supplements prior Findings 2 and 4 by including, for NEPA purposes, the "no repository" scenario, the long-term storage scenario, and further analyses of the environmental impacts of potential spent fuel pool leaks and fires. Findings 2 and 4 as previously drafted in the 2010 WCD remain valid. Therefore, the enhanced record of this rulemaking proceeding would clearly support continuation of all five WCD Findings for both AEA and NEPA purposes. At bottom, however, the key elements of Waste Confidence as required by *Minnesota v. NRC* and *New York v. NRC* are: (1) reasonable assurance that spent fuel can be safely stored until a permanent repository is made available, and (2) an assessment of the environmental impacts of interim spent fuel storage until a permanent repository is made available. (0827-5-3 [Ginsberg, Ellen])

Comment: While the NRC's Conclusions are well-supported by the record and summarized in the draft GEIS, NEI believes that the essential aspects of the Conclusions and traditional WCD Findings could be reflected more fully in the rule itself to provide clarity to the public and to assure consistency with the past WCD Findings. Specifically, NEI recommends that the NRC adopt the rule language provided below because: (1) it more directly addresses the questions and issues identified in the foundational case law (i.e., *Minnesota v. NRC* and *NRDC v. NRC*), and (2) it is more consistent with the agency's traditional WCD findings. NEI also believes that the Conclusions can be drafted in the SOC to better reflect the record and to be more consistent with the traditional WCD Findings. (0827-5-9 [Ginsberg, Ellen])

Comment: NEI proposes that the rule be clarified to address the prior court decisions by including all necessary elements of the WCD Findings in the rule itself. This could be accomplished by making modest changes to the proposed rule language. Specifically, section 51.23(a) and (b) should be revised as follows¹¹² [footnote 112 text: The entirety of 10 C.F.R. § 51.23 as suggested by NEI under this approach is set forth in Appendix A.] (a) The Commission has developed a generic environmental impact statement (NUREG-2157) analyzing the environmental impacts of storage of spent nuclear fuel beyond the licensed life for operation of a reactor. (b) The Commission has reasonable assurance that: (i) sufficient mined geologic repository capacity to dispose of spent nuclear fuel generated in any reactor can be available when necessary, and (ii) spent nuclear fuel can be safely stored until that time. We recognize that this modified rule language would include non-environmental conclusions (regarding spent fuel storage and repository availability) in a Part 51 environmental regulation. However, this approach would more directly ensure that the agency satisfies the recent D.C. Circuit remand. First, the rule would acknowledge that the generic environmental impacts of continued spent

fuel storage have been assessed in the GEIS. Second, the rule would explicitly reconfirm the agency's reasonable assurance that spent fuel can be managed safely (previously captured in WCD Findings 3, 4, and 5) and that a repository can be available when necessary (previously captured in the TSR and Finding 2). Reasonable assurance conclusions in the rule, rather than those related to feasibility, would update and replace the current Findings adopted after *Minnesota v. NRC*. Again, the inquiry in *Minnesota* was "whether there is reasonable assurance that an off-site storage solution will be available by the years 2007-2009" and if not, whether there is reasonable assurance that the fuel can be stored safely at the sites beyond those dates."¹¹³ [footnote 113 text: *Minnesota v. NRC*, 602 F.2d at 418.] In addition, with respect to repository availability, the U.S. Court of Appeals for the Second Circuit described the NRC's finding as "an implied finding of reasonable assurance that safe permanent disposal of such wastes can be available when needed."¹¹⁴ [footnote 114 text: *NRDC v. NRC*, 582 F.2d at 170.] (0827-6-1 [Ginsberg, Ellen])

Comment: No specific conclusion in the SOC would be necessary for prior Finding 4 regarding the safety and environmental impacts of continued spent fuel storage, since those determinations would be captured in the rule itself. The rule language regarding continued safe storage of spent fuel would be supported by the other SOC conclusions, particularly the conclusion described immediately above (prior Finding 3). (0827-6-6 [Ginsberg, Ellen])

Comment: Finally, the SOC should explicitly express the NRC's conclusion that it is reasonable to assume that safe independent onsite or offsite spent fuel storage will be made available if such storage capacity is needed. This conclusion tracks to prior Finding 5 and is based on the rationale in prior WCDs, such as the obligations under the Nuclear Waste Policy Act, NRC regulatory requirements, and the industry's commitment to continued safe storage pending disposal. The SOC's discussion of safe storage should continue to include the Commission's conclusion that spent nuclear fuel can be safely managed in spent fuel pools in the short-term timeframe and dry casks during the short-term, long-term, and indefinite timeframes evaluated in the draft GEIS. This conclusion is based on technical studies, operating experience, regulatory oversight, and the draft GEIS. (0827-6-7 [Ginsberg, Ellen])

Comment: § 51.23 Storage of Spent Nuclear Fuel After Licensed Term of Operation. (a) The Commission has developed a generic environmental impact statement (NUREG-2157) analyzing the environmental impacts of storage of spent nuclear fuel beyond the licensed life for operation of a reactor. (b) The Commission has reasonable assurance that: (i) sufficient mined geologic repository capacity to dispose of spent nuclear fuel generated in any reactor can be available when necessary, and (ii) spent nuclear fuel can be safely stored until that time. (c) As provided in §§ 51.30(b), 51.53, 51.61, 51.80(b), 51.95, and 51.97(a), and within the scope of the generic determinations in paragraph (a) of this section, no discussion of environmental impacts of spent nuclear fuel storage in reactor facility storage pool or an independent spent fuel storage installations (ISFSI) for the period following the term of the reactor operating license or amendment, reactor combined license or amendment, or ISFSI license, renewal, or amendment for which application is made, is required in any environmental report, environmental impact statement, environmental assessment, or other analysis prepared in connection with the issuance or amendment of an operating license for a nuclear power reactor under parts 50 and 54 of this chapter, or issuance or amendment of a combined license for a nuclear power reactor under parts 52 and 54 of this chapter, or the issuance of a license for storage of spent nuclear fuel at an ISFSI, or any amendment thereto. The Statements of Consideration would set forth "Conclusions" similar to the traditional WCD Findings to explain the basis for the rule and to link the rule to the prior WCD Findings and the current GEIS. (0827-7-1 [Ginsberg, Ellen])

Comment: On Page 1-9, you say that "unless a threat to the public health and safety of the common defense and security exists, the NRC has no authority to deprive current licensees of their vested interest in licenses...." This means that we can never decide that we have made a very big mistake by ever getting these plants running from a safety standpoint. Once we decided to allow it, then we can never turn back? WRONG. (0836-70 [Davis, Anonymous])

Comment: Instead of supporting its reasonable assurance findings by conducting an appropriate environmental analysis of the probability of failing to site sufficient repository capacity and the consequences of such a failure, the NRC simply abandons those findings in the proposed rule. The words "reasonable assurance" — the key language of compliance with the Atomic Energy Act — do not appear in the proposed rule. Instead of predicting with "reasonable assurance" that spent fuel "will" be safely stored and disposed of, the NRC asserts — without any assurance — that it *can* be safely disposed of, *i.e.* that it is "feasible." These words confirm that, in the words of the Court of Appeals, "[t]he Commission apparently has no long-term plan other than hoping for a geologic repository." (0897-1-1 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: But mere hope cannot satisfy the Atomic Energy Act. Under the Act and over thirty years of NRC and judicial interpretations, the proposed rule's failure to make reasonable assurance findings regarding the availability of a disposal solution for spent fuel deprives the NRC of any authority to license or re-license reactors. (0897-1-2 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Moreover, even if the NRC were to attempt to make reasonable assurance findings, it lacks any technical basis for such findings. The DGEIS contains no analysis of the probability that sufficient repository capacity will be available or unavailable when needed. Such an analysis would require an evaluation of the likelihood that spent fuel repositories could be found that meet the U.S. Environmental Protection Agency's standards for a repository and the capacity of various geologic sites to accommodate the quantity of spent fuel to be generated. The last study the NRC did of that issue was in the mid-1970s, and it is severely outdated. (0897-1-3 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Similarly, in order to provide sufficient support for a reasonable assurance finding regarding the safety of storing spent fuel for many decades if a repository is delayed, the NRC would have to catch up on long- delayed research regarding the long-term behavior of spent fuel in dry storage conditions. But the NRC is years away from obtaining adequate research results to make informed judgments about the safety of storing spent fuel for lengthy periods. (0897-1-4 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Without "reasonable assurance" safety findings regarding the availability of sufficient repository capacity or means of safely storing spent fuel for lengthy time periods -- or a technical basis for such findings -- the NRC has no authority under the Atomic Energy Act to continue licensing reactors to generate spent fuel. This failure to satisfy the Atomic Energy Act cannot be cured by the DGEIS, because a NEPA analysis cannot substitute for the safety findings that are independently required by the Atomic Energy Act. (0897-1-5 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The proposed rule violates the Atomic Energy Act by completely eliminating any "reasonable assurance" safety findings regarding the safety of spent fuel storage or the availability of spent fuel disposal capacity. The only safety finding made in the proposed rule is a statement in the preamble that the NRC lacks confidence to make a reasonable assurance

finding regarding the availability of a "disposal solution" at "the end of a reactor's licensed life for operation." 78 Fed. Reg. at 56,784. (0897-2-10 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: While admitting in a footnote that "reasonable assurance" findings regarding an "offsite storage solution" and interim storage are required by law (78 Fed. Reg. at 56,778 n. 1 (citing *Minnesota*, 602 F.2d at 418)), the NRC asserts that the proposed rule's only purpose is to codify the results of a NEPA analysis: *B. Waste Confidence Rulemaking* B1. What is the purpose of this Waste Confidence rulemaking? The NRC's use of a rule to generically satisfy its NEPA obligations with respect to continued storage will enhance efficiency in individual licensing reviews by analyzing the environmental impacts of continued storage, which are the same or largely similar at each nuclear power reactor or storage site, and codifying the results of that analysis. Part of the environmental analysis for a nuclear power reactor or storage facility license includes a review of the impacts caused by the spent nuclear fuel generated in the reactor. That analysis must assess the impacts of the spent nuclear fuel from generation through disposal. If the Commission lacks reasonable assurance that a disposal solution will be available at the end of a reactor's licensed life for operation, NEPA requires that the Commission assess the impacts of continued storage of the spent nuclear fuel pending disposal at a repository. (0897-2-11 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: But the NRC's complete substitution of NEPA findings for safety findings is unlawful. The NRC must comply with *both* the Atomic Energy Act *and* NEPA. *Limerick Ecology Action v. NRC*, 869 F.2d 719, 729 (3d Cir. 1989). The two statutes are independent and distinct in their requirements. The Atomic Energy Act establishes a minimum level of protection of public health and safety against radiological hazards. NEPA, on the other hand, requires disclosure and weighing of risks posed by licensing actions that are authorized by the NRC under the Atomic Energy Act; but it does not establish minimum standards. The two statutes do overlap. For example, NEPA requires the NRC to consider the reasonably foreseeable risk that siting sufficient repository capacity will not be feasible, and what would be the impacts if it is not feasible. But compliance with one statute does not excuse compliance with the other. *Limerick Ecology Action*, 869 F.2d at 729-30 (noting that case law "do[es] not suggest that NEPA can never require consideration of additional alternatives simply because there is some overlap in the considerations required by both statutes"). Moreover, while the Court of Appeals in New York focused on the NRC's noncompliance with NEPA in promulgating the 2010 Waste Confidence Decision, nothing in the Court's opinion could be read to reverse *Natural Resources Defense Council* or *Minnesota*'s holdings that the NRC must make waste confidence safety findings that comply with the Atomic Energy Act. In the absence of such reasonable assurance findings, the NRC has no lawful basis for issuing or re-issuing reactor licenses. 42 Fed. Reg. at 34,393; *Natural Resources Defense Council*, 582 F.2d at 170; *Minnesota v. NRC*, 602 F.2d at 418. (0897-2-12 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: B. The Proposed Rule Violates the Atomic Energy Act by Removing the Previous Finding Regarding Sufficiency of Repository Capacity[.] As discussed above, until the instant proposed rule, all NRC "waste confidence" decisions have included "reasonable assurance" findings. In addition, until the proposed rule, all "waste confidence" decisions have specifically addressed the question of whether the NRC has reasonable assurance that sufficient repository capacity will be available to accommodate spent reactor fuel when it is needed. This change can be seen by comparing the proposed rule with all of the quotations from Findings 2 and 4 in Section A above. In contrast to these previous findings, the proposed rule finds only that it is "feasible" to "safely store spent nuclear fuel following the licensed life for operation of a reactor" and that it is "feasible" to "have a mined geologic repository within 60 years following the licensed life for operation of a reactor." 78 Fed. Reg. at 56,804.¹ [footnote 1 text: In previous

waste confidence decisions, the NRC used the term “feasible” in reasonable assurance findings regarding high-level waste disposal. See, e.g., Finding 1 of the 1990 waste confidence decision: “The Commission finds reasonable assurance that safe disposal of high-level radioactive waste and spent fuel in a mined geologic repository is technically feasible.” 55 Fed. Reg. at 38,475 (1990).] The NRC’s previous reasonable assurance finding regarding the availability of sufficient repository capacity for disposal of spent fuel *has completely disappeared from the NRC’s regulations*. Its disappearance is not explained. Neither the proposed rule nor the accompanying DGEIS gives any explanation as to why the proposed rule now fails to address the question of whether the NRC has a reasonable basis for confidence in the availability of sufficient repository capacity when it is needed. The closest the NRC comes to addressing the issue is by entitling a section in Appendix B “Repository Capacity will be Available to Dispose of Spent Fuel.” *Id.* at B-2. But the heading makes no reference to reasonable assurance or the sufficiency of capacity, and the text that accompanies that heading makes no assertion that the NRC has a technical basis for a finding of reasonable assurance that sufficient repository capacity will be available when it is necessary. Nor does the DGEIS contain any analysis of the risk that sufficient repository capacity will not become available when it is needed. (0897-2-13 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Nor does the NRC have a sufficient technical understanding of the risks of extended spent fuel storage to support a reasonable assurance finding. As discussed in the Organizations’ comments on the scope of the DGEIS, NRC’s own documents show that existing information is grossly inadequate to support any reasonable predictive findings about the safety of such long-term spent fuel storage.³ [footnote 3 text: The Organizations’ scoping comments and supporting declaration of Dr. Arjun Makhijani (“Makhijani Scoping Declaration”) are attached to these comments as Exhibits E and F, respectively.] There is no existing environmental or other study that has even attempted to predict the environmental impacts of storing spent fuel on site for hundreds of years, or perhaps indefinitely. Indeed, all other studies have been premised on the opposite conclusion – that a repository will be available in the relatively near future. NRC has commenced a study of the issue: the “Long-Term Waste Confidence Update Project,” in which the NRC proposes to assess the environmental impacts of storing spent fuel for 200 years after cessation of licensing. See 75 Fed. Reg. at 81,040.⁴ [footnote 4 text: As the Court observed in *State of New York*, that rulemaking may address “some or all of the problems: that it remanded the agency. 681 F3dat483.] But work on the Long-Term Waste Confidence Update Project had only just begun at the time of the D.C. Circuit’s decision, and it is far from complete. The NRC Staff has estimated that the Long-Term Waste Confidence Update Project EIS will take until 2019 to finish. COMSECY-12-0016, Memorandum from R.W. Borchardt to NRC Commissioners re: Approach for Addressing Policy Issues Resulting from Court Decision to Vacate Waste Confidence Decision and Rule at 3 (July 9, 2012) (“COMSECY-12-0016”). Two preliminary studies issued as part of the Project support the Staff’s seven-year time estimate by demonstrating (a) the complexity of the issues raised by long-term and indefinite spent fuel storage and (b) the Commission’s lack of knowledge on the subject. The first study, issued for comment in December 2011, sets forth a series of topics that must be addressed in the Long-Term Waste Confidence Update Project EIS, including the degree to which nuclear power will be used in the future, the nature of future dry cask storage and transportation technology, prospects for long-term maintenance of institutional and regulatory control, and accidents to be considered. Draft Report for Comment: Background and Preliminary Assumptions for an Environmental Impact Statement – Long-Term Waste Confidence Update (Dec. 2011) (the “Preliminary Assumptions Document”). While the NRC proposed, as a preliminary matter, to make assumptions about many of these topics, comments show that they may not be assumed and instead should be the subject of the EIS for the Long-Term Waste Confidence Update Project. See comments by Institute for Energy and

Environmental Research, Blue Ridge Environmental Defense League, Natural Resources Defense Council, Riverkeeper, and Southern Alliance for Clean Energy on NRC Report Updating Preliminary Assumptions for an EIS on Long-Term Spent Fuel Storage Impacts (Feb. 17, 2012) (copy attached as Exhibit G). The second study, issued for comment in May 2012, identifies an array of technical issues regarding dry storage and transportation impacts on which the NRC must collect additional data before it can evaluate dry cask long-term integrity and cask vulnerability to degradation and accidents. Draft Report for Comment: Identification and Prioritization of the Technical Information Needs Affecting Potential Regulation of Extended Storage and Transportation of Spent Nuclear Fuel (May 2012) ("Technical Needs Document"). (0897-2-18 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The NRC attempts to rationalize its lack of support for a reasonable assurance finding about the safety of interim spent fuel storage by characterizing the finding as a "policy statement." 78 Fed. Reg. at 56,799. The characterization is fallacious and evasive of the NRC's responsibilities under the Atomic Energy Act. The Atomic Energy Act requires that safety must be assured by factual predictions that are based on technical evidence, not by policy statements. *Limerick Ecology Act*, 869 F.2d at 734-35. Thus, the lack of reasonable assurance findings in the proposed rule renders them invalid as a matter of law for supporting the issuance of new reactor licenses or the re-issuance of existing licenses. The NRC cannot cure this fatal deficiency by inserting the "magic words" of "reasonable assurance." Instead, it must have a technical basis for such findings. As discussed above, it has no such basis. In light of the fatal deficiencies in the proposed rule, the NRC lacks lawful grounds for issuing or re-issuing any reactor licenses. *Calvert Cliffs Nuclear Project, L.L.C. and Unistar Nuclear Operating Services, L.L.C.* (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-12-16, 76 NRC 63, 66 ("Waste confidence undergirds certain agency licensing decisions, in particular new reactor licensing and license renewal.") (0897-2-21 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The Proposed Rule Violates the Atomic Energy Act by Eliminating Previous Safety Findings That Are Essential to Atomic Energy Act Compliance (0897-2-7 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: As the NRC conceded in its first waste confidence pronouncement (Denial of Petition for Rulemaking, 42 Fed. Reg. 34,391 (July 5, 1977)) and as affirmed by the U.S. Court of Appeals in *Natural Resources Defense Council v. NRC*, 582 F.2d 166 (2nd Cir. 1978), in order to satisfy the Atomic Energy Act, NRC reactor licensing decisions must include predictive reasonable assurance findings regarding (a) the availability of sufficient and safe spent fuel disposal capacity when it is necessary and (b) the safety of spent fuel storage in the meantime. See also *Minnesota v. NRC*, 602 F.2d 412 (D.C. Cir. 1979). As the NRC explained in 1977, in its first pronouncement on the issue: (0897-2-8 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: While these reasonable assurance findings do not need to be as rigorous as other safety findings because they predict events far in the future, they must demonstrate a technical basis for a reasonable level of "confidence" that reactor fuel will be isolated from humans and the environment as long as it remains radioactive. 44 Fed. Reg. at 34,393. (0897-2-9 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Thus, the DGEIS fails to provide an adequate technical basis for a reasonable assurance finding regarding the safety of long-term or indefinite spent fuel storage. Worse, the DGEIS ignores a wealth of studies concluding that much more study of spent fuel behavior is required before it is possible to reach informed conclusions about its behavior under extended storage conditions. Finally, the DGEIS ignores the safety and environmental risks posed by

variations in spent fuel about which it has little knowledge. Not only has the NRC failed to obtain the information it needs to make a safety finding, but it has not even analyzed the uncertainty created by the lack of information. (0897-4-18 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Makhijani Declaration, par. 4.16 (quoting Kadak 2012). Of equal concern as the serious data gaps identified by the National Academy of Engineering is the fact that as recently as 2012, neither the NRC nor the nuclear power industry had implemented the periodic examinations of spent fuel recommended by the NWTRB in 2010. *Id.* Without this basic information, the NRC has an inadequate foundation for any predictive safety finding regarding the behavior of spent fuel in long-term storage conditions. And any EIS that is prepared to discuss these matters should acknowledge and analyze the considerable uncertainty that exists. (0897-4-9 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Here, the disjointed nature of NRC's program for evaluation of environmental impacts related to spent fuel storage and disposal is not only piecemeal but internally inconsistent, full of gaps, and riddled with outdated information. As a result, the NRC utterly fails to support its safety findings with an adequate environmental analysis, thus violating both the Atomic Energy Act and NEPA. (0897-7-18 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: 10 C.F.R. §51.23 (the proposed rule). This proposed rule appears in Part 51 of NRC regulations, indicating that it is an environmental regulation. Yet, it has safety language. To make matters more confusing, the NRC has dropped the "reasonable assurance" findings formerly made in the waste confidence decision. The Atomic Energy Act and NEPA both require the NRC to make findings. Safety findings should be included in Parts 50 and 52 and environmental findings should be included in Part 51. The NRC should also explain that safety findings must be supported by an adequate NEPA analysis. After three decades of distorted and partial environmental analysis leading to uninformed licensing and re-licensing decisions, it is time now for the NRC to come into compliance with NEPA. The NRC must update its outdated and repudiated assumptions, conduct an environmental study that provides an integrated examination of all environmental impacts and costs related to spent fuel management, and promulgate a new set of regulations that provides for meaningful consideration of these impacts in individual licensing decisions. (0897-7-21 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In the proposed waste confidence rule, the NRC makes a finding that spent fuel disposal is feasible, but it fails to make any reasonable assurance finding regarding the availability of sufficient repository capacity to accommodate the spent fuel that will be generated as a result of future NRC licensing decisions. While the Court directed the NRC to analyze the uncertainty associated with failure to site a repository, the NRC simply dropped the safety finding from its regulations. (0897-7-8 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In the Draft GEIS, NRC seeks to support three findings that are presented in proposed 10 CFR 51.23(a)(2) and Table B-1: (a) that it is feasible to store spent fuel safely and without significant adverse environmental impacts for an indefinite period, (b) that it is feasible to have a mined geologic repository within 60 years following the life of a licensed reactor, and (c) that spent fuel disposal will not have impacts on the environment that are significant enough to foreclose extended operation for any nuclear power plant.¹⁰ [footnote 10 text: NRC 2013b, p. 56804-56805] In my professional opinion, the Draft GEIS is extremely inadequate to support these proposed findings. Significant evidence exists to show that the environmental impacts of long-term or indefinite storage of spent fuel will likely be significant and could cause significant risks to human health. In the case of indefinite storage, they are likely to be catastrophic; among other things it is likely that institutional control will be lost. (0898-1-1 [Curran, Diane] [Makhijani, Arjun])

Comment: 4.0 THE NRC'S PROPOSED FINDING THAT SPENT FUEL CAN BE STORED FOR A LONG-TERM OR INDEFINITE PERIOD SAFELY AND WITHOUT SIGNIFICANT ENVIRONMENTAL IMPACTS IS NOT SUPPORTED BY ADEQUATE DATA OR ANALYSIS.

4.1. The NRC's first proposed findings are that spent fuel can be safely stored for an indefinite time period (10 CFR 51.23(a)(2)(i)) without significant adverse environmental impacts (Table B-1). These findings are almost devoid of valid technical support so far as long-term and indefinite storage is concerned. (0898-1-12 [Curran, Diane] [Makhijani, Arjun])

Comment: In view of the above, it is my conclusion that the NRC lacks a factual and scientific basis for a finding of confidence that spent fuel can be safely stored for the long-term, much less indefinitely. (0898-1-9 [Curran, Diane] [Makhijani, Arjun])

Comment: The failure of the proposed rule to assure that sufficient repository capacity will be available is contrary to the prior waste confidence assertion in the 2008 version of 10 CFR 51.23, which stated: Further, the Commission believes there is *reasonable assurance* that *at least one* mined geologic repository will be available within the first quarter of the twenty-first century, and *sufficient repository capacity* will be available within 30 years beyond the licensed life for operation of any reactor to dispose of the commercial high level waste and spent fuel originating in such reactor and generated up to that time.¹¹⁴ [footnote 114 text: 10 CFR 51 2008, at 51.23(a); italics added] (0898-4-11 [Curran, Diane] [Makhijani, Arjun])

Comment: In view of the above, it is my conclusion that the NRC lacks a factual and scientific basis for a finding of confidence that spent fuel can be safely stored for the long-term, much less indefinitely. The NRC also lacks a factual and scientific basis for a finding of confidence that spent fuel can be disposed of safely within acceptable, legally binding health and safety standards. In fact, the available evidence suggests that both long-term storage and disposal of spent fuel could pose significant safety and environmental risks. The NRC should prepare a new Draft GEIS that meaningfully examines these risks. (0898-5-24 [Curran, Diane] [Makhijani, Arjun])

Comment: On Page 1-9, you say that "unless a threat to the public health and safety of the common defense and security exists, the NRC has no authority to deprive current licensees of their vested interest in licenses...." This means that we can never decide that we have made a very big mistake by ever getting these plants running from a safety standpoint. Once we decided to allow it, then we can never turn back? WRONG. The NRC does have the authority to pull licenses if they decide the plant is not safe, period. It does not matter if the licensee has some vested interest. (0930-2-23 [Lutz, Ray])

5. Comments Concerning the NEPA Process

Comment: Petitioners [The State of Vermont with the Vermont Department of Public Service, the State of Connecticut, the State of New York, and the Commonwealth of Massachusetts] request that the Commission review and reverse certain conclusions reached by the Regulatory Staff in the Waste Confidence Generic Environmental Impact Statement Scoping Process Summary Report (March 2013) ML13060A128 ("Staff Scoping Decision"). The Commission has inherent supervisory authority over the Staff and should act now in furtherance of the Commission's stated goal of resolving the pending proceedings expeditiously. (0001-1 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: The Staff Scoping Decision is inconsistent with Commission directives. In Staff Requirements COMSECY-12-0016, the Commission directed Staff to be guided by the "Council

on Environmental Quality's Guidance on Improving the Process for Preparing Efficient and Timely Reviews Under NEPA" ("CEQ Guidance"). Staff Requirements COMSECY-12-0016. In that Guidance, CEQ reminds federal agencies that "NEPA requires Federal agencies to consider the potential environmental consequences of their proposed action, and any reasonable alternatives, before deciding whether and in what form to take an action." CEQ Guidance, 77 Fed. Reg. 14473, 14475 (Mar. 12, 2012). While the Guidance encourages agencies to incorporate by reference completed analyses from other documents (see, e.g., 77 Fed. Reg. at 14475 ("NEPA reviews should coordinate and take appropriate advantage of existing documents and studies, including through adoption and incorporation by reference")), nowhere does it authorize Federal agencies to avoid consideration of impacts or alternatives and proceed to a final decision on a major federal action merely because another, yet to be completed, proceeding is evaluating some of those issues. To the contrary, the Guidance makes clear that the NEPA process must be fully completed *before* a decision is made on the major federal action: Agencies must integrate the NEPA process into their planning at the earliest possible time to ensure that planning and decisions reflect environmental values, avoid delays later in the process, and anticipate and attempt to resolve potential issues. NEPA should not become an after-the-fact process that justifies decisions that have already been made.;***;[A]n agency shall prepare an EIS so that it can inform the decisionmaking process in a timely manner "and will not be used to rationalize or justify decisions already made."; CEQ Guidance, 77 Fed. Reg. at 14476-77 (footnotes and citations omitted). Thus, if the Staff wishes to use any environmental analyses conducted in the "Rulemaking Revising Security Requirements for Facilities Storing SNF and HLW" as part of the GEIS process in these proceedings, it will have to wait for that rulemaking to complete its environmental impact statement analysis, a delay that will substantially interfere with the Commission's clear goal of completing the GEIS within 24 months of its initiation. (0001-19 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: [I]t appears from the Federal Register Notice for the Rulemaking Revising Security Requirements for Facilities Storing SNF and HLW (74 Fed. Reg. 66589 (Dec. 16, 2009)) that the scope of that analysis is far narrower than the scope of a proper consideration of dry cask storage as an alternative to the long-term or indefinite use of spent fuel pools. The rulemaking on security revisions is focused only on security issues at Independent Spent Fuel Storage Installations (ISFSI) and Monitored Retrievable Storage Installation (MRS): The Nuclear Regulatory Commission (Commission or NRC) is seeking input from the public, licensees, certificate holders, and other stakeholders on a draft technical basis for a proposed rulemaking that would revise the NRC's security requirements for the storage of spent nuclear fuel (SNF) at an Independent Spent Fuel Storage Installation (ISFSI) and the storage of SNF and/or high-level radioactive waste (HLW) at a Monitored Retrievable Storage Installation (MRS). 74 Fed. Reg. at 66589. The scope of that proceeding thus appears to ignore the many environmental impacts at over 100 reactor sites that may occur as a result of accidental releases from spent fuel pools, or fires at spent fuel pools, and it also appears to ignore the environmental and economic impacts of the continued use of a reactor site for waste storage for a long-term or indefinite period after the reactor has shutdown. Whether that rulemaking will even consider requiring dry cask storage at reactor sites remains unresolved. (0001-20 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: It is essential that these scoping issues be resolved as quickly as possible. The current GEIS process and rulemaking are part of a saga spanning 35 years. During that time, the Commission has struggled with whether it is environmentally prudent to allow nuclear wastes to be generated before there exists a facility of sufficient size to safely and permanently dispose of that waste. Because such a facility does not yet exist, the Commission has also

struggled with whether there is reasonable assurance that nuclear wastes can be safely stored at reactor sites with acceptable environmental risks that have been mitigated to the fullest extent possible forever. The Commission has already made several important first steps in its efforts to achieve the legally required analysis by: (1) choosing to conduct its review by using the full power of NEPA to develop a comprehensive GEIS; and (2) choosing to suspend the issuance of any new authority to generate nuclear wastes until this review process has been finally completed. But to resolve these matters fully, fairly, and efficiently by the end of 2014, the Commission must act now to review the Staff Scoping Decision before the problems that are inherent in that decision adversely affect the rest of the GEIS process. To that end, Petitioners respectfully request that the Commission establish the following schedule for immediate action on this Petition: 1. May 31, 2013-Any entity that participated in the scoping process can file a brief supporting or opposing the request for the Commission to hear the Petition on the merits; 2. June 7, 2013-Commission decides whether it will address the merits of the Petition; 3. June 14, 2013-Any entity that participated in the scoping process can file a brief on the merits of the Petition; 4. June 21, 2013-Any entity that filed a pleading on June 14 files any reply; 5. July 2013-Commission decides the merits of the Petition.; Time is of the essence, and the Commission should act quickly to ensure that the scope of the GEIS complies with NEPA and with the D.C. Circuit's decision in *New York v. NRC*. (0001-31 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: [T]he purpose of the Staff Scoping Decision was to define the parameters of the GEIS, essentially deciding for these proceedings what will be analyzed and what will not be analyzed. The Commission's regulations identify the determination of the scope of a proposed EIS as a central decision point in the EIS process which controls the future EIS analysis: (a) Scope. The draft environmental impact statement will be prepared in accordance with the scope decided upon in the scoping process required by §§ 51.26 and 51.29. As appropriate and *to the extent required by the scope*, the draft statement will address the topics in paragraphs (b), (c), (d) and (e) of this section and the matters specified in §§ 51.45, 51.50, 51.51, 51.52, 51.53, 51.54, 51.61 and 51.62. 10 C.F.R. § 51.71(a) (emphasis added). Thus, the Staff Scoping Decision is effectively the final word on that issue and will define the parameters of both the proceeding and draft and final GEIS. If the Staff has erred in determining the proper scope, as is clearly the case here, the error will infect the entire GEIS process and the two proceedings which will be relying on the GEIS. That error will ultimately result in either review and reversal by the Commission or more federal court review and more delay in the completion of this important process. See, e.g., Notation Vote, Chair Macfarlane (Aug. 10, 2012) (recognizing that serious errors in the initial NEPA process can cause substantial delays in the final resolution of the issues: "Experience has shown that on issues of particular controversy, an environmental assessment will not result in resource or time savings in the end, because of the likelihood of challenges to the finding of no significant impact."). The Staff's overly narrow and erroneous conclusions in the Scoping Decision will, if allowed to stand, "[a]ffect[] the basic structure of the proceeding in a pervasive or unusual manner." 10 C.F.R. § 2.341(f)(2). The Staff limited the scope of the evaluation of alternatives in the GEIS and failed to identify in the Staff Scoping Decision the criteria to be applied in deciding what issues will be subject to resolution on a site-specific basis. (0001-9 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: There is no such thing as "small" or "moderate" dangers. This being nuclear waste, it is ALL highly dangerous. I suggest the "small" and "moderate" terminology should be deleted. As you know, it is absurd. (0020-1 [Carter, Pat])

Comment: The NRC effectively assumes licensing, and then goes on from there to look at the impacts of irradiated nuclear fuel storage, although it does a very poor, woefully inadequate,

and, in my opinion, legally insufficient and violative job of doing that. The whole point of the environmental impact statement is to allow an informed decision regarding whether to license the reactor in the first place; that is, to allow the creation of irradiated nuclear fuel. NRC does not even attempt to answer that question in this environmental impact statement. (0030-2-2 [Kamps, Kevin])

Comment: I would also like to remind everyone that it is important to keep in mind the relevant NEPA principles -- National Environmental Policy Act principles -- as the NRC proceeds through this rulemaking. First and foremost, an EIS serves two purposes. It is intended to ensure that Federal agencies have available and consider detailed information on the environmental impacts of major federal actions. This is the so-called "hard look." Second, the EIS also is intended to ensure that information is made available to the public and other stakeholders who may also play a role in the decision-making process. (0030-3-5 [Ginsberg, Ellen])

Comment: NEPA itself does not mandate specific results or licensing decisions, but, rather, it prescribes a process designed to prevent uninformed agency action. Agencies may take action, even in situations where significant environmental impacts may result, because the agency has carefully balanced the various environmental and other impacts and is not to elevate such impacts over other considerations. Finally, NEPA does not require that an agency delay action until better or other information becomes available. CEQ regulations directly address the notion of incomplete or unavailable information and suggest that worst case assumptions simply are not required. (0030-3-6 [Ginsberg, Ellen])

Comment: I would like to close with two points. First, the agency has an established history of addressing this set of waste confidence issues generically. That approach was not the subject of criticism by the D.C. Circuit. In fact, the generic approach and reliance on the substantial body of existing work was anticipated by the Court. Second, NEPA does not require unanimity of public opinion or even consensus. It requires that the agency take a look at the available information and apply a rule of reason. NRC already has gone well beyond the requirements of NEPA to establish -- to evaluate the issues in this draft GEIS. It should now complete the process and timely issue the final GEIS and the final rule. (0030-7-8 [Matthews, Tim])

Comment: The National Environmental Policy Act (NEPA) requires consideration of all reasonably foreseeable environmental impacts of a proposed action ---- from cradle to grave. The question that must be answered in an atomic reactor licensing decision is: If you look all the way, to the end of the reactor's life, including decommissioning, spent nuclear fuel/irradiated nuclear fuel/high-level radioactive waste storage, and disposal, is having that source of electricity generation -- nuclear power -- worth all the environmental and economic costs, risks, and impacts that will then inevitably ensue? As soon as NRC licenses a reactor, the generation/creation of irradiated nuclear fuel and all its related costs, risks, and impacts will then follow. The NRC effectively assumes licensing, and goes on from there to look at the impacts of irradiated nuclear fuel storage, although it does a very poor, woefully inadequate job of that! But the whole point of the Environmental Impact Statement is to allow an informed decision regarding whether to license the reactor in the first place, that is, to allow the generation of irradiated nuclear fuel. NRC does not even attempt to answer that question. (0034-1 [Wagner, Jim and Virginia])

Comment: As a threshold matter, APS [Arizona Public Service Company] agrees with the Court versus NRC, that the National Environmental Policy Act is a procedural statute that is intended to ensure fully informed and well-considered decision making. (0045-2-3 [Green, Michael])

Comment: Although, it's too early to tell, we believe it's fair to say, that the NRC is likely going to receive many comments that challenge the staff's conclusions regarding environmental impacts of short-term, long-term, and indefinite storage, as well as postulated accidents and potential acts of sabotage or terrorism. As the staff reviews the comments made in this public comment period, we remind the staff to keep in mind the fundamental proposition that the National Environmental Policy Act is a process statute. (0045-2-6 [Green, Michael])

Comment: I am advocating for the U.S. Nuclear Regulatory Commission to update and revise its 2010 Waste Confidence Generic Environmental Impact Statement (GEIS). According to the U.S. Court of Appeals for the DC Circuit (2012), the NRC's 2010 Waste Confidence GEIS did not fulfill its responsibility to meet the required NEPA expectations regarding spent nuclear fuel storage. (0047-1 [Anonymous, Anonymous])

Comment: I believe that it should be mandatory for the NRC to continually research the potential human health and environmental impacts that could result from storing nuclear spent fuel even after their proposed regulatory document is considered to fulfill their NEPA obligations. By doing this, the NRC could potentially discover new findings and address them instantaneously rather than waiting for parties to discover flaws and challenge their projections in court. I think this process would be ideal because the NRC could inform the public of new pertinent information, which in turn would allow the public to be aware of these findings immediately and adapt accordingly. (0047-5 [Anonymous, Anonymous])

Comment: First, I would advise that we stop the train on this whole issue. The reason being first the national -- the Congress charged the National Academy of Sciences to determine the adequacy of NRC regulations. And it asked specifically an emphasis on waste storage. Until that document is completed, it is premature to carry on with this business you're doing. (0112-3-1 [Lampert, Mary])

Comment: I urge the Nuclear Regulatory Commission (NRC) to develop a valid, realistic assessment of the environmental impacts of radioactive waste. Radioactive waste is one of the most toxic and persistent threats to human health and it is paramount that we consider its storage with full research, overview and detailed long-range environmental impact studies. (0144-1 [O'Nan, Margaret S.])

Comment: EI's recommendations were ignored, including the request that evidence brought out through cross-examination at adjudicatory proceedings be included in the references in order for the NRC to use them in addressing the court's ruling. Numerous requests and recommendations from others were also ignored. (0174-7 [Thomas, Ellen] [Thomas, Ruth])

Comment: This updated EIS needs to be written in order to for us, as a human race, to morally deal with a possible problem that can put many lives at stake. I am not saying that if this updated EIS is not signed that we fail at being humane. It just feels wrong to have this major power in our hands and not give it our best in order to make it work at the best level it can possibly perform at. As well as being morale, it's also just relatively not a good idea from a health aspect to let such potentially dangerous power go unnoticed. (0192-11 [Einhorn, Jeremy])

Comment: It is time that the NRC creates an updated EIS so that everything is up to current standards. To have an out of date EIS is pretty dangerous actually, as it probably misses a lot of potential hazards that have occurred. (0192-13 [Einhorn, Jeremy])

Comment: The more updated and more accurate this EIS is, the better chance that the community is more prepared for any situation to arise. As well as being more prepared, the community also has the chance to further educate themselves on nuclear waste, and ways to protect themselves from it. This EIS really is not just for the NRC or any company; it can majorly impact our society we live in a great way. (0192-4 [Einhorn, Jeremy])

Comment: So, not only is it beneficial for U.S. citizens to have an updated EIS, but it has the potential to greatly benefit the NRC as problems such are far less likely to occur. (0192-7 [Einhorn, Jeremy])

Comment: NEPA, established in 1969, was solely created to protect the environment we live in. Through various policies, it makes sure that what we do as a society affects the environment as little as possible. In an article written in Science magazine, the authors say that, "It [NEPA] was meant to force agencies to 'insure the integrated use of the natural and social-sciences' in planning and decision-making" (Bronstein, Baer, Bryan, DiMento, Narayan, 2005). This clearly states that it is the agencies job, in this case the NRC, to have sound research when it comes to the creating of something or planning. When it comes to the update of the EIS in regards to nuclear waste, I think it's more than obvious that sound research is needed to make this EIS as effective as possible. Going off of that, the EIS needs to be as effective as possible in order to reduce any ill effects, which is the responsibility of the NRC. This is clearly is a matter that is of grave importance and needs to be handled with delicate procedures by the NRC. I've been talking a lot about benefits for both the agency and the community if the NRC was to update the EIS in regards to nuclear waste. (0192-8 [Einhorn, Jeremy])

Comment: The Court ruling to which the NRC is responding, with this Draft GEIS, requires the NRC to examine the risks of spent fuel storage and did not allow the NRC to merely assume that storage would be safe. Instead of examining what would happen if spent fuel remained unprotected at reactor sites indefinitely the NRC assumed the spent fuel can be safely managed in service storage for an indefinite period. To this end the NRC is essentially involved in the same fallacy that rendered the Waste Confidence rule insufficient. (0244-3-2 [Hancock, Mandy])

Comment: The guidance from the Environmental Protection Agency and the Council on Environmental Quality called for a section in the Environmental Impact Statements on the alternatives to the proposed project, and the NRC has done that with this revision for the Waste Confidence Rule. I wrote a memo to the agencies suggesting that the guidance add a section on the environmental and national impacts of not going ahead with the project. Not going ahead. The Council on Environmental Quality rejected the idea, but I think the NRC should provide a clear analysis of the potential environmental impacts and the national impacts if the Waste Confidence Rule continues to be derailed. (0244-4-2 [Rossin, A. David])

Comment: The Court ruled correctly that NRC did not justify its waste confidence, which is, in a sense, allowing more nuclear waste to be created. It withdrew that confidence. It said no more should be created, unless you can really guarantee that it can be taken care of, or at least have confidence that the environmental impacts will not be significant. (0246-2-3 [D'Arrigo, Diane])

Comment: Thank you for accepting this supplemental comment. I am sorry I did not have time to make this comment during my oral comments. I was disturbed because Paul (NRC staff) indicated that NRC is not required to prepare responses to comment to finalize the EIS. This seems contrary to NEPA, and I feel cheated. (0284-15 [Borchmann, Patricia])

Comment: The environmental impact statement the Nuclear Regulatory Commission prepared for its "Waste Confidence Rule" in response to New York v. NRC fails to take the required "hard look" at the future impacts of nuclear waste at U.S. nuclear reactors, including Indian Point, which is located just 35 miles from Midtown Manhattan in New York State. (0324-1 [O'Mahony, Emily])

Comment: So, that is my sort of -- my constructive request for how the GEIS might actually gain a sense of purpose, and a sense of direction, and a sense that the NRC is actually connecting this GEIS process to the mandates that it has to protect the public health and safety, and the environment. I would have a very specific recommendation that I've made a very long time ago, and have continued to make, and that is that in 2002 and 2004, the NEPA Task Force Council on Environmental Quality created a report about modernizing NEPA implementation. And one of the things that it highly recommended was to incorporate adaptive management and monitoring strategies into these kinds of challenges, long-term challenges that we face. In Canada, their council there is using adaptive management and monitoring for their permanent storage facility, and I think that at the very barest minimum the NEPA recommendations on adaptive management and monitoring should be seriously considered by the NRC in addressing -- in this GEIS in evaluating the GEIS, and that adaptive management and monitoring guidance should be applied to precisely the timeframes that the GEIS address, which is short, long-term, and indeterminate storage. (0328-12-7 [Eide-Tollefson, Kristen])

Comment: While the EIS framework has a long history in addressing environmental impacts, it may be inappropriate for risk assessment of spent nuclear fuel hazards over decades. Thus, even the most thorough EIS could be irrelevant to the critical issues at hand. (0431-1 [Pascall, Glenn] [Watland, George])

Comment: I am writing to you to urge you to support and encourage truthful information disclosure to the American public, as well as to all relevant persons and agencies, regarding the current condition of our nuclear waste sites. We can only make wise and safe choices about our nuclear waste when we see, speak, and share what the needs are. (0432-1 [Wopat, Jeen])

Comment: Furthermore, the entire concept of a generic EIS is challenged as incompatible with the intent of the National Environmental Policy Act (NEPA). (0447-2-8 [Andrews, Richard])

Comment: The GEIS framework may not be adequate or appropriate for nuclear risk assessment. (0464-1 [Nelson, Pam])

Comment: The environmental impact statement the Nuclear Regulatory Commission prepared for its "Waste Confidence Rule" in response to New York v. NRC fails to take the required "hard look" at the future impacts of nuclear waste at U.S. nuclear reactors, including Indian Point, which is located just 35 miles from Midtown Manhattan in New York State. (0465-1 [Commenters, Multiple])

Comment: At this time the Commission does not have any legally sufficient analysis, under NEPA, that addresses the issue of the environmental impacts of spent fuel storage beyond 30 years after plant shutdown or alternatives that could be used to mitigate those impacts. In fact, the Commission has only one document that purports to comprehensively address those issues under NEPA, NUREG-0575. However, as noted above, that document only looked at the issue of spent fuel storage at reactor sites for the period up to 2000, when it assumed a permanent waste repository would be available. Further, it is outdated for a number of reasons, including ignoring what is now known to be a credible threat of a terrorist attack.¹⁷ [footnote 17 text: In the

Generic Environmental Impact Statement for License Renewal of Nuclear Plants, NUREG-1437 (1996) ("NUREG-1437") and its update NUREG-1437 Rev. 1 (June 2013) ("NUREG-1437 Rev. 1") NRC purported to look at the environmental impacts of spent fuel storage at reactor sites during plant operations but did not separately look at the question of storage at reactor sites after plant shutdown. NUREG-1437; NUREG-1437 Rev. 1 at 4-175. In addition, neither of those updates addressed the issue of environmental impacts with consideration of the information NRC Staff assembled in its non-NEPA analysis included with COMSECY-13-0300 including its conclusions that under several scenarios, spent fuel storage in dry casks would reduce environmental consequences of spent fuel storage in pools at a cost that was less than the benefits to be gained by such dry cask storage. See COMSECY-13-0300.] (0473-10-3 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: NRC's Use of "Small," "Medium," and "Large" Does Not Comport With NEPA: NEPA provides for a detailed statement of "(i) the environmental impact of the proposed action, [and] (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented." 42 U.S.C. § 4332(2)(C). The NRC frames its impacts by using the vague terms of "Small," "Medium," or "Large," although neither NEPA, CEQ regulations, nor NRC regulations reference, define, or sanction the use of such terms. NRC's basis for so doing appears to be that it has done so before. DGEIS at xx ("NRC used terms in other NEPA documents... for defining the standard of significance for assessing environmental issues" and does the same here). Yet this set of terms has no relevance under NEPA, CEQ, or NRC NEPA regulations, and does not comport with NEPA's "significant impacts vs. non-significant impacts" parlance. NEPA requires the NRC to include in every recommendation or report on proposals for ... Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on -- (i) the environmental impact of the proposed action, (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented, (iii) alternatives to the proposed action, (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented. 42 U.S.C. § 4332(2)(c)(i)-(v). The DGEIS does not directly relate back to this statutory scheme. NRC's Small/Medium/Large characterization does not explain what adverse environmental effects cannot be avoided should the proposal be implemented, for example, or irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented, nor does it provide any specific values that can be included in the ultimate cost benefit analyses that will have to be conducted for each licensing action that will rely on the final generic impact statement. (0473-10-4 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Under NEPA, the discussion of adverse effects must not improperly minimize negative side effects. *Western Watersheds Project v. Kraayenbrink*, 632 F.3d 472, 491 (9th Cir. 2011) (quoting *Earth Island Inst. v. U.S. Forest Serv.*, 442 F.3d 1147, 1159 (9th Cir. 2006), abrogated on other grounds by *Winter v. Natural Res. Def. Council, Inc.*, 555 U.S. 7 (2008)). NRC's vague analysis of impacts is particularly troubling given the D.C. Circuit's direction to NRC in the context of waste confidence that "[o]nly if the harm in question is so 'remote and speculative' as to reduce the effective probability of its occurrence to zero may the agency dispense with the consequences portion of the [NEPA] analysis." *New York v. NRC*, 681 F.3d 471, 482 (D.C. Cir. 2012). Thus, NRC cannot avoid a discussion of even "small" impacts in the DGEIS. By using the term "small," "medium," and "large," NRC is cloaking impacts in vague terms that avoid disclosing what the actual impacts are. (0473-10-5 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Moreover, for some of these impacts, NRC has no basis for even making these findings. See DGEIS at 6-56 (acknowledging that "[a]ctivities that involve bare fuel handling in a postulated dry transfer facility at nearby facilities could involve additional accident risk" but postulating that those impacts would be "Small;" without any functioning DTS facility anywhere in this country, the NRC does not have a factual basis for making this finding.) (0473-10-6 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: This is unacceptable under NEPA, and the DGEIS should be revised to include a qualitative and quantitative assessment of each impact and its significance in plain language. At a minimum, NRC must clearly set out the legal authority that supports the use of these terms, and include an explanation of what the "small," "medium," and "large" label means for each individual impact. (0473-10-7 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: As the States raised in their scoping petition, the NRC cannot defer discussion of NEPA-required information because another, yet to be completed, non- NEPA proceeding is evaluating some of those issues in the context of an AEA rulemaking. To the contrary, the Guidance makes clear that the NEPA process must be fully completed before a decision is made on the major federal action: Agencies must integrate the NEPA process into their planning at the earliest possible time to ensure that planning and decisions reflect environmental values, avoid delays later in the process, and anticipate and attempt to resolve potential issues. NEPA should not become an after-the-fact process that justifies decisions that have already been made. *** [A]n agency shall prepare an EIS so that it can inform the decisionmaking process in a timely manner "and will not be used to rationalize or justify decisions already made." CEQ Guidance, 77 Fed. Reg. at 14476-77 (footnotes and citations omitted). The "Rulemaking Revising Security Requirements for Facilities Storing SNF and HLW" contains no analysis of the environmental impacts of spent fuel, and thus cannot serve as any deterrent to the full exploration of all of those impacts here. Moreover, if the NRC wanted to rely on that rulemaking as part of the DGEIS process in these proceedings, it would have to wait for that rulemaking to be finalized before completing its environmental impact statement analysis here. (0473-11-12 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: NRC has the full authority to order expedited fuel transfer under the AEA, but is also obligated to discuss environmental impacts of this option in the context of mitigation measures or alternatives under NEPA. The expedited fuel transfer should be examined as an alternative so it can be assessed for all plants, not in an ad hoc way under the backfit or other NRC procedure.¹⁹ [footnote 19 text: Former Commission Chairman Jaczko explained the problems and uncertainties inherent in the "so-called 'backfit' regulations that allow licensed reactors to avoid compliance with new safety enhancements based on considerations like implementation costs" and the "difficulty of requiring timely compliance with new safety requirements that are not tied down in the license." Southern Nuclear Operating Co. (Vogtle Electric Generating Plant, Units 3 and 4), Dkt. Nos. 52-025-COL & 52-026-COL, Memorandum and Order, CLI-12-02 (Feb. 9, 2012) (Jaczko, dissenting).] Additionally, to the extent the DGEIS is relying upon the Spent Fuel Pool Study, it should expressly explain any such reliance. (0473-11-15 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Finally, since the Spent Fuel Pool Study has only now been finalized, a supplemental DGEIS will be now required if the NRC seeks to incorporate its conclusions in this rulemaking. (0473-11-16 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The Draft GEIS fails to demonstrate that site-specific evaluations would not result in different findings than the GEIS with respect to environmental consequences. This demonstration is required to support the decision to follow a GEIS approach with no issues identified as requiring site-specific analysis. (0473-12-1 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Also, the NRC's reliance on the future DTS licensing idea has resulted in the NRC failing to do a number of other required analyses here. For example, there is no environmental justice analysis for long term-storage because the NRC asserts that will be done as part of the DTS licensing proceedings taking place at each facility. This segmented approach fails to provide the adequate information in this DGEIS for all impacts related to the storage of waste. (0473-12-19 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The Draft GEIS only considers environmental impacts of limited storage scenarios and does not specify whether, and in what context, additional scenarios may be considered at a given site or in general. In short, while the Draft GEIS appears to conclude that site specific factors can be considered at a later time, the overall conclusion is that no such site specific analyses would be required with respect to environmental impacts of continued storage. (0473-12-3 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The IE Report identifies how the DGEIS subverts the NEPA process by failing to justify the use of a generic approach to address problems that are widely considered to be site-specific. What the DGEIS would have needed to do, but has not done, is to demonstrate that the many differences between reactor sites that bear on the environmental consequences of spent fuel storage for indefinite periods at those sites are either captured in the environmental analysis or are not sufficiently different to warrant separate treatment. As the IE Report demonstrates, the DGEIS does neither but, instead, assumes away the differences. The use of assumptions instead of analysis is not an acceptable approach under NEPA. (0473-12-4 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: In any case, studies referenced in the vacated 2010 document are years out of date. See, e.g., 75 Fed. Reg. 81037, 81053 (citing a 2001 National Academy of Science report). (0473-17-8 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Moreover, the DGEIS fails to meet the requirements of NRC's own regulations requiring it to use plain language in EISs. By referring a concerned member of the public back to an invalid federal register notice, after which the public must then find the relevant page number of that notice and then find the citations cited therein, NRC Staff unduly burden reviewers of the EIS. The NRC Inspector General has recently faulted the NRC Staff for this practice. The DGEIS should cite clearly, with as much information as possible, the source of the assertions it makes concerning the safe storage of nuclear waste in American communities. (0473-17-9 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Rather, based on the findings and analysis of the DGEIS, NRC will merely note in any site-specific environmental impact statement regarding issuance of any license or amendment to a license, that the impacts of spent fuel storage at the plant are "small" and that there are no alternatives to how the applicant/licensee proposes to store the spent fuel at the reactor site that need to be considered and no alternatives to how long the applicant/licensee proposes to store the spent fuel at the reactor site. (0473-6-2 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: On March 4, 2013, the NRC released the Waste Confidence Generic Environmental Impact Statement Scoping Process Summary Report, ML13060A128. The NRC did not propose any changes to the proposed Waste Confidence DGEIS scope based on the State Scoping Comments, nor did it provide a substantive and thorough explanation of the basis for its rejection of these comments. (0473-7-1 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The Office of the Inspector General recently took NRC to task for its failure to meet its NEPA obligations in a way that is accessible to the public. Office of the Inspector General, Nuclear Regulatory Commission, Audit Report: Audit of NRC's Compliance with 10 CFR Part 51 Relative to Environmental Impact Statements (OIG-13-A-20) (ML13232A192) (Aug. 20, 2013) ("OIG Report"). The OIG report found that NRC's NEPA documentation "does not clearly present, in an accessible way, the proposed action, alternatives, and conclusions to stakeholders" and "undermines its extensive efforts to be clear, open, and transparent." OIG Report at 12. The OIG criticized NRC's EIS documents for being "lengthy and complex" and "overwhelming to the average person." OIG Report at 7, 10-11; see also id. at 15. The OIG Report cited suggestions from stakeholders that "NRC ought to break down the information "in a common sense approach so the average person can do a quick read and learn how they may be impacted by the action." Id. at 15. The NRC has again failed to produce an EIS here that is easily amenable to public review. (0473-9-10 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The DGEIS Should Have A Scope of Issues and Alternatives At Least As Broad as NRC's Previous Generic Analysis in NUREG-0575: For over 30 years, the NRC has been struggling with whether spent fuel will ever leave reactor sites and the environmental consequences of continued onsite storage. NRC's one generic impact statement addressing these issues (NUREG- 0575) is out of date and relies on assumptions that are no longer valid. Further, it fails to include new and significant information that demonstrates that its conclusions are ill-founded. That waste confidence decision and its predecessors relied on NUREG-0575 and its findings in reaching conclusions about whether spent fuel could be safely stored at reactor sites for 30 or even 60 years after plant shutdown. As already noted, the need for the generic analysis in NUREG-0575 was the dilemma caused by the absence of an anticipated place where spent fuel would be sent - in that case for reprocessing. The cause of the problem today is the absence of a permanent waste repository but the dilemma is the same. In both cases reactors were generating spent fuel while licensees expected it would be removed from the site in a finite period of time. Now it is clear that expectation will not be met. Thus, there remains the same need for the same type of generic analysis of the environmental consequences of long term and possibly permanent spent fuel storage at reactor sites, and reservation of appropriate issues for site-specific review. (0473-9-11 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Because the "waste confidence findings" were in place for so many years, no generic or site-specific EIS since 1984, which relied substantially on NUREG-0575, has included an analysis of the environmental impacts of nuclear waste generation or storage. (0473-9-2 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The scope of the WCGEIS involves consideration of options and alternatives for storage and disposition of the national inventory of spent-fuel from the nation's fleet of operating nuclear power reactor. This constitutes a "new national program." A programmatic EIS is required to be prepared for a new national program of this scope and complexity. The purpose of a programmatic EIS (PEIS) is to identify, evaluate, and determine a national course of action.

As its name implies, the WCGEIS is a generic EIS, designed to assess generic issues common to the storage and disposal of spent fuel. The WCGEIS is NOT a programmatic EIS. Thus, NRC needs to prepare a programmatic EIS to rigorously study alternatives and develop a national path forward, and then supplement it with the WCGEIS to determine generic issues for use in preparing later tiered LR EISs. (0496-13 [Batobato, Alicia])

Comment: By limiting its generic analysis to only 60 years, the NRC bases its analysis on nothing more than hope, and therefore failed to take the hard look required by NEPA. In order to satisfy its obligations under NEPA, the NRC must either convincingly explain why 60 years is a reasonable timeframe for analysis, or expand the timeframe for analysis to a period that reasonably reflects the availability of permanent waste storage. Brushing off the inquiry as speculative or unlikely is not sufficient. "[O]ne of the functions of a NEPA statement is to indicate the extent to which environmental effects are essentially unknown.... Reasonable forecasting and speculation is thus implicit in NEPA, and we must reject any attempt by agencies to shirk their responsibilities under NEPA by labeling any and all discussion of future environmental effects as 'crystal ball inquiry.'" *Scientists' Inst. for Pub. Info., Inc. v. Atomic Energy Comm'n*, 481 F.2d 1079, 1092 (D.C. Cir. 1973); see also *N. Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1079 (9th Cir. 2011) (same). (0558-2 [Strell, Ethan])

Comment: Staff acknowledges that NEPA requires NRC to "analyze the impacts of continued storage at the facility until ultimate disposal for the spent fuel is available."¹⁶ [footnote 16 text: Draft GEIS at 1-4.] Nevertheless, NRC prohibited the evaluation of the environmental and safety impacts of continued storage at the proposed PFS facility. For example, because of the Commission's pronouncement in its waste confidence decision that spent fuel can be safely stored without significant environmental impact for "at least" 100 years, the NRC, Atomic Safety and Licensing Board rejected a contention that the "repository's inability to absorb the PFS stored fuel until 'at least' the last quarter of the twenty-first century increases fuel removal and decommissioning costs, extends environmental impacts, and may cause funding shortfall-related safety problems."¹⁷ [footnote 17 text: In the Matter of Private Fuel Storage, LBP-98-07 at xiii.] Continued storage impacts were not considered in the PFS evaluation. Also, as the lead agency in the preparation of the final EIS for the PFS facility, NRC restricted other cooperating agencies, such as the U.S. Bureau of Indian Affairs ("BIA") from considering environmental impacts from the ultimate disposition of the spent fuel. The PFS FEIS states "BIA's NEPA review is limited to the scope of the proposed lease negotiated between the parties, not evaluation of actions outside the lease (e.g., ultimate disposition of the SNF [or spent nuclear fuel])."¹⁸ [footnote 18 text: PFS FEIS at 1-17.] Because of the inability to address impacts from continued storage, the BIA disapproved the PFS lease agreement, in part, as a result of their concern that "years-long delays in construction of a permanent SNF repository, reflected in the Waste Confidence Decisions of the NRC, provides no firm basis to determine when and under what circumstances SNF might be taken away from trust land if the proposed ISFSI is built."¹⁹ [footnote 19 text: U.S. Bureau of Indian Affairs, Record of Decision for the Construction and Operation of an Independent Spent Fuel Storage Installation (ISFSI) on the Reservation of the Skull Valley Band of Goshute Indians (Band) in Tooele County, Utah (BIA ROD), September 7, 2006, at 19.] BIA was further concerned that the PFS EIS "fails to adequately address the impacts of transportation of SNF away from the PFS facility."²⁰ [footnote 20 text: Id. at 21.] The BIA ROD disapproving the PFS lease agreement was vacated and remanded back to BIA.²¹ [footnote 21 text: *Skull Valley Band of Goshute Indians v. Davis*, 728 F. Supp. 2d 1287 (D. Utah 2010) (holding that the Records of Decision for the U.S. Bureau of Indian Affairs and the U.S. Bureau of Land Management be vacated and remanded back to the agencies, but the court stated that the agencies could deny the lease agreement and the right-of-way requests if performed in manner consistent with the decision).] Notwithstanding that the BIA decision was

overturned, impacts from continued spent fuel storage were not addressed for the PFS facility. (0579-12 [Smith, Amanda])

Comment: Utah agrees and appreciates that the Draft GEIS states NRC will prepare a site-specific environmental analysis prior to "any future NRC licensing action."¹² [footnote 12 text: Draft GEIS at 3-10.] (0579-7 [Smith, Amanda])

Comment: Although the Preparers do indeed cite many research studies and References to support their analysis and conclusions, an Environmental Impact Statement is mandated, at least in spirit (by NEPA), to be an original and independent, fresh assessment which necessarily requires a thorough and comprehensive scoping process and a gold-standard, rigorous investigation, NOT an anemic, "B-team," copy-and-paste approach. It is no wonder, then, that the NRC's Waste Confidence Rule has been unanimously rebuked by the U.S. Federal Court of Appeals of the DC Circuit (New York v. NRC, June 2012); and, going forward, the NRC should certainly expect further legal challenges stemming from multiple states acting through the Federal Court system. (0603-14 [Schonberger, David])

Comment: The NRC's decision to conduct a Generic EIS does not meet the NEPA requirements. A GEIS cannot and does not adequately address all the various site specific issues of long term on reactor site storage on sites with differing surrounding population densities, seismic, geological and structural issues. (0611-16 [Shapiro, Susan])

Comment: The GEIS fails to consider the worst case scenario at Indian Point and therefore cannot be relied upon as a comprehensive environmental impact statement. (0611-18 [Shapiro, Susan])

Comment: Since in the GEIS the NRC arbitrary without basis considers the vast majority of impacts of thousands of tons of nuclear waste to be SMALL, this is a red flag that the NRC is not capable to taking the required hard look necessary to comply with NEPA. (0611-50 [Shapiro, Susan])

Comment: For these reasons it is equally inappropriate for the NRC staff to repeatedly describe nuclear waste management as "a small piece of the puzzle" as they have been doing. Waste Confidence is a lynch-pin, an Achilles' Heel, a show-stopper. Over time it will undoubtedly become the most expensive piece of the puzzle, by far -- not small at all. (0616-5 [Hoffman, Ace])

Comment: With respect to drafting a document that reflects the NRC's current understanding of the environmental impacts of continued storage, we see no discussion regarding the NRC's plan to update the GEIS in the future. The final GEIS published in 2014 should not be the final word on environmental impacts in the year 2174 or beyond. The final GEIS should include some discussion regarding the NRC's plan or ideas about how or whether the final GEIS would be revised or updated. It should not be left to the public to litigate an update to this important document. (0619-1-8 [Mahowald, Philip R.])

Comment: In 2013, we are no closer to having a mined geological repository for this waste than we were when the Commission denied a petition for rule making in 1977, stating that, as a matter of policy, it "... would not continue to license reactors if it did not have reasonable confidence that the wastes can and will in due course be disposed of safely" (42 FR 34391, 34393; July 5, 1977, pet. for rev. dismissed sub nom., NRDC v. NRC, 582 F.2d 166 (2d Cir. 1978)). What "due course" has since emboldened the Commission to continue permitting and expanding the capacity of pools to store high-level irradiated fuel, enabling 70,000 metric tons of

commercial high-level radioactive waste to accumulate across this country in such configurations with little, if any, attention paid to its ultimate status? The D. C. Court's 2012 finding that these pools and the temporary storage casks currently in use do pose undue risk to public health and safety does more than imply that the Commission, in effect, has not complied with the nation's own nuclear waste laws. (0620-6 [Rivera, Evelyn])

Comment: It is unclear how the updated waste confidence rule affects plants that have recently been relicensed - for example, Pilgrim was relicensed in 2012, only two weeks before the D.C. Circuit Court of Appeals ruled that the Waste Confidence Rule was unsatisfactory. Pilgrim's pool currently holds nearly four times the number of fuel assemblies than it was originally licensed for, and its ISFSI is being built - with little oversight, no apparent assessment of its vulnerability to sea level rise and other climate change effects, and before the NRC finishes addressing environmental impacts of continued spent fuel. (0622-1-2 [Vale, Karen])

Comment: The NRC does not explain how the updated waste confidence rule would affect plants that have recently been relicensed -for example, Pilgrim was relicensed in 2012, only two weeks before the D.C. Circuit Court of Appeals ruled that the Waste Confidence Rule was unsatisfactory. (0622-1-7 [Vale, Karen])

Comment: Furthermore, the NRC needs to clarify how the updated waste confidence rule would affect plants recently relicensed, such as Pilgrim. (0622-4-15 [Vale, Karen])

Comment: With respect to the effect of the Waste Confidence Decision on revoking renewed licenses, there are two classes of reactor relicensing decisions: those that were issued before the December 23, 2010 Waste Confidence Decision and those issued after that decision. The former, first issued in 2000, were issued when the 1990 Waste Confidence Decision was in effect. The latter were issued when the 2010 Waste Confidence Decision was in effect. Any reactor licensed after 2010 should be subject to the findings of the Court of Appeals that the Waste Confidence Decision is invalid and cannot form the basis for relicensing. If pending licensing and relicensing proceedings cannot result in licenses being issued, the renewed licenses after 2010 should not have been issued because those relicensings are based on a "condition[] . . . which would warrant the Commission to refuse to grant a license on an original application." The licenses renewed before December 23, 2010 are invalid because the 1990 Waste Confidence Decision suffered from the same infirmity that invalidated the 2010 decision. In fact, the 1990 Waste Confidence Decision predicted a permanent repository by 2025, a date that no one now believes is even remotely realistic. This is clearly shown by the NRC's now aborted attempt to justify on-site storage for 200 plus years. Thus, the relicensing decisions prior to the issuance of the 2010 Waste Confidence Decision were based on a false premise and those renewed licenses would be issued in violation of 42 U.S.C. § 2133(d) and 10 C.F.R. § 50.57(a)(3). (0688-14 [Taylor, Wallace])

Comment: The National Environmental Policy Act (NEPA) is the basis for the DGEIS in this case. NEPA "declares a broad national commitment to protecting and promoting environmental quality." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348, 109 S.Ct. 1835 (1989). NEPA has in fact become the "basic national charter for protection of the environment." 40 C.F.R. § 1500.1. Compliance with NEPA ensures that federal agencies will consider significant environmental impacts of federal action, make available the relevant information, and open to public scrutiny their decision making process. *Churchill County v. Norton*, 276 F.3d 1060, 1072 (9th Cir. 2001). In order to comply with NEPA an agency must take a "hard look" at the environmental impacts of a project before acting. *Sierra Club v. Kimbell*, 623 F.3d 549 (8th Cir. 2010). An agency takes a hard look when it "obtains opinions from experts outside the

agency, gives careful scientific scrutiny, and responds to all legitimate concerns that are raised." *Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 377, 109 S.Ct. 1851 (1989). But the agency cannot take a hard look and then "ignore what it saw." *Audubon Soc. of Cent. Arkansas v. Dailey*, 977 F.2d 428, 436 (8th Cir. 1992). (0688-4 [Taylor, Wallace])

Comment: The draft GEIS claims that NRC did not identify any cooperating agencies and did not receive any formal requests. Yet NRC knows that DOE is charged with developing a repository and with management of hundreds of nuclear waste facilities and sites. There can be no excuse for the lack of involvement by DOE in the Waste Confidence GEIS, especially given the fact that DOE has identified close to 100 technical or data gaps associated with nuclear fuel storage and transportation. (DOE Review of Used Nuclear Fuel Storage and Transportation Technical Gap Analyses, 7/31/2012. <http://1.usa.gov/1bQr5xO>)[.] Not involving DOE is very convenient, when discussing these knowledge gaps might pose difficulties for an EIS. (0693-2-2 [Warren, Barbara])

Comment: The majority of the references in the GEIS are to NRC evaluations and assessments, in contrast to technical studies. We provided an important reference in our scoping comments that was not used for the GEIS. Of particular significance, the article was written by a team of authors, including Allison Macfarlane, the current NRC Chairperson. The entire article as well as other studies of spent fuel pools, such as the National Academy of Sciences study should have been used for the EIS analysis. (0693-2-3 [Warren, Barbara])

Comment: Page 1-23. "1.8.5 Significance of Environmental Impacts." NRDC Comment[:] As noted above, the Draft GEIS is a deficient presentation that fails a federal agency's basic duties to both define the scope of a major federal action and take a "hard look" at the significant environmental impacts associated with that action.⁴¹ [footnote 41 text: NEPA directs NRC take a "hard look" at the environmental impacts of its proposed program and compare them to alternative means of fulfilling the same purpose and need for agency action that may avoid or mitigate environmental harms or risks posed by the proposed action. "What constitutes a 'hard look' cannot be outlined with rule-like precision, but it at least encompasses a thorough investigation into the environmental impacts of an agency's action and a candid acknowledgement of the risks that those impacts entail." *Nat'l Audubon Soc. V. Dept of the Navy*, 422 F.3d 174, 185 (4th Cir. 2005).] Indeed, NEPA is clear in its well-established mandates. NEPA characterizes environmental impacts broadly to include not only ecological effects, such as physical, chemical, radiological and biological effects, but also aesthetic, historic, cultural, economic, and social effects. 40 CFR § 1508.8. NEPA requires an agency to consider both the direct effects caused by an action and any indirect effects which are reasonably foreseeable. Effects include direct effects caused by the action and occurring at the same time and place and indirect effects caused by the action, but later in time or farther removed in distance, but still reasonably foreseeable. 40 CFR § 1508.8. Rather than comply with these well-established NEPA requirements, the Draft GEIS submits a set of quantitatively baseless set of environmental conclusions (that impacts will be SMALL) about an arbitrarily and generically presented set of broad assumptions, without any integration of meaningful site specific data. While the NRC's taxonomy (small, moderate, or large impacts) for classifying and characterizing environment impacts has been established for some time, the way it has evolved in its use is inadequate and the Draft GEIS illustrates these problems. This Draft GEIS is clearly not in conformity with the agency's own NEPA regulation requiring that "the analysis for all draft environmental impact statements will, *to the fullest extent practicable, quantify* the various factors considered." Slapping vague qualitative labels on impacts is only permitted "to the extent that there are important qualitative considerations or *factors that cannot be quantified...*" 10 CFR 51.71 (d). Indeed, this Draft GEIS simply abandons any effort to quantify "the environmental

effects of the proposed action; the environmental impacts of alternatives to the proposed action; and alternatives available for reducing or avoiding adverse environmental effects," [*Id.*] because its analysis of reasonable alternatives *is entirely divorced from its consideration of* environmental consequences, which are themselves quantified in vague terms that do not conform to any reasonable interpretation of the phrase "to the fullest extent practicable." Specifically, such terms are no longer tied to any consistent set of quantitative or otherwise objectively ascertainable metrics for assessing and comparing the impacts of indefinite storage of SNF activities on groundwater or any other environmental resource, or on human health. (0706-3-17 [Fettus, Geoffrey])

Comment: In 1984 the Nuclear Regulatory Commission (NRC) issued its first 'waste confidence' decision, which claimed that permanent nuclear waste storage was technically feasible. This enabled the NRC to license and renew aging nuclear reactors without considering public concerns about the effects of extended waste storage for each individual site, given their "confidence" that a permanent repository would be found. In Wisconsin, the NRC renewed the operating license for the Kewaunee Power Station 2011, which would have extended the station's operation an additional 20 years until 2033, had it not ceased operations earlier in 2013 due to economic issues. The NRC renewed the operating license for our remaining nuclear reactors, Point Beach Unit 1, with a capacity of 512 MW, operating since 1970, until 2030; and Point Beach Unit 2, with a capacity of 514 MW, operating since 1973, until 2033. (0707-1 [Werner, Shahla M.]

Comment: There is no way to "clean up" and dispose of radioactive waste, except in a temporary manner, by keeping it densely packed in irradiated fuel pools. Dry casks are predicted to last 30-70 years, and that is as far as the nuclear industry has made plans. Why am I mentioning that at this point? Because we can't take a snapshot of one moment in time, such as is suggested with the GEIS, without ignoring that radioactive elements and isotopes will continue to decay and emit significant amounts of radiation for the half lives of the various elements which extend to thousands of years. These chain reactions go on at the subatomic level and they are ever changing. One GEIS at one point in time cannot capture the reality of how atomic and subatomic particles behave. (0708-6 [Lewison, Linda])

Comment: For these reasons it is equally inappropriate for the NRC staff to repeatedly describe nuclear waste management as "a small piece of the puzzle" as they have been doing. Waste Confidence is a lynch-pin, an Achilles' Heel, a show-stopper. Over time it will undoubtedly become the most expensive piece of the puzzle, by far -- not small at all. (0709-5 [Wythe Elnagar, Romi])

Comment: The GEIS is premature. There are many fundamental questions that have never been adequately addressed in radioactive waste management, storage and eventual isolation. NRC should use this opportunity to put resources (and time) into answering those questions rather than ignoring, dismissing, or using incomplete, out-dated, partial and in some cases inappropriate and unreliable information. It is particularly egregious that NRC has recently started studies on high burnup waste that are not complete, but it is proceeding with this EIS. See the "Questions" attachment to these comments for a partial list of questions that should be answered (and published as a resource for all) before any kind of EIS is issued. (0711-3 [Olson, Mary])

Comment: What is the significance of the levels of impact in the DGEIS (SMALL, MODERATE, LARGE)? The NRC describes the affected environment in terms of resource areas: Land use, socioeconomics, environmental justice, air quality, climate change, geology and soils, surface

water, groundwater, terrestrial resources, aquatic ecology, ecology, special status species and habitats, historic and cultural resources, noise, aesthetics, waste management, transportation and public and occupational health. Table 1 indicates the environmental impact - small, moderate or large - of these specified areas: Short-term storage, Long-term storage and Indefinite storage. "Small" is the predominant description of the environmental impact given in this table. Yet, facts have been presented regarding Indian Point that indicate "large" environmental impact" in these areas. (0762-2 [Skopic, Catherine])

Comment: While the City [Red Wing, MN] understands that the scoping decision for the Draft GEIS has been completed, there was never an opportunity to respond after the scoping decision for the Draft GEIS was finalized. In other words, while parties had an opportunity to weigh in, as the City did in its January 2, 2013, Comment Letter (which is identified as Document No: 291), there was no period or timeframe for comments after the parties comments were considered and required. While the City focuses its comments below on the scoping decision, these comments also apply to the Draft GEIS and should be considered equally with the same. (0783-1-4 [Harlan, Thomas])

Comment: The same basic position of non-compliance which started with the AEC has continued with the NRC. The approach of the Commission has become more flawed over the years. Rule-making procedures have been and go on being used to place concerns beyond NEPA reviews, such as the buildup of radioactive waste, the transport of radioactive materials, even liquids. Generic is now applied to more facilities and projects, such as the relicensing of old reactors. These are tactics to block public participation and it is going on with the issue of there not being a repository for radioactive waste by-products of the nuclear industry. (0813-1 [Thomas, Ruth])

Comment: NEPA requires that agencies take a "hard look" at the environmental consequences of major federal actions.¹⁹ [footnote 19 text: *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n.21 (1985) (citation omitted).] The hard look mandated by NEPA is subject to a "rule of reason."²⁰ [footnote 20 text: *See Davis v. Latschar*, 202 F.3d 359, 368 (D.C. Cir. 2000); *San Luis Obispo Mothers for Peace v. NRC*, 751 F.2d 1287, 1300-01 (D.C. Cir. 1984), *vacated on other grounds*, 760 F.2d 1320 (D.C. Cir. 1985).] As a result, an agency's environmental review need not include all theoretically possible environmental impacts arising out of an action, but only those impacts that are shown to have some likelihood of occurring.²¹ [footnote 21 text: *See Northern States Power Co. (Prairie Island Nuclear Generating Plant, Units 1 & 2)*, ALAB-455, 7 NRC 41, 48, 49 (1978).] Thus, NEPA only requires a discussion of "reasonably foreseeable" impacts.²² [footnote 22 text: *See, e.g., Wyoming Outdoor Council, Inc. v. U.S. Forest Serv.*, 165 F.3d 43, 49 (D.C. Cir. 1999); *Sierra Club v. Marsh*, 976 F.2d 763, 767 (1st Cir. 1992).] Similarly, it is well-settled that environmental reviews need not consider "remote and speculative"²³ [footnote 23 text: *See Limerick Ecology Action v. NRC*, 869 F.2d 719, 739 (3d Cir. 1989); *Trout Unlimited v. Morton*, 509 F.2d 1276, 1283 (9th Cir. 1974).] impacts or "worst case" scenarios.²⁴ [footnote 24 text: *See Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 354 (1989); *Edwardson v. U.S. Dept. of the Interior*, 268 F.3d 781, 785 (9th Cir. 2001).] (0827-1-4 [Ginsberg, Ellen])

Comment: For these reasons it is equally inappropriate for the NRC staff to repeatedly describe nuclear waste management as "a small piece of the puzzle" as they have been doing. Waste Confidence is a lynch-pin, an Achilles' Heel, a show-stopper. Over time it will undoubtedly become the most expensive piece of the puzzle, by far --not small at all. (0856-5 [Fritz, John])

Comment: In order to comply with NEPA, the NRC must show that it has made a thorough assessment of the environmental risks of siting a repository and storing spent fuel for lengthy and perhaps indefinite periods. As discussed in the attached declarations by Dr. Arjun Makhijani, Dr. Gordon Thompson, and David Lochbaum, these impacts are significant. (0897-1-14 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Nor does the DGEIS satisfy NEPA. Even if the NRC could have made the reasonable assurance findings required by the Atomic Energy Act, the DGEIS is completely inadequate to support the licensing or re-licensing of reactors to generate spent fuel. (0897-1-6 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Therefore, the NRC has years of research to do in order to gather sufficient data regarding spent fuel degradation and transportation and handling risks. (0897-2-19 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In Violation of NEPA and *New York v. NRC*, the DGEIS Assumes that NRC Will Continue to License Reactors to Generate Spent Fuel, and that the Proposed Rule is Unrelated to Those Decisions[.] The DGEIS also indicates that the NRC has made a pre-conceived determination that reactors *will* be licensed and re-licensed, and that the DGEIS is a mere formality. In Section 7, the NRC claims to have considered whether to include one set of physical impacts in its cost-benefit analysis, *i.e.*, the costs and benefits related to “the environmental impacts of continued storage.” DGEIS at 7-2. But the NRC explains that the DGEIS omits such an analysis because “continued storage [is] an activity that will occur regardless of the alternative that the NRC selects to consider its impacts.” DGEIS at 7-1. This assertion can only be true if the decision to allow the future generation of spent fuel is “foreordained.” *Citizens Against Burlington*, 938 F.2d at 195. Thus, the DGEIS effectively confirms that consideration of the environmental impacts of spent fuel generation will not affect reactor licensing or re-licensing decisions in any way. This is a blatant violation of NEPA and the Court’s decision in *New York v. NRC* that the NRC’s evaluation of the environmental impacts of spent fuel generation is “not separate” from licensing decisions for nuclear reactors. 681 F.3d at 476. (0897-3-12 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: THE DGEIS VIOLATES NEPA BECAUSE IT DOES NOT FULLY CONSIDER THE REASONABLY FORESEEABLE IMPACTS OF THE PROPOSED RULE (0897-3-17 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The NRC’s piecemeal and disjointed approach to the consideration of spent fuel storage and disposal impacts violates the NEPA principle that an agency may not segment its analysis in a manner that conceals the environmental significance of its action. *Taxpayers Watchdog, Inc. v. Stanley*, 819 F.2d 294, 298 (D.C. Cir. 1987) (“‘Piecemealing’ or ‘Segmentation’ allows an agency to avoid the NEPA requirement that an EIS be prepared for all major federal actions with significant impacts by dividing an overall plan into component parts, each involving action with less significant environmental effects.”). See also *Coalition on Sensible Transportation v. Dole*, 826 F.2d 60, 68 (D.C. Cir. 1987). See also *National Wildlife Federation v. Appalachian Regional Commission*, 677 F.2d 883, 890 (D.C. Cir. 1981) (“The existence of a comprehensive program with cumulative environmental effects cannot be escaped by disingenuously describing it as only an amalgamation of unrelated smaller projects.”); *Natural Resources Defense Council v. Hodel*, 865 F.2d 288, 297-98 (1988). In order to provide a true picture of the environmental impacts of pool storage of spent fuel, for example, the NRC may not divide it into smaller segments based on arbitrary time periods. And it is “simply illogical” to view the admittedly interrelated waste confidence proposed rule and DGEIS

separately from NRC's environmental impact analyses for spent fuel disposal. See *One Thousand Friends of Iowa v. Mineta*, 364 F.3d 890, 894 (8th Cir. 2004) ("A segmentation is improper when the segmented project . . . is simply illogical when viewed in isolation."). (0897-7-16 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The NRC claims that its piecemeal approach constitutes permissible "tiering." DGEIS at 1-17– 1-22.³² [footnote 32 text: 32 The CEQ regulations explain tiering as follows: A. Tiering refers to the coverage of general matters in broader environmental impact statements . . . with subsequent narrower statements or environmental analyses . . . incorporating by reference the general discussions and concentrating solely on the issues specific to the statement subsequently prepared. Tiering is appropriate when the sequence of statements or analyses is: (a) From a program, plan, or policy environmental impact statement to a program, plan, or policy statement or analysis of lesser scope or to a site specific statement or analysis. (b) From an environmental impact statement on a specific action at an early stage (such as need and site selection) to a supplement (which is preferred) or a subsequent statement or analysis at a later stage (such as environmental mitigation). Tiering in such cases is appropriate when it helps the lead agency to focus on the issues which are ripe for decision and exclude from consideration issues already decided or not yet ripe. 10 C.F.R. § 1508.28; see also 10 C.F.R. Part 51, App'x A(1)(b).] But tiering is only permissible when the cross-referenced environmental analyses are valid. Here, the NRC relies to a significant extent on Table S-3, whose basis the NRC itself has repudiated. An agency "errs when it relies on old data without showing that the data remains accurate." *Western Watersheds Project v. Abbey*, 719 F.3d 1035, 1052 (9th Cir. 2013) (citing *N. Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1086–87 (9th Cir.2011) (concluding that the Surface Transportation Board did not take a "hard look" at environmental impacts when it relied on ten-year-old aerial surveys)). See also 10 C.F.R. § 51.92 (requiring NRC to prepare supplemental EISs if, "[t]here are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts"); *City of Olmsted Falls, OH v. FAA*, 292 F.3d 261 (D.C. Cir 2002) (quoting *Wisconsin v. Weinberger*, 745 F.2d 412 (7th Cir. 1984)) (agency must consider new information that "provides a seriously different picture of the environmental landscape.") (0897-7-17 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: THE PROPOSED RULE AND DRAFT WASTE CONFIDENCE EIS VIOLATE NEPA BECAUSE THEY SEGMENT THE ANALYSIS OF ENVIRONMENTAL IMPACTS OF SPENT FUEL STORAGE AND DISPOSAL[.] The NRC has splintered the analysis of safety and environmental issues associated with management of spent fuel into myriad of separate subparts. This hodgepodge of regulatory provisions and environmental findings is characterized by inconsistencies, internal deficiencies, and huge analytical gaps. Although all of them are related, the NRC refuses to consider their relationship or to reform any of them. The result is that any decisions NRC makes about licensing of reactors are utterly uninformed about the environmental impacts of spent fuel storage or disposal. (0897-7-7 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: It is unacceptable for NRC to foreclose all such future challenges under NEPA, regarding the generation, storage, or disposal of irradiated nuclear fuel - one of the most hazardous materials humans have ever generated - based on such a shallow to non-existent NEPA analysis as is currently included in the WC DGEIS. NRC has abused its "Waste Confidence" Decision, Rule, and Policy in just such a way for a long time. (0919-1-4 [Kamps, Kevin])

6. Comments Concerning Public Participation

Comment: I'm calling from the state which has the most nuclear reactors and the most stored nuclear waste from those reactors of any state in the country. I just want to say I have a comment on maximizing the opportunity for public comment. With a total of three hours allowed at each of these 12 hearings for public comment, these meetings, minus the time for introductions, protocols, NRC presentations and a break, which took today over 30 minutes, the whole country has less than 30 hours total of publicly facilitated commentary time spread across the entire nation. Two of the twelve meetings, the first and the last, will have teleconference Web casting available to the public to listen and make commentary. This is not maximizing the opportunity for public comment. This is not a thorough or comprehensive process as the nuclear industry's spokesperson stated earlier, and certainly if any meetings are canceled due to the Government shutdown and not rescheduled, that would make it even worse. (0030-10-1 [Snyder, Gail])

Comment: It's my contention that the comments made at a public hearing process of any governmental hearing is an important component in community involvement and transparency that has a different but equally important role from the submission of written comments. Publicly made statements allow for the discourse on the topic to be shared in real time that facilitates immediate feedback and stimulates conversation and thought among the participants of the community. If this process were not important, all comments would be submitted in written form. So I would just like to submit to you that many people would like the opportunity to participate in all 12 of the public hearings, or public hearings that don't currently have the Web casting teleconference option available. I would like to request that the NRC facilitate all 12 meetings or as many as possible with the teleconferencing Web casting, and I don't think that a task is an unreasonable request to ask of NRC. You're already familiar with this process. I know it's not perfect, but I know you're familiar with it and I don't think it's unreasonable to request. (0030-10-2 [Snyder, Gail])

Comment: The public meetings are not being held near reactor communities with the exception of the California meetings. The public was not given enough notice for the first meetings. Those of you who have seen the GEIS, you know, we could use it for a doorstop, and it's been less than 30 days since it was submitted to the public for us to read. So I want to reproach the NRC for trying to rush this process. (0030-12-2 [March, Leslie])

Comment: I wanted to mention on the phone the other day with Waste Confidence talking about these meetings we were told that only the first and the last meeting were going to be Web cast and teleconferenced, and I think that's not democratic and it's not fair for the rest of the people in the country to hear what's going on in their communities. I also don't like the idea that after the 12 meetings are done, from what I understand, this Waste Confidence Generic Environmental Impact Statement will be finalized. And so the public won't have another chance at all to comment on any revisions or anything that's done, and I think that's really, really wrong. So really transparency isn't the real good rule here that we're going by. (0030-15-3 [Gray, Erica])

Comment: [W]e (Nuclear Energy Institute) commend the NRC for its efforts to explain the context of the current waste confidence proceeding and we encourage the Agency to continue to keep that context in mind as the process continues and we look forward to you continuing to participate in these public meetings (0030-16-7 [Bonanno, Jerry])

Comment: I'd like to start by thanking the NRC for holding this public hearing today, and particularly the hard work that the staff has done and is doing. It's been a long afternoon and I appreciate the opportunity to speak. (0030-18-1 [Curtin, Kenneth])

Comment: I'd like to first thank the NRC for this opportunity, as well as my fellow participants. It's an important discussion and one that we need to be having. (0030-20-1 [Lapiska, Evan])

Comment: I do want to say that in terms of transparency I want to thank you for the appearance of transparency, but I think it can go far, far further. I think every meeting, every hearing needs to be as today's was where the public has the ability to weigh in, even if it's just on their lunch hour. (0030-22-1 [Headington, Maureen])

Comment: I appreciate you having a light hand on the trigger here. It's actually great to hear the lively dialogue here and I think to really let the public have a chance. I think, you know, notwithstanding the complications of the sequester, I'm not surprised to see the Waste Confidence Team here. I think they've had a very thorough, professional, open, and transparent approach all the way through. (0030-23-1 [Blee, David])

Comment: We commend the agency for encouraging and embracing wide public participation through multiple avenues, allowing the agency to consider stakeholder comments from all and various viewpoints. This approach will ensure that the Waste Confidence rule and GEIS are grounded in a thorough and comprehensive record. (0030-3-1 [Ginsberg, Ellen])

Comment: The waste confidence decision has always been, and continues to be, somewhat of a confusing item. We support the NRC's efforts, therefore, to clarify the related issues. As Andy stated, from a substantive viewpoint, it is important to understand that the waste confidence issues continue -- does not constitute a licensing decision. The rule does not authorize licenses and, instead, it compromises just one element of the agency's NEPA analysis as licenses and renewed licenses are considered. Individual plants must still separately obtain a license and be reviewed for the necessary safety and environmental issues. The industry commends the staff's effort to communicate how the waste confidence fits into the broader regulatory context, and we urge you to continue doing this as you proceed through these meetings. (0030-3-4 [Ginsberg, Ellen])

Comment: I want to echo what Ellen Ginsberg said and thank the NRC for its openness in providing this opportunity. At a time where we may be questioning our faith in our government during the shutdown, this is certainly an example of how our democratic processes do work, that we do have independent agencies that do reasoned considerations of important issues such as this. (0030-6-1 [McCullum, Rod])

Comment: So, basically we will ask that the comment period be extended, since it is apparently likely -- I missed the beginning here on whether the rest of the hearings are going to take place or what the plan is for those. But we would like to have the comment period extended, since the government has shut down. (0030-8-1 [D'Arrigo, Diane])

Comment: The public meetings are not being held near reactor communities with the exception of the California meetings. The public was not given enough notice for the meetings. It has been less than 30 days since the draft EIS was submitted on September 13 by the NRC. I want to reproach the NRC for trying to rush this whole process. (0045-11-2 [March, Leslie])

Comment: I would like to thank the members of the Commission and its staff who are here today and for holding this public hearing. (0061-1 [Kirton, Kenneth])

Comment: I want to thank the Commission and its staff again for the opportunity to speak and their commitment to an open and transparent process. (0061-6 [Kirton, Kenneth])

Comment: I'm grateful that the public comment period was extended for nearly a year; however, the fact that such a brief comment period was initially proposed indicates the NRC's disregard for public involvement. (0112-11-1 [Agnew, David])

Comment: I'd like to commend the NRC on having these meetings and giving the public an opportunity, including myself, to attend and to speak on these issues and to voice our thoughts, and each of our thoughts on these issues. And I would like to also say that Chelmsford obviously is a good location for the Northeast and I think the turn out reflects that. (0112-17-1 [Stamm, Steve])

Comment: This seems -- feels like an exercise of futility because our words are really meaningless to the NRC. But I guess it's a good way to communicate with each other and vent about our frustrations. (0112-22-1 [Nestel, Hattie])

Comment: This is supposed to be a democracy in which the common citizen has a voice, but you are not listening. We need your help and not what Sally [Shaw] called your faith-based science. (0112-24-5 [Darling, Ann])

Comment: I'm also heartened to see that we have not only robust engineering, but we have robust public process. We've had a lot of energetic discussion here. A lot of strong views on both sides. That's what makes America a great country. This is part of our process. And I thank NRC for providing that. It reminds me of my favorite Winston Churchill quote. Winston Churchill once said, "Democracy is the worst system of government ever known to man except for all the others." And American democracy I think is particularly good at being at least not as bad as all the others. (0112-25-3 [McCullum, Rod])

Comment: Again, I want to thank the Commission and its staff for committing to this process and allowing an open and honest conversation about this important issue. (0122-3 [Bailey, Savannah])

Comment: It's important to have you in our community hearing from the people directly, having our comments be officially on the record. (0163-15-1 [Garner-Ritter, Maureen])

Comment: I want to thank the NRC for holding this public meeting and providing an opportunity for comments. (0163-17-4 [Schepperly, David])

Comment: This is an important discussion to be having and I applaud the NRC for taking the time to hold these public meetings and for rescheduling those affected by the shutdown. (0163-18-2 [Lapiska, Evan])

Comment: I would like to thank the members of the Commission and its staff for holding this public hearing and giving us the opportunity to share our perspective. (0163-29-2 [Bailey, Savannah])

Comment: One is that it is so rare that the public gets to voice our feelings. We're so helpless at the mercy of the government's corporate masters. Let me assure you that when the

government policy is set to benefit corporate interests, we the public lose every single time. (0163-9-1 [Gerard, Daniele])

Comment: Throughout the scoping process and the meetings and teleconferences which followed, we observed that the inputs from the public interest viewpoint rarely were acknowledged as being useful or of value to those working on developing a nuclear waste plan, even recommendations and evidence offered by knowledgeable scientists. For example, Arjun Makhijani warned against the use of Department of Energy (DOE) reports as references because DOE's work was not verified by the NRC. On the other hand, Nuclear Energy Institute (NEI) and other nuclear industry representatives received favorable acceptance (0174-6 [Thomas, Ellen] [Thomas, Ruth])

Comment: On behalf of GmP, I want to express our thanks for the opportunity to provide comments on the proposed Waste Confidence rule. GmP considers it one of the hallmarks of the US regulatory process that the NRC embraces the concept of stakeholder input, and the Waste Confidence rulemaking has been no exception. (0182-1 [Vytlačil, Gordon])

Comment: I would like to thank the NRC for engaging in public outreach, and for the opportunity to provide comments on the Waste Confidence Rule. (0201-1 [Fregonese, Vic])

Comment: Nothing I say will change this document, which might be slightly nihilistic of me but not without its truths, so do whatever you can to make that dollar stretch. Money means more than people, doesn't it? (0203-2 [Louise, Tiffany])

Comment: I was disappointed that the commissioners were not available in person to comment at the public hearing. Since their 'confidence' has been sufficient for the past 30+ years concerning nuclear safety, it would have been insightful to have asked, if they had considered their actions in those 30+ years as sufficient and prudent in the safety and welfare of the people of the United States. (0204-1 [Stein, Tami])

Comment: I would like to thank the NRC for this opportunity, and having attended a few of these meetings throughout the hearing period I applaud their efforts to allow all sides to be heard. (0212-2 [Lapiska, Evan])

Comment: One consequence of the foreshortened schedule is that it has eliminated any opportunity to participate by members of the public who live far from NRC Headquarters or have not the capability to access Internet webinars. This practice creates an artificial divide, favoring those in locations with high-speed Internet and the latest hardware and software. This is patently discriminatory and manifestly unfair. Within the context of the extant EIS process, the Commission should stop and reassess this procedure. (0222-7 [Zeller, Lou])

Comment: Public meetings for the EIS should be in every reactor community (0230-8 [Garb, James])

Comment: I commend the NRC for having these meetings to provide an opportunity for interested parties to provide comments on the Waste Confidence Draft Generic Environmental Impact Statements and the Proposed Rule. (0244-1-5 [Tulenko, James])

Comment: It is an impressive document, we urge the NRC to continue to collect comments, to respond to them. Again, I look forward to that Comment Response Document. I look forward to the rest of this process. (0244-11-14 [McCullum, Rod])

Comment: I, of course, come to these meetings to state the industry's -- one thing I must digress on. Another good aspect of this process will be that all that is said tonight and all that's been said in the previous meetings, and all that will be written and sent into NRC -- and this is why it's going to take you almost a year to complete this process after you've closed the last hearing -- will be put into something called a Comment Summary Document. I know I went through a similar process with Yucca Mountain, where they produced -- they had an Environmental Impact Statement of similar scope and produced a Comment Summary Document. I found that to be one of the most useful documents ever produced there, and I'm sure that what you guys produce will be the same. Because all of the questions that are being asked on both sides in these meetings will continue to be asked over time as we continue to safely store used nuclear fuel. And that will truly be one of the best references we can look back for the answer, so I really look forward to that. (0244-11-3 [McCullum, Rod])

Comment: Thank you for making this evening possible and allowing people from diverse backgrounds to participate in the planning process regarding nuclear waste confidence. Waste confidence revision warrants careful examination because it serves as a foundation to several key safety and environmental findings regarding the operation of nuclear power plants and the disposal of waste that they generate. (0244-14-1 [Prescott, Lisa Marie])

Comment: I would like to thank the NRC for hosting this public meeting and providing an opportunity for AABE to comment. (0244-2-5 [Knowles, Berdell])

Comment: Before I comment on the Draft Generic Environmental Impact Statement or DGEIS, I'd like to address the accessibility of this meeting location. As the gentleman mentioned in the beginning, there is not a very big turnout here. And a meeting in Atlanta, Georgia was requested by U.S. Representative Hank Johnson, which was echoed by several organizations including SACE. Despite Atlanta having 11 nuclear reactors within 170 miles compared to the 5 reactors within 250 miles of Orlando, the NRC denied the request, citing, in part, a lack of resources. This is surprising rationale considering the location of NRC's Region 2 headquarters in the city. Atlanta is also a major metro area and serves as a hub for airline and bus transportation for multiple surrounding states, which would have made it much more accessible and affordable than Orlando to organizations and residents from many reactor communities. I personally know of several people in Atlanta that were forced to travel nearly six hours to attend the Charlotte hearing on Monday. We still request an additional meeting be held in Atlanta. (0244-3-1 [Hancock, Mandy])

Comment: The NRC can't even handle a speaking list with integrity. How sad. (0244-5-1 [Klutho, Mark])

Comment: We'd first like to thank the NRC for holding this hearing and allowing us -- allowing public comment during this process. (0244-7-1 [Kuntawala, Jitesh])

Comment: We again would like to commend the U.S. Nuclear Regulatory Commission for holding this hearing and allowing us the opportunity to express our comments and concerns on Waste Confidence. (0244-7-6 [Kuntawala, Jitesh])

Comment: I wanted to first thank you, Mr. Director, and NRC staff, for taking the time, not just to hold these proceedings, but to do it all across the country and to come to a place like Florida. And hopefully today is an opportunity for you to hear a few Florida-specific pieces of input. (0244-9-1 [Paul, Jerry])

Comment: I think you heard a little bit of that from Professor James Tulenko, who talked about the work that's being done here at the University of Florida, many years of research, high-level technical analysis by technical experts like Mr. -- Professor Tulenko, people like Mr. Rossin who has a PhD in Nuclear Science with many years in the nuclear industry. And it was nice to hear from a group of undergraduate and graduate level nuclear engineering students right here from the University of Florida here in this state. I would like to point out, respectfully, that the credible, factually correct, technically correct testimony that you've heard today has largely been from those who have indeed studied these issues, have spent time at these plants, and have, quite frankly, been the ones who have spoken most directly to the issue that is on the table today. (0244-9-2 [Paul, Jerry])

Comment: People quote movies, but this one I'd like to quote, "What we have here is a failure to communicate." This NRC meeting, I can't thank you for, it's a farce. It was not publicized. I was told that they had paid to publicize this. There's many newspapers and organizations that would put it out there. (0245-17-2 [Thompson, Tammy])

Comment: I appreciate the chance to speak to the NRC's, or in the NRC's confidence game. (0245-25-1 [Lehman, Dale])

Comment: We represent nearly 900 supporters in Illinois, 34 states, and 4 countries. And we thank the Commission for allowing us three minutes of meaningful comment on a problem destined to haunt humankind for tens of thousands of years. We hope we've demonstrated that people in Illinois, while not having the original NRC list of sites for the GEIS public meeting, are indeed interested in radioactive waste issues after all. And we hope you enjoy Orlando, one of the NRC's originally proposed sites despite the turn out in what was Disney World central. (0245-3-1 [Kraft, David])

Comment: Our government works and I really am gratified not by just hearing my friends and supporters out here, but all the commentary, all the discussion. This is our process at work. This is us asking questions. I'm confident NRC will come up with the answers. I look forward and I support this process. (0245-34-6 [McCullum, Rod])

Comment: And thank you for this opportunity to speak, yet for the record I want to mention that the only way I found about this meeting was just I have friends who are in environmental organizations. So, I don't believe that this was widely announced. And the fact that there is no mainstream media here is evidence of that. (0245-43-1 [Michaud, Debra])

Comment: I want to express my gratitude that you all stuck through this this long, to have this kind of conversation to kind of explore where we're at and where we're going. I appreciate the NRC offering and inviting us to discuss. (0245-44-1 [Gallagher, Dr. Terry])

Comment: I want to thank for your comments. I hope they are heard, not just pushed aside. I don't want this to be a show. And all of you lovely people who work for the industry, I did appreciate that you would support the industry. But I think it is a statement of where we are at that almost everyone except me, one person, who has testified on behalf of this and on behalf of the NRC are with the industry. Now, that should tell us something. That should tell us that they are not speaking for the public, and that those people who are here who have spoken before me who are incredibly knowledgeable are the ones that are speaking in facts, not claims but facts. And I think that's what we should listen to. (0245-48-1 [Walter, Beverly])

Comment: I just want to address the fact that there is no mainstream media reporters here covering the story. You would think that this would be on the front page of every newspaper. We're talking about an issue that's going to affect people for perhaps hundreds of thousands of years, things that are happening right now with this conference, and yet almost nobody has known about it. And, on top of that, even though no one is getting the word out, I think it's worth noting that there is an overwhelming majority of support here from people who are against nuclear waste, concerning this nuclear issue. The only people that have really shown up here are representing the industry that they're in favor. They all have a bias because they're getting paid. There's a profit motive there. Pretty much unanimously, all the people who are not getting any money are against this proposition, I think that should be stated for the record. (0245-52-1 [Kalas, Mike])

Comment: [W]e are grateful for this and other numerous opportunities provided by the NRC for stakeholder input before making a final decision. (0246-12-1 [McMurrian, Katrina])

Comment: I appreciate that there are hearings, but there really are places that wanted hearings that didn't get them. I'm sure you have heard this before, but you did say that you thought you had accommodated and a lot of people feel like they haven't been. (0246-2-1 [D'Arrigo, Diane])

Comment: I would first like to thank the NRC for this opportunity. And having attended a few of these meetings throughout the hearing period, I applaud their effort to allow all sides to be heard. (0246-20-2 [Lapiska, Evan])

Comment: I am here today because my home state [Virginia] has been left out of conversation. It has not been in the news, it has not been in the newspapers, yet our state capital is in 50-miles radius of two aging nuclear power stations, North Anna and Surry. (0246-3-1 [Gray, Erica])

Comment: So again, I thank the NRC for running such an open forum, where we can have the free exchange of ideas, and I would encourage everyone, I think has been mentioned a couple of times here, to research all of the facts that you hear tonight, both in support of the ruling and against the ruling. (0250-14-1 [Brookhart, Ryan])

Comment: I want to thank the NRC for the opportunity tonight to provide these comments. I commend the NRC on the transparency of this rulemaking process, and I applaud your scheduling of these meetings around the country to get stakeholder feedback. (0250-15-2 [Rodack, Tom])

Comment: I'm personally disappointed that not one out of the five Commissioners could be here to see the faces of some humanity here to get a feeling of what's going on emotionally with people. I would suggest that that happen at the future activities. (0250-22-1 [Hands, Tara])

Comment: I appreciate the opportunity to provide comments this evening on the draft Waste Confidence and GEIS. I also want to commend the NRC's efforts to encourage and engage the public through a number of public meetings and other venues. Over my 30 plus years in the nuclear industry, I've witnessed the NRC's efforts to ensure public engagement and transparency, and this meeting is yet another example of that commitment. (0250-3-1 [Archie, Jeff])

Comment: I would like to thank the NRC for hosting this public meeting and providing opportunity for comments. (0250-32-5 [Wesley, Ashleigh])

Comment: This public meeting is supposed to be an important part of the Democratic system where the many voices can be heard, and much more importantly, be respected. (0250-34-3 [Sorenson, Ole])

Comment: I hope you'll hear everyone who speaks tonight with an open mind, and especially those who are coming from their own home states where nuclear waste is emitted, or is created and has been leaking into the environment. The future of our precious planet depends on what you decide to do. (0250-39-2 [Richards, Kitty Katherine])

Comment: Throughout the scoping process for the EIS and the meetings and teleconferences which followed, we observed that the inputs from the public interest viewpoint rarely were acknowledged as being useful or of value to those working on developing a nuclear waste plan, even recommendations and evidence offered by knowledgably scientists. On the other hand, Nuclear Energy Institute and other nuclear industry representatives received favorable acceptance. (0250-51-5 [Thomas, Ellen])

Comment: And please pay close attention to what everybody has to say and not just the people in the industry. (0250-51-9 [Thomas, Ellen])

Comment: I would like to thank you, the Nuclear Regulatory Commission, for undertaking this task and allowing for public comment on this issue. (0250-57-5 [Jones, Lauren])

Comment: First off, I would like to thank you all for allowing me to speak and thank you to the NRC for continuing their culture of public involvement and transparency with respect to nuclear issues. It really is a great thing for all of us to be here to talk and to listen today. (0250-58-1 [Cagnetta, Matt])

Comment: First, let me thank you for the opportunity to provide comments on the draft Waste Confidence EIS and Proposed Rule. It's a very important rulemaking on the part of the NRC. I appreciate the extent to which the NRC has gone to gather public input on it. Thank you for holding one of your public meetings in Charlotte, which is the center of a large and growing hub of energy-related industry and education here in the southeast. Nuclear power is an essential part of the energy mix in this region. (0250-6-1 [Nesbit, Steve])

Comment: I appreciate the NRC's process to allow comment on the Generic EIS and the proposed rulemaking. It is probably one of the best-run processes I know in the federal government. (0250-61-2 [Little, Jim])

Comment: The second thing is providing transparency. I think this rulemaking process does allow for that. It is very unique. It's a well-administered process by the NRC. And I think it allows all of the public, even the members of the opposition, the opportunity to provide their input and comment. (0250-61-4 [Little, Jim])

Comment: But I think first and foremost is that I think the industry is one where transparency and even listening to members of the opposition allows us I think that integrity to be able to address comments from wherever in addressing those things. So I think the ability to get that transparency and that dialogue is important. So I welcome the opportunity to provide these comments as I also welcome the opportunity to listen to the various views tonight. (0250-61-8 [Little, Jim])

Comment: And I thank the NRC for the opportunity to comment tonight on the proposed EIS, especially here in Charlotte, North Carolina. We have had a great turnout. (0250-62-1 [Fregonese, Vic])

Comment: On behalf of GmP, I wanted to express our thanks for the opportunity to provide comments on the proposed Waste Confidence Rule. GmP considers it one of the hallmarks of the U.S. regulatory process that the NRC embraces the concept of stakeholder input. And the Waste Confidence rulemaking has been no exception. (0250-65-1 [Vytlačil, Gordon])

Comment: I would like to start by highlighting that I am actually not very surprised that you have only seen people from companies in the nuclear industry speaking in favor of it tonight. This is a sophisticated technology. It is very typical for someone to have years of college education, even more years of experience to fully understand it, let alone to speak to it confidently. And it is simply something that many laymen probably wouldn't be able to do. (0250-67-1 [DeVoe, Joe])

Comment: You cannot cut the public out of these future discussions. That would be a wrong thing to do. We need to be involved in this every step of the way. (0250-7-7 [Corbett, Susan])

Comment: Thank you for coming to San Luis Obispo and soliciting comments from citizens near the Diablo Canyon Nuclear Power Plant (DCNPP.) It is important that the Nuclear Regulatory Commission hear from the people most at risk in the case of a radiation release from the plant. (0255-1 [Frank, Fred])

Comment: [T]he NRC's rulemaking process is the kind of open and transparent process that should take place in all aspects of government regulation. There has been widespread participation from all aspects of government, industry, and the public in order to ensure that all viewpoints are considered. A total of twelve public meetings will take place, and members of the public will have the opportunity to submit comments to the commission through December 20, 2013. (0273-3 [Kinzinger, Adam])

Comment: We thanks the Commission for allowing us three minutes of meaningful comment on a problem destined to haunt humankind for tens of thousands of years. We hope we have demonstrated that people in Illinois, while not on the original NRC list of sites for a DGEIS public meeting, are indeed interested in radioactive waste issues after all. (0274-1 [Kraft, David])

Comment: I thank the Commission for allowing me three minutes to speak. (0276-1 [Kurz, Carol])

Comment: Unable to stay long enough to speak, I would like to share my story with you. You are the agency that can change the world by your action—for positive or disaster. I appeal to your humanity to hear my story. (0292-1 [Comer, Gail])

Comment: I commend the Commission for holding public hearing. As a citizen with many concerns about nuclear issues, I traveled a long way, to Charlotte, NC, to express some of these to you, in relation to spent fuel waster and your assessment and plans for it. Since being unable to testify at the Charlotte hearing, I am submitting the comments, below, for the record, on these matters. (0303-1 [Lamberts, Frances])

Comment: The NRC must stop listening to and giving in to the small group of vocal Anti-Nuclear activists that keep pushing the NRC around. The NRC must take the political heat that

these people create knowing that they are indeed a small vocal minority. They will go away if they are ignored. Hear them once, answer them and then ignore them. (0312-1 [Meyer, Charles])

Comment: This public meeting is supposed to be an important part of the democratic system, where the many voices are to be heard AND more importantly respected. (0314-3 [Sorensen, Ole])

Comment: The San Clemente City Council respectfully requests your consideration of extending the public comment period for the Waste Confidence Draft Generic Environmental Impact Statement to February 28, 2014 to allow Council sufficient time to review the document. (0315-2 [Brown, Tim])

Comment: And I'm glad we're having this meeting tonight, but we wouldn't have had it if it wasn't ordered by the Court. And I think it's really important that we do this more often and with real expertise, and with a determination to solve this problem. Somewhere between unsafe storage and unsafe transportation, we're going to have to do something, and it's got to be the best answer we can come up with. (0325-1-3 [Headrick, Gary])

Comment: I appreciate the opportunity to provide oral comment here tonight on the important topic of Waste Confidence and its relationship to the continued nuclear plant licensing and operations (0325-13-1 [Wicks, Tonja])

Comment: I would like to thank the NRC for hosting this public meeting and providing the opportunity for public comments (0325-13-8 [Wicks, Tonja])

Comment: In closing, I would like to thank the Commission for holding these public hearings to discuss such an important issue (0325-16-5 [Bailey, Savannah])

Comment: [T]onight, in my opinion, is a dog and pony dance because it has nothing to do with establishing any confidence. (0325-21-3 [Iwane, Cathy])

Comment: One of the things that I hope to happen this evening is that the folks that have come here from Washington have learned what our concerns are. The reason I say that is we're here to help with rulemaking and adjudication. Is that what this is about? (0325-24-1 [Kernahan, Gary])

Comment: We're interested that whatever that [our concerns] means, it conveys for us the significance of facing clearly from our point of view they can see it, how the people in the communities around here are jeopardized, how we are concerned, and it isn't about changing rulemaking or helping giving better clues about adjudication. (0325-24-2 [Kernahan, Gary])

Comment: I appreciate the opportunity to participate in this public meeting and share my thoughts with some of those who are responsible for regulating the nuclear safety here in the United States. (0325-26-1 [Hannaman, Bill])

Comment: There's two words tonight that stand out. The first one is confidence, and there's one thing about this meeting which gives me confidence, and that's the fact that someone from Senator Feinstein's office is here tonight. Thank you for that. And I would like to know is there a representative -- from Congressman Issa's office here tonight? Please raise your hand. Is the NRC in touch with Congressman Issa? It's under his jurisdiction, this area. To my knowledge, he has not had any impact at all on this whole process. Have you people been meeting with him? Why not? What is his position? Why hasn't he said anything? (0325-31-1 [Johnson, Roger])

Comment: So, thank you for listening. I appreciate it. It's nice to listen to everybody else[.] (0325-32-5 [Lord, Stephen])

Comment: I want to start by thanking everybody here tonight, including the NRC, for both coming out to this meeting and hosting this meeting. (0325-5-1 [Kirton, Stratton])

Comment: We will be following up, I know, with the NRC Commission itself. They have been very responsive in the past to our concerns, including Chairperson McFarland, so we hope to be able to bring this back up to your Board of Supervisors in the coming months as well. So my letter is in, the Board's letter is forthcoming, and again, I appreciate everybody being here tonight. (0326-1-3 [Hill, Adam])

Comment: I appreciate the NRC holding this meeting and allowing a very vigorous discussion on this issue. (0326-18-2 [Schrader, Ken])

Comment: Thank you, all, for taking your time this evening to join us in the opportunity to speak out about something that is really not very sensible. (0326-22-1 [Davies, Phyllis])

Comment: Thank you, NRC. Thank you very much for having us here. I respect everybody's opinion. I don't think there's anybody here who has ulterior motives. Everybody's sincere, whether they're pro or con, so, you know, our media kind of teaches us nowadays to distrust the next person; the next race; the next gender. You know, I trust everybody. I think everybody is very sincere. (0326-24-1 [Gloege, William])

Comment: In closing, I would like to thank the Commission for holding these public hearings to discuss such an important issue. (0326-25-5 [Bailey, Savannah])

Comment: Thank you, NRC, for coming this evening and spending some time here with us that live with this nuclear plant. (0326-35-1 [Owen, Linde])

Comment: I first wanted to thank the NRC staff. I know the rulemaking process is a lot like sausage making, and, you know, really respect you coming out and hearing everybody's point of view tonight. (0326-37-1 [Rethmeier, Blain])

Comment: I very much appreciated hearing everyone's thinking. This is one of the most exciting things about living in our country, that we still can voice our strong thinking and our passionate thinking about any side of an argument. I'm speaking tonight as a concerned citizen, a parent, a grandparent, a retired educator, and a taxpayer. (0326-39-1 [Weissglass, Theresa])

Comment: There's a lot of suits here taking our testimony because they have to. They're very well paid by us. The fleet of PG&E lawyers that come to every NRSE meeting are ultimately paid for by us against our couple of attorneys. And I just mainly want to say tonight that I am in full support of our legal interveners, the Mothers for Peace, who have for over 40 years, represented us in trying to protect our best interests, the people of this state, and not private commercial interests. (0326-50-2 [Evans, Pete])

Comment: And I hope that you folks that are here to listen to us will put that foremost in your mind and heed the words of the two Americans who spoke tonight and many of the immigrants who spoke, raising the alarm of the legitimacy, validity and safety of this plant and especially our atrocious treatment of the waste storage problem. (0326-50-3 [Evans, Pete])

Comment: I wanted to start by thanking the NRC and PG&E for holding this meeting. And I know it's not easy to have a bunch of hecklers but we're all passionate here for a reason. So I would also encourage environmentalists to be as polite as they can when engaging people they feel are their enemies. I worked for an environmental non-profit and I found that we were the most successful when we all came to the table and focused on our goals. And that's when we were able to be successful and actually achieve those goals. So I would also invite-- like to invite people who do not like having Diablo nuclear power plant in their backyards to, on a regular basis, visualize it being decommissioned. Think about the positive. What do you want to happen, not what do you hope never happens. (0326-60-1 [Spooner, Rena])

Comment: Oh, this is really important. Because an accident could affect the entire Pacific Rim I recommend that the NRC invite the entire Pacific Rim, and I'm dead serious. I know it sounds silly, but to engage in this dialogue as well whenever you have this type of review because it really does affect them. What happened in Japan is going to affect us. And so they never asked us if we wanted, you know, that thing over there. (0326-60-6 [Spooner, Rena])

Comment: Just to kind of wind this up, I wish I had more time. One thing I might suggest, if this happens in the future, I think at each location that's chosen for public comment there should be two days of public comment, just a suggestion. (0327-11-7 [Kline, Connie])

Comment: I have several things to say. One of them is, this is an absurd site to have a public hearing. It's nearly half a mile from the nearest right-of-way. There were 30 people or so who attempted to express themselves with their feet, with their presence, but they couldn't make a very effective message because it's a half mile away. It's sort of like having NRC hearings at Camp Perry, which is also very quite commonplace. (0327-13-1 [Lodge, Terry])

Comment: Many of us feel these hearings are a waste of our time. We do not have confidence that the NRC is listening. (0327-3-1 [Todd, Doug])

Comment: Well, in any case, what can we do? We can talk here. We can write to our congresspeople, who seem to be the ones that are supposed to make the laws by which the agencies are invented, and we can write them over, and over, and over, and over again and demand answers, real answers. (0327-33-3 [Carey, Corinne])

Comment: In conclusion, we need to always be concerned about the stakeholders. Stakeholders, not only those that are active that's showing up to these meetings or those that get paid to be here. Many of us were not. We have to be understanding that stakeholders are those that will be with us now and those in the major future. So any policy, we must always be thinking about the short, the long, and then, I'm sorry to say, the indefinite because we do not have the technological whereabouts to look beyond two years when we can't even get a healthcare.gov working, okay? (0327-38-3 [Stansberry, Mark])

Comment: According to the NRC, Davis-Besse has been the source of two of the top five most dangerous nuclear incidents in the United States since 1979. When I read in the Toledo Blade that the NRC is asking the public what to do about spent nuclear waste, I laughed out loud. Perhaps we should be flattered we're being asked what our opinion is. We're not flattered, we're angry. Is this akin to NASA asking the public the best way to get astronauts back safely from a space mission? Should this problem have been figured out before the first plant was ever built? (0327-42-1 [Faris, Kelly])

Comment: I guess the first thing I got to talk about is a long time ago when I was, like, 18 or so, my grandfather told me, he said, you know, if you ever stand up before a commission, stand up before a city council, some type of hearing or something, or even for a judge, he says the decision is already probably made. And, you know, I tried to prove him a liar for many, many years. It's been a long time, and what I found is that he was right. So right now, as far as the agency here, I'm asking you to prove him a liar. (0327-44-1 [Chavez, Tim])

Comment: But this hearing here tonight is about sorting out the laws and/or making new laws. I hope it's also about protecting the future, making good on the NRC logo that states they are promoting, protecting the people and the environment. I have lived through the Fermi 1 meltdown, Three Mile Island, Chernobyl, and now Fukushima which is not over yet, so I try to educate myself on the dangers of living near a possible Fukushima-type accident. I say try because most of the information I review is labeled proprietary and not available for me to review. (0327-5-2 [Collins, Jessie Pauline])

Comment: We want to take this opportunity to thank the NRC for scheduling this meeting in Minnesota to take comments for the Waste Confidence Draft Generic Environmental Impact Statement. (0328-1-1 [Johnson, Ron])

Comment: The Prairie Island Indian Community appreciates the opportunity to be here tonight. We do have some additional comments to make, and will submit additional written comments during the comment period. (0328-1-11 [Johnson, Ron])

Comment: There are probably others waiting to talk, but I do have a procedural question. You've identified December 20th as the end of the public comment period. Could we have some assurance the transcript of this meeting will be available, say a week before that deadline, so that use could be made of it in preparing supplemental comments? (0328-11-7 [Muller, Alan])

Comment: This is an unfair, unconstitutional, outrageous hearing, but I do appreciate the chance to be here and give my testimony. (0328-15-6 [Davis, Leslie])

Comment: Everybody that's not here, and all of Minneapolis, and all of Minnesota, and all of the United States, and all around the world, everybody that is not here has a right to be represented. (0328-16-4 [Bonniwell, Colleen])

Comment: I have a question, actually, for many of the people here in this group, here in this room. How many of us here have any faith at all in this process, that process being where we come here, come to a little public forum and we pretend that you hear us, governmental officials, and you get to pretend that you're listening to us. This is much like, for example, the Public Utility Commission's hearings going on in St. Paul on the Enbridge XL Tar Sands Pipeline, Clipper number 67 going through Norton, Minnesota, or in Dade, Governor Dayton's little environmental roundtable discussions, which was going on about six, seven months ago. All of this, all of this is a sham. It is a complete sham. We know you don't give a shit what we say. We know that you don't care what our views are. (0328-17-4 [Cavlan, Michael])

Comment: I would like to thank you, the representatives of the NRC, for being here tonight and affording the city and other interested parties the opportunity to publically state certain comments and concerns that we have with respect to the Generic Environmental Impact Statement. (0328-2-1 [Rauterkus, Ralph])

Comment: I'd like to thank the NRC for providing the opportunity for the public to comment during this process. (0328-8-1 [Cummings, Kristopher])

Comment: I want to thank the NRC for having provided these forums, the 13 public meetings and this call. (0329-10-1 [McCullum, Rod])

Comment: There have been a number of parties that have asked for an extension for the comments deadline and, to my knowledge, nobody has received an answer to that. There was a statement made that there would be comments allowed 30 days after the last meeting, at the very least. Well, the last meeting was December 4th, and then there's this meeting. So I ask that there be a decision and that we be informed about that. (0329-14-2 [Sondheim, Steven])

Comment: The first one is an agreement with Steven Sondheim to extend the public commentary period for these hearings, that the GEIS is highly flawed and I believe that we should be having these public commentary, this public commentary period until the NRC has satisfied all that the public needs to have confidence in the NRC, which we clearly do not have, to proceed with what to do with storing high-level or low-level radioactive waste. (0329-15-1 [Star, Priscilla])

Comment: I've been listening lately, up in Canada they're having hearings on a waste dump that's going to be maybe created just off of the Great Lakes, and these have been going on for, literally, months and they go on, you know, I don't attend them every day. They're on the internet. They go on for hours and hours, and the people that want to talk, like here we've been given the opportunity to talk for more than three minutes. I probably won't do that, but they're allowed to talk for as much as 30 minutes. And then after that there's rebuttal, and then there's rebuttal to answer the rebuttal. It can go on quite a bit. And then the commissioners ask questions, and everybody talks with everybody. It's pretty different from what we're doing here, which is a couple of hours a week for a couple of months, and then it's over. After today, it's over. So I'd like to see more interaction between them and we. I think that would be a good thing. And what's really funny, I guess, is that they're discussing a low-level waste dump, which means we're discussing something that's perhaps a million times more important than what they're discussing and, yet, they're putting more time into it than we are. And I think that's a shame. (0329-16-1 [Hoffman, Ace])

Comment: And the first thing I would like to talk about is those meetings themselves. I think that the NRC did a disservice to the public by holding those meetings in very inaccessible locations. They were mostly in suburbs or away from public transportation. A lot of the people I know that wanted to comment or wanted to show up in person had to try to arrange carpools. A lot of the people do not have cars or just were very inaccessible. They were at very expensive hotels, people that were coming from out of town. They were very inconvenient places to have them. (0329-18-1 [Carberry, Mike])

Comment: Also, I don't believe all of the locations selected were opportune places. I think they should have had some meetings in Georgia or a meeting in Georgia, also in the TVA area. (0329-18-2 [Carberry, Mike])

Comment: [T]here is a general sense of noblesse oblige by the Nuclear Regulatory Commission to listen and basically just pass on the comments without doing much more than that. I'm concerned that the times that you have had these meetings, listening and acting wholly transparent in some way that you believe that you are, is the opposite and a very opaque method being used to move on and do what you want to do without really fully canvassing the

public as to what the public would like to see you do. And it's the process that seems to stink like the hole in the head process, like we're kind of absorbing all that you're doing in rapid speed, but we don't accept it. If you had town hall meetings, which I'm sure would be highly improbable, I think everybody in the country would be understanding these issues better. Most of the people don't have the time to pay attention to them, just get their paychecks. (0329-21-1 [Star, Priscilla])

Comment: I just want to say before I start that I agree with Priscilla [Star] and with Mike Carberry that this process, although you may mean well, is essentially demeaning to the public. Giving us three-minute limits for such remarks is in itself demeaning. And all of the other points that Mike and Priscilla made about the process I would certainly concur with. (0329-23-1 [Lewison, Linda])

Comment: And so another definition of confidence is actually when it's talking about a scam. And that is "or relating or involving a swindle or a fraud, a confidence scheme, a confidence trickster." I believe this whole waste confidence issue in these hearings has been kind of a waste confidence con and a swindle. And the people are really tired of it. And I really think that things need to change. I think the Congress needs to step up. The people need to step up. We are trying to speak up. I don't think we've had a very good opportunity. I mean, I get three more minutes, but, you know, we should have been allowed a lot more time. The time of the written should be extended. We had a month of government shutdown. We had just a lot of, you know, bait and switch, shell game-type tactics that have made this whole process just very unpalatable. So, again, I thank you for my additional three minutes, but it's really not enough. (0329-31-4 [Carberry, Mike])

Comment: I would like to first comment that I have been trying to get on the line for about 25 minutes. And I pressed *1 probably a dozen times. And I hung up and called back. So your system is not perfect is what I am saying. And there may be other people who have experienced the same problem because it's not going through for some reason. So that is my first comment. (0329-32-1 [Seeley, Linda])

Comment: I know I sound snarky, but I don't mean to be snarky. I mean to be outraged, concerned, feeling helpless against an institution that is deaf to the logical and sensible and practical and hard-fought lessons that we have been trying to tell you all over this country in your 12 public meetings. As I said before, I am hopeless that it will do any good. But there is nothing else that we can do as citizens. And so that is why we're doing this because this is our venue. And if I could fall on the ground in front of you and beg you and think that that would make a difference, I would do that. I would do whatever I could do and will do whatever I can do in my life as long as I live to try to help you understand what you are doing to this Earth that we are all inhabiting together. And you are the only ones who have the power to do anything about it. And so that is why. That is why we spend our nights and our days not getting paid, not getting rewarded, but for the sake of our world is why we're doing this. And so, you know, I wish I had a magic word that would go into your brain that would go ping and you would suddenly wake up and look at it through our eyes. I know that won't happen, but I want you to hear the words. (0329-32-8 [Seeley, Linda])

Comment: I would like to reiterate our disappointment that a public meeting was not held in Atlanta, Georgia. A meeting in Atlanta was requested by U.S. Representative Hank Johnson and was supported by several organizations, including SACE. Despite Atlanta having 11 nuclear reactors within 170 miles, compared to the five reactors within 250 miles of Orlando, the NRC denied the request, citing, in part, a lack of resources. Yet, Atlanta is NRC's Region II

Headquarters. Atlanta is also a major metro area and serves as a hub for airline and bus transportation for multiple surrounding states, which would have made it far more accessible and affordable than Orlando to organizations and residents from many reactor communities. People in Atlanta were forced to travel nearly 6 hours to attend the Charlotte, North Carolina hearing. And for NRC staff that attending the Orlando meeting, you are well aware that the participation was very low in Orlando in comparison to the other public meeting locations. Just a couple dozen of people attended. Members of the public living in the TVA region, among other utility service territories, were offered, essentially, no reasonable opportunity to attend an in-person meeting. The NRC should have held more meetings in more locations across the country. (0329-5-1 [Barczak, Sara])

Comment: Thank you for this opportunity to comment and thank you for running a very professional meeting on December 2nd, 2013 in Perrysburg, Ohio. I attended the December 2nd, 2013 Perrysburg, OH public comment period on NRC Nuclear waste confidence and was taken aback by the passion in the room, not on the issue of nuclear waste, but upon the issue of nuclear energy generation. I assumed I was there to comment upon nuclear waste and not to argue the merits of nuclear energy production. (0347-1 [Morrow, Jon Paul])

Comment: Nuclear waste, is deadly, and is toxic, and should be handled and stored with the greatest of respect. With that being said, the public has a lot of passion about the issue of nuclear waste and of nuclear energy, and this passion is built upon personal perception. No thought out solutions to our energy problems were submitted and no respect was given to the problems America would face without nuclear energy. One side dominated the discussion and that was the flavor of capitalism and personal profit motive were destroying the American dream. (0347-2 [Morrow, Jon Paul])

Comment: But, the hearing here tonight is about sorting out the laws and/or making new laws. I hope it is also about protecting the future, making good on the NRC logo stating they are protecting the people and the environment. I have lived through the Fermi 1 meltdown; the Three Mile Island, Chernobyl, and now Fukushima which is not over yet. And so I try to educate myself about the dangers of living near a possible Fukushima type accident. I say try because much of the information I review is labeled proprietary and not available for me to review. I certainly hope the officials here have full review of documents, proprietary or not. (0349-2 [Collins, Jessie Pauline])

Comment: Will the Commission provide an adequate comment period after the issuance of relevant reports referred to in the above email concerning the actions before the Advisory Committee on Reactor Safeguards? (0376-4 [Lewis, Marvin])

Comment: Instead of wanting to protect our air, water, earth, all living things from the obvious dangers of the nuclear industry, I felt the NRC was protecting the nuclear industry from the citizens most vulnerable to the problems it poses. I found a group of very intelligent, conscious, knowledgeable, and rightfully concerned, fearful and angry citizens "talking to the wall". There was no evidence whatsoever to me that those representing the NRC listened or heard or cared to hear what these people had to say. (0381-3 [Fasten, Susan])

Comment: Thank you for giving me the opportunity to comment on this proposed regulatory action. I hope you will read these comments carefully, objectively and with the constructive spirit in which they are meant and then address these concerns and issues in your final report. (0410-33 [Nelson, Dennis])

Comment: After studying the issue, I believe that the proposed rule for handling/unhandling nuclear waste is invalid. It is vague, and it leaves the public out of the process. The NRC should continue to have public meetings where the public can address concerns. (0416-1 [Barnes, Kathryn])

Comment: The nuclear industry and the regulatory agency, the NRC, must act responsibly and not write themselves out of the issue, nor should they end public involvement in solutions. (0416-3 [Barnes, Kathryn])

Comment: I am grateful that the public comment period was extended for nearly a year. However the fact that such a brief comment period was initially proposed indicates the NRC's disregard for public involvement. (0419-1 [Agnew, David])

Comment: I completely agree with Ace Hoffman's email [requesting that NRC make all Waste Confidence public meetings available by audio and/or video]. (0420-1 [Rudolph, Shannon])

Comment: Thank you for the opportunity to speak at the Perrysburg, Ohio meeting on 12/2/2013. Because of the three-minute time constraint I appreciate your considering the more detailed explanation of my concerns in written form. (0421-1 [Clemons, Victoria])

Comment: SUGGESTIONS ON WAYS THE NRC CAN IMPROVE ITS PUBLIC MEETINGS [:] Acknowledge that we are all in this together. (0445-1 [Fasten, Susan])

Comment: Respect what attendees have to say and include their requests, fears, and concerns in your "regulating". These people live in close proximity to nuclear facilities. Their lives, families, homes, and communities are in constant jeopardy. They are your best and most invested source for the corrections, precautions, and actions needed. Treating the critics of the present nuclear situation with arrogance, dismissiveness, and a smug air of superiority is not constructive or smart. Nor is paying more attention to the length of their comments than to the content. These caring, dedicated, knowledgeable people have nothing to gain politically or financially, no job to protect, no superiors to impress or answer to, and no ego to feed. They spend their own time and money preparing for and travelling to these meetings and speaking up because they understand that their lives and all of our lives as well as the lives of generations to come are on the line. Why do the NRC representatives and the drafters of the GEIS not seem to get it? (0445-4 [Fasten, Susan])

Comment: Earn the "confidence" label. Invite, incorporate, and embrace these very knowledgeable, dedicated, and concerned citizens in your decisions and actions. Remember that we are all in this together. (0445-6 [Fasten, Susan])

Comment: I have long advocated for NRC to embrace the use of plain language in its regulatory products. I worked very hard to that end while employed at the NRC. This proposal is a credible effort in that direction. I strongly support any and all efforts on the part of NRC to communicate with the public, the regulated community and the U.S. Congress in plain language. (0532-15 [Kotra, Janet])

Comment: NRC's commitment to providing extensive opportunities for public participation in its decision-making process has been a model of openness and transparency. (0535-3 [Damratoski, Katie] [Thornton, Adam])

Comment: Thank you for giving me, as a citizen of the United States of America, the opportunity to comment on this important issue. I would have gone to the meeting in Minnesota

to make my comments in person, but the road conditions that evening were bad. (0543-1 [Senkiw, Sheryl])

Comment: During the protocol portion of the Waste (No-)Confidence proceedings, which are scheduled to start October 1st, I (and others) repeat asked for the ability to view, and participate in all the hearings which are to be held nationally. Webcast, phone-in, webinar -- all have been denied. So at the last Waste (No-)Confidence protocol phone-in earlier this week, instead of asking yet again for one of these things, I commented instead on the SCOPE of the Waste (No-)Confidence decisions being considered. That comment was also denied but in a different way: I was told it would be a good comment to submit during the Waste (No-)Confidence comment period, which began the next day. I therefore am submitting those comments, as suggested. As it turns out, I had thought to record the comment with my smartphone at the last moment, so I can submit it not only word-for-word, but inflection-for-inflection by submitting it as an audio recording. But inflection also only carries part of the meaning. There's still nothing to see. That is why NRC is required to meet in the same room with the ratepayers, advocates, concerned citizens, and other interested parties and stakeholders in their decisions. That is why the NRC is required to come out to the local communities. (0561-1 [Hoffman, Ace])

Comment: Visual accompaniment -- either of the speaker or of the speaker's presentations (slides, videos, etc.) -is another important part of communication. Therefore I took the recording of the comments I made at the Waste (No-)Confidence protocol phone-in, which I was told should be submitted during the comment period, and added visual aids to further explain what I'm talking about. That video has been uploaded to You-Tube and is available here: <http://youtu.be/P6zqHtGZ-N4>. The audio is uncut and unedited, and runs under two minutes. I would like this video to be played at the opening hearing to be held October 1st, 2013 at the central NRC headquarters in Maryland. Additionally, if possible, it would be very convenient if my time to speak is scheduled fairly accurately for that hearing, because the California Public Utilities Commission is holding a hearing locally (in San Diego, 30 miles from my home) the same day, about decommissioning San Onofre. I would like to speak at both hearings if I can arrange it, since the topics are tightly intertwined. I will probably end up listening to and watching the Waste (No-)Confidence proceedings with earbuds on my smartphone while physically at the other hearing, paying as close attention to it as possible with my other ear. If my 4G connection fails so I am unable to speak, at least the video could be played. If I have a live connection, as I expect to have, then I hope I could also add a minute or two of additional commentary such as responding to the NRC staffer's additional comment that I should take a look at page 4 -79 of the recently-published Waste Confidence document, which I have since done, and which was not enlightening in any way. (0561-2 [Hoffman, Ace])

Comment: Why can't the Nuclear Regulatory Commission set up some form of Internet bi-directional connection for EACH of the dozen Waste (No-)Confidence meetings around the nation? Of course you don't want to be loaded up with the same people "preaching to the choir" over and over again -- but there are ways to avoid that. So why not transmit the audio and video and have a live audio/video chat line or at least a typed questions column? It's something that literally tens of thousands of other organizations (and you too, probably) do every day. So why not for these vitally-important, judicially-mandated proceedings? After all, this is 2013. NRC needs to get real about the technological challenges it faces regarding nuclear waste. NRC should also get real about the technological marvels that are available in the real world to help them follow their mandates: To protect the world from radioactive accidents (best done by switching to solar power), to properly inform the public of their regulatory decisions, and to allow the public to take part in formulating our national nuclear policies. Those policies have been irrational for too long. Not allowing ALL of the public to witness and be a part of ALL of these

historic "65-years-of-failure" Waste (No-) Confidence proceedings is a criminal act of denial -of- service. Even to drive 50 miles round trip these days can be a significant expense for a struggling household. A nuclear accident can easily affect 100s of miles around. Roughly 80% of the population of the United States lives that close to a nuclear power plant, nuclear infrastructure (such as a fuel fabrication facility) or transportation route for nuclear waste. NRC's "Waste (No-)Confidence" decisions affect everybody. Everybody should have a right and an opportunity to participate. In fact, the hearings -- sorry, meetings -- should allow people to speak for far more than the usual three minutes if they need too. I would like to also submit the following video, called "THE PHYSICS OF SPENT NUCLEAR FUEL" which we made from a live Internet chat I did a couple of months ago: <http://youtu.be/xfVx-UysJol>. It's a 31 1/2 minute video, but if there's a more appropriate kickoff to explain to interested parties what the issues are regarding "Waste (No-)Confidence" I haven't seen it, which is why we made it. The team that created these videos (myself and my buddies) would be happy to go to EACH of the NRC's "Waste (No-)Confidence" meetings and ensure that some form of live transmission occurs. We would also record the meetings in HD. We could live-broadcast all the proceedings for the NRC -unforeseeable technological hurdles notwithstanding (unlike nuclear power operators, we are realists). For financial reasons of course, it would be impractical for us to do so without compensation for travel, time and expenses, but the public would undoubtedly appreciate the money being spent so they could see and even participate in the proceedings live as they occur. NRC should already know the public wants this, based on the many comments requesting Internet access that were made during the protocol phone-ins. I'm sure, however, if NRC was willing to pay for it, they could ensure that each hearing is broadcast on their own, without our help. Most universities these days can do it from any classroom, for instance. I'm sure NRC could do it too, if they tried. (0561-3 [Hoffman, Ace])

Comment: Hearings on the Nuclear Regulatory Commission's proposed Generic Environment Impact Statement (GEIS) for nuclear waste were held nationally over the past few months and attended by more than 1400 people. The comment period (for written comments) for "NRC NUREG-2157" ends December 20th. In California, about 150 people attended a hearing in Carlsbad, and over 200 attended the San Luis Obispo meeting. Tonight in San Clemente, citizens will ask their city council to request an extension of the comment period. (0562-1 [Hoffman, Ace])

Comment: Let me first begin by saying I attended the Waste Confidence meeting the NRC held on December 2, 2013 in Perrysburg, Ohio and I was quite disappointed. The moderator said oral comments would be taken based upon the initial sign-up of the speaker. I signed up months ago to speak at the initial hearing (In October, prior to postponement due to the government shutdown), yet I wasn't called on until after individuals who signed up at the hearing. Unfortunately, due to the latest of the hour (after 10:00 PM) and the fact I had a three hour drive, I left before being called on to give my below listed presentation. (0578-1 [Blackburn, Lee])

Comment: I appreciate the opportunity to provide oral comment on the important topic of waste confidence and its relationship to continued nuclear plant licensing and operations. (0598-1 [Wicks, Tonja])

Comment: I would like to thank the NRC for hosting this public meeting and providing an opportunity for comments. (0598-8 [Wicks, Tonja])

Comment: Re: Scoping Process and DGEIS review; To the best of my knowledge, the vast majority of participants who attended or spoke at the NRC's public comment meetings,

sessions, forums and national teleconference agreed that the NRC has "stacked the deck" to prevent an honest, holistic and comprehensive debate and discussion of the DGEIS. Note the brilliantly devious and clever evasion on page xxvi, lines 12 - 25 of the DGEIS Executive Summary. Throughout the process, the NRC has narrowed the scope and parameters of discussion to such a degree that any reasonable and serious alternative to the NRC's proposal is automatically and summarily dismissed, rejected and disallowed for further consideration, thus cutting off debate and effectively giving the NRC's proposal a "rubber stamp" of approval. Nevertheless, the overwhelming reaction of the public proves that Abe Lincoln was entirely correct when he famously stated: ". . . you cannot fool all of the people all of the time." (0603-21 [Schonberger, David])

Comment: Just because a human being is in science, it does not prevent hubris. And that is what I saw in the young Exelon engineers at the hearing. Faith in science can be erroneous. I was frightened to see how sure the young engineers of Exelon seemed to truly believe that they knew everything that they needed to know about nuclear safety. At the end of the meeting in Oak Brook, a woman testified as to her fear and despair at trying to find out more information when the millions of gallons of radioactive water was released into the Kankakee River. As she spoke, the young engineers of Exelon--what did they do? They laughed at her and mocked her. Truly, that was a shocking moment to me. These young engineers, who are so sure of themselves, I question their character and their judgment. Can such people who jeer at a woman seeking information regarding a terrible nuclear event--are they truly concerned about all the far-reaching consequences of our nuclear energy plan? Can they really care about safety if they are so callous? Even if these young engineers of Exelon may not all be hubristic, did any of them challenge their peers to truly address the process issue of what happened at Braidwood? Was there any discipline applied, any sanctions internally to the appalling behavior of the young engineers? (0612-5 [Takarabe, Tamae])

Comment: I point out that I cannot present Chairman MacFarlane's exact words as the transcript of that meeting is not available yet. This is a further reason to extend the comment period past today. (0615-2 [Lewis, Marvin])

Comment: I've shared several thoughts, mostly questions, because the truth is, as I am sure you are well aware of, my voice means very little in the construct of a rule on nuclear waste management. I'm just an average Stakeholder. As mom, private citizen, an enthusiast in all things nuclear and its connection to our exploration in space, I merely have an interest in healthy life on earth to make all the but I really do not know anything that you do not already know and I am sure you have your own well-informed perception on the issue of nuclear waste management and, as is the subject of this dialogue, confidence in the ability to manage the growth, expansion and reclamation of nuclear products. (0639-1 [Vandel, Nikohl])

Comment: ANA appreciates the Nuclear Regulatory Commission's efforts to collect public input on the draft Generic Waste Confidence Environmental Impact Statement through written comments as well as public meetings, which ANA groups attended in their regions. (0646-1 [Hanson, Courtney])

Comment: ANA supports an early and substantive role for tribes, states, and the public in decision making. ANA's experience with DOE sites demonstrates that the effects of nuclear activities extend far beyond the immediate area. In fact, the "affected public" is not just people in the "host" community, but includes people near other nuclear facilities and even other states. (0646-11 [Hanson, Courtney])

Comment: Duke Energy commends the Nuclear Regulatory Commission (NRC) for its inclusive approach to obtaining public input throughout the development of the draft Environmental Impact Statement (EIS) and proposed rule. (0672-2 [Jamil, Dhiaa])

Comment: In terms of risk communication, it is a democratic imperative that parties affected by regulatory policies and practices be adequately informed, involved substantively in decision making, and influential (rather than simply included) in the decision process. I believe that the NRC has good intentions in this regard, and having served with a U.S. Department of Energy site-specific advisory board (Hanford site) I recognize the many difficulties that challenge efforts at robust public engagement. Nevertheless, the very legitimacy of the NRC is at stake, as is the legitimacy of the nuclear industry. The conversation I have observed in connection with the Waste Confidence public involvement process has been restricted to the "usual suspects": the NRC, the nuclear industry, and a limited number of public interest groups that have technical resources and are able to make the necessary commitments of time and effort. The latter are grossly underrepresented in the conversation, and the result is a conversation that does not adequately represent the full range of public interests. (0684-4 [Kinsella, William])

Comment: Public interest groups and individual citizens have presented substantial evidence to the contrary at the recent Waste Confidence public meetings, but those concerns have not been incorporated into the draft GEIS. Numerous questions regarding seismology, fire safety, reactor safety, security against hostile parties, radiological hazard models, fuel storage configurations, storage of high-burn-up fuels, and other issues, all impinging on spent fuel storage and all requiring site-specific analysis, have been raised frequently and credibly but are dismissed in the draft GEIS. (0684-9 [Kinsella, William])

Comment: NIC commends the Nuclear Regulatory Commission (NRC) for its broad, comprehensive, and inclusive approach to obtaining public input throughout the development of the draft Environmental Impact Statement (EIS) and proposed rule. (0685-3 [Davis, Ed])

Comment: All of the people who spoke in support of DCNPP at this meeting were either employees of PG&E, most of them working at the plant, or from other groups funded by the profits of the nuclear power industry. It is clear that they were all protecting their jobs, for which they are highly paid, or their hopes of getting a job in the future for which they will be highly paid. (0686-18 [Malboeuf, Simone])

Comment: [O]ur members follow the issue of waste confidence closely, and we are grateful for this and numerous other opportunities provided by the Nuclear Regulatory Commission (NRC) for stakeholder input before making a final decision. Specifically, we compliment the NRC Waste Confidence Directorate's outreach efforts. Not only have they planned and successfully conducted 13 public meetings across the country, they have presented information on numerous status calls and at various stakeholder events to provide significant opportunities for all those interested to stay fully apprised of relevant waste confidence activities. (0689-1 [Boyd, David])

Comment: VI. The President's Blue Ribbon Commission (BRC) strongly recommended a process of involving the public and gaining their consent for the siting of nuclear waste facilities. Despite making reference to the BRC in the GEIS, the NRC's proposed action actually involves long term and even indefinite waste storage, while the public is excluded from any future involvement in these major decisions. (0693-3-3 [Warren, Barbara])

Comment: This means that the proposed NRC process is not consent-based as the BRC envisioned. The public, local government agencies, elected officials and emergency responders deserve the opportunity to present any relevant information pertaining to the storage of large quantities of highly radioactive spent fuel on-site at reactors, its management and the safety issues of concern. The NRC proposed action is the opposite of consent-based. With the proposed waste confidence rule, NRC is acting to prevent the public from having any role in matters that require transparency and public scrutiny in order to protect public safety. (0693-3-9 [Warren, Barbara])

Comment: TVA also agrees that the NRC's waste confidence rulemaking process fully satisfies NEPA in that it has included considerable transparency and public participation. As NEI notes, the process has been a model of transparency in agency action.²³ [footnote 23 text: NEI comments.] The NRC has afforded all stakeholders numerous and timely opportunities to participate directly in the rulemaking process. For example, the NRC has held numerous meetings, conferences, and workshops to inform the public about the rulemaking and to solicit input, including comments on the Proposed Rule. (0694-1-12 [Shea, Joseph])

Comment: Entergy also agrees that the NRC's waste confidence rulemaking process fully satisfies NEPA in that it has included transparency and public participation. As NEI notes, the process has been "a model of transparency in agency action."²⁰ [footnote 20 text: NEI comments (Cover Letter).] The NRC has afforded all stakeholders numerous and timely opportunities to participate directly in the rulemaking process. For example, the NRC has held numerous meetings, conferences, and workshops to inform the public about the rulemaking and to solicit input, including comments on the Proposed Rule. (0697-1-16 [Bessette, Paul] [Kuyler, Raphael])

Comment: Thank you for your considered effort to bring the issue of Nuclear Waste Confidence to the forefront of the common citizen in our nation. I believe the NRC could have utilized its connections with National Public Television and the news networks to bring even more attention of this issue to the every-day citizen not aware of nuclear power and weapons and the great risk of nuclear waste in our local communities. (0703-1 [Vandel, Nikohl] [Vandenberg Clermont, Elaine])

Comment: It was my intention to read carefully the U.S. Nuclear Regulatory Commission's entire *Waste Confidence Generic EIS* (Draft Report for Comment) before submitting comments by today's December 20 deadline. I am disappointed I have not had sufficient time to complete my study of this document. (0715-1 [Drey, Kay])

Comment: I also agree with Priscilla Starr and with Mike Carberry that this public process, although you may mean well, is essentially demeaning to the public. Giving us three-minute limits for commenting on such a grave threat to all living things is in itself demeaning. All of the other points that Mike and Priscilla made about the process I would concur with also. (0717-3 [Lewison, Linda])

Comment: First I would like to thank you all for considering my comments here and all the testimony submitted by concerned people who have approached you with a concern for the children, the people and All Life of Today and Tomorrow. Never forget the by, for and of the people, and the prior, free, informed consent governance that so many have sacrificed to defend, without it, you will get no confidence in the NRC's con-fidence! (0744-1 [Bonniwell, Colleen])

Comment: Do not ! like Japan - restrict Freedom of Speech! Allow those (us) Life Protectors to Stand Strong - United and have our voices heard. (0744-10 [Bonniwell, Colleen])

Comment: Had THE PEOPLES' right to vote on a law that effected them (us) from the beginning (1920's-TESLA) it would not have brought us here where we are today at this late hour. Have confidence in the people. This issue will take the patience of all to get right - when ever we can. The process must remain open! Give consideration to the Peoples ideas. (0744-3 [Bonniwell, Colleen])

Comment: Vista 360 thanks the U.S. Nuclear Regulatory Commission for it efforts in addressing the Waste Confidence issue and carrying out the long standing practice of conducting your regulatory, licensing and oversight activities in an open manner. Informing the public and taking its unvarnished perspective into account should be an institutional imperative of the highest order and providing opportunities for participation in a defined process and your decision making process is a laudable goal and objective. (0809-1 [Rielly, Thomas P.])

Comment: After deliberations are concluded, we challenge the U.S. Nuclear Regulatory Commission and the DGEIS professional staff to outline to the public (by methodology) the means by which solicited comments were organized for consideration and review, then how the solicited public comments were correlated by applicability and then incorporated by reference into the final work product of the Waste Confidence Environmental Impact Statement. Respectively, this disclosure effort should be conducted and carried out by the dictates of the Government Performance Results Act of 1993 and in the spirit of openness as purported by the U.S. Nuclear Regulatory Commission in its stated policies. (0809-2 [Rielly, Thomas P.])

Comment: I point out that I cannot present Chairman MacFarlane's exact words as the transcript of that meeting is not available yet. This is a further reason to extend the comment period past today. (0818-3 [Lewis, Marvin])

Comment: Your public engagement plan, including public meetings across the country, accessible website links to documents and clear directions about comment opportunities and deadlines, was well executed. Facilitation of the public meeting in Minnesota was excellent. I particularly appreciated the teams' openness to discussion after the meeting. This is a critical document, which will be pivotal in the mission of the NRC to "ensure the safe use of radioactive materials for beneficial civilian purposes while protecting people and the environment". (0820-1 [Eide-Tollefson, Kristen])

Comment: Scientific overview through assessment and analysis of safety priority requires development of methods of accepting official public testimony at any time that does not limit submission of official comments to limited scheduled timeframes. Such submissions require some way to appropriately prioritize by the timeliness of any safety issues, particularly to strictly contain any and all ionizing isotopes from leakage source through the entire timeframe of their cumulative ionizing impacts in consideration of the duration of time required for all the sets of half-lives to display until totally expired. From sufficient overview, a method should be required to promote identifying and addressing safety more certainly within an open timeframe permitting submission of new information, new concerns, new approaches, and insights into safety issues as well as the discovery of past fatal flaws, incomplete or inaccurate information and/or conclusions, unsafe practices, or any concerns about failures of sufficient oversight. (0823-18 [Michetti, Susan])

Comment: For example, the International Joint Commission of Great Lakes Water Quality was formed around scientific principles for scientific academics and professionals and developed a policy to accept official comments continually in order to be alerted to a need to focus on emerging issues of concern in a timely way. To the extent that the NRC employs a process that does not permit a continual influx of official comments of concern with a sufficient method to ensure that each is prioritized to be addressed in the timely way required by any safety concerns, that is the extent to which the NRC is blocking the ability to apply the brightest and best application of scientific thinking, methods, and principles in the most timely way, which, in turn, is required to protect the environment and the public as safely as possible in the most timely way. (0823-19 [Michetti, Susan])

Comment: This is a terrible time to ask for comments when you know family and friends are celebrating Christmas. (0824-1 [Ingram, Gwen])

Comment: The Nuclear Regulatory Commission has been transparent throughout its processes and reiterated on many occasions the safety and security of used nuclear fuel management in post-Fukushima. (0825-4 [Palomarez, Javier])

Comment: Please extend the comment period for the "Waste Confidence Draft Generic Environmental Impact Statement (GEIS)", Docket ID No. NRC- 14 2012-0246." This is a very serious issue and will need more time for the public to understand the impacts of any decisions. (0836-1 [Davis, Anonymous])

Comment: The document says "Any interested party may submit comments on this report for consideration by the NRC." We take this to mean that "anyone" may submit comments, and we reject the notion that you have to have a specific "interest" by residing within 50 miles of a nuclear plant, or the notion that you have to suffer actual harm, and the notion that you have to be an official "party" to the proceeding. The NRC Staff and Nuclear Industry attorneys have carried their arguments to an extreme on this point. We would prefer that you discard this troublesome language, and simply say "anyone," and leave out the "interested" qualifier, as well as the notion of "party," which has legal connotations. Of course, if someone takes the time to comment, they must be interested. Using "interested" opens the door for the industry to argue that the comments are coming from a party that is "not interested enough" because they do not have a financial interest that goes beyond being a ratepayer, or because they have not suffered actual -- not hypothetical -- harm and injury. We know this because these arguments were used by NRC Staff and industry attorneys who have a singleminded agenda to block any input from the public. (0836-11 [Davis, Anonymous])

Comment: Please, if you really want participation, change "interested party" in your statement regarding standing to "anyone." (0836-12 [Davis, Anonymous])

Comment: I've shared several thoughts, mostly questions, because the truth is, as I am sure you are well aware of, my voice means very little in the construct of a rule on nuclear waste management. I know so little in comparison to those who work on these matters every day. I'm just an average Stakeholder. As mom, private citizen, an enthusiast in all things nuclear and its connection to our exploration in space, I merely have an interest in healthy life on earth to make all the but I really do not know anything that you do not already know and I am sure you have your own well-informed perception on the issue of nuclear waste management and, as is the subject of this dialogue, confidence in the ability to manage the growth, expansion and reclamation of nuclear products. (0838-1 [Clermont, Elaine])

Comment: Thank you for your considered effort to bring the issue of Nuclear Waste Confidence to the forefront of the common citizen in our nation. I believe the NRC could have utilized its connections with National Public Television and the news networks to bring even more attention of this issue to the every-day citizen not aware of nuclear power and weapons and the great risk of nuclear waste in our local communities. Yet, I do feel at some point, we do what we can do with where we are as a nation, exactly where we are, here we are. (0838-2 [Clermont, Elaine])

Comment: I was particularly interested in the NRC's methodology used to engage the public with the development of the report. Unfortunately, it appears that the public was not directly involved in creation of the report, but was merely presented previously created information and asked to provide an assessment. For example, the report states that, "The NRC announced that it was planning to develop an EIS and requested comments..." (xxvi) which does not indicate the direct engagement of the public with the development of the EIS. Furthermore, while the statement that, "...technical knowledge and experience alone are not sufficient to bring about the broad social and political acceptance needed to construct a repository" (B-5) shows some recognition of the need to directly involve the public, it seems to imply that the effort to convince the public is simply an obstacle to overcome so the right solution can be implemented. While I appreciate the NRC's efforts to involve the public I argue that the public must be an active participant in the process of NRC rulemaking. These observations lead me to ask, "Did the NRC engage social-scientists as participants in their assessment?" A total focus upon the technical artifacts of an issue is a flawed approach. The NRC must fully address the nuclear waste problem with the full range of expert knowledge AND the public. (0847-1 [Miller, Daniel])

Comment: Also it would help if you weren't discussing having drinks together with industry reps after the hearing in front of everyone there; or sit with industry folks & stop staging the events with the public vs. paid industry personnel. SERIOUSLY?!!! You used the same person at the last hearing to follow my comments & you made it impossible for people who were signed up to speak at all on purpose. How do I know, I know when they signed up & you refused to let them speak by making them wait all night until they were forced to leave due to the long drive home & jobs they have in the morning. (0862-10 [Thompson, Tammy])

Comment: You are liars who say its public comments & nothing about this fiasco & or NRC "ideas" to date have been made public. (0862-5 [Thompson, Tammy])

Comment: Next time you host a meeting try to make sure your microphones work; you blame the hotel but you are the ones ultimately responsible & responsibility is not something you are found to be credible or able to do. (0862-7 [Thompson, Tammy])

Comment: Thank you for opportunity to submit public comment - However due to the extreme importance of this proposal upon impacted communities, and the limited extent so far of OBJECTIVE media coverage of this proposal for long term storage of spent nuclear fuel, (especially on extremely large population centers within 50 miles of San Onofre = over 8.4 million people, on the unprecedented economic risks, and realistic risks (not a remote risk) of catastrophic damage to local, regional, statewide infrastructure, food and water supply, and the real limit(s) for victims for physical, social, economic recovery from catastrophic losses), it is imperative that NRC should EXTEND THE COMMENT PERIOD for a reasonable time -- until February 28, 2014. (0866-1 [Borchmann, Patricia])

Comment: In letter from San Clemente Mayor Tim Brown (dated December 18, 2013) to Annette Vietti-Cook (Secretary of NRC), Mayor Brown indicated "...The City Council takes its

responsibility to represent and protect our citizens with utmost seriousness. San Clement City Council respectfully requests your consideration of extending public comment period for the Waste Confidence Draft Generic Environmental Impact Statement to February 28, 2014 to allow Council sufficient time to review the document". There are several other cities (San Juan Capistrano, Dana Point, Oceanside) within 20 miles of SONGS, who have also been asked to support the same action taken by San Clemente. Beyond the 20 miles, many other local cities and agencies within 50 miles should also be extended the same courtesy. (I'm asking City of Escondido, where I live). (0866-3 [Borchmann, Patricia])

Comment: Basically, the meeting was to show what the NRC has in mind regarding storage of nuclear energy waste on site. A "draft" booklet (GEIS) was handed out for the purpose of gaining public opinion before the NRC establishes a "rule" or "rules" about it. Generally, they want to know if the public would feel "confident" (safe) continuing to store nuclear lethal waste (spent rods) in either water pools, or in the recently created dry casks for periods of: 1) "Short" term-approx. 60 years, or 2) "long" term-about 120 years--until an envisioned US repository is made available, or, 3) indefinitely because no repository is or will be made available. All three "options" boil down to storage in on-site in un-time-tested dry casks. (0868-1 [Tilbury, Don])

Comment: I believe the NRC knows beforehand that their meetings will be attended mostly by persons or groups that oppose nuclear power. (0868-3 [Tilbury, Don])

Comment: The meetings should be held on the weekends to increase attendance. The facility should be large enough to accommodate all participants and their parking needs. (0869-1 [Homick, Nick])

Comment: This GEIS meeting should be held in every single community that has a nuclear reactor - not just a select few. (0869-2 [Homick, Nick])

Comment: The anti-nuclear comments were enlightening and intelligent. I learned nothing from the NRC. (0872-2 [Wilvert, Calvin])

Comment: There was a terrible echo from the microphone. (0872-3 [Wilvert, Calvin])

Comment: A STUPID statement! *[Attendees were listened to and understood by NRC Staff]* The NRC staff sat there, but they gave no evidence that they understood the concerns of most of the speakers. (0872-4 [Wilvert, Calvin])

Comment: The NRC statements were not "balanced." (0872-5 [Wilvert, Calvin])

Comment: The NRC staff simply repeated the "company line." Obviously, they would be fired if they didn't do this. (0872-6 [Wilvert, Calvin])

Comment: A major point: The pro-nuclear speakers appeared to be employees of PG and E or from other pro-nuclear groups. Their statements appeared scripted, as if they had all been written by the same person in the P.R. office of PG and E. (0872-7 [Wilvert, Calvin])

Comment: My understanding was that the meeting was to provide public input as to what could be done with nuclear waste. There didn't seem to be any discussion of that in the first 1-1/2 hours so three of us retired engineers left and didn't hear all the talks. (0873-1 [Thome, William L.])

Comment: Most of the public comments were by anti-nuclear people. To them nuclear energy causes many problems with potentially huge future problems. I believe one of the speakers even mentioned Emerald Ash Borer being caused by nuclear waste. We have heard all their arguments before and there didn't seem to be anything new. Two speakers spoke for nuclear power. First was a Ottawa County Commissioner. He was looking at the tax base and jobs provided by the Davis Besse plant. A second was a union leader from Columbus who liked the jobs provided in building nuclear plants. (0873-2 [Thome, William L.])

Comment: None of the speakers addressed the stated purpose of the meeting of input on what to do with the nuclear waste. I believe the NRC should provide about ten minutes for the anti-nuclear group to present their case. After that any speaker who deviated from the intended purpose would have the microphone shut off and they would be asked to leave the podium. (Possibly police assistance would be required.) Then the NRC should present a technical presentation on what options have been considered with the pluses and minuses of each option. Then let the public comment on the options or other methods of handling the waste. (0873-3 [Thome, William L.])

Comment: The NRC staff did a great job at this hearing! I was very impressed in how they stayed so calm and polite despite the VERY angry and disrespectful Anti Nuke people! (0875-1 [Szabo, Lou])

Comment: Hands down. NRC staff are very patient and professional in their demeanor at these meetings. (0876-1 [Anonymous, Anonymous])

Comment: Perhaps future meetings would either require speakers to elect 1 speaker representing any group including concerned citizen and then continue to allow unlimited written comments. Many concerned citizens only wanted a soapbox to complain not to comment on document. (0876-2 [Anonymous, Anonymous])

Comment: I don't think the NRC really listens to people who are concerned about the extreme dangers of nuclear issues, including nuclear waste. If they ever listened they wouldn't propose rules to disenfranchise the public of their rights to protect the environment and therefore strip us of rights to equality, happiness, etc. (0877-1 [Anonymous, Anonymous])

Comment: The NRC should keep to the start time published. (0878-1 [Ellison, David])

Comment: The NRC should ask questions of the public and actually listen to their answers- The pre-meeting time was helpful and good-but if the meeting is scheduled at dinner-time, there should be some sort of crackers or food, in addition to water and caffeinated drinks. There should be more informal interaction with staff. (0878-2 [Ellison, David])

Comment: THIS WAS MY FIRST VISIT TO AN NRC PUBLIC MEETING. SO, I HAVE NO REAL FEEL FOR AN IMPROVEMENT IN THE NRC'S PUBLIC MEETING PROCESS(ES). POSSIBLY, A MOVEMENT WITHIN NRC MORE ALIGNED DIRECTLY INFLUENCING HIGHER LEVEL MANAGEMENT IS IN ORDER TO SERVE PUBLIC INTEREST(S)[.] (0879-1 [McCraney, Richard])

Comment: These should have been 2 day meetings. (0880-1 [Anonymous, Anonymous])

Comment: If, as rumored, public comments will not be permitted after the NRC decision is made, I would consider that a denial of my First Amendment rights. (0882-4 [Wright, Margaret Z.])

Comment: There was an annoying delay in the speaker system, and not enough seats. (0888-2 [Wilvert, Rosemary])

Comment: No questions were permitted. (0888-3 [Wilvert, Rosemary])

Comment: It's hard to feel "listened to" when we're hearing the same as 35 years ago[.] (0888-4 [Wilvert, Rosemary])

Comment: The pro-nuclear speakers seemed scripted and were often employees of PG and E. (0888-5 [Wilvert, Rosemary])

Comment: The NRC staff keeps telling us the same things, and expects confidence. (0888-6 [Wilvert, Rosemary])

Comment: Introduction to comment period was repetitive and a total time-waster. Each NRC speaker said the same thing the previous speaker had said. We all know that this show is only a show. NRC has all the info it needs. The Chair believes in the show biz of public comment. If anything new actually came out of this meeting or any other, it would be a huge surprise! We were told how our comments would be important. But our time is apparently not. (0889-1 [Rossin, A. David])

Comment: We all understand that the "public meeting" can be felt to be necessary when active critics can challenge NRC actions. But when funds are tight, they should have low priority. (0889-2 [Rossin, A. David])

Comment: I wanted to ask if any of the costs of this set of public meetings were covered by any \$ in the Waste Fund. You can reply by email. (0889-3 [Rossin, A. David])

Comment: However, from past experience and the FACT that the only participants who were FOR the GEIS and more nuclear licensing were folks whose JOBS depended on "liking nuclear" and vouching for its safety! (0890-10 [Arnason, Deb])

Comment: I think the NRC did a good, non-combative job of conducting the hearing. (But do they listen really?) (0890-2 [Arnason, Deb])

Comment: It was hard to know if we were "listened to and understood" by the staff. (0891-1 [Clark, Brita Larsen])

Comment: I was concerned that the NRC speakers, and others supporting the GEIS did not acknowledge that the problem of long-term high level waste disposal is very complex, with no clear, "good," solution. They seemed to dismiss many of the concerns expressed by the public speakers. If the staff had forthrightly addressed the fact that there are many difficulties ahead, (instead of blithely dismissing them), it would be harder for concerned citizens to assume that they (the staff) are biased rather than neutral guardians of the public safety. (0891-2 [Clark, Brita Larsen])

Comment: Since the audience and people wishing to testify were so large, time for individual testimony could have been shortened to allow everyone to speak. I, having pre-registered (via the website) to do so was unable to. (0892-1 [Lamberts, Frances])

Comment: The Hearing officer, most courteous, should however have requested (and seen to it) that audience applause be held (= not allowed) since-- predictably following each speaker, it

both wasted precious time and delayed or made inaudible the announcements of speaker sequences to follow. (0892-2 [Lamberts, Frances])

Comment: I believe the process could have been made considerably calmer and more efficient, so that all could have been heard. (0892-3 [Lamberts, Frances])

Comment: I think the NRC runs a public meeting very well. (0893-1 [Wylie, Robert])

Comment: It seemed as if little recognition was given to the 40 people who came + or minus 100 miles from Asheville and that preference seemed to favor those who worked for the industry. (0894-1 [Patrie, Lewis])

Comment: SOME ATTENDEES WHO IDENTIFIED THEMSELVES AS LEADERS OR EXECUTIVES OF ENTITIES IN FAVOR OF THE WCDGEIS AND P RULE, BRAZENLY EXCEEDED THEIR COMMENT TIME AND IT WAS TOLERATED, THEN APPLAUDED. (0895-1 [Stein, Ed])

Comment: I WAS DISAPPOINTED AT THE GUFFAWS, SNICKERS, AND COMMENTS PASSED AROUND WHEN NON-TECHNICAL HEART FELT COMMENTS WERE MADE BY CITIZEN SPEAKERS. THOSE OPPOSING THE RULE MANAGED TO KEEP IT TO SIMPLY GASPING AT THE HUBRIS OF MANY OF THE PRO-RULE SPEAKERS. (0895-3 [Stein, Ed])

Comment: THE CONDECISION AND HUBRIS DISPLAYED BY MANY OF THE NUCLEAR INDUSTRY EMPLOYEES IN THE ROOM WAS DISTURBING. LIKE A SUB-CULTURE OF SUPERIOR BEINGS. (0895-4 [Stein, Ed])

Comment: IT WAS WORTH ATTENDING, BUT DISTURBING. I APPRECIATE THE OPPORTUNITY TO COMMENT...BUT FEEL IT'S A CHARADE. (0895-5 [Stein, Ed])

Comment: This meeting was a sham. It was held so the NRC can say it listen's to the public's concerns. (0902-1 [Fasten, Susan])

Comment: Embrace and incorporate these very knowledgeable, concerned, invested citizens in your decisions and actions. Remember that we are all in this together. (0902-11 [Fasten, Susan])

Comment: More attention was paid to not letting them [attendees] talk too long than to the content of their valid concerns. (0902-3 [Fasten, Susan])

Comment: Attendees concerns and facts were basically dismissed and ignored by NRC staff. (0902-4 [Fasten, Susan])

Comment: Suggestions on ways the NRC can improve their public meetings: --Acknowledge that we are all in this together. (0902-5 [Fasten, Susan])

Comment: Respect what attendees have to say and include their requests, fears and concerns in your "regulating." Their lives, families, homes, and communities are on the line. They know what the problems and risks are and are your best source for the corrections needed. (0902-8 [Fasten, Susan])

Comment: Treating the critics of the present nuclear situation with arrogance, dismissiveness, and a smug air of superiority is not constructive or smart, nor is cutting their comments short.

These caring, dedicated people have nothing to gain politically or financially, have no job to protect, have no superiors to answer to. They spend their own time and money travelling to and preparing for these meetings and speaking up because they understand that their lives and all of our lives are on the line. Why do you not get it that your lives and families and communities are on the line as well? (0902-9 [Fasten, Susan])

Comment: This meeting was a sham. IT was held so the NRC can say it listens to the public's concerns. Comments were cut short. Not heard or understood. (0903-1 [Fasten, Susan])

Comment: Please provide any suggestions you have on ways the NRC could improve their public meetings: -Acknowledge that we are all in this together. (0903-2 [Fasten, Susan])

Comment: Respect what critics have to say. Include their requests, fears, and concerns in your "regulating." Their lives, families, homes, and communities are at risk. They know what the problems and risks are and are your best and most invested source for the corrections and precautions needed. (0903-5 [Fasten, Susan])

Comment: Treating the critics of the present nuclear situation with arrogance, dismissiveness, and a smug air of superiority is not constructive or smart. These caring, dedicated, knowledgeable people have nothing to gain politically or financially, no job to protect, no superiors to answer to. They spend their own time and money travelling to and preparing for these meetings and speaking up because they understand that their lives and all of our lives are on the line. (0903-6 [Fasten, Susan])

Comment: Invite, incorporate, and embrace these very concerned, knowledgeable, invested citizens in your decisions and actions. -Remember that we are all in this together. (0903-8 [Fasten, Susan])

Comment: I also request that the Comment Period for the Waste Confidence GEIS ,Nureg 2157, be extended to include the time needed to reanalyze Table S-3 in light of the above deficiencies. (0906-2 [Lewis, Marvin])

Comment: Thank you for the opportunity to comment. (0913-16 [Bevill, Bernard])

Comment: But one unpleasant aspect of NRC's rush job has been its enforcement of mere three minute public comment opportunities at meetings across the country. It is certainly difficult to say much in three minutes about a topic as societally significant, not just for current, but for all future generations, as irradiated nuclear fuel generation, storage, and disposition. (0919-4-22 [Kamps, Kevin])

Comment: Re: Page 3-37, Section 3.15 Transportation, where NRC admits: "For transportation of radioactive material from a nuclear power plant site, the affected environment includes all rural, suburban, and urban populations living along the transportation routes within range of exposure to radiation emitted from the packaged material during normal transportation activities or that could be exposed in the unlikely event of a severe accident involving release of radioactive material. The affected environment also includes those members of the public that could be exposed to radiation emitted from the packaged material during normal transportation activities including people in vehicles on the same transportation route, people living along transportation routes, and people at truck stops and workers that are involved with the transportation activities"...Given this admission, NRC should have expanded its public comment opportunities, given this important issue of transportation risks more focus and attention, and

held public comment meetings along likely transport corridor locations on the roads, rails, and waterways to centralized interim storage, away-from-reactor, parking lot dumpsites. No such focus, attention, or meetings took place in this entire public comment proceeding. (0919-6-4 [Kamps, Kevin])

Comment: After the Nov. 12, 2013 Nuke Waste Con public comment meeting in Oak Brook, IL, Nuclear Energy Info. Service of Chicago put out a one-sider entitled "IT ALL BOILS DOWN TO-DO WE TRUST THE NRC?" I so endorse what it says that I made copies of it available on the Beyond Nuclear information table at the Perrysburg, OH Nuke Waste Con public comment meeting in on Dec. 2, 2013. I staffed the info. table as much as I could that evening, although I did have to go into the big room to make my 3 minute public comment orally, had to do media interviews, etc. But the entire time I staffed the table, not a single one of the large number of NRC staff who were in attendance even so much as stopped by to glance at our table. So I assume that no NRC staff took a copy of this. And even if they did, I am fairly certain it would not find its way into the official record as public comment in this proceeding. (0921-1 [Kamps, Kevin])

Comment: The document says "Any interested party may submit comments on this report for consideration by the NRC." We take this to mean that "anyone" may submit comments, and we reject the notion that you have to have a specific "interest" by residing within 50 miles of a nuclear plant, or the notion that you have to suffer actual harm, and the notion that you have to be an official "party" to the proceeding. The NRC Staff and Nuclear Industry attorneys have carried their arguments to an extreme on this point. We would prefer that you discard this troublesome language, and simply say "anyone," and leave out the "interested" qualifier, as well as the notion of "party," which has legal connotations. Of course, if someone takes the time to comment, they must be interested. Using "interested" opens the door for the industry to argue that the comments are coming from a party that is "not interested enough" because they do not have a financial interest that goes beyond being a ratepayer, or because they have not suffered actual -- not hypothetical -- harm and injury. We know this because these arguments were used by NRC Staff and industry attorneys who have a singleminded agenda to block any input from the public. (0930-1-4 [Lutz, Ray])

Comment: Please, if you really want participation, change "interested party" in your statement regarding standing to "anyone." (0930-1-5 [Lutz, Ray])

Comment: I don't expect my words to be considered in any decision. No one of us, of the 99% is ever listened to. I feel we are talking to deaf ears. The only voices that are heard are of the 1% and lapdog agencies such as the NRC. But I am totally without hope. Democracy is what the people want, maybe someday it will happen. (0933-10 [Anonymous, Janet])

Comment: NRC's commitment to providing extensive opportunities for public participation in its decision-making process has been a model of openness and transparency. (0948-3 [Commenters, Multiple])

Comment: Since the current comment period ends November 27, 2013, since public hearings are currently scheduled for as late as November 20, and since several public hearings have not yet been set, the Commission should extend the deadline for written comments on the waste confidence rule. The deadline for written comments should be at least thirty days after the final public hearing. Also, to facilitate written comments, the Commission should make transcripts or recordings of each of the public hearings available to those wishing to refer to oral comments in

their written comments--an ample time before the conclusion of the written comment period. (0955-1 [Haggerty, Bernard])

Comment: Since the onset of the initial scoping period, Vista 360 has been involved as a participant of record in the U.S. Nuclear Regulatory Commission's ongoing Waste Confidence Generic Environmental Impact Study and Rule making efforts and process. Pursuant to today's GEIS Status Update Conference Call (Wednesday, October 30, 2013) and questions and remarks related to the present closing date for the Public Comment Period as formally determined by the NRC's previous reference as being Friday, December 20th, 2013, we formally request by this communication that the Public Comment Period be extended to a closing date of Friday, January 31, 2014. As stated briefly today, Vista 360 has unilaterally determined that the GEIS subject matter depth, volume, scope and complexity calls for an extended Public Comment Period as a process imperative. (0956-1 [Rielly, Thomas P.])

Comment: I am writing to you in the hopes that this important request does not get lost in the myriad of emails Chair Macfarlane receives every day. On Tuesday, 12/17 the San Clemente City Council will be voting on a resolution which expresses deep concerns about nuclear waste in our surrounding communities. Seeing how they voted unanimously to initiate this resolution, I am certain this will be an important message for the NRC to consider. Fortunately, we were able to convey some recently understood facts about high burnup fuel in time to make the latest deadline. Unfortunately, there is not enough time to reach out to the other cities, groups and individuals who will likely follow San Clemente's lead. Judging from the NRC's wording below, there seems to be an opportunity to consider comments that come in after the deadline. We will proceed with that assumption in mind, but it would be very helpful to have this confirmed by the NRC. We are also seeking the help of Senator Boxer's office in this matter. We understand it may be difficult to arrange yet another extension following the government shutdown, however we also feel that this is justified by the discovery that high burnup fuel, and it's excessive thermal and radioactive heat accelerating the degradation of dry cask storage containers, has not been adequately addressed in the GEIS. With the holidays and vacations and changing of mayors and other elected officials, we respectfully request the deadline for comments be extended at least until the end of January. The 5000 + members of San Clemente Green would greatly appreciate you forwarding this message on our behalf. (0957-1 [Headrick, Gary])

Comment: I respectfully submit a request for an extension of the comment period on NUREG 2157 and associated rulemaking actions. I recently found a notice that states the Commission will meet on January 6, 2014, to discuss and be briefed on Spent Fuel Pool Safety and Expedited Transfer. Closing the comment period before the Commission is presented the staff's finding and conclusions is a very limited approach. The Commission may offer a solution that makes the Nureg mute or provides findings that have little to do with the NUREG. At a minimum, the comment period needs to be extended past the January 6 Commissioners' Meeting. (0958-1 [Lewis, Marvin])

7. Comments Concerning the Scope of the GEIS

Comment: That said, I would like the scope of waste handling to include the complete safety of land, water, air and all of the living and interdependent organism in those elements to be protected until the waste is no longer harmful. The scoping should include the economic impact to tax payers based on prior mishandling, accidents of man and nature regarding nuclear waste storage. The scoping should include a study on the industry which produces the waste and

their liability for the complete handling of the waste now and of unforeseen consequences which may be statistically calculated on past miscalculations by this industry. (0011-2 [Follett, Carol])

Comment: Small Module Reactor (SMR) technology also is not fully developed or licensed and should not be included in the Environmental Impact Statement. (0023-3 [Bridges, Martha])

Comment: The EIS needs to consider the entire fuel cycle in its scope, including the effects of mining, milling, processing, transport, reactor operation, decommissioning and final storage. (0030-21-11 [Carberry, Mike])

Comment: Prevention and precaution. The EIS must consider and analyze the variety of potential methods for storing the more than 80,000 tons of highly-radioactive irradiated spent fuel that is currently housed at our reactors. The risk of a pool storage and cask storage needs to be carefully considered. Overcrowded and irradiated and spent fuel pools is an unacceptable risk to the public. The NRC should take immediate action to reduce the number of fuel assemblies in the water-filled pools, as well as analyzing the deficiencies of the current dry cask storage. New potentially less dangerous methods such as hardened on-site storage, also known as HOSS, should be fully evaluated in the EIS. The storage and transport of high-burnup fuel must be fully evaluated also in the EIS. (0030-21-3 [Carberry, Mike])

Comment: NRC case law holding in part that NEPA did not require the NRC to withhold the granting of a renewed license simply because there may be some future available -- future information that is not currently available. So, in conclusion, while the NRC has chosen to broadly address the environmental impacts of waste storage in the draft GEIS, it is important to recognize and not to exaggerate what the Court of Appeals directed the agency to address; that is, spent fuel pool fires, leaks, and the no repository scenario. And in addressing the agency, the Court asked the agency to provide a basis for its conclusions. The Court of Appeals did not reject the NRC's longstanding findings on the feasibility of a geologic repository or the safety of spent fuel pool storage -- spent fuel storage pending disposal. The prior findings and record continue to support the current rulemaking and GEIS. (0030-3-7 [Ginsberg, Ellen])

Comment: The GEIS includes detailed sections and appendices that thoroughly address the three issues identified by the D.C. Circuit in New York v. NRC. Specifically, the no repository scenario, spent fuel leaks, and spent fuel pool fires. Notably, the no repository scenario is fully evaluated throughout the GEIS as the in-depth storage scenario. And, furthermore, the GEIS includes a detailed technical evaluation of the environmental risks of spent fuel pool leaks and fires, and in particular the supporting appendices in the GEIS fully demonstrate that the risk-based impacts of spent fuel pool leaks and fires both are small. (0030-7-7 [Matthews, Tim])

Comment: I am proposing that the EIS meet its and EPA requirements by offering alternatives, considering each reactor site separately, and to evaluate all costs involved, not just how much it will cost to do an EIS. (0045-11-11 [March, Leslie])

Comment: New rules, yes! An EIS clearly compares the environmental footprint of nuclear power from the mine to the construction and operation of the reactor to the disposal of the waste and decommissioning of the reactor with the footprint of renewables and energy efficiency. (0075-2 [Hill, Barbara])

Comment: However, I have a very first and specific concern that I would like to consider -- that I would like the NRC to consider. Specifically it is on the public confidence about reclamation of orphan sites. Measures must be taken to seek the input from the local residents around an

extended storage site on the fairness of continued storage at that site after the decommissioning of the reactor. As the NRC knows, there are multiple sites across the country at which a reactor has been decommissioned already and the dry cask storage remains as the only remnant of this important energy production. (0112-28-3 [Diaconeasa, Mihai])

Comment: [A]nalysis must include: sabotage and terrorist acts; current and future leaks from SFPs. (0230-10 [Garb, James])

Comment: And I wanted to correct something from two nights ago in Chicago. A question was asked before the public comment period began and Keith McConnell answered it but incompletely. Significantly incompletely, when you said that this document and this proceeding has to do with at-reactor storage, or perhaps you used the term onsite storage. Yes, that is true there is an entire chapter about at-reactor onsite storage in this document. There is another complete separate chapter about away-from-reactor storage. And of course when you have away-from-reactor storage, that brings up the issue of transportation, which is also covered inadequately, very shallowly in this document. And of course, the Court ruled and ordered the NRC to deal with the repository issue, the lack of a repository or the presence of a repository. And so, this document has to do with all of those things, not just onsite storage. (0246-32-2 [Kamps, Kevin])

Comment: Every day of my life, high-level radioactive waste has been generated, and every ten years of my life there has been a major reactor accident which took that which was fuel and rendered it to that which must be called waste, and quite frankly, we have to add to this Generic Environmental Impact Statement the consideration of all phases of this material, not only those that are assemblies in pools or in casks. (0250-2-1 [Olson, Mary])

Comment: So, I think that there are some really critical functions that this GEIS needs to -- can address if it were not assuming that all of the things that are necessary for responsible nuclear waste management are already taken care of, because they're not. They're not taken care of, and we don't have those frameworks, and we don't have those pieces in place that we very much need. (0328-12-6 [Eide-Tollefson, Kristen])

Comment: The GEIS supports three storage timeframes that include both implementation of a repository and failure to secure a repository. The GEIS does not cover reprocessing and therefore is appropriately silent on the potential for spent fuel to be used for reprocessing. (0534-4 [Vetter, Richard])

Comment: The HPS notes that the NRC has restarted a review of the Department of Energy license application for the Yucca Mountain repository. That decision is also appropriately outside the scope of the GEIS. (0534-6 [Vetter, Richard])

Comment: *An accounting of the public cost of reactors from uranium mining through shielding and monitoring of nuclear waste forever has not been done and must be included in the GEIS. That will demonstrate the better alternative: energy efficiency, conservation, wind, solar, hydro.* (0552-1-17 [Macks, Vic])

Comment: The analysis needed to answer these questions would require a detailed assessment of the role nuclear power can reasonably be expected to play in the commercial energy sector into the distant future. There is no such assessment in this Draft GEIS. (0608-7 [Crocker, George])

Comment: Since NRC failed to include in the scope of this GEIS site specific issues, the GEIS fails to comply with the requirements of NEPA. (0611-19 [Shapiro, Susan])

Comment: I would like to respond to the Nuclear Energy Institute's (NEI's) self-serving claim that the Nuclear Regulatory Commission (NRC) "need not assess the environmental impacts of nuclear plant operation more generally" in order to fulfill the requirements of the Waste Confidence Decision (WCD). Perhaps this is true -- they "need not" as in, it is not explicitly stated that they do so by the judgement. But assessing environmental impacts of nuclear plant operation more generally is implicitly required because if there is no waste confidence, it is immoral to continue making nuclear waste. (0616-1 [Hoffman, Ace])

Comment: The plan should include Class C or greater waste (rather than exclude it as the current GEIS plan does). (0618-11 [Johnson, Roger])

Comment: Please make site specific recommendations for removing nuclear waster from closed nuclear reactors. (0624-1 [Large, Gerry])

Comment: We also believe that the analyzed scenarios for the intermediate term storage must be emphasized, clarified, and defined as addressing at reactor ISFSIs and away from reactor ISFSIs. The staff chose not to include Consolidated Interim Storage as an analyzed scenario in its work. In doing so, it would leave the Commission with less to defend its tenet that it does not intend to endorse indefinite storage. While Chapter 5 of the draft GEIS reasonably addresses the impacts of away-from reactor storage, the Commission should work to ensure that the GEIS addresses a Consolidated Interim Storage site or sites as well as at reactor ISFSIs. This might best be done by additional emphasis early in its executive summary and consistently throughout the text. (0637-10 [Norton, Wayne])

Comment: The NRC also decided that the "density and concentration of spent fuel is outside the scope of the proposed action." p. 1-9. This issue is at the heart of the problem of producing more nuclear waste than the government or industry can handle. It is also at the heart of the potentially catastrophic impacts of dangerous storage in overcrowded spent fuel pools. Of course, NRC was the agency that determined the scope of the proposed action, and this circular reasoning explains nothing, while evading what was essential to evaluate if public safety were a priority. (0693-1-11 [Warren, Barbara])

Comment: •Reprocessing logically should have been evaluated in this GEIS since the NRC has already engaged in meetings in which it is considering approving reprocessing activities. The past record of reprocessing and the reasons for the past moratorium could have been thoroughly reviewed in the GEIS. (0693-4-8 [Warren, Barbara])

Comment: TVA believes that the DGEIS already encompasses nuclear plants used for tritium production. For example, the DGEIS states that it encompasses "fuel types that have been used in the past and continue to be stored under an NRC license" and "fuel types that are presently used."⁷¹ [footnote 71 text: DGEIS at 2-5. Additionally, the DGEIS specifically mentions WBN-1. See, e.g., DGEIS at 7-5.] Nonetheless, for clarity, TVA requests that the NRC address the issue of tritium production in the Final GEIS by confirming it is bounded and reference the substantial body of additional environmental analyses supporting this conclusion. (0694-2-20 [Shea, Joseph])

Comment: Entergy first notes that the scope of the Proposed Rule and the DGEIS is appropriate. The scope includes the environmental impacts of continued storage of SNF from the end of a reactor's licensed life for operation until disposal of the SNF.⁵³ [footnote 53 text:

DGEIS at 1-4 to 1-5.] This scope encompasses spent fuel storage issues applicable to Entergy's nuclear plants. (0697-2-2 [Bessette, Paul] [Kuyler, Raphael])

Comment: The DGEIS explains that certain issues are eliminated from review in the GEIS, including foreign spent fuel, need for nuclear power, and reprocessing of commercial spent fuel.⁵⁴ [footnote 54 text: *Id.* at 1-23 to 1-24.] The DGEIS also explains that the waste confidence rulemaking does not include whether NRC licensing activities and operation of commercial reactors should continue and does not include whether the NRC should impose additional requirements on spent fuel storage.⁵⁵ [footnote 55 text: *Id.* at xxvi, 1-9 to 1-10.] Specifically, the DGEIS states: Imposing new regulatory requirements, such as requiring licensees to implement hardened at-reactor storage systems, reduce the density of spent fuel in pools, or expedite transfer of spent fuel from pools to ISFSIs, is outside the scope of this proposed action, which includes alternatives that improve the efficiency of the NRC's licensing process by generically addressing the environmental impacts of continued storage. Adoption of a revised 10 CFR 51.23, supported by this draft GEIS, is not a licensing action, and does not impose new requirements on licensees or applicants. Therefore, the NRC cannot impose new requirements or regulations on the duration of spent fuel storage in pools through this proposed action.⁵⁶ [footnote 56 text: *Id.* at 1-9.] Entergy agrees that these issues are outside the scope of the waste confidence rulemaking. Additionally, the exclusion of any of these topics does not impact the applicability of the Proposed Rule and DGEIS to Entergy's plants. (0697-2-22 [Bessette, Paul] [Kuyler, Raphael])

Comment: Federal Register Vol. 78, p. 56780, In response to "A6" and "A7." Mostly, it seemed that these answers were for the "nuNukes" -- the newer nuclear technology, rather than the established power plants in operation. The statement that made me cringe, was, "Small modular will use fuel very similar in form and materials to the existing operating reactors and will not, therefore introduce new technical challenges to the disposal of spent nuclear fuel." Ok. But, since we have EXISTING technical challenges (never mind any NEW ones) in the maintenance of spent nuclear waste, and we all know this is reality, what does this really mean? Is the NRC is going to use the old standards for the new plants and that's acceptable? (0703-11 [Vandel, Nikohl] [Vandenberg Clermont, Elaine])

Comment: Page 1-4. "For both power reactor and storage facilities, NEPA requires that the NRC address direct, indirect, and cumulative impacts of its licensing actions. Thus, in issuing a power reactor license, the NRC must analyze the environmental impacts resulting from the generation of spent fuel by the reactor and its continued storage pending ultimate disposal. Likewise, for an ISFSI [Independent Spent Fuel Storage Installation], the NRC must analyze the impacts of continued storage at the facility until ultimate disposal for the spent fuel is available. The environmental impacts addressed in this draft GEIS are limited to the environmental impacts of continued storage." NRDC Comment[:] NRDC concurs with the NRC that it must address the direct, indirect, and cumulative impacts of its licensing actions. But NRC's presentation of the proper scope is inadequate and the agency must evaluate the environmental effects of all reasonable alternatives for on-site and off-site storage of waste during and after the period of extended operation; offsite land, water, and air use impacts of continued operations and the storage of additional spent fuel on the surrounding areas; whether the current GEIS adequately evaluates the long term impacts and safety of the generation and long-term storage of radioactive waste; the comparative impacts of SNF storage in pools versus in dry casks; the implications of on-site storage of waste for decommissioning; the effects of spent fuel disposal and the effects of SNF storage and disposal in the event of extended delay or if no final disposal option or repository is ever identified , with extended loss of institutional control over the SNF and the storage facility; and alternatives to mitigate these impacts, among other issues. Many of

these issues have a site specific component and cannot be dealt with entirely within the confines of a generic analysis. Rather than seeking to use this DGEIS as blanket to suffocate all future consideration of continued SNF storage issues in future licensing decisions, the NRC should regard this DGEIS as one in which broad programmatic issues and impacts are addressed, thus enabling the "tiering" of subsequent site-specific EIS documents from this overall analysis. (0706-1-15 [Fettus, Geoffrey])

Comment: Page 1-22. "The environmental impacts of portions of the uranium fuel cycle that occur before new fuel is delivered to the plant and after spent fuel is sent to a disposal site have been evaluated and are codified in regulation (10 CFR 51.51, Table S-3)." (See also, Figure 1-2 at 1-18). NRDC Comment. As noted in our February 2009 comments on NRC's last iteration of the Waste Confidence Determination, NRC has no basis for continued reliance on Table S-3, the outdated uranium fuel cycle rule—which itself was contingent upon the now vacated Waste Confidence Rule—that depends on assumptions long since proven wrong or, simply, no longer applicable by virtue of current law. We detail the reasons for Table S-3's inadequacy in Appendix B to these comments. And we remind the agency to the DC Circuit's direction regarding the relationship between Table S-3 and its new iteration of the TSR and its Waste Confidence obligations: The Commission argues that its "Table S-3" already accounts for the environmental effects of the nuclear fuel cycle and finds no significant impact. Not so. Table S-3, like the Commission itself, presumes the existence of a geologic repository. Therefore, it cannot explain the environmental effects of a failure to secure a permanent facility. The Commission also complains that conducting a full analysis regarding permanent storage would be an "abstract exercise." Perhaps the Commission thinks so because it perceives the required analysis to be of the effects of the permanent repository itself. *But we are focused on the effects of a failure to secure permanent storage.* The Commission apparently has no long-term plan other than hoping for a geologic repository. If the government continues to fail in its quest to establish one, then SNF will seemingly be stored on site at nuclear plants on a permanent basis. The Commission can and must assess the potential environmental effects of such a failure. *New York et al.*, at 479. NRDC agrees Table S-3 attempts to evaluate the environmental impacts after spent fuel is sent to a disposal site—not the environmental effects of a failure to secure permanent storage that must be analyzed here (and later incorporated into the fuel cycle rule). But it is a rule that depends on assumptions long since proven wrong are no longer applicable simply by virtue of current law. (0706-3-15 [Fettus, Geoffrey])

Comment: 3. There is no basis for continued reliance on an outdated uranium fuel cycle rule -- which itself is contingent upon the Waste Confidence Rule -- that depends on assumptions long since proven wrong or, simply, no longer applicable by virtue of current law[.] Finally, the NRC's lack of a basis for any determination that there is "confidence" in a final disposal option for some or all of the nation's spent fuel fatally undermines Table S-3 of the NRC's Uranium Fuel Cycle Rule, which depends on the assumption that radioactive releases from a repository will be zero. Final Rule, Licensing and Regulatory Policy and Procedures for Environmental Protection; Uranium Fuel Cycle Impacts From Spent Fuel Reprocessing and Radioactive Waste Management, 44 Fed. Reg. 45,362 (August 12, 1979). (0706-5-3 [Fettus, Geoffrey])

Comment: The life cycle costs of nuclear power should be assessed in detail in the EIS, including the substantial front end subsidies, uranium mining and enrichment impacts, and the long term, substantial costs of safely, properly decommissioning and managing nuclear waste. (0707-8 [Werner, Shahla M.]

Comment: I would like to respond to the Nuclear Energy Institute's (NEI's) self-serving claim that the Nuclear Regulatory Commission (NRC) "need not assess the environmental impacts of

nuclear plant operation more generally" in order to fulfill the requirements of the Waste Confidence Decision (WCD). Perhaps this is true -- they "need not" as in, it is not explicitly stated that they do so by the judgement. But assessing environmental impacts of nuclear plant operation more generally is implicitly required because if there is no waste confidence, it is immoral to continue making nuclear waste. (0709-1 [Wythe Elnagar, Romi])

Comment: The U.S. Nuclear Regulatory Commission (NRC) has failed to address adequately the scope of the ultimate environmental, political and economic challenges associated with the continued production and accumulation of longlived radiotoxic waste materials, absent a well-planned and scientifically based strategy for the long-term management of these wastes over a period of time that dwarfs the span of human history. (0714-1-23 [Edwards, Gordon])

Comment: Under section ES.12, page xxxi-xxxii, under table ES-1, there is no articulable public safety component and how it would play into various affected areas identified in the Draft GEIS. In addition, consistent with the general objections, the narrowness of the affected area, as defined in the Draft GEIS, is too narrow to effectively analyze the impact of continued storage on both the human and natural environments. Public safety has to be included in the analysis and the analysis itself must be expanded to include indirect impacts of continued storage. (0783-1-15 [Harlan, Thomas])

Comment: In summary, the rulemaking documents for the waste confidence rulemaking should include an affirmative statement that waste confidence issues do not apply to Early Site Permit (ESP) applications , and the DGEIS should be revised accordingly. (0810-1 [Mallon, James])

Comment: Comment No. 2 - The DGEIS should be revised to remove any implications that waste confidence issues apply to ESP applications and also should include an affirmative statement that waste confidence issues do not apply to ESP applications. As discussed above, the DGEIS includes a few statements that could be interpreted to incorrectly imply that waste confidence issues apply to ESP applications. The DGEIS should be revised to prevent any unnecessary confusion or resource expenditures due to the confusion during ESP application reviews. To accomplish this, PSEG requests that the NRC revise the DGEIS as follows:

- Remove any discussion of ESPs or ESP applications from Section 7.1 of the DGEIS, and instead discuss new reactor applications affected by waste confidence issues, including COL or operating license applications. ° On page 7-3, lines 8-9 , delete "and one early site permit (ESP) application." ° On page.7-3, line 10, delete "and ESP." ° On page 7-3, line 16, delete "and ESP." ° On page 7-3, line 18, delete "and ESP." ° On page 7-5, line 8, delete "or ESP." (0810-10 [Mallon, James])

Comment: Add a statement in Section 7.1 to clarify that the waste confidence issues do not apply to ESP applications. PSEG proposes the following statement, or its equivalent: • "The issues encompassed by 10 CFR § 51.23 and NUREG-2157 do not apply to ESP applications. Because ESPs do not authorize their holders to generate or store spent nuclear fuel, the NEPA analysis for ESP applications does not need to consider the environmental impacts of continued storage of spent nuclear fuel beyond a reactor's licensed life for operation and prior to ultimate disposal." (0810-11 [Mallon, James])

Comment: Remove any discussion of ESPs or ESP applications from Table H-1 of the DGEIS, and instead discuss only new reactor applications affected by waste confidence issues, including COL or operating license applications. • Revise any discussion of "new reactors" or similar phrases to clarify that they only apply to new reactors affected by waste confidence issues. • Remove any discussion of the PSEG ESP from the last sentence of Footnote (d).

PSEG proposes the following revised sentence, or its equivalent: "Bell Bend is treated as a new review because the NRC is not likely to issue a draft EIS by the end of fiscal year 2014; the NRC assumes that the environmental impacts of continued storage will be addressed within a normal review schedule for that project." • Revise Table H-1 to the extent that it assumes a site-specific review of waste confidence issues for the PSEG ESP application. If the NRC intended Table H-1 to be based on a future potential site-specific review of a COL application that references a future PSEG ESP , then that should be clarified. (0810-12 [Mallon, James])

Comment: Revise the discussion of the cost-benefit analysis in Chapter 7 or elsewhere in the DGEIS to the extent it is otherwise affected by the above changes. (0810-13 [Mallon, James])

Comment: Because ESPs do not authorize their holders to generate or store spent nuclear fuel, the National Environmental Policy Act (NEPA) analysis for ESP applications does not need to consider the environmental impacts of continued storage of spent nuclear fuel beyond a reactor's licensed life for operation and prior to ultimate disposal. (0810-2 [Mallon, James])

Comment: Notwithstanding the above statements that support a conclusion that the waste confidence issues do not apply to ESP applications, the DGEIS raises some confusion. For example, Section 7.1 of the DGEIS addresses assumptions for the cost-benefit analysis for the proposed action. Section 7.1.1 addresses new reactor applications, including the PSEG ESP application, because it is the only pending ESP application. That section states: "In general, COL and ESP application reviews take longer and require more staff effort to complete than other NRC reviews that rely on the Waste Confidence rule." This statement could be interpreted to mean that the NRC believes that the Proposed Rule applies to ESP applications. (0810-4 [Mallon, James])

Comment: Furthermore, Appendix H of the DGEIS provides the estimated costs of alternatives used in the cost portion of the costs and benefits analysis in Chapter 7 of the DGEIS. Table H-1 provides estimated site-specific costs for new reactor reviews. Footnote (d) to this table bins the Bell Bend project with the PSEG ESP and states that they are "treated as new reviews because the NRC is not likely to issue a draft EIS by the end of fiscal year 2014; the NRC assumes that the environmental impacts of continued storage will be addressed within a normal review schedule for those projects." This statement also could be interpreted to mean that the NRC concludes that the waste confidence issues apply to the PSEG ESP application. (0810-5 [Mallon, James])

Comment: In the District of Columbia Circuit Court of Appeals decision June 8, 2012, the Court vacates the NRC's Waste Confidence Decision update, remanding it for further proceedings. The judges objected to the NRC's depending on its "Table S-3" which finds that there would be "no significant impact" from the environmental effects of the nuclear fuel cycle." (0813-3 [Thomas, Ruth])

Comment: The GEIS adopted by the Commission must include a planning component to direct utilities and responsible federal stakeholders to engage in strategic planning, funding, and execution of technical and environmental protection requirements to ensure responsible - safe - long term storage. NRC's charge to protect the public health and safety requires *direct action*, *not evasion*, of the potential impacts of long term and indefinite at reactor site storage. This should include at least the following: 1. Execute: A. Full phased Environmental Site Evaluation for existing shut down sites, and extended long term (beyond 60 years) storage at any plant site. This should be done before permit decision or license extension for plants or ISFSIs are granted. a) Engage all relevant federal agency expertise including EPA, Geological Survey and

Corps; b) Provide for local, state and tribal stakeholder education and involvement. c) Provide funding for a full Health Assessment for long term storage host communities B. An Adaptive Phased Management Plan for long term/indefinite storage at reactor sites. See attached documentation and recommendations from Federal Council on Environmental Quality - CEQ. 2. Analyze and apply a) The three engineering studies for the No-Action alternative to the federal EIS for Yucca Mountain - analyzing deterioration effects on casks of precipitation and temperature variations in different zones. b) Effects of uprated burn up fuels on both initial pool and cask storage for each of the periods. c) Detailed deterioration factors - and impacts of radiological releases under several scenarios, including the 350 year peak release. d) A demographic and environmental analysis of long term exposures -different for each plant and including the multiplier of skyshine effects of dry cask storage for each period. 3. Initiate: a) Guidance documents for institutional controls for indefinite at reactor site storage b) Health assessments for host communities facing indefinite at reactor site storage 4. Adopt: a) Minimum standards and criteria for long range at reactor/ISFSI site storage b) Optimum standards and criteria for long range at reactor/ISFSI site storage c) Incentives and mechanisms, including funding, to close the gap. 5. Direct: a. Utilities to do long range planning specifying what technology, funding, cask and facility design options will be needed to ensure complete replacement every 100 years. b. Utilities to establish escrow accounts for Long Term Storage Funding Assurance, in addition to and separate from their decommissioning funds. c. Establishment of federal funding for utilities to partner with host communities and states on long term institutional controls, including monitoring, education, emergency planning for indefinite storage. 5. Establish: a) Estimated costs for the above; b) Mechanisms to ensure funding for long term/indefinite storage. There is no responsible or safe nuclear waste storage - without adequate planning, funding, and institutional controls. (Reference: PINGP- EIS, MN PUC docket 08-690) (0820-15 [Eide-Tollefson, Kristen])

Comment: While these facts show just why nuclear energy is a vital part of our electricity portfolio and economy, we also understand that there is a need to address the transportation, storage and disposal of used nuclear fuel. (0825-3 [Palomarez, Javier])

Comment: GEIS section 1.8.6: NRC has eliminated greater-than-class-C LLW (GTCC) from consideration. Industry has considerable experience with the storage of GTCC after the operating life of a reactor. GTCC is currently stored in dry casks at ISFSIs on six shutdown reactor sites. Because of the possibility that GTCC may share a common disposal path with spent fuel, it would be useful if NRC, based on existing knowledge of the nature of GTCC, could conclude that the analysis and safety conclusions in this GEIS would apply equally to GTCC. (0827-7-3 [Ginsberg, Ellen])

Comment: I would like to respond to the Nuclear Energy Institute's (NEI's) self-serving claim that the Nuclear Regulatory Commission (NRC) "need not assess the environmental impacts of nuclear plant operation more generally" in order to fulfill the requirements of the Waste Confidence Decision (WCD). This is for Docket I.D. No. NRC-2012-0246. Perhaps this is true -- they "need not" as in, it is not explicitly stated that they do so by the judgement. But assessing environmental impacts of nuclear plant operation more generally is implicitly required because if there is no waste confidence, it is immoral to continue making nuclear waste. (0856-1 [Fritz, John])

Comment: There are tons of DoD waste in addition to civilian spent fuel. What is the GEIS/Proposed Ruling doing to address that issue? (0896-1 [Anonymous, Anonymous])

Comment: • The Draft GEIS claims that environmental impacts of spent fuel disposal are irrelevant to the DGEIS. But when the NRC promulgated its final license renewal rule in 2013, it did not include any conclusions regarding the environmental impacts of spent fuel disposal, stating that “[t]he generic conclusion on offsite radiological impacts of spent nuclear fuel and high-level waste is not being finalized pending the completion of a generic environmental impact statement on waste confidence.” 78 Fed. Reg. 37,282 37,322 (June 20, 2013). In a footnote, the NRC further explained: As a result of the decision of United States Court of Appeals in *New York v. NRC*, 681 F.3d 471 (DC Cir. 2012), the NRC cannot rely upon its Waste Confidence Decision and Rule until it has taken those actions that will address the deficiencies identified by the D.C. Circuit. Although the Waste Confidence Decision and Rule did not assess the impacts associated with disposal of spent nuclear fuel and high-level waste in a repository, it did reflect the Commission’s confidence, at the time, in the technical feasibility of a repository and when that repository could have been expected to become available. Without the analysis in the Waste Confidence Decision and Rule regarding the technical feasibility and availability of a repository, the NRC cannot assess how long the spent fuel will need to be stored onsite. 78 Fed. Reg. at 37,323. Clearly, despite denying the existence of a relationship between waste confidence findings and spent fuel disposal impacts in the DGEIS, the NRC considered the relationship significant enough to hold off finalizing environmental findings regarding spent fuel disposal impacts in the license renewal rule. (0897-7-12 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: As the Commission acknowledges, the question of feasibility of spent fuel disposal is integrally related with the question of what are the environmental impacts of spent fuel storage for an indeterminate period of time. By evaluating only spent fuel storage impacts, the NRC excludes a major part of the picture regarding the environmental impacts of the back end of the nuclear fuel cycle. Specifically, if a repository becomes available, some spent fuel storage impacts will be avoided, and there will be some repository impacts. Similarly, if there is no repository, the spent fuel storage impacts will increase considerably, for a variety of reasons, including the potential loss of institutional control. (0898-4-24 [Curran, Diane] [Makhijani, Arjun])

Comment: The NEI scoping comments made a point to emphasize that there is no basis from which one could re-examine the 5 earlier Waste Confidence findings. Please publish these 5 findings, and discuss the implications of them in the final document. Are these 5 findings any more relevant to a real examination of comparative safety of various modes of radioactive waste storage. I note on page 2 of the NEI's scoping comments where they pointed out that it was a comparatively skimpy environmental assessment. An EA is not very thorough, and given that we are contending with extremely hazardous and long-lived wastes, the whole document deserves to have a thorough EIS completed with a reasonable range of alternatives and while thoroughly examining the mystery of those 5 earlier Waste Confidence findings. (0937-24 [Campbell, Bruce])

Comment: As part of the NEI's scoping comments on the Waste Confidence Generic EIS (under "Reasonably Forseeable Spent Fuel Storage Alternatives"), they try to (and succeeded in) convincing the NRC not to analyze an alternative featuring centralized interim storage of radwaste, and they are hoping that a skimpy Environmental Assessment may suffice for this analysis rather than the usually more thorough Environmental Impact Statement. I will quote two NEI sentences from their scoping comments on page 6, "However, such a facility is speculative at this point. And a full discussion of the environmental impacts of a centralized interim storage facility would be set forth in an environmental assessment or EIS supporting issuance of a license for such a facility." If a centralized "interim" storage may only call for an EA, then they likely figure that since nuclear power facilities have less radwaste at their individual sites than a

centralized interim storage facility, that they may be able to get away with a mere EA in analyzing those situations. (0937-8 [Campbell, Bruce])

8. Comments Concerning Site-Specific Issues

Comment: We are writing today to urge you to put a stop to creating more nuclear waste ASAP. It's the only way to safely deal with nuclear waste. We must move to wind & solar & away from nuclear. We live near Diablo Canyon Power Plant. The idea that a nuclear plant was ever situated on/near 13 earthquake faults & a tsunami zone is ludicrous and a horrific danger. Diablo continues to create waste everyday, with nowhere to put it. When does this madness stop? Let's do it now! (0022-1 [Smith, Diane])

Comment: Less than half an hour ago, on September 23, 2013, news was posted online that more cracks have been found in the Davis-Besse nuclear reactor in the Toledo, Ohio, area. The report also said that cracks which were previously found have widened. If something bad happens at that plant, it will happen to me and my husband and our precious children and grandchildren. And to hundreds of thousands of other people who are just as important to their loved ones. Please be diligent and honest, and keep us safe. (0025-1 [Schmitz, Diane])

Comment: It's very discouraging that while we're talking about this important document in 12 meetings that we hold across the country that Dominion is full steam ahead looking at putting the third reactor at North Anna, even prior to any of this being done. Supposedly that's legal. (0030-15-2 [Gray, Erica])

Comment: I live in the most nuclear state in the nation, Illinois. And I can tell you that most people aren't aware of it. They have become more recently. Actually, because Braidwood, the 10 years of dumping radioactive wastewater laced with tritium on that community took the front page of Chicago Tribune and people started waking up. Or more recently what's going in Byron. Every time something's on the news to allay fear, it's not injurious, it's not harmful. But I can tell you that I personally know of the families of multiple cancers in the Braidwood area. So I think that their stories need to be told. (0030-22-3 [Headington, Maureen])

Comment: I have personal experience with -- the high flux beam reactor in Long Island. I was in the Department of Energy. I worked on that. I worked with the people who went out into the communities and took the steps we needed to assure people that their drinking water would be safe. No regulatory limits were ever exceeded or approached. We don't just meet regulations; we exceed regulations. (0030-6-8 [McCullum, Rod])

Comment: Leslie March and her mother in 1955-- I first learned about "atomic waste" in my high chair; I grew up in the fifties in Washington State and my grandfather frequently had business at the Hanford Reservation (now the most contaminated nuclear waste site in North America). I remember my mother arguing with him about the dangers of nuclear waste: she was concerned about the health of the Columbia River; he trusted that the plant would be safe. But my mother was right: the tanks containing highly radioactive waste are leaking, and the Columbia River is at risk. We now have the opportunity to protect communities across the nation from radioactive waste. Please take action today! The reactors at Hanford are now closed. But when I discovered that another nuclear reactor (the same kind used at Fukushima) now operates within miles of the Columbia River, I was motivated to take action to protect the river, and began organizing in my community. I was dismayed when the Nuclear Regulatory Commission (NRC) recently relicensed the Columbia Generating Station for another 20 years -- even though they don't have a solid plan for storing the waste safely. (0039-2 [Littlejohn, Nick])

Comment: I've been aware of the nuclear waste problem for 50 years or more here in St. Louis. The Mallinckrodt Chemical Company was a subcontractor on the Manhattan Project since 1942, and was located in Downtown St. Louis, Missouri. They contracted with a company to remove the waste from that project, and from there the saga begins...A Brief History of Waste Management at West Lake and Nuclear Waste in St. Louis; 1939 - West Lake Landfill, owned by Rock Road Industries, opens as a limestone quarry and crushing operation; 1942 - Mallinckrodt Chemical Works agrees to enrich uranium for the first atomic bomb under the Manhattan Project (between July and December they produce a ton of pure uranium oxide per day); 1947 - The Manhattan Project condemns 21.7 acres north of Lambert Field Airport to serve as a disposal site for waste from Mallinckrodt and other facilities; 1950 - Portions of the quarried areas in West Lake begin to be used as a landfill; 1957 - Mallinckrodt signs a contract with the Atomic Energy Commission; move uranium processing facilities from downtown to St. Louis to Weldon Springs; Early 1960s - Mallinckrodt hauls some 5,000 truckloads of waste from downtown to abandoned limestone quarry near their new plant; 1966 - Mallinckrodt closes down their uranium enrichment plants and hires Cotter to discard of the waste; 1973 - Cotter illegally dumps radiologically-contaminated soil at West Lake Landfill; 1976 - The Missouri Department of Natural Resources (MDNR) closes West Lake Landfill; 1982 - Radiation Management Corporation conducts a radiological survey of West Lake that indicates elevated levels of uranium and thorium; 1988 - U.S. Nuclear Regulatory Commission releases report of West Lake, determining that the site has two contaminated areas with about 150,000 tons of contaminated nuclear waste; 1990 - West Lake Landfill added to EPA's national Superfund Site Priorities List (a list of sites around the US requiring long-term clean-up efforts); 1993 - Army Corps of Engineers conducts several risk assessment studies and determines that if nothing is done to cleanup various nuclear waste dumpsites, the public will be exposed to unacceptable levels of radiation; 2006 - EPA's Remedial Investigation and Feasibility Study work completed; 2008 - EPA's Record of Decision completed and released; states that waste is best left at the site and that they will continue to closely monitor the area in case of groundwater contamination; 2010 - Opposition to EPA decision leads to commissioning of Supplemental Feasibility Study (which lays out two additional options for remediation at West Lake); 2011- 1,400 page Supplemental Feasibility Study for West Lake is finalized and made public; January 2012 - EPA's National Remedy and Review Board has been reviewing the SFS report; April 2012 - 16 people file class action suit against Mallinckrodt, Inc and other companies involved in production and disposal of nuclear waste, alleging that the mishandling of nuclear waste caused untimely illnesses; Summer 2012 - EPA returns to West Lake site to conduct groundwater testing and take gamma scan measurements; October 2012 - Two more people file suit against Mallinckrodt, et al; one is a father whose 23-year old daughter died in 2009 after being diagnosed with malignant pleural effusion and acute respiratory failure; November 13, 2012 - Missouri Coalition for the Environment holds public meeting and calls on citizens to write EPA, government officials and demand that West Lake be transferred to Army Corps of Engineers; January 2013 - EPA says they will host a public meeting to discuss findings. But it never seems to end, or even be still long enough to forget about it. Its a matter of coming up with two parameters. One, to find a way to safely store the material until the danger subsides. AND.. Two, to stop producing the stuff until the PERMANENT repository is found. (0043-1 [Lewis, Dave])

Comment: In my case, the Columbia Generating Station is in the agricultural center of Washington State. An accident there threatens \$9.5 billion worth of products in Washington and another \$6 billion in Oregon. This is besides having Seattle, Spokane, and Portland affected based on what direction the wind blows. We also have the risk of contaminating the Columbia River and the double jeopardy of having the Hanford reservation next door. (0045-11-7 [March, Leslie])

Comment: Right now the waste tanks for nuclear at the Savannah River site are raging into the Savannah River. Oh, right, I forgot to mention that as a member of the Colorado Coalition for Prevention of a Nuclear War, I work with the Alliance for Nuclear Accountability and we know and we documented that leak. (0045-12-5 [Kinsey, Bob])

Comment: The tanks in Hanford are leaking into the Columbia Reach and are impacting the roe of the salmon that is spawn there. And nuclear plutonium has been found in the salmon off the Coast of the Columbia River in the Pacific Ocean. (0045-12-6 [Kinsey, Bob])

Comment: Palo Verde, for an example, is a major employer in Arizona and it also makes a substantial amount of local purchases from suppliers, supporting the region's economy. The plant directly employs 2,800 employees and contractors with the combined annual payroll of \$255 million. It also indirectly supports an additional 5,800 jobs and \$253.7 million in payroll annually in other businesses throughout the state. (0045-9-5 [Baker, Tammera])

Comment: Again using Palo Verde as my point of reference, the plant creates an economic impact of \$1.8 billion in the Arizona economy, and it's the largest single commercial taxpayer in Arizona, paying approximately \$50 million in property taxes alone. These tax dollars benefit our schools, our roads, and other state and local infrastructure, not to mention the generosity of the Palo Verde employees who donate over a million dollars every year to local charities. (0045-9-7 [Baker, Tammera])

Comment: When and where is the spent fuel at Millstone and Conn Yankee going to be put under ground? (0050-5 [Waterman, Charles])

Comment: I live in Florida and we have several nuclear reactors in this state, located at Crystal River and at Turkey Point in St.Lucie. We have fortunately been able to cancel Offshore Power Systems at the Port of Jacksonville and the Levy County nuclear power plant. However, Florida was the site of the Tooth Fairy Project showing that children living near nuclear powerplants have a radioactive body burden that increases their rate of cancer, and Florida has suffered negligence in management of radioactive waste. The nuclear reactors in Florida are located at the coastline and subject to a high potential for flooding from hurricanes as well as sea level rise, and tidal waves. Even earthquakes will become increasingly likely as a result of extensive and careless offshore drilling in the Gulf, and fracking being permitted in Florida. I do not want my beautiful state, which remains a good place to live in spite of the efforts of industries to destroy its natural beauty and small farms, to be destroyed by irresponsible negligence with high level nuclear waste on the part of the NRC now or in the future. This plan is irresponsible and absurd, and must be improved. (0053-1 [Minno, Maria])

Comment: It is ridiculous that states do not have power to decommission specific nuclear power plants when safety violations and health hazards have been proven. The good state of Vermont acted to protect its citizens from Vermont Yankee Nuclear Power's history of abuses by voting to not renew its license. The NRC should have backed up the local state government when the federal Judge declared that it was the NRC only that had the power to shut down a power plant, not the state. While the judge over ruled the state's attempt to protect its citizens, the NRC should have jumped in and shut down the power plant on its own. The state of Vermont would still be tied up in the fight if the aging nuclear power plant itself hadn't finally decided to close down due to its own financial concerns. . Please take your job with the seriousness that is necessary and shut down all nuclear power plants in the nation and be a responsible watchdog to make sure the shutdowns are done as safely as possible for the dozens of miles surrounding communities that house them. (0054-3 [Kurland, Miriam])

Comment: I too grew up in Washington State. It was known in the 1950s that the entire "tri-cities" Hanford area was contaminated and cancer rates there were huge. Discolored lakes and rivers in that region produced deformed fish. Most people refused to even drive past the towns in the area. Half a century later it is apparently the same. The NRC should at long last take action to reduce the number of fuel assemblies in the Hanford reactor's water-filled disposal pools. (0057-2 [Lamont, Dana])

Comment: Since 1998, the taxpayer has been paying billions of dollars to the Nuclear Energy companies like SCE to store nuclear waste on site until a place can be found to dispose of it. This fine goes on as long as the spent fuel is stored on site. How much money has SCE been paid by the Federal government since 1998 for the spent fuel it has stored at SONGS? How was that money used? How much money will SCE get each year even with the plant shut down for leaving the spent fuel at SONGS? Is there any law forcing SCE to spend the money from this fine for moving the spent fuel into transportable casks? Must the money be used for something related to storage of spent nuclear fuel or does it just go into the SCE or for that matter the International Edison general fund? (0063-11 [Magda, Marni])

Comment: SONGS must have attention paid immediately to its vulnerable spent fuel. The two years to create a PSDAR is too long to get in motion the kind of actions that are necessary to save Southern California from calamity and must begin today, not in two years. Southern California Edison has lied to the public about safety problems at SONGS of which the company was well aware. They knew the steam generators were a faulty design before they were installed. They have in a constant record that is public information now of failures to adhere to safety regulations. The company puts profit before safety. With this terrible record, they must not be given oversight of the Decommissioning of SONGS. There is a history that would show the \$4 billion dollars set aside to decommission SONGS would not be used for immediate, final solutions. There is profit for Edison in keeping the spent fuel on site. Since a US Military Base is in jeopardy if anything goes wrong with the spent fuel sitting at SONGS, and it is on military land, can the execution of the removal of the spent fuel be placed in the capable hands of someone from the military, protecting the future of Camp Pendleton Marine Base? When for two years Elmo Collins, who was then the administrative director of NRC Region IV, met with the public at NRC hearings and told us that SONGS was safe, he listed each of the possible disasters and said behind it, "adequate protection." He was referring to the nuclear fuel within the reactor domes. With the shutdown of SONGS, the public has learned that the 1631 tons of spent fuel on site is not held to that standard of safety. The spent fuel cooling pools are outside the reactor domes. They were not created for long term storage and are not required to have "defense-in-depth" nuclear safety features. SCE has the worst safety record of all nuclear energy companies in the United States. They are going to continue to falsely tell the public that safety is their first concern. We are playing with our future every day the spent fuel sits at SONGS. (0063-2 [Magda, Marni])

Comment: There is a vast difference in the type of the dry storage casks being used around the country for storing nuclear spent fuel. According to the Blue Ribbon Committee's report to the President in January of 2012, the US Navy has 50 final geologic disposal, transportable casks for its movement of nuclear waste out of Idaho by 2035. It will have 350 more before that date. How long does it take to make these casks? What do they cost? Is there any reason we can't use them at SONGS? Final disposal and transportable - that must be our goal. SCE profit in storing nuclear spent fuel on site at SONGS cannot be allowed to make us pretend that spent fuel should stay at SONGS for years. It shouldn't be there for even days. The Friends of the Earth report by Alvarez said the casks SCE is considering will be a million dollars each. Who determines the certification of the number of years a cask is safe? Many in the country currently

are said to be certified at 30 to 40 years. What makes a ten year difference? What do we do after the thirty or 40 years are up? Who sets the value of a cask, another corporation like SCE who values profit over public safety? (0063-6 [Magda, Marni])

Comment: When the four billion dollars projected to be spent decommissioning SONGS is spent, does that include final disposal of all spent fuel created at SONGS, even that which lasts 24,000 years? What dates did the current 42 casks for dry storage get fuel placed in them? These casks were constructed somewhere near SONGS. What is their certification for length of safe storage? Are these dry storage casks considered transportable? In Sept 2014, SCE wants to lower safety standards by using the NUHOMS 32PTH2 dry cask system. This requires crowding 32 fuel assemblies into the same size cask that currently holds 24. Who makes the approval of such a change? Edison always chooses profit over safety. Who will decide? What safety consideration would allow that change? (0063-8 [Magda, Marni])

Comment: [A]t the Seabrook nuclear power plant, which stores most of its spent fuel in wet storage, a 4.0-level earthquake hit recently only 20 miles from the plant. The Seabrook plant has been identified as one of the most vulnerable nuclear power plants in the nation to flooding and storm surges (Stanford University researcher, 2012). Yet, the public has not been informed if the plant has taken steps to protect against interruption of electrical generation for wet storage as a result of flooding or earthquake. (0064-10 [Skud, Bruce])

Comment: I am writing with great concern over the construction of the W.S. Lee nuclear plant in Gaffney, SC just 60 miles from Asheville, NC where I live. There is simply no safe way to store spent fuel over the long term. Radioactive nuclear wastes present a huge threat when they are transported, as well; they are dangerous for many thousands of years, and there is no such thing as a safe dose. This is all just "business as usual." The threat of an accident magnifies the risks many times over. Have we learned nothing from the Chernobyl and Fukushima tragedies? And if the safety and health hazards were not enough, take a look at the economics of nuclear power. It is FAR less expensive to use energy saving technology, wind power, and now even solar photovoltaic electricity is less expensive than nuclear generated electricity, especially if the cost of decommissioning and long term storage of radioactive waste are taken into consideration. There is just no excuse for building a nuclear power plant. Please take action to stop WS Lee before it's too late. (0066-1 [Holt, Cathy])

Comment: Just a note: I worked at the West Valley, NY waste site I lasted 2 weeks and was very frightened by what I experienced there. I was in the pool area (they store the radioactive cylinders under water) when we came out after reading the meter we had to scan ourselves with a Geiger counter in a small out building. When I scanned my left foot the counter went crazy! I freaked out, the coworker with me started laughing and said it was the breeze blowing over the waste tank farm carrying radiation. When I was hired I was told that only about .03rems escaped per year, is this really enough to set off the Geiger counter? Who knows, anyway, I quit rather than take the chance of more exposure. The gauge I wore was almost full everyday! Very disconcerting to say the least. (0076-1 [Jensen, Phyllis])

Comment: As a resident of New Hampshire living on the power grid that is directly supplied by nuclear energy, I am writing in support of any and all efforts to maintain and continue the operations of Seabrook Station. Nuclear energy plays a vital role in meeting our nation's electricity needs and diversity. Seabrook Station has, for decades, produced energy efficiently and cleanly. It is vital to our economic security that its operations continue. (0087-1 [Hinch, Richard])

Comment: I don't agree with the NRC's stance that the problem of nuclear waste will be solved in the future and therefore recommends relicensing of the power plant [Diablo Canyon]. In fact, the NRC is exposing the county and the people of the state to the real probability of a horrendous nuclear accident. There is no scientifically proven solution for safely disposing of nuclear waste. The plant was not built to store waste and the waste is stored in vulnerable pools. The only solution is to shut down the plant and move the spent waste into dry casks as soon as possible. Lastly, the plant sits on or near several active earthquake faults which represent a seismic hazard beyond which the plant was built to withstand according to the United States Geological Survey, namely Dr Jean Hardebeck, who discovered the Shoreline fault. Thus the possibility of a major earthquake at the site is very possible. I ask what would happen to the highly radioactive nuclear waste then? Another Fukushima. (0095-1 [Caulfield, Lee])

Comment: Please continue to maintain the DC Court of Appeals Waste Confidence Ruling making it illegal for Duke Energy to obtain a license for a new nuclear power plant in Gaffney, SC. This will help prevent the additional production of nuclear waste material for which we currently have no means of safely disposing. (0098-1 [Pluta, Tim])

Comment: It is incomprehensible to me that with all the information that's out there on the amount of spent fuel being stored at Indian Point and the questionable way in which Entergy is storing it, that with all the experience we've had with terrorism and catastrophic accidents here and abroad (911, Fukushima), not to mention the president's campaigning against the Yucca Mountain site starting in 2008 and finally scuttling it in 2011, that most of our New York electeds cannot find a way to come out against storing such seriously hazardous waste in this part of their state. (0102-5 [Woodward, Julie])

Comment: NOR SHOULD WE ALLOW PLANTS TO SEND THEIR WASTE TO OTHER PLANTS LIKE that at the Shearon Harris nuclear plant here in North Carolina: http://www.organicconsumers.org/articles/article_19936.cfm. There have already been frightening irregularities in plant operations that could prove fatal if SUCH storage capacities are operated. (0106-1 [Pipes, Betty])

Comment: And at Seabrook there was a 4.0 level earthquake only 20 miles from the plant just a few -- just a year ago. And as Doug Bogen mentioned, it's destined to be coated with -- covered with water some day. (0112-10-7 [Skud, Bruce])

Comment: Entergy began construction on the ISFSI at Pilgrim a year ago and has sited the facility 106-feet from the ocean at an elevation of 24-feet above sea level. Entergy failed to obtain any local zoning or construction permits for this facility until citizens notified the town that construction was underway. Entergy then applied for and received local zoning permits; however, relying heavily on the idea that the NRC provides oversight and regulation of dry cask storage facilities and nuclear waste generally, the town rubber stamped Entergy's construction and did not require public hearings or environmental review regarding this multi-million dollar project. Plymouth citizens have appealed the town's decision to Massachusetts land court. Judge Foster is hearing the appeal and recently ordered Entergy to notify him directly 90 days prior to storing any nuclear waste. He has taken citizen concerns seriously and warned Entergy that they are continuing construction at this site at their own risk. Entergy has stated that the ISFSI site will be safe over the long run in terms of flooding, sea-level rise, and coastal erosion because the site falls within the design conditions of the plant, itself -- conditions established when the plant was built 40 years ago and based on storm surge data from the 1600s through the 1960s. No Entergy or NRC representative has been able to identify any updates to this data. As of today there has been no site-specific environmental review of Pilgrim's ISFSI either at the

Federal or the local level. I hope you can understand why citizens can see this as a cause for alarm. (0112-13-2 [Byrne, Genevieve])

Comment: The only thing I want to say is that when Seabrook was built it was designed with a place to put these spent rods into a pool. Shortly thereafter it wasn't big enough so they got the idea that they could double up in the pool, and that was risky. And now they want to put them into casks and that's a hopeful afterthought, that's my only opinion, it's an afterthought. Forget the engineering, they don't know what to do with it, it's just an afterthought. (0112-14-1 [Tilbury, Don])

Comment: But, you know, I want to take just a couple minutes, because that's all I've got, to talk about the reality of something now that we're having to face in Vermont now that Entergy has announced that they've lost enough money and they've given up. I want to remind everybody that Entergy was amongst a group of large utilities who back in the 90s made the case that they wanted free markets and open markets for energy and we need, you know, vigorous, you know, market competition. Part of their announcement in closing Vermont Yankee was these markets are flawed and messed up and they just don't work. And I just wanted to make that note. (0112-15-2 [Williams, Chris])

Comment: So in Vermont we're going to close Vermont Yankee down in one year. And when it closes we're then going to have to deal with decommissioning and the spent fuel. There's about 800-tons sitting in the pool at Vermont Yankee about 120 miles from here. It's going to cost, according to Entergy, a little over a billion dollars to decommission the plant. A billion dollars. Because, as part of their sales agreement in 2002, Entergy, insisted -- and the State of Vermont foolishly agreed -- that they wouldn't make anymore contributions to the decommissioning fund. We, in Vermont, have \$580 million. Entergy has the option to go into safe store and they also have the option in safe store to not move anymore of that fuel out of that pool for up to 60 years. NRC, this is real. This isn't, you know, generic, this isn't theoretical. We need your help. We need your understanding. We need action. We have \$580 million. That \$580 million will only grow if the market's gone. It actually lost money in 2008 when the markets went down. And like everybody's IRA, it came back a little. (0112-15-3 [Williams, Chris])

Comment: Because, frankly, if you stand back and look at it, what conclusion can you draw? That they [Pilgrim Nuclear Generating Station] don't have enough money to do the preventative maintenance that needs to be done to continue to operate in a way that any rational person would consider safe. At a conference at the Mass State House a couple of weeks ago -- Arnie Gundersen -- when you hear a plant is safe what should you assume? "You should assume," -- and this is quoting Arnie -- "it is meeting the minimal requirements of a compliant agency." (0112-2-2 [Lampert, Jim])

Comment: The other point I really want to bring up is the lies that have come down from Entergy and been completely ignored by the NRC. At Vermont Yankee 11 people, top people in the Entergy corporation, swore under oath at the Department of Public Service that there were no underground pipes that could possibly exist or leak. They were caught in their lies. (0112-22-4 [Nestel, Hattie])

Comment: I just wanted to tell you a little bit about our experience with Pilgrim and their building of a dry cask storage area. And I think it speaks to the Entergy culture similarly to the way Hattie [Nestel]-- Hattie's experience was up at Vermont Yankee. You know, we're watching Pilgrim morph into a -- from an energy-producing plant to a dry cask -- to a nuclear waste storage dump. And they started this, as Genevieve [Byrne] said, without any permitting at all.

And it was only noticed by citizens from an aerial photograph that saw some scarring on the ground that looked like construction activity. And so we called up the nuclear -- we, like, we e-mailed the Nuclear Regulatory Agency, a Mr. Dean I think is who I exchanged e-mails with. And he reported that Entergy was just doing preliminary work. You know, grading, cutting trees, moving material around. We went down to the building department and found out, well, they didn't have any permits for any of this yet and that they were actually pouring concrete for the approached slabs, the heavy-haul path, and the turning slabs. And they were getting ready to build the retaining wall. So what they did was they applied for a fractional permit. They didn't apply for a permit to build a nuclear waste dump site. They applied for a permit to build a retaining wall so that they could build the slab where the pads go. By doing that, they avoided a comprehensive review of the project. This was done by design. They started the construction before having permits. This is a company that's got permits for administration buildings, sheds for equipment, meteorological towers, parking lot changes, tents to have -- they get permits for tents to have functions outside that they can't do inside. And so now they're building a nuclear waste dump site without any permitting at all. You know, this is not a casual mistake. So that's the culture of Entergy. And it just boggles my mind that in the town of Plymouth it is harder to get a permit to put a deck on your house than it is to get a permit to build a nuclear waste dump site. (0112-23-1 [Maurer, Bill])

Comment: So I first came to Vermont in 1972, the same year that Vermont Yankee was built. And at the time I took a tour of this sparkling new facility and I was in awe. I was like the bridge the bridge of the Starship Enterprise, I mean, it was just amazing. And I just, you know, 40 years later I'm in a very different place. I've moved from awe to deep, deep fear. (0112-24-2 [Darling, Ann])

Comment: In going to some of these meetings I'm always looking at people with a lot of confidence in looking at the science behind what they're doing. And about in 1999 I went to Washington at a WAN conference with Helen Caldicott. And at the conference we were trying to make people aware about the possibility of what might happen to the grid during the change over to 2000, the Y2K issue. And we addressed several issues. And one of them was Helen, you know, asked us to go back to our nuclear power plants, which in my case was Plymouth, and find out what they would do if there was a loss of electricity and how we were prepared to have generators backup. The other thing that she asked me to ask the nuclear power plant was what would we do if we had a terrorist attack. And she gave us two options to ask the nuclear power plant. What would you do if you had, you know, a terrorist attack that attacked you by plane filled with fuel? So this is 1999. So I talked to nuclear power plant at Plymouth and I said, I asked them what they were going to do as a backup and they did have a backup plan. But they didn't have another backup one in case that one didn't work. (0112-29-1 [Roman, Margo])

Comment: We heard from the spokesman from the Seabrook plant back in 2006 that, quote, "Environmentalists can submit as many plans as they want. The decision on dry cask storage has already been approved." And that was from Alan Griffith, the spokesman for Seabrook in 2006, seven years ago. There's never been a public hearing on that site, on the process. And to this day we haven't really heard the details. (0112-5-8 [Bogen, Doug])

Comment: A year from now Vermont Yankee will be closed and that means it will no longer be producing nuclear waste. But we're not celebrating. We're not celebrating for the reason that we're all in this room. We don't know what to do with that waste. We don't know what to do with 40-plus years of this stuff. And like Doug [Bogen] said, we've been working on it for 40-plus years. Vermont Yankee has 2,627 fuel assemblies in its spent fuel pool, seven stories above the

Connecticut River. That's four times as many as it was designed to hold. That's many more times than the fuel in Fukushima. (0112-7-1 [Sachs, Leslie Sullivan])

Comment: [A] lot of us are not necessarily anti-nuclear. You don't have to be anti-nuclear to believe that there are many problems at the current plants we have running. Call yourself whatever you want, it doesn't mean that Pilgrim, for example, doesn't have a mass of problems that could eliminate our whole geographic area and sacrifice our lives and livelihoods. (0112-9-2 [Baker, Anna])

Comment: We [The African American Men of Westchester] strongly believe that Indian Point's continued operation is imperative to reducing reliance on fossil fuel generators, which are unequally located in minority and low income communities. If Indian Point shuts down, there will be significant pressure to replace this carbon-free facility with power from fossil fuel plants, the majority of which are located in African American and other minority communities in the New York metropolitan area. In fact, a 2011 study commissioned by the New York City Department of Environmental Protection found that Indian Point's closure would cause carbon emissions to increase by up to 15 percent and nitrous oxide emissions to increase by 7-8 percent in both the City and State. This will only exacerbate the disproportionate incidence of childhood asthma, and other health related problems in these communities caused by air pollution. (0115-1 [Salley, Lawrence])

Comment: I am sure that most of those in charge of renewing the license for Indian Point as well as finding a safe way to store the waste, also have find the time to raise our voices to stop the path we are on. We are rightfully concerned, as compassionate people in our great country, about the use of chemical weapons as a crime against humanity, when other countries poison and kill innocent civilians and people in their own community. Now we are on a path in New York State to use chemical warfare against ourselves by ignoring the hazards of nuclear waste. Until we receive evidence of a substantial number of requests to the NRC to allow everyone within 70 miles of the plant to risk death or relocation, we respectfully request that the Commission do what is best for everyone. We must not allow ourselves to commit suicide by ignoring what is obvious. Dr Kevorkian was requested by people who wished to terminate their lives. I have seen no documentation that this something anyone in the Greater New York Area wishes to see happen to them or their families. There is no documentation of any citizens in the Greater New York Area requesting that we become a new JonesTown. Intelligent action to save a tragedy from occurring at Indian Point can set an example to the whole country that our government is still devoted to serving the needs of the people it represents. I respectfully request, on behalf of all my neighbors, my friends and family, and with equal respect to all of you [at NRC] and your friends and families, to choose a solution to assure our survival. Your decision at NRC will determine our shared destinies. (0117-4 [Amram, David])

Comment: The Business Council of Westchester and our more than 1,000 members recognize the substantial contribution to our region by the Indian Point Energy Center, and we support its continued operation. (0118-1 [Westchester, Business Council of])

Comment: The Business Council of Westchester supports Indian Point because it is an important asset to the reliability and affordability of electricity in the State of New York. Additionally, Indian Point is a major contributor to the local economy of Westchester County. According to a study that our organization commissioned in September of last year, Indian Point's closure would result in the elimination of 3,300 local jobs, \$75 million in revenue funding for local services, and millions more in economic development resources. These staggering losses would have a dramatic negative impact on the region. (0118-3 [Westchester, Business Council of])

Comment: Entergy has spent more than \$1 billion upgrading and enhancing the facility and preparing the plant for safe operation during the 20-year period under a renewed operating license. For nine years in a row, Indian Point has received the NRC's highest annual safety evaluation. These are the findings of trained experts who spend tens of thousands of hours evaluating the Indian Point's operations and they agree the plant is unequivocally safe. (0119-2 [Mooney, William])

Comment: Recently, I received a geiger counter to take part in the project monitoring radiation from levels in our atmosphere caused by Indian Point for citizens who live within the 10-mile dead zone, the "impossible" to evacuate zone, and I work with children. The experience of using the geiger counter makes the reality of Fukushima so profoundly real. I have seen a documentary with the citizens of Fukushima with Geiger counters. It is haunting to walk about with a geiger counter, thinking of what it means that we need a detection program. We can only hope that this detection program is only going to be something that will wisely inform the shutdown of Indian Point, and never to become a program that tells us which of our beds and pillows are too contaminated to lay down on at night. (0120-2 [Seeman, Laurie])

Comment: People need to realize the vulnerability we live with every day with Indian Point is tick-tocking towards the eventuality of causing increased sickness. The women of Fukushima came here to tell the people of the Hudson Valley and the NRC, - Learn from Fukushima! Do not let this happen to you!! So while we can only hope that Indian Point will never wreak devastation, the NRC can more than hope. The NRC can assure that this devastation will never occur. Has anyone in the NRC heard and understood the truth of the messages from Fukushima? Have the citizens of the Hudson Valley heard this message? What is next? (0120-4 [Seeman, Laurie])

Comment: I am waiting for the Indian Point decision makers to get scared. To see what has happened in Fukushima that is poisoning not only the coastal waters of Japan, but now the whole planet. I am waiting for the Indian Point decision makers to say, enough. We need to wind this down. The stakes are way too high at Indian Point. This is a risk we cannot afford to take. This is the time to proceed with closing Indian Point. It is notably slated for retirement. Failure to listen to this precaution would be much the same as TEPCO in Fukushima failing to heed the pre-caution to build a higher sea wall. They did not do that. Now what is the cost? To TEPCO? To the world? There are a many tons of radioactive material impounded at Indian Point. The agreement to relicense Indian Point is a sentence to add 50% more tons of poorly contained lethal matter to our environment. We are already suffering. And in Rockland County the people are wildly opposing the drinking water that would be withdrawn from just 3.5 miles downstream of the plant. This must all stop! With the Geiger counter unit that I now have, I will be alerting the authorities and the medical science people when things are not right, when radiation is rising. (0120-6 [Seeman, Laurie])

Comment: This is the beginning of how Indian Point is going to be monitored into closing down. To the NRC, I say, start planning the decommissioning now. Ensure that the funds are in order. Shut this plant down properly, with every respectful precaution for safety. I have been to Three Mile Island Pennsylvania three years after the 1979 Un-reported accident, which is called by the people there the "Accident without end", and again in 2009 for the events of the 30-year commemoration. The people of Three Mile Island would give every penny they ever earned to go back to the day before March 28th, 1979. They will tell you there is no cost saving on energy that is worth the perpetual worry about sickness that they live with now ever since. One mom told me she looked at her daughter every year at her birthday party and wondered if this was the year she would become sick. They worry too for the genetic flaws in their future generations too.

Please close Indian Point nuclear power plant. It is the right and conscionable time to retire it. It has come to the end of it life span. (0120-8 [Seeman, Laurie])

Comment: In baseball, one has three strikes and you're out. In the nuclear industry, we've had three strikes: Three-Mile Island, Chemobyl and Fukushima. You're out! It's time to close Indian Point! This deadly nuclear plant threatens the lives of over 21 million people in the most densely populated Metropolitan area, poisons the Hudson River and ground water. Indian Point is situated on two fault lines. Scientists of Columbia University reported that a 7.0 magnitude earthquake is possible at Indian Point; and this aging structure was built to withstand a 6.1 earthquake only. (0121-1 [Skopic, Catherine])

Comment: Indian Point uses 2.5 billion gallons of water daily, circulates it through the system and dumps it back into the river, hotter, untreated and now containing strontium-90. The Westchester Journal News reported in 2007 that 4 out of 12 fish sampled showed detectible levels of strontium-90 in their flesh. Cancer rates are 66% above the US average in communities surrounding Indian Point, according to the U.S. Centers for Disease Control and Prevention. There is NO EVACUATION PLAN! (0121-3 [Skopic, Catherine])

Comment: We don't even need the electricity produced here - reported to be sometimes as low as 4%. We have a surplus of electricity. New transmission lines have been approved that will save consumers money and preserve the environment. I encourage Entergy to go green, along with the rest of the world's movement in this direction. (0121-4 [Skopic, Catherine])

Comment: This summer, I paddled down the Hudson River with about two hundred native and non-native people for the 400th anniversary of the Two Row Wampum - the 1st covenant between Native Peoples and Europeans that agrees to respect each other, work together and protect Mother Earth. No matter what side of this issue we are on, we are called to honor this covenant today. The time of environmental destruction is over - it is now a time of healing for each other, for the earth, for all creation. Going back even further than 400 years, and I quote, "The earth lies polluted under its covenant." Isaiah 24: 5 It's time to close Indian Point! (0121-5 [Skopic, Catherine])

Comment: As someone who resides and works within 50 miles of Indian Point, I would like to express my informed opinion that Indian Point should be permanently closed (0125-1 [Kidney, Barbara A.])

Comment: As a long term resident of Charlotte and the Carolinas, my concern is the number of nuclear sites in this region and the ongoing storage of radioactive waste at these sites. Charlotte is a burgeoning population center, as are the I-85 and I-40 corridors. Millions of us are at risk, and consequences can be catastrophic. (0131-1 [Felder, H.M.])

Comment: I live 5.5 miles from the Indian Point Nuclear plant and I have been trying to close the plant since Indian Point2 had a steam pipe rupture in February 2000 and became the first nuclear plant in this country to earn a red rating from the NRC. Indian Point 2 stayed offline for almost a year after the steam pipe rupture. That rupture spread radioactive steam into the air near my house and irradiated water through the Buchanan sewer system into the Hudson, a US Heritage waterway that belongs to all the American people. (0136-1 [Shaw, Gary])

Comment: That is the same type of oversight we have seen from this agency that did not ensure that the IP2 [Indian Point 2] transformer would not explode three years after the same transformer at IP3 [Indian Point 3] exploded, that has not prevented ruptures and leaks from

underground piping and that did not know that there was spent fuel pool leakage, probably for years, until the operator started excavating to prepare to move high level radioactive waste into dry cask storage and. That leakage included Strontium 90. Again, Indian Point became the first nuclear plant in our country to set a bad standard. And the GAO has identified Indian Point as the nuclear plant with the highest number of safety violations in the past year. And this agency has granted numerous exemptions from regulatory standards including the waiver of the requirement that Hemyc fire wrap protect critical safety cables in the automatic shutdown system from fire for an hour. The same person who let the Davis-Besse plant in Ohio get within a quarter of an inch from breach of containment then oversaw the reduction of the Hemyc 60-minute requirement to 24-minutes. In a public meeting, when NRC was asked how many exemptions have been granted at Indian Point, not one member of the NRC panel knew the number. Now you are telling us that you have a workable plan to secure and keep the public safe from the thousands of tons of high level wastes that are currently sitting in the plant and the additional tonnage that will accumulate if the plant gets a new twenty year operating license. If that wasn't so scary it would be funny. (0136-3 [Shaw, Gary])

Comment: It is my understanding that only about 15% of the spent fuel assemblies that have been accumulating at Indian Point for these last 40+ years have been moved to on-site dry cask storage although far more, perhaps 75% - 80% is cool enough to be moved, and you seem in no hurry to reduce the dense packing that has resulted in many times more fuel assemblies than design basis specified. (0136-4 [Shaw, Gary])

Comment: But we [Indian Point Energy Center] have had 10 more years of wet storage since that report was issued with very little waste moved. Why? Because it costs the operator money. (0136-6 [Shaw, Gary])

Comment: Suggestion: Solar energy jobs could be made available within a fifty mile radius of Indian Point. These jobs would be to transform Indian Point from using nuclear energy to using solar energy. Could there also be a job program to install solar panels on qualifying homes? Could there be a manufacturing plant established for solar devices in some less prosperous town in the 50 mile radius, such as Beacon or Newburgh? Money for such job projects could be transferred from the amount scheduled for new nuclear plants or for repair of present plants. (0137-1 [Cypser, Betty])

Comment: Quote from Entergy (Indian Point Energy Center) "Indian Point safely and reliably provides about 25 percent of New York City and Westchester's power, with virtually no greenhouse gas emissions, at far lower costs than other power plants. Its continued operation is a vital component of the region's economic and environmental future."

<http://www.safesecurevital.com/rightfornewyork/?gclid=CJXp75GW6KoCFaoSNAoduTU6dQ>. Is it true that the coal necessary to make uranium usable, is costly, dirty, and has greenhouse gas emissions? If so, is the above quote unreliable? Is it true that Indian Point and its waste products are "safe and reliable" for the people of the 50 mile radius, or for the people all over the world who have been subjected to weaponry of depleted uranium? Another quote: "Exelon Corp. said that four of its nuclear power plants declared "unusual events" following the earthquake. Exelon's Limerick plant near Philadelphia; Oyster Creek plant near Toms River, NJ; Peach Bottom plant near Lancaster, Pa.; and Three Mile Island Unit 1 near Harrisburg, Pa., all declared "unusual events," the lowest of four emergency classifications used by the NRC. Plant operators are inspecting facilities and equipment to check for any damage or impacts, an Exelon spokesperson said." (Dow Jones, Aug. 23, 2011)

<http://www.ww4report.com/node/10250>. Do you know if Indian Point had any "unusual events" to report on August 23rd, 2011? Another quote: "A nuclear power plant that was shut down after

an earthquake struck central Virginia Aug. 23, 2011 had seismographs removed in the 1990s to save money. Officials said that the North Anna Power Station, which has two reactors, lost offsite power and switched to diesel generators to maintain cooling operations after the 5.9 quake. The North Anna plant, which was near the epicenter of the quake, is reportedly located on a fault line. The US Nuclear Regulatory Commission (NRC) rates the plant as the seventh most likely to receive core damage from a quake, although it says the odds are very low. According to the Virginia Department of Mines, Minerals and Energy (DMME), the Virginia Tech Seismological Observatory (VTSO) removed all seismographs from around the plant in the 1990s due to budget cuts. In February, Dominion Virginia Power announced plans to add a third reactor at the plant." (Raw Story, Aug. 23) <http://www.ww4report.com/node/10250>. Do you know if Indian Point is first in line as the most likely to receive core damage from a quake? (0137-3 [Cypser, Betty])

Comment: Already we have Energy Solutions Corp. storing waste which was never sanctioned and stored illegally without the State's permission. Now we have hotter waste than was allowed, yet the citizens have no recourse for its removal. (0158-4 [Payne, Joanne])

Comment: So I have a bill. It's A-10-38 and Entergy has lobbied heavily against this bill. If we're going to play the science card, let's look at this bill. This bill will study under the Energy, it will amend the Energy law to study alternative sources of energy to Indian Point. It does not say close Indian Point. It says study. And to the gentlemen who represent the 400 people who work at the site, this law, if it became a law, this bill will in fact protect your jobs and look at new ways to relocate because we respect the work that you do in the Valley. And I call upon the NRC to support me in this effort and to please communicate to Entergy that we should work on, in the name of science and truth, getting this bill passed so that we can really look at the impact of this bill and we can look at -- we can stop the production of long-term waste. (0163-13-2 [Jaffee, Ellen])

Comment: You've heard many people tonight who are forced to live with the continued threat of Indian Point every day and the waste that it produces. And, you know, what's in a name? So I don't think EIS -- I don't think there should be the "G" before it. It's a generic. Indian Point is anything but generic. It is a specific power plant in the most crowded region of the United States with 20 million people living in a 50 mile radius, so I think to apply a generic EIS is ludicrous. (0163-15-2 [Garner-Ritter, Maureen])

Comment: I just have four questions that I do want to answer to the -- ask the NRC, is how does the fact that if IP is making waste now and it is now considered actually a storage facility instead of a generation -- place of generation? That's one question I have. (0163-15-7 [Garner-Ritter, Maureen])

Comment: My deep concern about Indian Point started some years ago when Entergy couldn't get the sirens to work properly, and I wondered if they can't get something that simple outside the plant to work, what's going on inside the plant. (0163-16-1 [Wolf, Peter])

Comment: We're here tonight to discuss nuclear waste, and it's probably a much more serious topic than even our discussion about the ongoing licensing at Indian Point because this will go on for decades, and we do not know how the protection will go, who will pay for it, and who will monitor it. It's difficult to predict what will happen in the future. Yesterday was the first anniversary of Sandy's visit. Many didn't foresee the type or extent of that type of damage. When we look back at just the last dozen years, we did not envision 9/11. We did not envision

Katrina. We did not envision the Deep Water Horizon, and we did not envision Fukushima. And as we know, Fukushima is still leaking today. (0163-16-6 [Wolf, Peter])

Comment: Indian Point is considered by some to be the least safe site of any reactor in the country. We live with possible disasters, remote yet frightening possibility. In addition, of course, Indian Point leaks invisible radiation constantly as well as heating river water that it draws in vast quantity every day to operate the reactor and cool the ever increasing number of irradiated fuel rods. (0163-20-3 [Gellert, Sally Jane])

Comment: As we know, the NRC does not want to discuss the percentage of high burn-up fuel at Indian Point. It was suggested that that is a matter of national security. However, local security must also be considered. Without enough of an idea of how much irradiated fuel rods are stored safely, Woodcliff Lake and the area surrounding are less secure than they might be. I therefore request this information be made public. (0163-20-6 [Gellert, Sally Jane])

Comment: I live six miles from Indian Point. This hotel is less than 20 miles from the nuclear power plant. Do you remember when Fukushima began to melt down and the NRC told all the Americans in Japan that it was dangerous to be within 50 miles of the reactors in spent fuel pools. If we heard sirens right now, we have to get in our cars and drive 30 miles. Unfortunately, the sirens can't be heard this far from Indian Point. That's one of the many reasons that Raging Grannies demand that Indian Point be shut down immediately. Here you are within the 50-mile range, okay. (0163-25-1 [Armer, Sunny])

Comment: Indian Point's a nuclear power plant near here. Nineteen Miles. That makes 50 tons of spent fuel every year. That waste is stored in pools and because we are not fools, we know we have good reasons to be scared. Sing along. If Entergy keeps spinning what it's spun, and their fight for re-licensing is won, 15 million on the roads will flee their doomed abodes. A 50-mile race they'll have to run. A terrorist could hit it with a bomb. The earthquake in Japan gave us some qualms. Where will we find the answer to protecting folks from cancer, who haven't yet been blown to kingdom come? Bring us solar, bring us hydro, bring us wind. Bring us energy from sources that won't end. Before we could trust uranium, we'd need holes in our cranium. We haven't yet gone that far 'round the bend. (0163-25-2 [Armer, Sunny])

Comment: Oh, we are a gaggle of grannies urging you off of your fannies. Indian Point is a dangerous joint. Shut it down. With all that Entergy's spending to keep their license from ending, you'd think go broke with mirrors and smoke. Shut it down. The NRC approves of waste storage by Entergy. The NRC is a lapdog to the nuclear industry. So, we may be a gaggle of grannies, but we've gotten off of our fannies. Stop Entergy's spin. If they lose, we win. Shut it down. We really mean it. Shut it down. And we mean business. Shut it down. Shut it down. (0163-25-3 [Armer, Sunny])

Comment: The National Regulatory Commission has the chance today to avoid another one at our backyard. I'm sure that most of those in charge of renewing the license for Indian Point, as well as planning a safe way to store the waste, also have families and have worked hard their whole lives to give their kids a better life than they had. That's the great tradition of our country. (0163-26-3 [Amram, David])

Comment: And unless we receive a substantial number of requests of the NRC to allow everyone within 70 miles of the plant to request the Commission what's best for everyone, we cannot allow ourselves to commit suicide by ignoring what's obvious. Dr. Kevorkian was requested by people who wished to terminate their lives and there's no documentation of

anyone in the greater New York area who has requested another Jamestown.....So I request on behalf of my neighbors, my friends, and my family with equal respect to all of you and your friends at the Nuclear Regulatory Commission and your families, a solution to ensure our survival. Your decision at the National Regulatory Commission will determine our shared destiny. (0163-26-5 [Amram, David])

Comment: In baseball one has three strikes and you're out. In the nuclear industry we've had three strikes. Three Mile Island, Chernobyl, and Fukushima. You're out. It's time to close Indian Point. This deadly nuclear plant threatens the lives of over 21 million people in the most densely populated metropolitan area, poisons the Hudson River and groundwater. Indian Point is situated on two fault lines. Scientists of Columbia University reported that a 7.0 magnitude earthquake is possible at Indian Point, and this aging structure was built to withstand a 6.1 earthquake only. In 2005 NRC and Entergy reported that radioactive water was leaking from IP2 spent fuel pool. 2007 -- a tritium leak was found, leaks into the ground water and Hudson River. (0163-32-1 [Skopic, Catherine])

Comment: Indian Point uses 2.5 billion gallons of water and the fish have been found with strontium-90 in their flesh. Cancer rates are 66 percent above the average in communities surrounding Indian Point according to U.S. Centers for Disease Control and Prevention. There is no evacuation plan and we don't need it. We have viable renewable energy. This summer I paddled on the Hudson River with about 200 native and non-native people. (0163-32-4 [Skopic, Catherine])

Comment: For the 400th anniversary of the Two-Row Wampum in the first covenant between native peoples and Europeans. They agreed to respect each other, work together, and protect Mother Earth. No matter what side of this issue one is on, we are called to honor this covenant today. The time of environmental destruction is over. It is now a time of healing for each other, for the earth, for all creation. And lastly, going back even further than 400 years and I quote, "The earth lies polluted under its inhabitants for they have transgressed laws, violated the statutes, broken the everlasting covenant." Isaiah 24:5. It's time to close Indian Point. (0163-32-5 [Skopic, Catherine])

Comment: So I would like to contextualize what I'm saying in that context as well as the fact that as Cathy pointed out, Indian Point is located on these faults and that the possibility of a 7-point earthquake is probable. When is up for grabs. Well, we don't have to worry about earthquakes because severe hurricanes are expected sooner than later, and I remember during Hurricane Sandy I was up all night listening to reports about anticipating the surge, the storm surge, and it came within inches of the fuel ponds here at Indian Point. (0163-33-3 [Geist, Sheila])

Comment: Now, New York City does not need the energy from Indian Point, and they -- it's clear from just a few days ago, the Public Service Commission approved a series of three projects that would enable the upstate energy to get downstate through changes in the transfer policies and in changing the grid. So it's not for any kind of necessity that we need Indian Point and we must move -- not only shut it down, not produce any more waste and put this waste that we have into dry cask storage. And I would wish that somebody knew about that. (0163-33-4 [Geist, Sheila])

Comment: Where is the money for decommissioning Indian Point? Does this fund include plans for converting to hard cask storage? What happens if Entergy walks away and goes out of business? If the operating permits are not renewed now, when does the de-commissioning start? Under whose management? The guy outside told me that Entergy wouldn't have to do

anything for 60 years if it stopped, you know, operating the plant. The last question is what money and plans are in place to oversee this transformation? (0163-33-5 [Geist, Sheila])

Comment: [W]e're [Alliance for a Green Economy] concerned about the waste building up at Indian Point, as well as New York's four other nuclear reactors, which are all on the shore of Lake Ontario, Fitzpatrick, Ginna, Nine Mile Point 1, and Nine Mile Point 2. (0163-34-1 [Azulay, Jessica])

Comment: Not only that, the seismic reality at Indian Point is ridiculous and that's not something that any gridlock in Washington can affect either. (0163-35-3 [Shaw, Jeanne])

Comment: Senator Gillibrand seemed even less concerned. Lohud reported almost two years ago that she actually supported building new reactors in communities that want them. Her quote "There's lots of places in the state that would certainly welcome a nuclear facility." One minute. Really? I guess so. So the point that I'm trying to make is that it is incomprehensible to me that with all the information that's out there on the amount of spent fuel being stored at Indian Point and the questionable way in which Entergy is storing it, that with all the experience we've had with terrorism and catastrophic accidents here and abroad, not to mention the President's campaigning against the Yucca Mountain site starting in 2008, scudding it in 2011, that most of New York electeds cannot find a way to come out against storing such seriously hazardous waste in this part of their state. (0163-37-2 [Woodward, Julie])

Comment: "For the record, Entergy has spent more than one billion dollars upgrading and enhancing the facility and preparing the plant for the safe operation during a 20-year period under a renewed operating license. For nine years in a row Indian Point has received the NRC's highest safest rate in its annual safety evaluation. These are the findings of trained experts who spend tens of thousands of hours evaluating the Indian Point's operations and they agree that the plant is unequivocally safe." (0163-4-2 [Thomas, Richard])

Comment: We've gone through a lot of technologies. The coal that we were mining, we thought was harmless and we found that tens of thousands of people died of black lung disease. The manufactured gas that was manufactured here in Tarrytown, \$14,000,000 to clean up the coal tar...all of the new technologies we've gone through whether it was leaking gas, gas tanks that have taken out aquifers in Armonk, New York, where I lived, permanently destroyed the aquifer in Wilton. All of these technologies were unproven and brought with them all kinds of risk that were unmeasurable at the time. We thought it was all safe. We think this is safe. In my view it is not safe technology. We didn't expect the pools to leak. They're leaking into the Hudson River I love right now this minute as we are speaking. These are unacceptable risks. (0163-42-2 [Fry, Mark])

Comment: "I have no confidence that under any rules that waste stored at Indian Point will be handled appropriately." This is Laurie speaking. "Recently I received a Geiger counter to take part in the project for monitoring radiation from levels in our atmosphere caused by Indian Point for citizens to live within the ten-mile dead zone. The impossible-to-evacuate zone, and I work with children. The experience of using the Geiger counter makes the reality of Fukushima so profoundly real. I've seen a documentary with the citizens of Fukushima with Geiger counters. It is haunting to walk about with a Geiger counter thinking of what it means that we need a detection program. We can only hope that this detection program is only going to be something that will wisely inform the shutdown of Indian Point and never to become a program that tells us which of our beds and pillows are too contaminated to lay down on at night. When the women farmers from Fukushima came here a year ago, as they did, that is one thing that they said that

stuck with me hard. That in Fukushima they had no place to rest safely at the end of each exhausting day. This is traumatic. Imagine you go to lie down and you know your pillow was contaminated with radiation. Then also imagine that your family is divided maybe forever. The elders did not want to leave their homes. Men stayed behind to work while women left with children. Imagine. Imagine. But don't just imagine. People need to realize the vulnerability we live with every day with Indian Point is tick-tocking toward the eventuality of causing increased sickness. The women of Fukushima came here to tell the people of the Hudson Valley and the NRC 'learn from Fukushima. Do not let this happen to you.'" (0163-45-1 [Seeman, Laurie])

Comment: [L]et's close Indian Point and the many tons of radioactive material that are impounded at Indian Point. If we relicense Indian Point we're going to add at least 50 percent more. This is -- this is lunacy. (0163-45-2 [Klein, George])

Comment: I'm listening to all of this and I'm thinking we're dealing with Entergy. It's a specific corporation. It does specific things. Its stockholders decided not to change the spent fuel rods that were ready to go into dry cask. Only 15 percent of them in dry cask. 85 percent is left and they don't do anything. They don't care about it. Who is going to pay for it when they depart from the scene? Entergy ran Indian Point during Sandy. The buses had been canceled the day before. The trains had been canceled the day before. There were logs all over the roadways. They had no evacuation. Not even a pretend evacuation. And still they decided to keep running it. We're leaving the responsibility for something as dangerous as this to a corporation that doesn't act as if it cares. It doesn't believe that its responsibility is to take some of the profit and put the spent fuel rods that are aged enough out of the pools which are too crowded and put them in dry cask. I don't believe the Nuclear Regulatory Commission can actually twist it enough to follow -- get them to follow anything that's real and I'm not assured that their staff, their engineers, and anything have a bigger picture in mind. And so, I would say let's close Indian Point. (0163-46-1 [Leiter, Susan])

Comment: It's time now to shut down Indian Point and put the fuel that is already there into dry cask storage. (0163-49-3 [Evans, Laurie])

Comment: I know I should say thank you for being here, but I don't thank you. You had two years to work on similar problem with Indian Point and nothing is done. It's just another rubber stamp. I think your arrogance is shameful and I don't know how any one of you can look at me full in the face and tell me that I am safe. I'd like to hear one of you say that to me. I don't believe that. And I'm -- I'm very upset. I think quite honestly that you've all insulted the intelligence of many people here tonight, and I am really shocked and dismayed by this, so that's all I have to say. I want Indian Point shut down immediately if not sooner, and I agree with my sister's statement that you can -- well, she said it very well. I don't need to repeat that. So do your jobs and protect the public. I am the public. You are the public too. Protect me. That's your job so do it. (0163-51-3 [DeCrescenzo, Jocelyn])

Comment: The NRC conducts detailed rigorous annual safety inspections at each of the country's 100 nuclear power plants. Due to political pressure, Indian Point is the most scrutinized and it has -- and it continues to receive the NRC's highest safest rating year after year. These inspections include comprehensive review and oversight of the process for using used fuel onsite at Indian Point in both cooling pools and dry cask storage, the state-of-the-art solution. The Hudson Valley Gateway Chamber of Commerce supports the continued operation of Indian Point because we understand its importance for the region's energy supply, electrical grid reliability, and the economy. New York does not have the generation or transmission infrastructure to replace the 2,000 megawatts of power that Indian Point supplies each day. Let

alone a proposed replacement source that could provide comparable economic benefits and not result in higher electricity rates. (0163-8-2 [Milone, Deb])

Comment: At the November 14, 2012 NRC hearing/teleconference, Ruth Thomas of EI called attention to Duke Power Company's Oconee Nuclear Station. Its three reactors are located approximately halfway between a series of lakes. Here are some facts about Oconee: 1. The Oconee reactors were built in the 1970's. Oconee was the second plant to be relicensed, until 2033-34. 2. Duke Energy has noted that a failure of the Jocassee dam could flood the plant and cause the loss of power and safety equipment, potentially damaging its three reactor cores within 8 to 9 hours. It could further lead to reactor containment failure within 59 to 68 hours, triggering a significant release of radioactivity into the environment. Duke informed the NRC about this flooding hazard as early as January 1996. (Wikipedia) 3. The owner/operator Duke Energy Carolinas has been served with a Notice of Violation, Severity Level III, July 1, 2013. This violation involved Duke's failure to complete three changes in the requirements for the Fire Protection Program License of Units 1, 2 and 3. 4. The NRC's own engineers were concerned that the agency was not doing enough to address the risks associated with Jocassee dam failure. Public Employees for Environmental Responsibility (PEER) filed a lawsuit against the NRC in the federal court in Washington for not providing answers to their Freedom of Information Act requests (Spartanburg Herald Journal, September 1, 2013) 5. Disaster plans were not kept in a critical area and other copies were outdated. (Greenville News, July 15, 2011) 6. The NRC has failed and continues to fail to recognize the long-term damaging effects of radiation from numerous sources. (0174-10 [Thomas, Ellen] [Thomas, Ruth])

Comment: For example, the people of Vernon, Vermont are extremely worried now about the economic impact, loss of jobs, and loss of tax revenue that will be realized next year when Vermont Yankee closes. (0181-5 [Waters, Christine])

Comment: For example, the people of Vernon, Vermont are extremely worried now about the economic impact, loss of jobs, and loss of tax revenue that will be realized next year when Vermont Yankee closes. (0183-5 [Green, Carlyn])

Comment: This is true for all nuclear reactor sites, over a hundred in the United States. Many of those are clustered near coastal waters and centers of population, like all five of Florida's nuclear plants, and hence vulnerable to colossal storm surges. (0190-4 [Phelan, Steven] [Phelan, Walter])

Comment: More importantly, I want Diablo Canyon closed so no more nuclear waste is being created in my backyard. I have no confidence whatsoever that nuclear waste is being safely stored here in SLO [San Luis Obispo] county. (0207-2 [Denton, Jill])

Comment: I would like assurance that the pool storage for spent fuel from San Onofre, especially the high burn-up fuel, is safe under credible tsunami conditions. If a tsunami were to damage the pool storage in a way that would cause loss of pool water while shoving the waste containers into a corner of the pool (causing unsafe geometry for cooling) the results could be catastrophic, even if the emergency generators can perform their function of providing emergency cooling. Typically, nuclear systems that could have a catastrophic failure are designed to withstand natural phenomena that could occur with an expected frequency of 1/1000 per year. In the case of tornadoes, because of the uncertainty in historical data, the design is 1/10,000. Because of poor documentation of past tsunamis, and the demonstrated inability of the scientific community to predict tsunami magnitudes (e.g., Fukushima), I think the

pool cooling at San Onofre should be designed for the worst tsunami expected in 10,000 years. I do not see where this has been accomplished. (0214-1 [Deshotels, Bob])

Comment: Another credible new unanalyzed threat should receive scrutiny in an updated, more rigorous scientific analysis, which consists of the possible designation for San Diego as a new 'drone testing' facility. While 'drone analysts' might believe that designating San Diego as a new drone testing facility poses minimal, or no risk(s), I am unconvinced, and I have requested County of San Diego Board of Supervisors to reevaluate that recent action. (0218-4 [Borchmann, Patricia])

Comment: California's nuclear waste is sited on an eroding coastline, in tsunami zones, and is exposed to a highly humid and corrosive coastal environment. NRC's NUREG/CR-7030 states "atmospheric corrosion of sea salt can lead to stress corrosion cracking within 32 and 128 weeks in austenitic (corrosion resistant) steel canisters" It would be impossible to evacuate the millions of people living near California's Waste. Of the 34 million people in California, over 8.5 million reside within 50 miles of San Onofre !! A radiological disaster impacts the nations, and world's security, economy, and food supply. California is the eighth (8th) ranking economy in the world, virtually tied with Italy and Russian Federation, larger than Canada, Australia, and Spain. More than 40 percent of containerized imports enter the country through California ports. A radiological release from San Onofre would destroy public infrastructure, and disable Ports of Long Beach, Los Angeles, and possibly San Diego, causing irreversible economic damage at a local, regional, statewide, national, global scale. California produces nearly 1/2 of US grown fruits, nuts, vegetables. Californias remained the number one state in case farm receipts in 2011, with \$43.5 billion in revenue representing 11.6 percent of US total. US customers regularly purchase several crops produced solely in California. San Onofre is located adjacent to the primary vehicle transportation artery between Los Angeles and San Diego (I-5), and one of the largest military installations (and targets) on West Coast (Camp Pendleton). (0218-6 [Borchmann, Patricia])

Comment: The projected Scope of Decommissioning Project, and Decommissioning Costs are currently still preliminary, only in early stages being prepared by SCE, or considered by CPUC, CEC, and NRC, and are still largely UNCERTAIN. It is important that NRC will require Licensee to fully perform Decommissioning at SONGS in safest, most reliable method, the most "in Public Interest" method possible, and not necessarily the least expensive for Licensee (SCE), contractors, or subcontractors. Timing of NRC actions should be more carefully coordinated with action(s) also pending with CPUC, CEC, California Coastal Commission. (0218-9 [Borchmann, Patricia])

Comment: When I heard that the NRC intends to leave the nuclear waste on site at San Onofre for, potentially, three hundred years, I was nothing short of appalled. The idea that we must leave such dangerous materials in an earthquake zone surrounded by some 10 million people is an abomination. Is it really possible that the kind of scientific minds who created the plant in the first place are capable of painting us into such a corner? If so, it will surely go down as one of the greatest and most horrifying screw-ups in the history of mankind. (0220-1 [Degher, Darius])

Comment: And no, leaving the nuclear waste in crowded Southern California is NOT just as good as leaving it somewhere else, such as a desert in Nevada. An accident involving leaking nuclear waste in the desert, far from population centers, would be very unfortunate, but it would be surmountable. On the other hand, a Fukushima type of accident here could cost millions of lives, the destruction of food sources, the destruction of cultural and economic sources the likes

of which the world has never seen. An accident at that particular location, near both San Diego and Los Angeles, would have economic impacts that would last generations. Such economic impacts would dwarf those of the Great Recession, as real estate values in Southern California would tumble permanently. A major accident at San Onofre would end California as we know it. We cannot take such chances. No, I refuse to accept Mr. Dricks' evaluation of the situation, that the nuclear waste must remain on site. And I hope other Californians will do the same thing. Let's pay whatever it takes and get those materials away from our population centers. If we don't, our children and grandchildren will never have security. (0220-3 [Degher, Darius])

Comment: Finally, I am living in St. Louis, MO, a city that has been contaminated by nuclear waste for seven decades. The Mallinckroft corporation took part in the Manhattan Project, and purified the uranium that was eventually used in the creation of Big Boy and Little Boy, the nuclear bombs dropped on Hiroshima and Nagasaki. The nuclear waste left over from this purification process was stored in metal drums that rusted under the sun and weather in a parking lot north of Lambert Field airport for two decades before being buried in landfills across the city, like West Lake Landfill. These landfills were not set up to retain nuclear waste; there are no concrete and lead bunkers for the material...just clay. These drums have been leaking for decades into the environment and a local stream, Cold Water Creek, that then empties into the Missouri River, eight miles upstream from the spot where St. Louis draws its drinking water supply. As a result, St. Louis has THE largest cancer cluster in the nation. Although the residents here in the city have tried to work with the EPA and with Republic Services, the owner-operator of the landfill, the nuclear waste remains in place with an underground landfill fire racing towards it. Within one year, we may have a dirty bomb situation in St. Louis. I am appalled at the conditions here, and across the country. If we cannot use nuclear power in a safe manner, then we should not use it at all. (0223-1 [Doctor, Appalled])

Comment: [I]t is my opinion that the use of nuclear energy for electric power, with the attendant problems of nuclear waste generation and storage, represents the single greatest threat to public health that we face in this country. For a few of the 100 nuclear reactors located around the US, including the Pilgrim Nuclear Power Station in Plymouth Massachusetts, the danger is magnified because, in the event of a nuclear accident, a significant population (240,000 on Cape Cod in the off-season) would have to drive toward the disaster in order to escape from it due to limited egress routes. (0230-1 [Garb, James])

Comment: Finally the Pilgrim Nuclear Power Station is an old facility with the same flawed reactor design as at Fukushima, poorly sited, and plagued by mechanical difficulties. It should be shut down immediately before the unthinkable happens. (0230-14 [Garb, James])

Comment: Because of the complex geometry of the San Onofre site, and possibly other pool storage sites, a simple static analysis is not sufficient. Because the San Onofre pools are located between the reactor containment structures on the ocean side, and a steep cliff on the land side, the high-speed linear motion of a tsunami would be converted into a lower-speed very turbulent flow pattern. It is conceivable that this resulting turbulence and possible reflection of the water flow could result in damage to the fuel support structure, displacement of fuel containers, filling the pool with mud or sand, or damage that could reduce the level of water in the pool. The effect could possibly be loss of critically-safe geometry, and/or unsafe reduction in cooling. (0231-2 [Deshotels, Bob])

Comment: It is vital that a new in-depth analysis of the situation be undertaken, especially with regards to spent fuel. There is no long-term solution - there is no safe storage place, there is no

safe transportation. It is almost certain that this spent fuel will be in San Luis Obispo county for thousands of years posing a potential hazard. (0232-2 [Hall, Caroline])

Comment: Just as it is around the country, the spent fuel pools in our region, Calvert Cliffs and Peachbottom have several times as much radioactivity as Daichi #4.(1) Peachbottom shares the Mark 1 design like the Fukushima reactors with the precarious elevated spent fuel pool. (0233-1 [Dubois, Gwen L])

Comment: I live 10 miles downwind from Diablo Canyon NPP, on the central coast of California, a place that is very seismicly active. It is an area of steep hills and ridges, most of which are much steeper than the angle of repose. It is obvious that these hills have been pushed up recently and dramatically and that it is a dynamic landscape. Despite the assurance from PG&E that "it can't happen here" (it referring to the Fukushima disaster) I believe that it could happen here -- Mother Earth is unpredictable. And Diablo Canyon is a disaster waiting to happen. DCNPP is vulnerable not only to earthquakes, but also to extreme storms, tsunamis and terrorist attacks. If --or when -- an emission accident occurs at DCNPP, I will be forced to leave my home, perhaps forever. I would lose my possessions, my life saving (tied up in my home), my garden where I grow most of my food and my community. There would be no recourse for me or for any of my neighbors, since this would be an uninsured disaster. Tens of thousands of people would be affected, along with our prime farmland, scenic coastline and wide ocean. This is a beautiful part of the world but it could be lost to humankind forever. (0236-1 [Reinheimer, Alice])

Comment: Second, do not re-license DCNPP, in fact, revoke it's current operating license. There is no viable plan for removal of radioactive waste from the site. Yet, it cannot be stored safely and indefinitely because of the instability of the ground it sits on. It is folly and arrogance to continue to build up waste when it cannot be safely stored and it cannot be safely removed. This makes no sense and should be stopped as quickly as possible. New solar farms in San Luis Obispo county are currently providing power equivalent to 1/4 of DCNPP's peak output. DCNPP can be replaced with safer alternatives. (0236-3 [Reinheimer, Alice])

Comment: I am writing you because I am concerned that the Columbia Generating Station (CGS) nuclear reactor has been relicensed and approved to generate more waste until 2043. In the last thirty years it has generated 200 million Curies of high level radioactive waste. At this rate, by the end of another thirty years, CGS will have generated 400 million Curies of radioactive waste. This will be more high level radioactive waste than exists on the Hanford Reservation - the most contaminated site in the United States. The DOE has not been able to clean up Hanford. There is nowhere for this waste to go. (0243-1 [Hoch, Susan])

Comment: Communities in the Southeast bear a heavy load of burden when it comes to highly radioactive spent nuclear fuel. There are only five states with over 3,000 metric tons of spent fuel and two of those are in the Southeast in North and South Carolina. Of the 104 licensed reactors in the country, 33 of them are in our region, and all 5 of the reactors currently under construction are here. (0244-3-6 [Hancock, Mandy])

Comment: And I brought with me an article -- I have copies of this for anyone who's interested, and I also have a Rolling Stone article that talks specifically about Miami and Turkey Point. And we think it's pretty interesting that the Rolling Stone is supporting the consensus among scientists, yet it doesn't seem that the NRC is heavily weighing those factors. (0244-3-8 [Hancock, Mandy])

Comment: I want to address my remarks especially to speak about Zion. 40 miles up the road at the Zion Nuclear Power Generation Plant in December, over a thousand tons of high-level radioactive waste is going to be transferred into dry casks, as reported by Pat Daley of Zion Solutions in August 2013. In the near future, in Fukushima, over 400 tons of high-level radioactive waste were transferred out and into dry casks. Zion was operating from '76 to '78. Fukushima was operating from '78 to 2011. What we have here is a situation where we in the Chicago-Milwaukee Metropolitan Area, over six million people, are going to be exposed to comparative or greater risk - from a larger and dirtier radioactive waste fuel transfer, which is projected to take about a year to complete in both places - than what's going to happen soon at Fukushima. Although everyone is doing their best at Zion Solutions, a shell company authorized through Exelon, the scale of decommissioning fuel transfers has never, this scale of decommissioning has never been attempted before. We the people who live within a 50-mile radius of Zion remain deeply concerned because the public oversight and transparency is far from adequate to the enormity and riskiness of the task. Irradiated fuel transfers have never been attempted before on this scale. (0245-10-1 [Lewison, Linda])

Comment: There's the largest General Electric Mark I boiling water reactor in the world at Fermi Unit 2 in Monroe, Michigan, and ironically enough it shares a lot in common with Fukushima Daiichi Unit Number 4. Some 40 years ago, the structural wells were not put in place that can support the crane and the hundred-ton waste transfer casks that would be used to remove the fuel. So, despite having a permit for dry cask storage for several years now, Fermi Unit 2 still has all the waste it's ever generated in its high-level radioactive waste storage pool. (0245-13-3 [Kamps, Kevin])

Comment: I want to just shift with my remaining time to dry cask storage risks in this part of the country. The way I got involved in these issues 20 years ago was at Palisades near Kalamazoo on the Lake Michigan shoreline. A lot of people, including the Attorney General of Michigan, fought the loading of those dry casks, and for a very good reason. They're a hundred yards from the water of Lake Michigan. In fact, they're in violation of NRC earthquake safety regulations. This was brought to light in February of 1994 by the NRC Region III Dry Cask Storage Inspector Dr. Ross Landsman who is now retired. He warned that an earthquake could open up the sand that those casks rest on and they could find themselves on the bottom of Lake Michigan. And in fact, there's enough fissile material still in the waste that, in the presence of water, you could have a chain reaction in the waste. So, that's a risk going on on the Lake Michigan shoreline right now. (0245-13-5 [Kamps, Kevin])

Comment: Another thing about safety is that Braidwood has created a VPP star safety site. And that's not something that corporate pays for, that's something that comes from the people that work there. A lot of people have jobs in other manufacturing industries, you may have to wear a hard hat, you may have to wear safety glasses, you may have to wear steel-toed shoes. Those are just requirements to work in our plants. And it goes beyond just those things, too. It goes to the level of checking components to a degree that you never would have thought that we actually do. So, that's another reason why I have confidence in our station's safety. The first week that I started at Braidwood, I started in radiation protection as I mentioned before, the first for me was on dry cask storage. And it wasn't because I was on a team, it was because I work for a power plant and they wanted me to understand what they were going to be doing outside. And that's the kind of level of effort that our company puts on its employees. They want us to understand what's going on and how to explain to other people, I give a lot of tours and, you know, watch citizens come in and talk to them about the safety of the plant and just really answering any question that they have. I've also talked to college students as well about this as well. And that's why I'm confident. (0245-18-3 [Stenson, Amanda])

Comment: St. Louis purified the first uranium self-sustaining nuclear chain reaction. We have some of the oldest radioactive waste on the planet and it doesn't take a nuclear accident to have to worry about cleaning it up. We're still dealing with it. So, regardless of a hypothetical accident, release of radioactivity into the environment is a significant challenge that takes decades to address. (0245-19-1 [Smith, Ed])

Comment: One problem we have, just so everybody knows, is some of this radioactive material, a significant amount of thorium-230, made it into a landfill in the Missouri River, unlined, which is currently experiencing a surface landfill fire a thousand feet away from the radioactive wastes. And we're bickering with the EPA and other government agencies on exactly how to disposition these radioactive wastes. There's actually people who want to leave it there. (0245-19-2 [Smith, Ed])

Comment: But when we went to go challenge the [Callaway] license extension, we faced challenges including challenges with respect to nuclear fuel pool. We'd have to prove that there were site-specific degradation to the fuel pool is my understanding. I'm not a lawyer but we couldn't comment or challenge the future integrity of that unless we had experienced issues. (0245-19-4 [Smith, Ed])

Comment: Here in Illinois, I don't know how many people from the NRC come from this state, but we have more reactors than any other state, four are the same make and model as the ones that blew in Fukushima. Again, we have the safety violations which are treated so routinely, they're seldom reported in the news except the headlines at Braidwood. So, I would take exception with how fine Braidwood's track record has been, especially dumping polluted, irradiated water on the community unbeknownst to them for ten years. In addition to leaks, we also have, in recent days, the felonies created by folks over at Dresden. So, if our futures are in the hands of an entity and we hear that the people that they're hiring are of this caliber, I do not have confidence. I don't have confidence in an industry that relies on our tax dollars to subsidize its own interests, long guarantees to build new reactors, expecting main street to invest in what Wall Street will not. Wall Street refuses to take on the risk and why should we? For that, I have no confidence. (0245-6-3 [Headington, Maureen])

Comment: Gulf State [River Bend Station] is a nuclear waste site dump, or should be one. (0246-16-5 [Michetti, Susan])

Comment: Three of the worst risks at Limerick are, first, Limerick's use of high burn nuclear fuel; second, its overcrowded, corroding, and thinning fuel pools; and third, its above ground concrete cask storage system is not designed to last the length of time that the waste could be stored in them. First, regarding Limerick's use of high burn nuclear fuel, evidence suggests its use is far more dangerous than fuel previously used at Limerick. Higher radioactive gas releases, increased corrosion, thinning and brittleness of fuel cap cladding, increased radioactivity and decay heat from spent fuels, and increased damage to the fuel rods in the reactors*all these can results ** leading to radiation leaks in the spent fuel pools and casks. My first question is this. Is Exelon using high burn nuclear fuel without regulatory oversight? Second, regarding Limerick's overcrowded fuel pools. These packed, vulnerable, thinning, and corroding pools post catastrophic risks to our heavily populated region. Yet, the NRC is failing to adequate action for precaution. Why does the NRC fail to require Exelon to adequately guard against air strikes or missiles? Why do Limerick's two pools have more spent fuel than even older nuclear plants and twice as much as Fukushima's four pools? Why has the NRC allowed Exelon to put off even studying the risks related to earthquakes when the plant sits on an earthquake fault, is located within 17 miles of four other earthquake faults, and is number three

on the nation's earthquake risk list? Why does the NRC not require immediate recoding of Limerick's fuel pool liners when an NRC safety evaluation found them corroding and thinning up to ten times faster than estimated? Third, regarding Limerick's aboveground concrete cask storage, this is a short-term solution to a long-term problem. (0246-17-3 [Dugdale, Jane])

Comment: Why did the NRC deny the corrosion risks found by a recent NRC safety evaluation and stop its own 2005 study when corrosion concerns were identified? Why were the concerns that ACE expressed to the NRC ignored regarding the design flaws of Limerick's concrete casks? (0246-17-5 [Dugdale, Jane])

Comment: In these tough economic times, this plant [Calvert Cliffs Nuclear Power Station] has provided my community with a stable tax base and jobs. (0246-18-2 [Karbowsky, Brad])

Comment: Now, to get back to Limerick, the Limerick Nuke Plant has an earthquake fault line directly under it, which is called the Sanatoga fault line and there are four others within 17 miles. I, well, started researching these to see if there were any earthquake fault lines and I received a map but I didn't receive the Sanatoga fault line that was directly under it. That was missing from the map I was given by the NRC. Hmm, so I don't know what that was all about. But anyway, Limerick has miles of underground pipes and that really worries my family and friends. They have taken so much water from the Schuylkill River, which is our bathing water and we drink it. Now, it is contaminated with mine water from Wadesville Mine. They are pumping in massive amounts of it. They use millions of gallons a day, more than three times a day just to make that power plant work. Pretty soon, there is not going to be any water left. (0246-23-4 [Ruppe, Lorraine])

Comment: I would just like to provide one example regarding issues of spent fuel storage. And this is an example of current unsafe conditions in Indian Point Unit 2's spent fuel pool. So, just some background. In an NRC meeting in September 2013 regarding Japan Lessons Learned Project, Rod McCullum of the Nuclear Energy Institute stated, "We understand in the industry we can no longer rely on boroflex." Boroflex is a neutron absorber which is intended to help prevent criticality accidents and it is located in spent fuel racks. Boroflex has a documented history of degrading. Nonetheless, it is still used in a number of spent fuel pools, including Indian Point Unit 2's spent fuel pool. And there is a document from 2002 that says that the high-density storage racks in Region 1-2 of the Indian Point Unit 2 spent fuel pool were "assumed to have sustained a 50 percent loss of boroflex." That is due to degradation. That can be found in your ADAMS database at ML021230367. So, that is back in 2002. However, that is actually based on a criticality analysis that was done in September 20, 2001 because there is an NRC letter regarding Indian Point Unit 2 that is from that September 24, 2013. And that letter says that the current criticality analysis of record, which takes credit for boroflex insert as neutron absorbers was submitted back in 2001. And then it also notes that subsequent operating experience has demonstrated the non-uniform physical degradation of boroflex inserts. Now, that is in ADAMS database at ML13256A086. So, basically back in 2001 your current analysis of record for criticality concerns, that assumed a sustained loss of 50 percent of boroflex that was in the Region 1-2 part of the spent fuel pool. So, how much boroflex is left now, 12 years later? Apparently, there was a criticality analysis that was supposed to come out in November of this year. I'm not sure if that has been released yet. But basically, there was assumed that there was a loss at that time, 12 years ago. And even Entergy, the licensee of Indian Point, even they have acknowledged that the current, at least the one from 2001 was non-conservative. So, I mean this is just one little example of a myriad of other problems that are going on with spent fuel pools and I just wanted to cite it just to give some concrete evidence. This is Indian Point. (0246-28-1 [Leyse, Mark])

Comment: But Illinois has even more in common with Fukushima than just four Fukushima twin reactors that need to be shut down for safety inspections. Just as Fukushima is about to start the high-risk, high-level radioactive waste fuel transfers out of Unit 4, 40 miles north of Chicago, the Zion Nuclear Generation Plant is about to start its own fuel transfer operation in December of irradiated fuel of over 1,000 tons of high-level radioactive waste, almost three times the amount that, as Erica described -- this very high-risk operation is going to happen in Japan. This is the largest scale decommissioning in history. (0246-9-3 [Lewison, Linda])

Comment: In conclusion, there can be NO CONFIDENCE that Limerick's nuclear wastes do not jeopardize our future. (0249-13 [Dugdale, Jane])

Comment: o The steel rails holding the steel containers inside the casks are highly vulnerable to corrosion, likely rendering the containers they support virtually impossible to extract. Highly corrosive air from Limerick's massive cooling tower plume enters the vents of the cask system, according to its design. This plume is so corrosive it can crack steel within a year, according to an NRC recent safety evaluation. Why did the NRC deny this corrosion risk and stop its own 2005 study when corrosion concerns were identified? o Because Limerick's concrete casks have serious design flaws, including faulty concrete and undetectable corrosion. ACE expressed concerns to NRC and elected officials. Why were our concerns ignored? (0249-16 [Dugdale, Jane])

Comment: Three of the worst risks at Limerick are, first, Limerick's use of "high-burn" nuclear fuel; second, its overcrowded, corroding and thinning fuel pools; and third, its above ground concrete cask storage system, not designed to last the length of time the wastes could be stored in them. (0249-4 [Dugdale, Jane])

Comment: Second, regarding Limerick's overcrowded fuel pools, these packed, vulnerable, thinning and corroding pools pose catastrophic risks to our heavily populated region, yet the NRC is failing to take adequate action for precaution. These pools, similar to the roof-top pools at Fukushima now threatening the world, are highly vulnerable to loss of water, meltdown, and fire. o Loss of water can be caused by earthquakes, terrorist planes, or missiles. As the world now knows, with loss of water, roof-top spent fuel rods will heat up, self-ignite, and burn in an unstoppable fire, causing tens of thousands of deaths up to 500 miles away. Why does the NRC fail to require Exelon to adequately guard against air strikes or missiles? o Limerick's two fuel pools, packed far beyond design basis, contain twice as much radioactive waste as the four Fukushima fuel pools, and far more than many other, older US nuclear plants. Why does Limerick have so much so-called "spent" fuel in its roof-top pools? Why does Limerick have more spent fuel than even older nuclear plants? o Limerick's fuel pools were constructed with substandard cement, according to a Limerick construction site engineer, and the plant sits on an earthquake fault. In addition, it is located within 17 miles of four other earthquake faults, but the NRC has allowed Exelon until 2017 to complete even an earthquake study. Why? Why has the NRC allowed Exelon to put off even studying the risks related to earthquakes, when the plant is #3 on the nation's earthquake risk list? o Limerick's fuel pool liners are corroding and thinning up to 10 times faster than estimated, according to an NRC Safety Evaluation. NRC staff told Exelon to immediately recoat the liners, but then the NRC caved in to Exelon's request to put off the recoating for a decade. Why? Why did the NRC not require immediate recoating? o Why is the NRC allowing Limerick to transfer fuel rods from the fuel pools to dry storage casks after just 1-3 years, when the NRC literature states it is unsafe to remove them from the fuel pools for cask storage before five years? (0249-6 [Dugdale, Jane])

Comment: Third, regarding Limerick's above ground concrete cask storage system, this is a short term solution to a long term problem. (0249-7 [Dugdale, Jane])

Comment: Recently, I was over doing my civic duty, voting absentee since I am working the polls tomorrow, and lo and behold on the television news on the TV overhead in the room over at the Election Commission meeting, the TV reporter reported tritium leaks over at the nearby Catawba Plant, not far from Charlotte, fact, not emotion. For the first time, I heard several voters, black, white, all walks of life, expressing their unanimous concern over tritium leaking from the Catawba Plant. (0250-20-1 [Cooper, Elaine])

Comment: Closer to home, V.C. Summer has waste that is an overcrowded -- it's spent fuel pools. Residents who live around V.C. Summer express their extreme concern over the risk to the public from these overcrowded spent fuel pools to me, saying that as I man the booth over at the State Fair. And I think many of the residents heard this over a period of two weeks over and over, that residents were concerned about spent fuel being piled up in overcrowded spent fuel pools. (0250-20-4 [Cooper, Elaine])

Comment: I'm wondering if some of you have heard that Plant Vogtle, as mentioned on the radio last week, had 75 violations. (0250-22-2 [Hands, Tara])

Comment: And I looked up the Catawba accident leak and, of course, the response is that there's no problem, everything is safe. They've got it under control, but the very last sentence of this article from WBTV says, "The U.S. Environmental Protection Agency says drinking water that contains tritium can increase the risk of developing cancer." (0250-29-9 [Rivard, Betsey])

Comment: The Unit 3 concrete pour was a continuous pour lasting approximately 43 hours, with the placement of approximately 7,000 cubic yards of concrete. Safe, reliable electric generation is a high priority for our customers in South Carolina. (0250-3-3 [Archie, Jeff])

Comment: I have been studying the nuclear waste situation for the past 20 years, having lived in the shadow of nuclear energy plants both here in North Carolina and previously in Florida, and also being made to pay for them advance, even if they don't come on line. Now, that's my own added. I have attended conferences to deal with this issue and have heard former government employees say that this area of the Southern U.S., at least a five-state radius, has been referred to as a nuclear sacrifice zone. I wonder if you ever heard that. I've heard it several times. (0250-42-3 [Arnason, Deb])

Comment: Now I live on the Cumberland Plateau in Tennessee, not too far from the Watts Bar Nuclear Reactor, the last reactor completed in this country. They were going to build two there, but they abandoned one because they went so far over budget, which is pretty common with this industry. And currently at that reactor, they are making tritium and using it to maintain the stockpile of U.S. nuclear weapons, which is really shameful when they should be destroying those. And the tritium is getting into the water of the Tennessee River and affecting that ecosystem as well. And they're currently trying to finish that reactor that they abandoned so many years ago. The Tennessee Valley Authority is. It's one of the sites where they are constructing a new reactor. (0250-50-1 [Blevins, Eric])

Comment: And a really important part of this work is working with communities that live near Plant Vogtle, which, as you know, is the construction site for the first two new nuclear reactors in the U.S. in about three decades; and also the Savannah River site, which is a Superfund toxic nuclear waste facility that is -- well, waste and weapons facility that is struggling to clean up its

tanks and is also slated to start producing mixed oxide plutonium fuel for nuclear power reactors. These communities are dealing with a long legacy of nuclear waste, of contamination, of environmental racism, and economic depression. So in Georgia, we really have a lot at stake when it comes to this Waste Confidence Rule and also the draft Environmental Impact Statement, which I can assure you we have read in full. And this is why we [Georgia WAND] have stood up together to oppose expansion at Vogtle and also to oppose consolidated interim storage at Savannah River site. (0250-66-1 [Hanson, Courtney])

Comment: In South Carolina, like I said, we're very concerned about nuclear waste. We have seven operating reactors. I don't think any of the fuel at V.C. Summer has left the pool. I don't think there's any dry casks, so that pool has got to be pretty full. We have a low-level site, Barnwell. It's been leaking for decades. It's been migrating underground, contaminating nearby groundwater and streams. And of course we have the Savannah River site, which is an ongoing problem. (0250-7-2 [Corbett, Susan])

Comment: We just had a situation down at the Savannah River site because there was a proposal brought to the Citizens Advisory Board, asking them to sign off on Savannah River site being used as interim storage. After many months of discussions, the Citizens Advisory Board voted 17 to 6, opposing any spent fuel storage in Savannah River site. (0250-7-5 [Corbett, Susan])

Comment: Presently, highly radioactive used spent fuel cells are stored on site. At Diablo Canyon nuclear plant, most are in pools. These pools are overcrowded and becoming more so as spent fuel cells are regularly replaced. These overcrowded pools of spent fuel cells are a threat to the health and safety of the community. Diablo Canyon nuclear plant is constructed on and surrounded by earthquake faults. The potential for unexpected damage to the plant as a result of earthquakes is always present. In addition to the possibility of a greater than anticipated natural disaster, the plant is also vulnerable to human error accidents and damage intentionally created. (0252-2 [Golden, Leon] [Goldin, Martha])

Comment: The closing of the San Onofre nuclear power plant means that 1,100 workers will lose their jobs. As an elected official that visited this plant, along with other members of Hispanic Elected Local Officials (HELO), I saw first-hand the number of jobs this plant was providing to CA residents. The decision to close this plant will have economic repercussions. (0253-2 [Avilla, Karen])

Comment: I suggest this material be stored in the backyards of the NRC which permitted this plant to even operate. It should NOT stored at Diablo (which is on top of earthquake faults like Japan) which is upwind to Nipomo. (0254-3 [Denneen, Bill])

Comment: Another potential "hot spot" for my part of the country is the former Trojan Nuclear Plant, also situated on the Columbia River. There is still nuclear waste being stored on that site, with no place for it to be taken for more permanent and safer storage. (0269-2 [Gale, Maradel])

Comment: Finally, please do not allow Illinois to become a nuclear waste dump. No dangerous high-level radioactive wastes should be coming to or being transported through Illinois. (0272-4 [Leighton, Taigen])

Comment: Of all the reasons people give us for wanting to move away from Illinois, I can say that no one has ever mentioned the stored nuclear waste as a reason. The tax structure, the pension problem, the high workers camp rates, the destructive attitudes in Springfield to the

business community -- THOSE are radioactive issues that keep business from coming to or growing in our state. (0275-4 [Wolf, Tom])

Comment: Since 1998, the taxpayer has been paying billions of dollars to the Nuclear Energy companies like SCE to store nuclear waste on site until a place can be found to dispose of it. This fine goes on as long as the spent fuel is stored on site. How much money has SCE been paid by the Federal government since 1998 for the spent fuel it has stored at SONGS? How was that money used? How much money will SCE get each year even with the plant shut down for leaving the spent fuel at SONGS? Is there any law forcing SCE to spend the money from this fine for moving the spent fuel into transportable casks? Must the money be used for something related to storage of spent nuclear fuel or does it just go into the SCE or for that matter the International Edison general fund? (0280-11 [Magda, Marni])

Comment: SONGS must have attention paid immediately to its vulnerable spent fuel. The two years to create a PSDAR is too long to get in motion the kind of actions that are necessary to save Southern California from calamity and must begin today, not in two years. Southern California Edison has lied to the public about safety problems at SONGS of which the company was well aware. They knew the steam generators were a faulty design before they were installed. They have a constant record that is public information now of failures to adhere to safety regulations. The company puts profit before safety. With this terrible record, they must not be given oversight of the Decommissioning of SONGS. There is a history that would show the \$4 billion dollars set aside to decommission SONGS would not be used for immediate, final solutions. There is profit for Edison in keeping the spent fuel on site. Since a US Military Base is in jeopardy if anything goes wrong with the spent fuel sitting at SONGS, and it is on military land, can the execution of the removal of the spent fuel be placed in the capable hands of someone from the military, protecting the future of Camp Pendleton Marine Base? When for two years Elmo Collins, who was then the administrative director of NRC Region IV, met with the public at NRC hearings and told us that SONGS was safe, he listed each of the possible disasters and said behind it, "adequate protection." He was referring to the nuclear fuel within the reactor domes. With the shutdown of SONGS, the public has learned that the 1631 tons of spent fuel on site is not held to that standard of safety. The spent fuel cooling pools are outside the reactor domes. They were not created for long term storage and are not required to have "defense-in-depth" nuclear safety features. SCE has the worst safety record of all nuclear energy companies in the United States. They are going to continue to falsely tell the public that safety is their first concern. We are playing with our future every day the spent fuel sits at SONGS. (0280-2 [Magda, Marni])

Comment: There is a vast difference in the type of the dry storage casks being used around the country for storing nuclear spent fuel. According to the Blue Ribbon Committee's report to the President in January of 2012, the US Navy has 50 final geologic disposal, transportable casks for its movement of nuclear waste out of Idaho by 2035. It will have 350 more before that date. How long does it take to make these casks? What do they cost? Is there any reason we can't use them at SONGS? Final disposal and transportable -that must be our goal. SCE profit in storing nuclear spent fuel on site at SONGS cannot be allowed to make us pretend that spent fuel should stay at SONGS for years. It shouldn't be there for even days. The Friends of the Earth report by Alvarez said the casks SCE is considering will be a million dollars each. Who determines the certification of the number of years a cask is safe? Many in the country currently are said to be certified at 30 to 40 years. What makes a ten year difference? What do we do after the thirty or 40 years are up? Who sets the value of a cask, another corporation like SCE who values profit over public safety? (0280-6 [Magda, Marni])

Comment: When the four billion dollars projected to be spent decommissioning SONGS is spent, does that include final disposal of all spent fuel created at SONGS, even that which lasts 24,000 years? What dates did the current 42 casks for dry storage get fuel placed in them? These casks were constructed somewhere near SONGS. What is their certification for length of safe storage? Are these dry storage casks considered transportable? In Sept 2014, SCE wants to lower safety standards by using the NUHOMS 32PTH2 dry cask system. This requires crowding 32 fuel assemblies into the same size cask that currently holds 24. Who makes the approval of such a change? Edison always chooses profit over safety. Who will decide? What safety consideration would allow that change? (0280-8 [Magda, Marni])

Comment: Dr. Arjun Makhijani, President of the Institute for Energy and Environmental Research, noted ironically that "the domes are the most visible part of a nuclear plant. They exist to protect against meltdown of the reactor core. Once the reactor is shut, the domes are just decoration." Makhijani said San Onofre has 3200 -3400 spent fuel assemblies containing 120 million curies of radioactive waste. "A curie is a lot of radioactivity. Each curie represents 37 billion radioactive disintegrations per second." Makhijani warned, "After a nuclear plant ceases operation a large part of the risk remains, especially the spent fuel pools. A fuel pool fire would create almost 100 times as much radiation as a dry cask fire." Like Resnikoff, Makhijani addressed the high burn fuel issue. "San Onofre has been authorized to use fuel rods that run hotter and contain more radiation but they seem to have exceeded to NRC high burn limit of 62.5 gigawatts. What we know about spent fuel in dry storage is based entirely on experience with low-burn fuel. Why high-burn was authorized at San Onofre without knowing how it might affect storage is a huge concern." The greatest risk during decommissioning, Makhijani said, is in maintaining pool storage and in dealing with dry casks that are certified only for 20 years. "We don't want to be transferring spent fuel from one cask to another if an assembly has been damaged. And in actual experience, there has never been a transfer from one dry cask to another under any circumstance." The endgame in Makhijani's view: "We need to work on a repository. All other solutions are much less adequate. A worst-case event on the surface, especially in a sensitive area like San Onofre, is an order of magnitude more severe than worst-case in deep geologic storage. Our goal should be to store waste in a way where the worst-case is not catastrophic." Makhijani asked why the U.S. government and international agencies aren't thinking more about precluding unacceptable consequences. One reason he cited is a kind of "risk analysis" that cancels out the seriousness of outcomes by rating the worst cases as extremely improbable. "Yet at Chernobyl and Fukushima they have happened," he concluded. (0283-2 [Pascall, Glenn] [Watland, George])

Comment: Bottom line for the Sierra Club: In the shutdown phase, the minimal response -fast track restart -was not adequate and did not prevail. In the decommissioning phase, the minimal response -San Onofre as a long-term mausoleum for "high burn" and other nuclear fuel waste - is not adequate and should not prevail. Our goal is a "better outcome" that creates a new national standard. (0283-3 [Pascall, Glenn] [Watland, George])

Comment: The projected Scope of Decommissioning Project, and Decommissioning Costs are currently still preliminary, only in early stages being prepared by SCE, or considered by CPUC, CEC, and NRC, and are still largely UNCERTAIN. It is important that NRC will require Licensee to fully perform Decommissioning at SONGS in safest, most reliable method, the most "in Public Interest" method possible, and not necessarily the least expensive for Licensee (SCE), contractors, or subcontractors. Timing of NRC actions should be more carefully coordinated with action(s) also pending with CPUC, CEC, California Coastal Commission. (0284-11 [Borchmann, Patricia])

Comment: Another credible new unanalyzed threat should receive scrutiny in an updated, more rigorous scientific analysis, which consists of the possible designation for San Diego as a new 'drone testing' facility. While 'drone analysts' might believe that designating San Diego as a new drone testing facility poses minimal, or no risk(s), I am unconvinced, and I have requested County of San Diego Board of Supervisors to reevaluate that recent action. (0284-4 [Borchmann, Patricia])

Comment: Our beach communities near SanO are more vulnerable than ever to radioactive disasters, thanks to planned major construction on the I-5 in 2014 through 2017. This planned widening will start from the San Juan Creek Rd. and finish just south of Avenida Pico. The I-5 is our lifeline to evacuation. Should, God forbid, any natural or terrorist disaster occur to disrupt the tons of thermonuclear waste stored at SanO, We are trapped. We are dead for sure. San Onofre's waste must be moved inland away from population concentrations as a national number one priority. In the meantime, we must stop this freeway widening, bridge demolition I-5 project before it starts. That freeway is the only possible way of escape from disasters to our stored nuclear waste --if any is possible, for people living in and visiting our beach communities. (0285-1 [Kernahan, Mel])

Comment: I am in favor of the safe restart of San Onofre, because it had significant economic value, it was a stabilizing power source for Southern California, and operated safely with a zero carbon footprint. But the decision was made to shut down both units. Thus, provision for safe storage of the spent fuel rods must be made before site clean up plans can be finalized. This is a national issue for plants across the nation, not San Onofre alone. (0286-1 [Hannaman, Bill])

Comment: In the case of Diablo, the stakes are way too high to allow these false assumptions. 1. Diablo's two reactors are surrounded by 13 earthquake faults, one of which is only one kilometer from Unit 1 -the Shoreline. And the Diablo Cove fault cuts into the bedrock of that reactor and appears to intersect with the Shoreline fault. (0287-4 [Swanson, Jane])

Comment: My recommendation is that Diablo Canyon Nuclear Power Plant be shut down now and the spent fuel removed. (0289-1 [Curren, Elizabeth])

Comment: I am very concerned, even more so after listening to this meeting. PG&G need to be brought into safety compliance. Earthquake faults (13??) No final repository plan[.] (0291-1 [Mauter, Nancy])

Comment: I pray for you to close the plant and begin the long road to cleaning up the mess we have created for future generations. Be the one remembered for being the catalyst that made a difference. Rather than carrying the Karma from all of us who have been affected by your decisions. Be the change—close Diablo today! (0292-4 [Comer, Gail])

Comment: DCPD [Diablo Canyon Power Plant] is located on one a piece of coastline that has very high potential for serious seismic activity. I have fished the coast commercially, near-shore, for 17 years from Point Purisima To Point Año Nuevo. It is obvious from a simple view from the water, that DCPD is located in a place where violent seismic activity has occurred in the past. The only other places on the entire stretch of coast I have described that have anything even close to the type of violent seismically formed rock structures as that surrounding DCPD, are that of Point Lobos Reserve area, and some of the coastline along Big Sur. DCPD is a nightmare waiting to happen. (0298-1 [Terra, Ben])

Comment: Please do the job that you are paid to do, and see to it that DCPD [Diablo Canyon Power Plant] is shut down. (0298-3 [Terra, Ben])

Comment: It is also time for Diablo Canyon to shut down. Old plant. Sits on earthquake faults. Once-through-cooling system doing detrimental damage. Over-filled waste storage. (0299-2 [Smith, Diane])

Comment: Close Diablo Canyon Plant. There can be no confidence in nuclear waste disposal. There is no viable alternative to closing the plant. There are large concerns that cannot be mitigated. (0301-1 [Hayati, Sally])

Comment: As a resident of San Luis Obispo I am very concerned about the storage of spent nuclear waste at Diablo Nuclear Plant. I understand it stays radioactive for a very long time. After the Fukushima disaster I hope the NRC will seriously consider closing Diablo and making sure the storage of the waste already there is as safe as humanly possible. (0311-1 [Johnson, Madeleine])

Comment: San Onofre needs to be rebuilt with new technology reactors that use the spent fuel from the old reactors. After all the electric generators and infrastructure are all there. (0312-3 [Meyer, Charles])

Comment: I live in the 10 mile zone of Indian Point Nuclear Facility. The spent fuel pools are old, leaking and require many backup systems. (0318-1 [Saltzman, Dale])

Comment: And back on the whole seismic topic, we only have to go back to 1930 here in California where off the coast of Redondo Beach was a rock slide triggered by a fairly small on land earthquake, that triggered a 9-foot tsunami, that went right ashore within about two minutes of the onshore 3.0 earthquake. This huge tsunami just sprang up, swept inward to places which are now LAX and downtown LA, Orange County were all inundated, so we really have no advance warning. We never know when that wave will come. So with that, I yield back my time. (0325-10-2 [Chambers, Fred])

Comment: What frightens me is the hours and hours of human beings putting this together when what we need is solid answers for San Onofre right now, not two years from now, not Southern California Edison making the decisions, but please, Diane Feinstein, Senator Feinstein, Congresswoman Loretta Sanchez, Congressman Dana Rohrabacher, Senator Barbara Boxer, we must have you with Jerry Brown, Governor Jerry Brown. We must have a political solution beginning immediately that takes this responsibility away from a company that has two years where they get our taxpayer's money, taxpayer's money to keep the fuel for 60 years where it is. We keep paying the fine. (0325-12-2 [Magda, Marni])

Comment: We need to have thermal nuclear base in California, away from the 8.4 million people, where we are away from the ocean, the rising tides. We don't have 60 years to leave this here. We know that, it's like we're sitting here like foolish children. We know we must move it. We've got to put all of our best minds together and put the money -- if it costs \$10 million per cask, we've got to find it and do it now. (0325-12-6 [Magda, Marni])

Comment: In 1993, we did cross-ties to make it even more efficient than it is today, so that if something goes over here, it can go over there. What just happened over there recently had nothing to do with who built the plant, how we built the plant, or nothing. Okay? That was something they had somewhere else and they brought it here. They tried to do something, but it worked for 27 years and was not a problem. And we didn't have any of these meetings at all, did

we? We didn't have all this stuff going on. Does the NRC need to do things? Of course they do. Do they try to do it? All the time they try to do it; every day they try to move forward and make things better. Don't think they're not. These people down here don't want to die. Think about that. They're not just blowing this stuff up to play games. Okay? They're here to make it happen, and to make it work. (0325-14-2 [Sallis, Gary])

Comment: Our student group applauds the NRC's handling of San Onofre, both locally and through in-person discussions, which I've had with Chairman McFarland during the student delegation (0325-17-3 [Pearson, Jeremy])

Comment: I think, and this is personal feeling, I think the NRC has done a wonderful job protecting workers at the San Onofre plant, the workers that I represent, 35,000 strong who have lost their jobs due to the shutdown of the nuclear plant. (0325-18-3 [Lemmon, Tom])

Comment: When we talk about nuclear waste, obviously we have Hanford Reservation leaking into the Columbia River. We've had several issues with Indian Point leaking into -- tritium into the Hudson River. We've got all sorts of issues, aboveground nuclear testing that went on all over this country in several sites until 1963. We have a history of accidents reported, unreported, and we always have our regulatory agencies coming in and saying there is no immediate problem. The public is not at risk. There is no problem with public health. (0325-21-1 [Iwane, Cathy])

Comment: Believe me, if you've been to San Onofre, if you walked the beach there, you know how close to the ocean it is. If you've lived in San Clemente, you know it's been a concern just down the road. We're almost next door. We have this concern for people. Now, if we're here to help rewrite some rules or help with adjudication, I'm sorry, I'm not qualified for that. But I am qualified, I think, as a person who's lived here a long time to care about my family, my neighbors, what happens on the freeway, the fact that the toll roads are considering building an extension that would end at the trestles. It was in the paper the other day. I mean, that's our neighbor down there, and it's a very sick neighbor. And to think that there's anything that can be done other than moving it, at least the dangerous stuff, inland where it is not within the reach of the sea, then I'm afraid that I have to differ with them. And it's a personal thing. It isn't theoretical, it isn't about what an agency should do, it's about how we're going to live here. (0325-24-4 [Kernahan, Gary])

Comment: [I]t's heartbreaking what the nuclear industry has done to our state, not only from this side of the Pacific, but the General Electric plant that is seeping and flowing to our shores from Fukushima. (0325-28-1 [Branigan, Mary Beth])

Comment: I believe that as long as San Onofre's high-level nuclear waste remains onsite it should be stored as safely as possible until it be safely moved, if ever. (0325-29-1 [Feathers, Jösan])

Comment: At SONGS, the NRC assured the state that they followed their 50.59 process to the letter, and yet steam generators were dysfunctional and will be subject to years of litigation and unanticipated rate payer and utility costs. At Diablo Canyon, the NRC is assuring the State that although Diablo Canyon does not meet its safe shutdown earthquake requirements, we should trust the NRC's Probabilistic Risk Assessment process that they will eventually determine that we need not be concerned. I'd like to mention that the evaluation released today uses the word "seismic" more than 100 times. California can have no confidence that waste can safely remain on our vulnerable coast. The NRC itself has been able to find a solution, yet the NRC's

decisions will eventually be paid for generations that will never receive a kilowatt of benefit from SCE's [Southern California Edison's] or PG&E's aging reactors. (0325-3-4 [Becker, Rochelle])

Comment: The tsunamis we talked about. We didn't even talk about what happens if there's an offshore landslide like what happened in 2004 in Banda Aceh, causing a tsunami that is way, way bigger than any of these estimates that they have for a long far-away tsunami wave finally getting to us. We can have a thousand-foot wave right here. (0325-7-5 [Hoffman, Ace])

Comment: [T]he first thing we have to do is shut down Diablo Canyon. (0325-7-8 [Hoffman, Ace])

Comment: Through the years, all of our concerns and our research about the defective and the now closed San Onofre plant continuously spotlights new revelations that actually continually bring us less confidence. (0325-8-1 [Von Thillo, Grace])

Comment: The proposal to store this waste indefinitely on our seismically active coastline dismisses the value of the health and prosperity of all of us living in this community. (0326-10-2 [ZamEk, Jill])

Comment: "I am here this evening to support the reasoning of many in this county who have a great concern over the huge and growing amount of nuclear waste accumulating at Diablo Canyon Plant. The high-level waste of the cooling pools is of critical importance." (0326-14-1 [Brown, Marti])

Comment: The only solution is to stop making the waste by shutting down Diablo and moving the waste to dry casks as soon as possible. The NRC is mandated by the Atomic Energy Act to put the health and safety of people above the economic interests of the nuclear power industry. A major earthquake greater than Diablo was built to withstand is possible according to the U.S. Geological Survey. What will happen then? Another Fukushima? (0326-20-3 [Caulfield, Lee])

Comment: I lived in Santa Barbara, actually, in Isla Vista, under the shadow of Diablo, and it's been over me since 1980, which is long enough. In 1981 and '82, I studied all aspects of the nuclear industry, the economics, the waste, the history, the mining, the accidents; I studied all the aspects, and Diablo specifically, and I was there when they put the reactor in backwards, and said, oh, it's just a minor mistake. It's all right. And from '81 to '82, I continued to study the nuclear industry and Diablo, to defend the arrest of 500 people who protested the licensing of Diablo, and it's still here today. (0326-21-1 [Conn, Diane])

Comment: The U.S. is still working on the plan for long-term storage of nuclear power plant waste. Please raise your hand now if you have confidence in the NRC's radioactive waste storage and environmental impact plan. The first and only storage repository in the world is under construction in Finland. Onkalo should be completed around 2020. The estimated price tag? About 818 million Euros, to be paid for by the power consuming customers. Just how stable is the world's political situation, and for how long? Diablo Canyon sits near 13 fault lines on an unprotected coast. It's fuel rods are in overcrowded water pools. A temporary holding place, we are told. They need, now, to be stored as safely as possible in dry casks and moved to a permanent storage facility as soon as that is available by the Federal government, away from San Luis Obispo County. (0326-23-3 [Malboeuf, Simone])

Comment: I was born and raised in the City of San Luis Obispo and chose to return to the City of San Luis Obispo and raise my children here. I have toured the plant and I believe in the work that PG&E is doing there, and I support the work that PG&E is doing there. (0326-27-1 [Devitt, Andrea])

Comment: First, I would like to acknowledge my respect, trust, and confidence in PG&E and its employees. For several decades now, PG&E and its employees have been our caring and involved community partner. Over the years, they have supported our mission by generously sharing their resources through volunteer time and donations. They continue to sit on our Board and are the parents of some of our youth board members. Additionally, I have always been pleased with the way they operate the Diablo Power Plant from the several opportunities I have had to visit and tour the plant. (0326-33-1 [London, Rick])

Comment: Where my concern lies, which is relevant to this evening's public meeting on Waste Confidence, comes from my 14 years living on Long Island, New York. My concern comes from the fact that during the 11 years it took to build the Shoreham Nuclear Power Plant, Suffolk County residents were promised an evacuation plan that ended up not being possible. The plant was never approved for operation and most of the \$6 billion cost was passed on to the Long Island residents. To this day, I wonder why the Long Island Lighting Company was ever allowed to break ground. Of course, it was because we were promised the certainty of a safe and sound evacuation plan. (0326-33-3 [London, Rick])

Comment: We talk about -- somebody mentioned that, Carrie Safford, I believe, said that rulemaking is one of the most important things we do at the NRC, that's what we're talking about, this Rule on waste; well, that's all good and well, but if you don't obey your rules, if you don't follow them, then it doesn't mean anything, and we're currently not following them regarding the license at Diablo Canyon. They are exceeding -- well, we don't know the seismic risk of the Hosgri and Shoreline faults; it may very well exceed the design basis of the plant. We don't know because the calculations haven't been properly done. If the rules were being followed, Diablo would be shut down right now, and they're not doing it. So in some sense, this meeting is kind of a farce because, if you don't follow the rules, what's the point of talking a whole lot about what they're going to be? (0326-34-3 [Phillips, Mark])

Comment: And then, I want to also say that I took the tour at Diablo earlier this year, and I asked how many solar panels they had installed. Well, they have about 15 of them on some light poles. They have no solar production. It's embarrassing. So I challenge them to continue shutting this plant down. It is too old to be safe. (0326-35-3 [Owen, Linde])

Comment: And I would ask that you begin tomorrow designing wind, safe solar that does not kill birds, wave generation, and then get us on to a good rooftop program, and give us a chance to shut that thing down [Diablo Canyon Nuclear Power Plant] and have enough energy. (0326-35-4 [Owen, Linde])

Comment: The second is that, as a resident living not far from the plant, I certainly have the confidence in PG&E and their ability to continue to store the spent fuel and operate the plant in a safe and secure manner. (0326-37-3 [Rethmeier, Blain])

Comment: First, if the Nuclear Regulatory Commission is seriously concerned about the health and safety of the citizens living on the Central Coast of California, it should, one, immediately suspend the operating licenses of the Diablo Canyon Plant until that nuclear plant is brought into compliance with existing NRC safety regulations regarding earthquake threats. And two, immediately move all of the fuel stored in spent fuel pools to an offsite location not vulnerable to earthquake risks and subsequently transfer them to dry cask storage. (0326-4-2 [Brown, Jerry])

Comment: A recent report by the Union of Concerned Scientists says that, in the case of Diablo Canyon, the NRC is ignoring its regulations, unfairly exposing millions of Americans to undue risk. There is a one in six risk of an accident, an earthquake, a serious earthquake at Diablo Canyon every year that this plant operates. One in six. (0326-4-5 [Brown, Jerry])

Comment: So I'd like to have a much shorter range solution to Diablo Canyon, and that would be to have it be converted to solar, wind production, wave production, and for decommission. (0326-43-2 [Rippner, Sharon])

Comment: What makes the situation at Fukushima right now, with the dangerous transitions from their open pools to their dry casks is that, this all was very unnecessary. All of Fukushima's dry casks containing spent fuel assemblies that were stored prior to the earthquake tsunami have survived without damage or release into the environment. The similarities between Fukushima and Diablo Canyon are chilling in the type of plant, the manner of storage, the proximity to earthquake faults, and the lack of government insistence that storage regulations be followed.. (0326-43-5 [Rippner, Sharon])

Comment: Since time immemorial, there are stories that have been handed down from generation to generation of dangers of Diablo Canyon. There is also documentation in the mission records, even more in recent history, as well as current studies, which is enough proof that Diablo Canyon Nuclear Power Plant is in a catastrophic location without projecting potential dangers of climate change. As stated before, Diablo Cove faults run directly under Unit 1 Reactor. Seismologist Jim Brune proved the faults around Diablo Canyon Nuclear Power Plant would give vertical acceleration. (0326-45-2 [Baker, Crystal])

Comment: My children, I have a little picture of them here, right there, and one thing that haunts me is the question; when you knew Diablo was not safe, what did you do? I hope we can, one day, say that we shut it down. You can't see it very well, but this is a map of Fukushima, the 12-mile radius is there; this is pretty much us, which is about 8-1/2 miles. I'm not just speaking as a parent and as a, you know, crazy liberal, if you will. I am a mechanical engineer, a software engineer; I have never had a design fail where I thought it would fail. I appreciate all of the Diablo engineers talking about how safe they think it is. I actually worked at PG&E at one point, and I understand how things fail, and it's not how you expect it. (0326-47-2 [Monge, Roberto])

Comment: One last thing, we have an ordinance here in San Luis Obispo. It's called the Neighborhood Preservation Ordinance. You have to bring in your garbage cans within 12 hours of putting it out. So I would like Diablo to take in their garbage. (0326-47-4 [Monge, Roberto])

Comment: I guess I want to speak of the underwater landslides that exist off of the coast of Isla Vista in Santa Barbara. It would take 12 minutes for a tsunami, rumor has it, to go from that location to San Pedro. How long and what would be the size of that tsunami from that location? You look on the map, you will go under the sea. There are three landslides there. (0326-52-4 [Fosmo, Vaughn])

Comment: I have a rhetorical question to ask, and please just humor me, but how many people have heard of Fukushima Daiichi? Would you please raise your hand? Okay, for those that haven't raised your hands, I'm just kind of wondering where your head had been in the last couple of years. But, so now could you raise your hand if you've heard of Fukushima Daiichi three years ago? Okay, not too many people. And why would that be? It would be because Fukushima Daiichi had a very safe record at that time, just like Diablo does. Diablo will be safe

until something happens. And it will happen. The USGS says that we are over 50 years due for a major earthquake. And we have 14 earthquake faults just sitting off of Diablo. (0326-53-1 [McGibney, Patrick])

Comment: One thing I want to point out, I've noticed that throughout the evening that most of the people supporting Diablo tend to work there. And I think it's just human nature to support whatever's putting money in your pocket. I think it's kind of what everybody does. But I'll try to make this short and to the point. This is for the record. I just want to say that I'm opposed to storing any spent fuel at all at Diablo. (0326-54-1 [Crimmel, Steve])

Comment: We, the citizens, must be an active part of this enterprise, reasonable negotiators for a fair and balanced management contract, something new and responsibly purposeful. We're all in this quandary together. And you don't want to kill a state, the bread basket of the country, while Fukushima Daiichi has already begun to sicken us and destroy the Pacific Ocean. The onus of responsibility, personal responsibility, falls on each of you, on your shoulders, to engage and include the citizenry in the plan to make Diablo Canyon safe, really safe, for the present and for the next 250, 000 years or more. (0326-58-2 [Davis, Adrienne])

Comment: I also urge the NRC to not renew the license for Diablo Canyon power plant when such license renewal is submitted. (0326-59-3 [Cordes, Reo])

Comment: The Diablo Canyon nuclear power plant was built before the truth was known about the many earthquake faults that are beneath and near the plant. With the truth known, that plant would never have been built then, and it would not be allowed to be built today. Given the known facts, to even consider extending Diablo's operating license defies all common sense. It will be a complete disregard of public safety if the NRC allows the continued production and onsite storage of highly radioactive nuclear waste in a seismically active location which jeopardizes the life, the health, and the property of every one of us who lives here. I hope that we can have confidence the NRC will do the right thing, halt the production of deadly radioactive waste which will be a danger to each and every person who lives here and for generations to come. Diablo Canyon nuclear power plant is in an unsafe location. Shut it down before it's too late. (0326-62-1 [Mellow, Marion])

Comment: I thought it was disingenuous that Daryl at PG&E Diablo was talking about construction to be able to store 138 casks rather than 38, but he didn't even go into the difference between the more traditional spent fuel and the spent fuel from high burnup fuel. (0326-63-5 [Campbell, Bruce])

Comment: In the case of Diablo Canyon, the stakes are far too high to allow these false assumptions. Number one, Diablo's two reactors are surrounded by 13 earthquake faults. One of them is only 1 kilometer away, the Shoreline Fault. It comes that close. And there's the Diablo Cove Fault, a little sub-fault that goes directly under Unit 1 Reactor and connects with the Shoreline Fault. The stakes are really high. (0326-8-4 [Swanson, Jane])

Comment: If the NRC were actually looking out for the welfare of the people and the environment, the Commissioners would order the immediate shutdown of Diablo Canyon. It's seismically unsafe and it's America's potential Fukushima, but your mandate is to protect the public while facilitating the use of nuclear power. Those two directives are inherently incompatible. I want you to know that we will fight every step of the way and we will use all of our resources to protect the future generations from this intolerable legacy we are leaving for them. It's a real David and Goliath battle, but we will never give up. (0326-9-7 [Seeley, Linda])

Comment: And regarding West Michigan, I wanted to mention since this is kind of the midwest, one of the two midwest public comment meetings on Nuclear Waste Confidence, that in October of 2005, the Palisades atomic reactor had a cask dangle accident where the 107 ton waste transfer cask was suspended over the fuel pool for a couple of days. The workers, inexperienced as most of the experienced workers had been dismissed by the company to save money, tried to override the emergency brake on the crane which could have sent the 107 ton weight plummeting through the floor of the pool, which could have drained the water away. And the worst case scenario is a partial drain down where there's water in the bottom of the pool, it blocks airflow, and the radioactive waste in the pool could catch fire. If that were to happen at Fukushima Daiichi Unit 4, for example, it would dwarf the radioactive releases that have occurred thus far in that global catastrophe. (0327-10-1 [Kamps, Kevin])

Comment: I just wanted to echo what Keith Gunter mentioned earlier, that this is the 71st anniversary of Enrico Fermi with his prototype reactor splitting the atom, a chain reaction, the first high-level radioactive waste in human history, and we don't know what to do with the first cupful of radioactive waste that Fermi generated. It's still, in a sense, in interim storage. So, of course, just up the road from here we have the Fermi 2 atomic reactor, and Ed McArdle just mentioned that Fermi 2 has way too much in common with Fukushima Daiichi Unit 4. (0327-10-2 [Kamps, Kevin])

Comment: Another site-specific issue at Davis-Besse is a pool leak which is listed in one of the tables in this draft GEIS in Appendix E, radioactive water leaking out of the pool, borated water which is corrosive. Davis-Besse seems to have a problem with leakage of borated water, so what you've got is a reactor pressure vessel that has continual lid corrosion and near breaches, the worst accident since the Three Mile Island meltdown happened at Davis-Besse with the hole in the head fiasco. You've got corrosion of the inner steel containment vessel, and you've got significant severe worsening cracking of the shield building. So, it's a recipe for disaster at Davis-Besse. (0327-10-4 [Kamps, Kevin])

Comment: There should be no license extension at Davis-Besse. The reactor should be closed today. Certainly, it has to be closed by Earth Day of 2017, when the 40-year license expires. I just wanted to give the figures for how much waste there is. By spring of 2010 there were 505 metric tons of high-level radioactive waste at Davis-Besse, so by spring of 2014 that'll be 585 metric tons. By 50 years of operations, 825 metric tons; 60 years of operations over 1,000 metric tons. (0327-10-5 [Kamps, Kevin])

Comment: And natural disasters, you know, often you hear tsunamis can't happen on the Great Lakes. Well, speaking of Tecumseh, War of 1812, some of the worst earthquakes in North American history, 1811, '12, '13, 8.0 magnitudes --Giant waves. Giant waves on the Great Lakes. (0327-10-7 [Kamps, Kevin])

Comment: I cut my teeth on Davis-Besse in 1972, so I've been doing this for a very long time. And as much as things change, nothing really changes. Mike Keegan mentioned the storm that occurred on Lake Erie in October of 1972 when 300 feet of dikes collapsed. They were washed away by the storm, flooding the Davis-Besse site which, fortunately, was not operational at the time. These are aerial photographs that were taken three days after the site was flooded. People had to be air lifted out from the site, cars were not salvageable. You cannot keep these. I will probably be submitting these with my -- Okay. I just presented aerial photographs of the Davis-Besse site three days after this storm. It's pretty unbelievable. All you can see are the tops of the trees. (0327-11-2 [Kline, Connie])

Comment: Specific to this region, and I'm going to talk about Lake Erie, is flooding potential. There is what is known as a seiche where you have straight line winds which blow the water out to Buffalo, and the water sloshes back. In 1972, the Davis-Besse site was flooded for over a month. If the plant had been operating at that time, it would have been a disaster. (0327-2-5 [Keegan, Michael])

Comment: In the UK, as well as in Canada the nuclear waste leadership role has been removed from the scientists and being handed to prominent citizens, and using philosophical and social science knowledge to gain their approvals. Upon a formal adoption of any new policies, then implementation is done by another authority. The U.S. Nuclear Regulatory Commission, the regulators, the stakeholders all seem to be waiting on the sidelines, as Canada is inching closer to a deep geological repository in the next few months. The entrance that repository is less than one-half mile from Lake Huron, and the possibility of radioactive contamination of Lake Huron and other waters downstream, including Lake Erie, Lake Ontario, and the St. Lawrence River are frightening. In Kincardine, Ontario, approximately 8,000 voters approved to host such a facility, and you call it volunteeristic siting, but the definition of a community for this planned burial requires the engagement and acceptance of 40 million other people that live on the Great Lakes, that live, work, eat, and drink from the Great Lakes. Consent-based management in this instance is a failure, and it's sitting on an international body of fresh water, the largest in the world. (0327-20-2 [Clemons, Victoria])

Comment: I have been working with my county commissioners. I am thankful that they are here, and keeping themselves informed, Mr. Sass, Mr. Arndt, and Ms. Regal. I hope that my hometown of Port Clinton, Ohio will be the third Ohio city to pass a resolution opposing the Canadian dump, and any dump on the Great Lakes watershed. (0327-20-3 [Clemons, Victoria])

Comment: I live in Cleveland. I worked on the Davis-Besse campaign with Ohio Citizen Action from the beginning to the end of that campaign. I also know about FirstEnergy, I call them worst energy's safety problems and their culture of safety. Culture of safety. That's special. And I also know very well about the goings-on inside the plant. I'm not going to repeat all this stuff because you guys are on it, and I love you all for coming out. (0327-22-2 [Muser, Mary Jo])

Comment: Fermi 2 has an overcrowded fuel pool. It is at risk for weather-related events, loss of coolant, or terrorist attack. (0327-27-6 [Macks, Vic])

Comment: The official story is wrong very often, time and time again. For example, here at Davis-Besse we have cracks in our containment dome. The official story is those were caused by the blizzard of '77 and that they've fixed them now and they haven't gotten any bigger. Yet, the last time they looked the cracks grew. This means that the cause was not the blizzard of '77 and that their solution is inadequate and wrong. So the official story was wrong. (0327-29-2 [DeMare, Joseph])

Comment: I certainly hope all you officials have full review of documents, proprietary or not. For example, let me refer to the Fermi 2 NRC Integrated Inspection Report dated October 22nd, 2013. It states, "selected CARDS were reviewed." At first I thought how appropriate since they're gambling with our lives, but then I found out CARDS stood for Condition Assessment Resolution Document. One CARD Fermi received was for foundation damage below several radial beams. The report goes on to say, "proprietary information was examined during this inspection, but is not discussed in this report." Endangerment to the bio region is proprietary? Shouldn't foundation damage below several radial beams be made public knowledge? Damage to Fermi 2's foundation is a danger to our lives. The same inspection report vaguely discussed and

approved problems associated with the radioactive waste, but they were properly addressed for resolution in the corrective actions. What problems associated with the waste? More proprietary dangers? And isn't NRC's oversight of these facilities a bit too lenient? For example, in March 2012, NRC issued an order to require Edison to have a reliable indication of the water level in the spent fuel pool. A year later, Detroit Edison responded saying that they would do that by the fall of 2012. (0327-5-3 [Collins, Jessie Pauline])

Comment: I've lived in Michigan most of my life, and I can remember times when I was a child I'd go swimming in Lake Michigan. I could drink the water. It didn't taste like chemicals, it tasted like tap water. It was pure. And there weren't very many people living on the lake at the time, and there were no nuclear reactors. And we were never afraid of the water, but now I don't like to swim in Lake Michigan. It doesn't taste the same, get rashes. And you think about well, they just had a spill, 91 gallons of radioactive waste went into the lake from Palisades, you know. And there's leaking tritium, and we have tremendous problems right now with nuclear waste. (0327-8-1 [Barnes, Kathryn])

Comment: Of course, some sites are not appropriate for cask storage, such as a previous speaker pointed out, Palisades Nuclear Station where they were placed in unstable sand dunes. And it should be realized there is a special problem with Fermi 2. They are unable to transfer irradiated waste from fuel pools to casks because of defects in original construction. Meanwhile, the NRC continues to allow waste to be stored in the fuel pools at Fermi 2 way beyond the design capacity. There is now over 620 tons of the most dangerous substances on earth stored in the pool five stories above the reactor. This is more irradiated fuel than all the Fukushimas put together. (0327-9-4 [McArdle, Ed])

Comment: And let's all remember, folks, that the Monticello Nuclear Power Plant is the exact same model, the exact same type as the Fukushima plant. (0328-17-3 [Cavlan, Michael])

Comment: Right now, Sequoyah is targeted by TVA for putting some irradiated fuel into dry cask storage, and they have appropriated somewhere under \$500 million for this activity to go to the lowest bidder, a bidder for these cask construction that actually, until a few months before the award of the TVA contract, had been debarred from Federal contracting for prior fraudulent activities. (0329-12-1 [Paddock, Brian])

Comment: We [BEST/MATRR] recently published a study called "Radioactive Emissions and Health Hazards Surrounding Browns Ferry Nuclear Power Plant," which shared our own radiation monitoring results at 50 sites we established around Browns Ferry. And it showed basically background radiation upwind but readings up to 40 times background downwind. The epidemiological data in that study found alarming rises in mortality rates downwind of Browns Ferry to over 20 percent above the average U.S. community. Over 300 million curies of radiation is stored at Browns Ferry, and, at last reporting, over 85 percent of that is stored in raised fuel pooling pools of the same design as Fukushima. BFN, Browns Ferry, is infamous for multiple fire events, a major vulnerability for any plant. But Browns Ferry still has not fulfilled the fire requirements its 1975 fire initiated. We are also now recognizing the extreme tornado dangers to these vulnerable raised cooling pools that are covered overhead only by metal roofing, such as we saw blown off in the Fukushima explosion. (0329-13-1 [Johnston, Gretel])

Comment: [W]e request that further studies be done at Browns Ferry on the radiation emissions which appear to be illustrating a bathtub effect as Browns Ferry approaches 40 years of age. (0329-13-3 [Johnston, Gretel])

Comment: I wanted to talk about Dr. Ross Landsman, an NRC whistleblower from Region III, dry cask storage inspector, who in February of 1994 identified the fact that the dry cask storage at Palisades Nuclear Power Plant in Southwest Michigan on the Lake Michigan shoreline is in violation of NRC earthquake safety regulations. That's just 150 yards from the water of the drinking water supply for tens of millions of people downstream. And since that time, Palisades has put in another dry cask storage pad, which, again, Dr. Landsman in full disclosure -- he served as our [Beyond Nuclear] expert witness when we took this issue back to the NRC in an emergency enforcement petition, when we took it to the Federal courts. And he warns that the newer of the dry cask storage pads, in addition to the older one, is also in violation of NRC earthquake safety regulations. (0329-20-4 [Kamps, Kevin])

Comment: However, as we are seeing with the decommissioning or dismantling of the nuclear reactor at Zion -- and we have been following it very closely -- our problems are just beginning. Zion, site of the largest dismantling of a reactor in history with almost a billion-dollar budget, is scheduled to start the irradiated waste fuel transfer in the next few months. One thousand metric tons of irradiated fuel will be transferred into dry casks over the course of the next 12 months. HOSS hasn't even been on the table, hardened onsite storage. This is over twice the 400 metric tons being transferred at unit 3 at Fukushima currently. Since the Zion decommissioning began, there have been two license transfers through the NRC. Now Zion Solutions, LLC, a privately held company, has been granted authority by the NRC to manage the decommissioning. As a privately held company, they are legally entitled to take a profit. When I, along with others as Con Ed ratepayers, contributed to the public funding of this project with a charge on our monthly electric bills, we expected that if there were any funds left over, they would be rebated back to the public. There are precedents for this in the last 20 years in the millions in Illinois with Con Ed. According to the NRC, their only responsibility; that is, Zion Solutions', Energy Solutions', only responsibility -- excuse me. According to the NRC, the NRC's only responsibility is to see that there is enough money to cover the cost of the project. At this point, those costs include a profit margin. Even if it turns out there is no profit to be made from the Zion decommissioning, the precedent is set for a privately held company to manage public funds and build in a profit into the budget. As a Con Ed ratepayer, I did not agree to this "public-private ownership" model. As a Con Ed ratepayer, I did not agree that the public could legally be prohibited from access to the records of a privately held entity. There is already one lawsuit in the courts challenging the Zion project. There may be more in the future. At the last sham of a public meeting of the Zion Community Action Panel, which is a group of local people appointed by Zion Solutions who were not elected in a public process and whose backgrounds do not encompass the oversight of a billion-dollar decommissioning project, Pat Daly, who has been managing this decommissioning up until now from Zion Solutions, announced that he was leaving the post and going back to Tennessee. And he introduced the new executive, who will be starting now. He is leaving us at the most vulnerable time, when the fuel transfers are due to start and when we, the public, will be at the most risk. How can we possibly have confidence in the NRC that is allowing this to happen? Whatever the next executive's fine credentials may be, this is not the way for this to unfold and to put the public at this risk. We do not oppose the fuel transfers. We oppose the process that is going on at Zion. And we are very concerned about the role or the lack of role of the NRC, where we feel we are all in clear and present danger. (0329-23-3 [Lewison, Linda])

Comment: I served on TVA's stakeholder group for its first integrated resource plan. And what I saw there as TVA as part of the nuclear industry and highly invested, even at that point, was that nuclear power and the departments in TVA that benefitted from that activity had control of the policy. And, for example, the first IRP that TVA did, which it is now in the process of starting over again because the facts on the ground have changed so much, but the nuclear people

said, "Oh, you've got to put in starting and finishing Bellefonte in your integrated resource plan because if we don't start by a certain time, we can't finish the reactors within the license period for construction." Of course, since then, TVA has essentially walked away and said, "We have no need for the power. And we are not going to build Bellefonte," although they haven't turned back in the licenses. (0329-25-1 [Paddock, Brian])

Comment: What I did want to make the point of in the limited time is that this is not a border issue. To say that we are dealing with this for the United States is very wrong. This spills over borders. We have got blatant examples: the hearings that were held in Great Lakes for the Great Lakes repository and the risk to Lake Huron. (0329-29-3 [Messer, Diane])

Comment: I am here in Maine. And just over the border into New Brunswick is the Point Lepreau Plant, which is, oh, less than 50 miles away from populated area, native population that has been very concerned. And we have reservation land there, Satiq, along the border between Maine and New Brunswick. And people have spoken to me that live there that are very concerned about the impacts of that Point Lepreau, which has had severe safety issues and been shut down for long periods of time. And they're pushing them to get back up, even though the problems, the faults have not been corrected, because it's costing them money to keep it idle. (0329-29-4 [Messer, Diane])

Comment: For more than a decade now, the Alliance for a Clean Environment has been researching and investigating Limerick Nuclear Plant's high-level radioactive waste fuel pools, storage casks, and risks associated with transportation of high-level radioactive waste. A body of compelling evidence is now posted on the ACE website, which is at www.acereport.org. And section number nine specifically addresses high-level radioactive waste is a ticking time bomb. For purposes of this study, ACE is going to be submitting a 25-page summary that combines previous and current findings (0329-3-1 [Cuthbert, Lewis])

Comment: I had an opportunity to work for the BLM in Roswell, New Mexico, just north of the WIPP pilot project, which is now actually running. I had a chance to review a lot of that documentation as a geology intern and found it very interesting that the parameters for how close the closest well would change every time they found a well closer than they wanted, big concerns with that, still have those big concerns, not to mention the area has a lot of issues with hydrogeology and salt zones, et cetera. (0329-34-1 [Myers, Susan])

Comment: We have been very fortunate in Maine to have shut down Maine Yankee. Back in 2005, the government committed to an agreement to remove the nuclear waste. None of it has been removed, no attempt has been made, no efforts. (0329-4-1 [Messer, Diane])

Comment: And, therefore, the spent fuel at Turkey Point and at St. Lucie needs to be moved to high grounds either in Florida or somewhere in southern Georgia, some place that's above and out of the reach of this tsunami. It would probably be around Wildwood to Ocala or Gainesville area, which is at the top of the Florida Turnpike, which is a fairly safe road. It should be shipped on the toll road because if you ship it on I-95 there's a chance, greater chances of accidents or wrecks or whatever. I used to drive semis, and the last company I worked for, they said to take all toll roads as often as possible because they do have fewer wrecks on them. (0329-8-2 [Wilson, Greg])

Comment: As far as Crystal River goes, that's on the Gulf side and who knows what's going to go on out there, especially with every drilling company in the world wanting to drill in the Gulf of Mexico. (0329-8-4 [Wilson, Greg])

Comment: As a resident of Washington State, I am affected both by the constant question of how to further clean up Hanford and the question of how Japan's recent reactor problems will impact the Pacific fisheries. (0334-1 [Nuccio, Theresa])

Comment: It is unacceptable to NOT develop a definitive plan to properly and fully decommission the San Onofre power plant by storing and moving the radioactive waste from the highly populated South Orange and North San Diego County areas that surround the plant. Please develop a timely and COMPLETE decommission process for San Onofre. (0337-1 [Johnson, Reed])

Comment: Regarding the decommissioning of the San Onofre Nuclear Power Plant. It is unacceptable to not develop a definitive plan to properly and fully decommission the San Onofre power plant. Storing and not moving the highly dangerous radioactive waste from the highly populated South Orange and North San Diego County areas that surround the plant is irresponsible. I ask that you please develop a timely, thorough and complete decommission process for San Onofre, and share that plan with the public and in particular, the residences of South Orange and North San Diego County for our input into the process. Our property and more importantly, our health are at stake if the radioactive waste leaks into the environment that is our home. (0338-1 [Johnson, Arlene])

Comment: We, here in San Luis Obispo County, have anxiety about the amount of waste that is mounting at Diablo - with several earthquake faults in close proximity to the plant. PLEASE QUIT MAKING MORE WASTE TO BE STORED IN A SEISMICALLY ACTIVE AREA. (0344-2 [Heald, Deborah])

Comment: Please do not allow any further delays in removing radioactive waste from Diablo Nuclear Power Plant. Do not allow for license renewal until a safe, permanent off-site location is built. (0345-1 [Rochte, Tim])

Comment: In the case of Entergy's Pilgrim Nuclear Power Station (PNPS) in Plymouth, which is of special concern to we the undersigned, shutdowns and malfunctions have been so numerous that the NRC itself has flagged the plant for intensive oversight. Presently on-site storage in dry casks is the only solution, but it is only a relatively short-term fix for a problem requiring containment for hundreds of thousands of years. So far the design for the Interim Spent Fuel Storage Installation (ISFSI) is underfunded, and its location is vulnerable to sea level rise, flooding and terrorism. The casks would not be separated by protective berms although that would obviously lessen the impact of an aircraft attack. (0348-4 [Agnew, David] [Roscoe, Lee])

Comment: For example, let me refer to the Fermi 2 NRC Integrated Inspection Report 05000341/2013004, dated Oct. 22, 2013. It states, "Selected CARDS were reviewed.." At first I thought how appropriate since they are gambling with our lives, but then I found out that CARDS stood for Condition Assessment Resolution Document. One CARD Fermi received, 13-26522 was for Foundation Damage Below Several Radial Beams. The report goes on to say, "Proprietary information was examined during this inspection, but is not specifically discussed in this report." Endangerment to the bio-region is proprietary? Shouldn't foundation damage below several radial beams be made public knowledge? Damage in Fermi 2's foundation is a danger to our lives. The same inspection report vaguely discussed and approved "...problems associated with radioactive waste...were properly addressed for resolution in the licensee's corrective actions..." What problems associate with the waste? More proprietary dangers? And isn't NRC's oversight of these facilities is a bit too lenient. For example, on Mar. 12, 2012, the NRC issued an order to require Edison to have a reliable indication of the water level in spent

fuel pools. DTE responded a year later, 28 Feb. 2013, describing how they would do that by the fall of 2015. NRC staff evaluation, dated 25 Nov. 2013, notes, "further information regarding the potential dose rate impact of other materials stored in the Spent Fuel Pool is not currently available for review." What kind of materials is stored in the SPF that would make this more proprietary information? (0349-3 [Collins, Jessie Pauline])

Comment: In the case of Entergy's Pilgrim Nuclear Power Station (PNPS) in Plymouth, which is of special concern to we the undersigned, shutdowns and malfunctions have been so numerous that the NRC itself has flagged the plant for intensive oversight. Presently on-site storage in dry casks is the only solution, but it is only a relatively short-term fix for a problem requiring containment for hundreds of thousands of years. So far the design for the Interim Spent Fuel Storage Installation (ISFSI) is underfunded, and its location is vulnerable to sea level rise, flooding and terrorism. The casks would not be separated by protective berms although that would obviously lessen the impact of an aircraft attack. (0352-4 [Roscoe, Lee])

Comment: I crossed a blue line and was arrested in front of the entrance to Diablo in 1978 because as a responsible Biologist I felt nuclear waste should NOT be produced until proper safe storage is provided. Radiation modifies DNA!!!! I paid a fine and went to jail. At the time PG&E claimed it would have proper storage when needed---I guess Yucca Mt. Why does the NRC permit Diablo to operate?? Diablo has earthquake faults like the Japanese Disaster. The NRC should demand that PG&E STOP producing this terrible nuclear waste or pay a fine & go to jail as I did. Tomorrow, Dec. 7th, I will be demonstrating in front of main gate of Diablo at 10am (but not crossing the blue line)----all legal. Our signs: NO DIABLO (0365-1 [Denneen, Bill])

Comment: Any of the following is reason enough to close Diablo Canyon Nuclear Powerplant/Waste dump: - The ratepayers deserve to have more inexpensive ways to generate power. - Nuclear is inefficient both in short term and long term. - It is immoral to inflict deadly waste on the humans and environment for the next 240,000 years. - Siting a nuclear powerplant/waste dump on multiple earthquake faults is insanity. - Fukushima (0369-1 [Georgi, David])

Comment: In the case of Entergy's Pilgrim Nuclear Power Station (PNPS) in Plymouth, which is of special concern to we the undersigned, shutdowns and malfunctions have been so numerous that the NRC itself has flagged the plant for intensive oversight. Presently on-site storage in dry casks is the only solution, but it is only a relatively short-term fix for a problem requiring containment for hundreds of thousands of years. So far the design for the Interim Spent Fuel Storage Installation (ISFSI) is underfunded, and its location is vulnerable to sea level rise, flooding and terrorism. The casks would not be separated by protective berms although that would obviously lessen the impact of an aircraft attack. (0373-4 [O'Malley, Brian])

Comment: Residents in our region have already been forced to live with the unacceptable risks of a defacto high-level radioactive waste dump, with wastes stored in fuel pools made of substandard cement and liners that are corroding and thinning at rates up to 10 times higher than expected, and steel in casks that can corrode in as little as 4 to 52 weeks based on corrosives in the air from Limerick's cooling towers. (0377-1-2 [Cuthbert, Lewis])

Comment: Loss of cooling water or power for Limerick's fuel pools, or a terrorist attack could have long-term devastating impacts on the future environment and public health in the entire Greater Philadelphia Region. An accident or terrorist attack on massive amounts of the most deadly materials on earth stored in fuel pools at Limerick Nuclear Plant could render the entire Philadelphia Region uninhabitable for centuries, if not forever. (0377-3-10 [Cuthbert, Lewis])

Comment: THE LIMERICK EXAMPLE PROVIDES EVIDENCE TO SUPPORT THE NEED FOR IMMEDIATE REMOVAL OF WASTE IN FUEL POOLS: Limerick's Fuel Pools are OVERLOADED, far beyond the original design basis since at least 2006. Over an estimated 1,000 metric tons of these lethal wastes are vulnerable to fire from meltdowns or terrorist attack, potentially creating a disaster 100 times worse than Hiroshima (0377-3-11 [Cuthbert, Lewis])

Comment: Pools are filled with radioactive fluids that can boil away due to an accident, natural disaster, or terrorist attack, introducing large volumes of radiation into the air. Pools are vulnerable to a 9/11 type terrorist attack with a plane or missile. An attack on Limerick's fuel pools could result in an unstoppable radioactive fire, with potentially worse consequences than Chernobyl. That kind of attack could lead to an unstoppable radioactive fire which could impact people hundreds of miles away, according to an NRC study (2000). Pools are outside the reinforced containment structures for the reactors. (0377-3-12 [Cuthbert, Lewis])

Comment: Cement used to construct Limerick's fuel pools is documented to be substandard. NRC'S FAILURE TO REQUIRE EXELON TO IMMEDIATELY REMOVE ALL 5-YEAR OR OLDER WASTES FROM LIMERICK'S FUEL POOLS FASTER SHOULD BE CONSIDERED REGULATORY MALPRACTICE, ESPECIALLY AFTER WATCHING THE FUEL POOL DISASTER UNFOLDING AT FUKUSHIMA. NRC'S INACTION RELATED TO LIMERICK'S FUEL POOLS CONSTITUTES GROSS NEGLIGENCE. NRC IS AWARE OF LIMERICK'S FUEL POOL DESIGN FLAWS AND RISKS FOR CATASTROPHE. NRC knows Limerick's fuel pools are corroding and thinning at rates 2 to 10 times faster than originally estimated, yet NRC has allowed Exelon to wait for over a decade to even recoat the pools. NRC was informed by Limerick's safety inspector, that Limerick's fuel pools were poured with substandard cement, and why that should concern NRC related to earthquake risk at Limerick. NRC should also see why this increases the risk from a terrorist missile or plane strike. NRC knows Limerick is among the nation's nuclear plants most at risk from earthquakes with a fault right under the site and four others within 17 miles, and that alarms went off in the control room at Limerick from the 9-23-11 Virginia earthquake, and yet NRC is allowing Exelon to wait 3 years (until 2017) to even complete an earthquake risk study. NRC knows there is not enough water available to adequately deal with extended loss of water and potential meltdowns in Limerick's fuel pools. NRC knows there is not enough back-up power available on site, to simultaneously prevent meltdowns in Limerick's 2 reactors and 2 fuel pools. Knowing about unfixable design flaws at Limerick and watching the fuel pool disaster in Fukushima's similar fuel pool design. NRC is failing to require Exelon to build on-site casks faster at Limerick for removal from pools. NRC is planning to relicense Limerick, knowing each year Limerick operates tons more of this deadly waste will be produced and there is no safe way to deal with this lethal waste (0377-3-13 [Cuthbert, Lewis])

Comment: NRC Is Jeopardizing Our Future When Failing To Address Major Issues and Concerns Related to Limerick's Fuel Pools: 1. Corrosion and Thinning Documented in Limerick's Fuel Pool Liners at Rates up to 10 times Faster than Anticipated; 2. High-Level Radioactive Wastes Stored in Limerick's Fuel Pools Beyond Design Capacity; 3. Limerick Previous Accepting Waste From Other Nuclear Plants Permit Changed in 2012 Without A Hearing; 4. Structural Deficiencies in the Concrete of Limerick's Fuel Pools; 5. Limerick's Fuel Pools Are Similar to Those That Exploded at Fukushima High Above Reactors With NO Containment; 6. Inadequate Alternative Back-Up Power; 7. Fuel Pool Instrumentation; 8. Spent Fuel Pools Are At High Risk For Meltdowns From Loss of Cooling Water Due To: Earthquakes, Cracking, Aging, Brittle, Deteriorating, Substandard Cement, Leakage and Evaporation, Explosion Inside or Outside Pool Building, Terrorist Acts With Planes Or Missiles Fuel Pools Are Not Protected Against Air Strikes or Missiles, Aircraft or Missile Impact, Siphoning,

Pumping. 12 Accidental or Deliberate Drop of Fuel In Transfer See: Spent Fuel Pools Pose A Danger - Associated Press - March 17, 2011 (0377-3-15 [Cuthbert, Lewis])

Comment: The Following Detailed Summaries Reveal NRC's Gross Negligence, And The Need For NRC To Take Immediate Action To Reduce Risks. CORROSION and LOSS of THICKNESS in LIMERICK'S SPENT FUEL POOLS: NRC caved in to Exelon, ignoring NRC's own objections to Exelon's request to delay coating of Limerick's fuel pools. NRC plans to ignore documented cracking, corrosion, pitting, and cavitations in Limerick's fuel pools holding the most deadly materials on earth, related to relicensing approval. Limerick could be relicensed with no guarantee Exelon ever can or will coat or provide other protective measures on Limerick's fuel pools. NRC told Exelon that to delay coating the degraded fuel pool areas is unacceptable. NRC outlined "Substantial Corrosion" and loss of thickness issues in Limerick's fuel pool liners. (Documented in 7-20-12 NRC letter to Exelon). The documented corrosion rate is far higher than original corrosion rate calculations for fuel pools. Pitting corrosion rates are unpredictable (usually 2 to 10 times more than the general corrosion rates). In spite of cracking, corrosion, pitting, and cavitations in Limerick's fuel pools, documented by NRC: 1. Exelon requested deferring protective measures like coating until Limerick's current licenses expires (a delay of 12 to 17 years) 2. Exelon proposes inspection only every 10 years. GROSS NEGLIGENCE: NRC CAVED IN TO EXELON. NRC officials made the inexplicable decision to allow delayed coating of Limerick's fuel pools, despite NRC staff's conclusion that to delay coating fuel pools was unacceptable. Despite proven adverse impacts on the safety and integrity of Limerick's fuel pools and associated unprecedented threats to public health and safety, NRC revised regulations to accommodate Exelon's requests to delay coating Limerick's fuel pools. We believe it is negligent for NRC to assume Limerick's fuel pools will remain safe until Exelon agrees to re-coat them. Corrosion has already been documented at rates far faster than originally calculated. ACE asked NRC to provide the names and contact information for NRC officials who made this dangerous decision. To date: NO NRC RESPONSE (0377-3-16 [Cuthbert, Lewis])

Comment: ACE Asked NRC To Explain Why NRC Assumes Limerick's Fuel Pools Can Be Re-Coated. Explain the exact process in detail that Exelon would use to coat liners, now or in the future. Answer critical questions below: a. Won't all radioactive water and radioactive wastes need to be removed from fuel pools for repair and coating? -As long as Limerick continues to operate, 2 more tons each year of this deadly radioactive waste will need to be cooled in Limerick's fuel pools for at least 5 years -Limerick's fuel pools are already overloaded, far beyond design basis, with this waste that requires cooling for a minimum of five years, to avoid combustion resulting in a devastating radioactive fire; b. Where would the radioactive wastes currently stored in the pools go until pools are coated? That waste will still need to be cooled.; c. Where will the massive amount of radioactive water go when drained for recoating? To date: NO NRC RESPONSE to any questions above (0377-3-17 [Cuthbert, Lewis])

Comment: Additional ACE Questions - NO NRC RESPONSE: 1. Did anyone except Exelon ever inspect fuel pool liners for cracking, corrosion, pitting, and cavitations? 2. Were fuel pool liners ever inspected by NRC? 3. How does NRC justify inspection only every 10 years, when pitting corrosion rates have proven to be much greater than original rate calculations? (0377-3-18 [Cuthbert, Lewis])

Comment: With loss of cooling water, Limerick's fuel rods can heat up, self-ignite, and burn in an unstoppable fire, causing tens of thousands of deaths up to 500 miles away, according to a 2000 NRC study. Health and Financial Costs Would Be Astronomical: Limerick Nuclear Plant's Fuel Pools Are A Major Threat To Public Health, Safety, And The Economy In The Greater Philadelphia Region, The 2nd Most Populated Region Around A Nuclear Plant. (0377-3-7 [Cuthbert, Lewis])

Comment: Limerick's Fuel Rods Are At Risk For Loss Of Water And Fire: NRC failed to require Limerick to follow the safest fire safety regulations. NRC allowed Limerick to use a second set of less stringent standards, determined to be "safe enough". That constitutes regulatory negligence, given the potential consequences. Limerick's fuel pools are outside the containment and vulnerable to a 9/11 type terrorist attack and fire from jet fuel. Yet, NRC failed to require Exelon to guard against this type attack. There is not an ample water supply to avoid meltdowns in the fuel pools. The closest body of water available to try to deal with leaking fuel pools is dangerously depleted due to Limerick's cooling tower use over decades. (0377-3-8 [Cuthbert, Lewis])

Comment: The Fukushima catastrophe shows why fuel must be removed from pools as soon as possible, regardless of costs to the nuclear industry, especially in reactor designs like Limerick's, similar to Fukushima's. (0377-3-9 [Cuthbert, Lewis])

Comment: LIMERICK'S FUEL POOLS ARE PACKED, FAR BEYOND DESIGN BASIS, CONTAINING FAR MORE THAN FUKUSHIMA'S AND OLDER US NUKES: Limerick's Fuel Pools Contain Far More Assemblies Than Other U.S. Nuclear Plants, Including Exelon's Three Mile Island and Oyster Creek. Compared to Fukushima: More Than Twice As Much In 2 Limerick Fuel Pools Than 4 At Fukushima. 6,203 Assemblies -2 LIMERICK FUEL POOLS (Estimated Spent Fuel At Limerick 1,143 Tons) 2,400 Assemblies -4 FUKUSHIMA FUEL POOLS. Information Above From The Institute for Policy Studies by Bob Alvarez, "Spent Nuclear Fuel Pools in the U.S.: Reducing the Deadly Effects of Storage" Appendix A: Site Specific Estimates of Radioactivity in U.S. Spent Fuel Page 26 Source: DOE/EIS-0250, Appendix A, Tables A-7, A-8, A-9, & A-1 (0377-4-1 [Cuthbert, Lewis])

Comment: UNDENIABLE EVIDENCE ABOVE CONFIRMS WHY EXELON SHOULD BE REQUIRED TO IMMEDIATELY START TO BUILD ENOUGH CASKS, IN THE SAFEST WAY POSSIBLE, TO DRY-STORE ALL THE WASTES THAT CAN SAFELY BE REMOVED FROM LIMERICK'S FUEL POOLS UNTIL LIMERICK'S FUEL POOLS CAN BE EMPTIED, EXELON SHOULD BE REQUIRED TO GUARD AGAINST AIR AND MISSILE STRIKES. A TERRORIST ATTACK COULD TRIGGER MELTDOWNS IN LIMERICK'S FUEL POOLS, YET VULNERABLE LIMERICK FUEL POOLS ARE NOT PROTECTED FROM TERRORISTS' MISSILES OR AIR STRIKES. NRC REFUSED TO PROVIDE A RISK ASSESSMENT FOR TERRORISTS. ACE REPEATEDLY URGED NRC TO PROVIDE A RISK ASSESSMENT FOR TERRORIST ATTACKS ON CASKS. Limerick has the 2nd most densely populated region in the U.S. NRC was negligent in failing to provide a risk assessment for terrorist attacks related to above ground storage of high-level radioactive wastes at Limerick Nuclear Plant A Federal Court Ordered NRC To Assess Terrorist Threats In California. A 2006 U.S. Court of Appeals 9th Circuit decision forced NRC to assess the threat of a terrorist attack on above ground storage at the Diablo Canyon Nuclear Plant in California. Similar threats exist at Limerick Nuclear Plant. ACE Asked NRC To Consider The Same Threats As Were Required At Diablo Canyon: 1) The threat posed by a land-based vehicle bomb; 2) A ground assault with the use of an insider; 3) A water-borne assault; 4) A large aircraft impact similar in magnitude to the attacks of September 11, 2001. NRC inexplicably claimed an assessment was not necessary at Limerick, dismissing harmful health impacts from radiation exposure and irrationally claiming a significant release of radiation affecting the public is not reasonably expected to occur. Army testing suggests otherwise. NRC also ignored potential for rods overheating and combusting. Specific Issues Not Included For A Risk Assessment For Limerick's Updated EIS: 1) Limerick is not guarded against airplane or missile attacks; 2) Nuke waste housing can be penetrated by missiles (proven by army testing); 3) THREE AIRPORTS are too close to Limerick Nuclear Plant. Army testing proves missiles can penetrate casks. Pilots take lessons at Limerick Airport, only 1 mile away;

Helicopters fly into the Limerick Airport from which missiles could be launched; 4) An industrial railroad runs through the nuclear plant site. Industrial rail tracks run directly through the nuclear plant property, providing a way for terrorists to enter the site undetected; 5) A large portion of the site is bordered by the Schuylkill River, Limerick Nuclear Plant property is bordered by the Schuylkill River (over a long distance), presenting a difficult, if not impossible challenge, for too few guards.; 6) Too few guards have to cover Limerick's 600 acres; 7) Heavily populated region surrounds Limerick Nuclear Plant - Almost 8 Million people within 50 miles (**0377-4-11** [Cuthbert, Lewis])

Comment: How much of this deadly high-level radioactive waste will be stored in how many of these casks on the Limerick site by 2029? 2049? Limerick is using new high-burn fuel which impacts the outer covering of the fuel (**0377-4-13** [Cuthbert, Lewis])

Comment: TO AVOID RADIOACTIVE WASTE INTERNAL COMBUSTION AND FIRES INSIDE CASKS, NRC SHOULD STOP ALLOWING LIMERICK NUCLEAR PLANT TO REMOVE WASTES PRIOR TO THE FIVE YEARS IN POOLS CALLED FOR BY THE TECHNICAL SPECIFICATIONS OF THE CASK SYSTEM. •NRC is allowing risky removal of fuel rods to accommodate Exelon's profits. This is yet another example of NRC lowering safety protections at Limerick Nuclear Plant to accommodate Exelon's profits. Clearly Exelon wants to load casks more quickly to free space and make room for more. •Early removal is far too risky. The less cool down time in fuel pools, the thermally hotter and more radioactive the waste - the more risk of internal combustion and an unstoppable radioactive fire. •Even if older rods are wrapped around newer rods that have been cooling in pools less than five years (as we have been told is being done at Limerick), there is no proof that this deviation from the 5-year technical specification requirement will not lead to combustion and fire over time. Removing Limerick's Radioactive Rods Sooner Than The 5-Year Technical Specification Requirement Jeopardizes Workers' Health and Safety. •Since 2006, when Exelon first tried to convince the public that cask storage was safe, NRC and Exelon repeatedly stated 5 years was required to safely remove fuel rods from Limerick's fuel pools. •However, that 's not what is happening at Limerick since 2010. May 6, 2010 -Exelon Employee At A Limerick Open House Said: Older and newer "spent fuel rods" are removed from Limerick's fuel pools at the same time. Older rods are stored outside newer rods in assemblies (sometimes 1-year old). •This could have been going on since 2008. Limerick's Independent Fuel Storage Installation was placed in service starting July 21, 2008. NRC Deception Speaks Volumes: •Dry cask technical specifications state: Radiation shielding and thermal heat removal require around 5 YEARS, minimum, cool down time in the pool before transfer to dry casks. 1. Yet, June 16, 2006, NRC in a letter to ACE claimed 1 year storage in the fuel pool at Limerick was sufficient before removal for above ground storage. 2. July 13, 2006 at a meeting in Limerick NRC again clearly stated cool down time before removal from fuel pools was at least 5 years. 3. July 25, 2006 ACE received an e-mail from NRC: NRC inexplicably said cooling time in the pool is: 1 year or 3 years or 5 years. From: James Trapp - NRC Date: 07/25/06 07:04:34 NRC's Pamphlet Proves How Dangerous Nuclear Power Plant High-Level Radioactive Waste Is. 10 years after removal of spent fuel from a reactor: Radiation dose 1 meter away from a spent fuel assembly exceeds 20,000 Rems Per Hour; 5,000 Rems would be expected to cause immediate incapacitation and death within 1 week. Information From: NRC's own pamphlet NUREG/BR-0216, Rev.2 May 2002: Removing spent fuel rods from pools to load dry casks far sooner than the 5-year requirement is an extremely dangerous experiment that needs to be stopped at Limerick. While it frees space in pools for new wastes to make more money for Exelon, it presents unacceptable risks to workers and the public. Consider The Following: 211 Radioactive Poisons found in every 10-yr. old irradiated fuel bundle (Canadian Study); Polonium 210 Just 1 of 211 the type that poisoned Alexander Litvinenko in 2006 is an alpha emitter with the ability to become airborne. 1 Gram

could poison 100 million people - Extremely dangerous in milligrams or micrograms. Biological life in humans is 30 to 50 days; Targets organs - liver and spleen. Short-term exposure carries long-term risk of death from cancer. (0377-4-14 [Cuthbert, Lewis])

Comment: NRC PROVES CORROSION FROM LIMERICK'S COOLING TOWERS CORRODES STEEL AND CAUSES CRACKING IN 4 TO 52 WEEKS: June 12, 2012 RAI B.2.1.25-1.1 Stress Corrosion Cracking for stainless steel surfaces in an outdoor air environment in auxiliary and steam and power conversion systems. -LIMERICK'S NPDES PERMIT SAYS:16,000 TO 58,000 lbs per day of CHLORINE (sodium hypochlorite) are used at Limerick Nuclear plant. - Exelon told NRC even though CHLORINE is ADDED to COOLING TOWERS AS SODIUM HYPOCHLORITE, there is no concern (for stress corrosion cracking of stainless steel surfaces) because COOLING TOWER PLUME IS DIRECTED AWAY FROM THE PLANT. NRC Responses to Exelon: Studies and industry operating experience in chloride-containing environments have shown that stainless steel exposed to an outdoor air environment can crack at temperatures as low as 104 to 120 degrees F, depending on humidity, component surface temperature, and contaminant concentration and composition. Cracking can occur in 4 to 52 weeks. NRC cannot conclude recent inspections are sufficient to demonstrate an aging effect will not occur during the period of extended operation. A prevailing wind does not result in the absence of contaminant deposition by the cooling tower plume. Information has not been provided on the potential for chloride contamination from the onsite soil or nearby agriculture and industrial sources NRC lacks sufficient information to conclude that stress corrosion cracking cannot occur in stainless steel components located in an outdoor air environment. Corrosion can make it difficult, if not impossible, to move Limerick's extremely heavy casks. To date, there is no proof Limerick's radioactive fuel rods can be moved safely after years of exposure to corrosive air. (0377-4-17 [Cuthbert, Lewis])

Comment: NRC'S DENIAL AND NEGLIGENCE COULD EVENTUALLY LEAD TO DISASTER RELATED TO LIMERICK'S CASKS: NRC admits there were fabrication deficiencies in materials used for Limerick's canisters and concrete, but refuses to call them flaws, and claims they were corrected, even though that may not be entirely accurate. While the company was fined a nominal amount, in years to come, we could find cask design flaws could lead to a radioactive disaster. July, 2006 Areva, the company making Limerick casks, received a Notice of Violation, documenting specific problems with casks already in place, yet NRC allowed casks for Limerick to continue to be built by this company. November, 2006 in a whistle blower letter it was revealed that there were specific concerns about casks planned to be used at Limerick. In an 11/06 letter to ACE, both NRC and Transnuclear (Areva) admitted there would be corrosion and settling of ground beneath 40 ton casks, yet NRC failed to require air testing in the vicinity of casks for corrosives against metals being used for casks (0377-4-18 [Cuthbert, Lewis])

Comment: REGULATORY NEGLIGENCE: NRC'S 2005 STUDY FOUND PROBLEMS WITH CORROSION RATES OF METALS USED TO STORE NUCLEAR WASTE, YET NRC STOPPED THE RESEARCH INSTEAD OF ADDRESSING THE CORROSIVE STEEL. 2006 Testimony to Congress by Public Citizen - Provided evidence of scientific misconduct by NRC and DOE related to corrosion rates of metals used to store nuclear wastes -In 2005 NRC found problems with the corrosion rates of metals used to store nuclear waste, yet failed to address the corrosion problems -Research identifying corrosion problems was stopped, not the use of steel that would corrode. 2006 NRC dismissed important evidence identified by ACE related to corrosion of steel planned to hold Limerick's high level radioactive wastes in above ground casks -Every day Limerick adds massive amounts of toxic chemicals to cooling tower waters - MSDS sheets identify 10 of them to be corrosive, some highly corrosive and some specifically corrosive to steel -There is NO FILTRATION to prevent corrosive chemicals from entering the

air from cooling tower steam -Synergistic combinations of the corrosive additives can result in a serious corrosive threat to people and everything exposed to the drift from the cooling towers (44 million gallons every day), including steel holding deadly radioactive wastes stored inside casks that require cooling with outdoor air -Corrosive air enters casks holding high-level radioactive waste rods stored in steel -NRC admits corrosion will happen, yet dismissed ACE concerns without site-specific testing of cooling tower emissions for specific and conversion corrosives -NRC's dismissive, misleading, and irresponsible conclusions defy logic. They can lead to irreparable disaster in our region (0377-4-19 [Cuthbert, Lewis])

Comment: TO DATE: NRC FAILED TO ANSWER THE FOLLOWING QUESTIONS. WHY DO LIMERICK'S FUEL POOLS CONTAIN SO MANY MORE FUEL ASSEMBLIES THAN OTHER NUCLEAR PLANTS OPERATING LONGER? Did Limerick ever take spent fuel from other nuclear plants? Did Limerick ever take spent fuel from Three Mile Island after the partial meltdown? NRC's 5-18-12 written response to ACE about quantity of fuel used at Limerick was puzzling. "Exact amounts of 'special nuclear material' in a licensee's possession is considered to be security sensitive information and not permitted to be released to the public." 1. We believe the public has a right to know how much waste is at Limerick and where it came from. 2. Approximately 2 tons produced each year for the 28 years Limerick operated should be 56 tons, NOT 1,143 tons. Explain in detail. Why is there so much more from two Limerick reactors than 4 Fukushima reactors? 3. Even if it is 2 tons per reactor per year, the amount stored in Limerick's pools should only be 106 Tons, NOT 1,143 Tons. This discrepancy needs to be fully understood by the public. If the amount of waste used per reactor each year can be estimated, there is NO LOGICAL REASON NRC should refuse to provide the public with approximate totals. Anyone should be able to do the math, including terrorists and NRC. NRC's response made us wonder what is really going on. Did Limerick's Operating License Amended 12-19-11 Allow Limerick To Receive and Possess Spent Fuel Rods From Other Nuclear Plants? YES OR NO. Limerick's Operating License Permit Was Amended (12-19-11). Language Included To Allow Limerick to Receive and Possess Fuel Assemblies and Fuel Channels From Other Nuclear Plants, Such As That Already Received From Shoreham Decades Earlier. Exact language (Below) Is From Limerick's Amended Operating Permit 12-19-11: UNITED STATES NUCLEAR REGULATORY COMMISSION WASHINGTON, D.C. 20555-00; EXELON GENERATION COMPANY, LLC DOCKET NO. 50-353 LIMERICK GENERATING STATION, UNIT 2 AMENDMENT TO FACILITY OPERATING LICENSE Amendment No. 167 License No. NPF-85 Page 3; (4) Pursuant to the Act and 10 CFR Parts 30, 40, 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and (5) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility, and to receive and possess, but not separate, such source, byproduct, and special nuclear materials as contained in the fuel assemblies and fuel channels from the Shoreham Nuclear Power Station. (0377-4-2 [Cuthbert, Lewis])

Comment: DID NRC ALLOW LIMERICK TO ACCEPT HIGH-LEVEL RADIOACTIVE WASTES FROM OTHER NUCLEAR PLANTS DECADES AGO, BUT JUST CHANGE LIMERICK'S OPERATING PERMIT TO ALLOW THAT 12-19-11? 14. ACE Requested Detailed Explanations From NRC, But Didn't Even Receive A Response To The Following Questions: 1. Why Would Limerick Have Its Operating License Amended In 2011 To Receive and Possess Radioactive Waste From Other Nuclear Plants, When Limerick Already Received These Wastes From Shoreham and Possibly TMI? 2. Did receipt and possession of Shoreham's waste violate Limerick's original operating permit? 3. When Limerick received waste from Shoreham decades ago, wasn't that in violation of Limerick's operating permit? 4. This Is A Major Permit Change,

Which Adds Dramatically to The Risk In Our Entire Region and the Transportation Route. Why Wasn't The Public Widely Informed With An Opportunity To Comment and Have A Public Hearing? (0377-4-3 [Cuthbert, Lewis])

Comment: How long will it take Exelon to remove most of Limerick's deadly wastes from dangerous fuel pools and store it in above ground casks? STRUCTURALLY SUBSTANDARD CEMENT IN LIMERICK'S FUEL POOLS. Defective concrete in Limerick's fuel pools could have serious adverse effects on the structural adequacy to prevent leaks and meltdowns triggered by an earthquake or a terrorist attack with a plane or missile. NRC's 5-12 response to ACE acknowledges the structural defect from the concrete pour of Limerick's fuel pools, but refers to a decades old unsubstantiated NRC "assumption" that it would have no adverse effect on the structural adequacy. NRC'S "ASSUMPTION" IS FAULTY AND UNSUBSTANTIATED. NRC's "assumption" was indefensible from the beginning, but it's worse now, with increasing threats from earthquakes and terrorist attacks with planes or missiles on the stories high fuel pools. We remind NRC that if Limerick's fuel pools suffer cracks and cooling water starts to leak, it can be the beginning of a catastrophic disaster. (0377-4-4 [Cuthbert, Lewis])

Comment: INADEQUATE FUEL POOL INSTRUMENTATION TO DETECT LOSS OF WATER TO PREVENT MELTDOWNS. March, 2012, Older reactors with General Electric Co (GE) design containment structures like Limerick's (similar to those that failed at Fukushima) were ordered by NRC to have sturdier venting systems to prevent damage to reactor cores. NRC rules required Exelon to install new, more reliable instrumentation at Limerick, to measure Limerick's spent fuel cooling pools - no later than within 2 refueling cycles. Exelon was given 60 days to respond. Limerick's spent fuel instrumentation may only be capable of monitoring under normal conditions. -Spent fuel pools rely on maintenance of an adequate inventory of water under accident conditions to provide containment to prevent meltdowns, as well as for cooling and shielding -Emergency responders need reliable information on water in spent fuel pools to prioritize emergency actions -At Fukushima responders were without reliable instrumentation to determine water level in the spent fuel pool -This caused concerns that the pool may have boiled dry, resulting in fuel damage. Fukushima demonstrated confusion and misapplication of resources that can result from inadequate instrumentation. Exelon's response was due by May 12, 2012. Orders were issued by NRC August 30, 2012. ACE ASKED IF HAS EXELON REPLACED LIMERICK'S FUEL POOL LEVEL INSTRUMENTATION. IF SO, WHEN? IF NOT, WHY NOT? (To Date: NO NRC RESPONSE) (0377-4-5 [Cuthbert, Lewis])

Comment: There is an earthquake fault under the Limerick site, with four others within 17 miles of the site. Still, NRC gave Exelon until 2017 to deal with earthquake risks at Limerick To date: NO Responses from NRC to ACE concerns below. What exactly will Exelon do to reduce threats of cracking of brittle cement in Limerick's fuel pools? Given the consequences, whatever can be done should be required immediately. Why would NRC allow Exelon to wait until 2017 to complete a study, when the 8-23-11 Virginia earthquake felt in Limerick's control room shows it is far too risky to wait? (0377-4-7 [Cuthbert, Lewis])

Comment: Summary: Large volumes of Limerick's high-level radioactive wastes produced since 1985, are among the most deadly materials on earth and are being stored in fuel pools and casks on the Limerick site. Limerick has become a defacto radioactive waste dump that will remain dangerous virtually forever. (EPA gave storage for high-level radioactive waste a million-year health standard). As long as Limerick operates, tons more of this deadly waste will be produced each year. Limerick's Spent Fuel Pools Are Packed Beyond Design Basis, And Vulnerable. Limerick's Spent Fuel Pools Are At High Risk From Loss of Cooling Water Through Leaks Due To The Many Valid Threats Identified. Release of Radiation From Limerick's Fuel

Pools Could Render The Entire Greater Philadelphia Region Uninhabitable For Generations
(0377-4-8 [Cuthbert, Lewis])

Comment: How much of this deadly waste will be sitting in our back yard by 2029 when Limerick's current license expires? Or 2049 if Limerick's license is extended? (0377-5-3 [Cuthbert, Lewis])

Comment: NRC MUST PROVIDE IMPROVED REGULATIONS AND OVERSIGHT FOR DRY STORAGE. Limerick's dangerous and deadly radioactive wastes will likely remain in our backyard forever, posing serious threats to us and future generations. Containers holding these deadly wastes are estimated to safely contain the waste for only 50 years, when the wastes remain deadly for hundreds of thousands of years. (0377-5-4 [Cuthbert, Lewis])

Comment: EACH YEAR LIMERICK OPERATES MANY TONS MORE OF LIMERICK'S DEADLY HIGH-LEVEL RADIOACTIVE WASTES WILL BE PRODUCED. VOLUMES MORE WILL INCREASE RISK IF LIMERICK IS RELICENSED (0377-5-9 [Cuthbert, Lewis])

Comment: I am a close neighbor to the Diablo Nuclear Power Plant located near Avila Beach California. I am very pleased with the work that has been done at the site. It is an operation that makes perfect sense, producing much needed power for the PG&E grid. (0382-1 [Tognazzini, Randall])

Comment: I am writing today to urge the New York State Department of State to object to Entergy's unfounded certification that a proposed 20 year license extension for its Indian Point nuclear power plant is consistent with NYS's Coastal Management Program and enforceable NYS coastal zone policies. Indian Point is an outdated, unsafe, and environmentally destructive nuclear plant, which inflicts severe and unnecessary impacts to the ecologically significant coastal resources of NYS. If Indian Point operates for an additional 20 years, it will continue to devastate, as well as pose an incredible risk to, NYS coastal areas. I encourage you to carefully consider the numerous ways in which the continued operation of Indian Point would be inconsistent with various of NYS's coastal policies, including, but not limited to, the following: -- Policy 7: The protection, preservation, and restoration of significant coastal fish and wildlife habitats: Indian Point's antiquated cooling water intake structure, located in the vicinity of the designated significant fish and wildlife habitat of Haverstraw Bay, slaughters millions of aquatic organisms in Hudson River every year. Decades of such devastation has contributed to the decline of 10 out of 13 key species in the river. If Entergy were to continue running the plant the way they want to, it would result in ongoing impacts, and clearly not in the protection, preservation, and restoration of significant coastal fish and wildlife habitats. -- Policy 8: The protection of fish and wildlife resources from hazardous wastes and pollution: 1,500+ tons of "spent" nuclear waste from Indian Point currently sit on the banks of the Hudson River. Should Indian Point continue to operate, the plant will generate approximately 1,000 additional tons of waste to also be stored at the site. This waste, which is largely in tightly packed, degraded, leaking, and highly radioactive waste storage pools, poses an exceptional risk of accident and attendant large scale release of radiation to the surrounding coastal area, and demonstrably not in the protection of NYS coastal resources from hazardous pollutants. -- Policies 9 & 19: Protection and expansion of recreational uses of and access to coastal resources: Historic and rampant radiological leaks from spent fuel pools, buried pipes, and other structures at Indian Point since the 1990s have resulted in extensive plumes of contamination underlying the site. These plumes include highly toxic radionuclides that are known to bioaccumulate in aquatic organisms and interfere with human health. Entergy's solution? Let the plumes leach into the Hudson River. This has been happening for years and will continue for decades, especially as

the plant continues aging, breaking down, and leaking additional radioactivity to the environment. Entergy's complacency completely fails to assure the protection of NYS coastal resources for recreational activities, such as fishing and swimming. The proposed continued operation of Indian Point violates letter and intent of these, as well as other, NYS coastal policies. I, thus, urge you to ensure that Indian Point is disallowed to continue operating at the expense of NYS coastal resources by strongly objecting to Entergy's entirely unjustified coastal consistency certification. (0395-1 [DeCrescenzo, Jocelyn])

Comment: I am writing today to urge the New York State Department of State to object to Entergy's unfounded certification that a proposed 20 year license extension for its Indian Point nuclear power plant is consistent with NYS's Coastal Management Program and enforceable NYS coastal zone policies. Indian Point is an outdated, unsafe, and environmentally destructive nuclear plant, which inflicts severe and unnecessary impacts to the ecologically significant coastal resources of NYS. If Indian Point operates for an additional 20 years, it will continue to devastate, as well as pose an incredible risk to, NYS coastal areas. I encourage you to carefully consider the numerous ways in which the continued operation of Indian Point would be inconsistent with various of NYS's coastal policies, including, but not limited to, the following: -- Policy 7: The protection, preservation, and restoration of significant coastal fish and wildlife habitats: Indian Point's antiquated cooling water intake structure, located in the vicinity of the designated significant fish and wildlife habitat of Haverstraw Bay, slaughters millions of aquatic organisms in Hudson River every year. Decades of such devastation has contributed to the decline of 10 out of 13 key species in the river. If Entergy were to continue running the plant the way they want to, it would result in ongoing impacts, and clearly not in the protection, preservation, and restoration of significant coastal fish and wildlife habitats. -- Policy 8: The protection of fish and wildlife resources from hazardous wastes and pollution: 1,500+ tons of "spent" nuclear waste from Indian Point currently sit on the banks of the Hudson River. Should Indian Point continue to operate, the plant will generate approximately 1,000 additional tons of waste to also be stored at the site. This waste, which is largely in tightly packed, degraded, leaking, and highly radioactive waste storage pools, poses an exceptional risk of accident and attendant large scale release of radiation to the surrounding coastal area, and demonstrably not in the protection of NYS coastal resources from hazardous pollutants. -- Policies 9 & 19: Protection and expansion of recreational uses of and access to coastal resources: Historic and rampant radiological leaks from spent fuel pools, buried pipes, and other structures at Indian Point since the 1990s have resulted in extensive plumes of contamination underlying the site. These plumes include highly toxic radionuclides that are known to bioaccumulate in aquatic organisms and interfere with human health. Entergy's solution? Let the plumes leach into the Hudson River. This has been happening for years and will continue for decades, especially as the plant continues aging, breaking down, and leaking additional radioactivity to the environment. Entergy's complacency completely fails to assure the protection of NYS coastal resources for recreational activities, such as fishing and swimming. The proposed continued operation of Indian Point violates letter and intent of these, as well as other, NYS coastal policies. I, thus, urge you to ensure that Indian Point is disallowed to continue operating at the expense of NYS coastal resources by strongly objecting to Entergy's entirely unjustified coastal consistency certification. (0396-1 [Arrabaca, Andrew])

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devastate, as well as pose an incredible risk to, NYS coastal areas. I encourage you to carefully consider the numerous ways in which the continued operation of Indian Point would be inconsistent with various of NYS's coastal policies, including, but not limited to, the following: -- Policy 7: The protection, preservation, and restoration of significant coastal fish and wildlife habitats: Indian Point's antiquated cooling water intake structure, located in the vicinity of the designated significant fish and wildlife habitat of Haverstraw Bay, slaughters millions of aquatic organisms in Hudson River every year. Decades of such devastation has contributed to the decline of 10 out of 13 key species in the river. If Entergy were to continue running the plant the way they want to, it would result in ongoing impacts, and clearly not in the protection, preservation, and restoration of significant coastal fish and wildlife habitats. -- Policy 8: The protection of fish and wildlife resources from hazardous wastes and pollution: 1,500+ tons of "spent" nuclear waste from Indian Point currently sit on the banks of the Hudson River. Should Indian Point continue to operate, the plant will generate approximately 1,000 additional tons of waste to also be stored at the site. This waste, which is largely in tightly packed, degraded, leaking, and highly radioactive waste storage pools, poses an exceptional risk of accident and attendant large scale release of radiation to the surrounding coastal area, and demonstrably not in the protection of NYS coastal resources from hazardous pollutants. -- Policies 9 & 19: Protection and expansion of recreational uses of and access to coastal resources: Historic and rampant radiological leaks from spent fuel pools, buried pipes, and other structures at Indian Point since the 1990s have resulted in extensive plumes of contamination underlying the site. These plumes include highly toxic radionuclides that are known to bioaccumulate in aquatic organisms and interfere with human health. Entergy's solution? Let the plumes leach into the Hudson River. This has been happening for years and will continue for decades, especially as the plant continues aging, breaking down, and leaking additional radioactivity to the environment. Entergy's complacency completely fails to assure the protection of NYS coastal resources for recreational activities, such as fishing and swimming. The proposed continued operation of Indian Point violates letter and intent of these, as well as other, NYS coastal policies. I, thus, urge you to ensure that Indian Point is disallowed to continue operating at the expense of NYS coastal resources by strongly objecting to Entergy's entirely unjustified coastal consistency certification. (0397-1 [Stadnik, George])

Comment: We in Illinois don't want high-level radioactive waste being stored in Illinois or being transported through our state. The idea of creating storage in Illinois for 9000 tones of spent fuel from the nation's closed reactors makes no sense given the proximity of the City of Chicago and Lake Michigan, America's major source of drinking water. In fact, nuclear reactors need additional large amount of water to cool the reactors when they are running. This is a huge waste of our drinking water that is already threatened by droughts and chemical/radioactive contamination from fracturing operations throughout America. Close them down now. (0406-5 [Gerleman, Douglas])

Comment: Regarding the New York versus NRC case, please rule to shut down Indian Point so that no more highly radioactive waste continues to be produced in the tri-state area (just 35 miles from Midtown Manhattan in New York State and less than 15 miles from parts of New York City's drinking water supply) where approximately 6% of the population of the United States lives and works. (0407-1 [Kerr, Mary Ellen])

Comment: The security and health issues of storing highly radioactive spent nuclear fuel stored in an unprotected and unhardened industrial building is too high risk to 20 million people living and working in the New York, New Jersey and Connecticut areas. Note that current and former security guards of Indian Point indicated disturbing details about security at the plants which is potentially deadly. If there is an accident or terrorist attack involving this enormously

dangerous toxic waste dump, there no possible way to evacuate people within a 50 mile radius of the waste dump (note that 50 mile radius evacuation is what the NRC recommended in the case of the Fukushima disaster). Beyond the terrible health and property damage to the people living and working in the tri-state area, it would also cause terrible impacts to the world economy since it is the financial capital of the world. A 2004 study by the Union of Concerned Scientists, indicated that a "hypothetical terrorist attack" at Indian Point could kill 44,000 people in the short term and another 500,000 over the long term. The cost of such a disaster would be about \$2 trillion. In today's dollars, I expect that cost to be higher. Currently, the Indian Point waste dump leaks toxic radioactivity such as tritium and strontium-90 into the Hudson River and into the ground water around the aging Indian Point nuclear power plants which has been an on-going problem since at least the 1990s and it has not been fixed. (0407-2 [Kerr, Mary Ellen])

Comment: PG&E has proven that they are very good at public relations. However, accidents like San Bruno leave me to wonder how careful they are. No matter, PG&E believes that the ratepayers should pay for their mistakes rather than their CEOs or shareholders. It is pretty hard to trust them, and we are within a few miles of a radiation producing plant that could have problems at any moment. (0413-2 [Palaia, Joyce])

Comment: U.S. nuclear waste regulators and stakeholders currently are waiting on the sidelines as Canada inches closer to approval of their Deep Geological Repository in the next few months. The entrance to this radioactive repository would be less than one-half mile from Lake Huron and the possibility of radioactive contamination of Lake Huron and other waters downstream including Lake Erie, Lake Ontario and the St. Lawrence River are frightening. In Kincardine, Ontario approximately 8000 voters approved to host such a facility, you call it "voluntaristic siting"... but...the definition of "community" for this planned burial requires the engagement and acceptance of 40 million other people who live, work, play, eat and drink from the Great Lakes. Consent-Based-Siting in this instance is...a failure...SITTING on an international body of FRESH water, the LARGEST in the world. My hometown of Port Clinton, Ohio is the third Ohio city to pass a resolution opposing radioactive waste burial in the Great Lakes watershed. The Lake Erie Caucus of the House of Ohio State Representatives will also be writing a resolution, joining Michigan in opposing the Canadian Nuclear Waste Repository. (0421-4 [Clemons, Victoria])

Comment: As you explore options for the plant in Avila, on the Pacific Ocean, near a large population, in an earthquake zone, with a storehouse of waste, I ask you to protect us and our beautiful environment. Don't allow this dangerous game to continue. (0434-1 [Malone, Patricia])

Comment: Arizona already has a problem with radiation contamination. One only needs to walk through parts of the Navajo Nation where uranium and yellow dust are out in the open, on the ground where people and animals are easily in contact. Winds also spread the contamination. (0435-1 [Coor, Kristen])

Comment: TODAY, ONE OF THE TOXIC WASTE POOLS LOST A LEVY ON ONE SIDE AND EMPTIES MANY MILLIONS OF GALLONS OF HIGHLY TOXIC WASTE INTO THE ATHEABASKA RIVER IN ALBERTA. THIS WAS FROM A COAL MINE. IMAGINE IF IT HAD BEEN THE TYPE OF TOXINS THAT ARE USED IN BREAKING DOWN THE TAR SANDS AND/OR FRACKING. ALREADY THE LARGE RIVERS IN ALBERTA ARE AT A SERIOUS POINT AND CANNOT BE USED TO DRINK OR WATER CATTLE. THE FISH ARE DYING AND THE RIVERS ARE BECOMING 'DEAD ZONES'. AND THE PEOPLE IN THE REGION AND ESPECIALLY THOSE WHO LIVE ALONG THE VERY LONG RIVERS WHERE THE KEYSTONE/KEARL PROJECTS ARE SPILLING THEIR TOXIC WASTES, ARE HAVING

WHOLE FAMILIES SICK AND DYING FROM LIVER CANCERS, THROAT CANCERS, NOT TO MENTION THE INFANTS AND CHILDREN WHO ARE USED TO SWIMMING IN THESE ONCE PRISTINE WATERS BUT MUST NOT DO SO AGAIN. (0442-1 [Butler, Dee])

Comment: A factor to consider is that the damaged spent fuel pool inventories at Fukushima were far less than exist at almost all of the USA nuclear power reactor spent fuel pools. As an example, the Vermont Yankee BWR reactor spent fuel pool holds about 100 million Curies, three times the amount of spent fuel that was in the damaged pool of Fukushima Dai-Ichi Unit 4. And the Millstone units 1, 2 and 3 have more than 400 million Curies of spent fuel in storage. Clearly this disaster should be a wake up call to NRC of the potential disasters in waiting in the USA. (0447-1-18 [Andrews, Richard])

Comment: PGE's record of untruths and profit over safety mandates distrust. (0450-6 [Bast, Nancy])

Comment: CLOSE DIABLO CANYON NUCLEAR POWER PLANT. You are playing Russian Roulette with our lives and other living beings. It must be a terrifying responsibility. (0450-8 [Bast, Nancy])

Comment: I don't want the nuclear waste from San Onofre to be stored near me. I live in Santa Monica. Please close this down. (0469-1 [Joslyn, Celia])

Comment: Indian Point is environmentally destructive and runs afoul of various coastal policies, Entergy should not get a coastal consistency certification because of: a) The rampant and ongoing radioactive leaks from Indian Point that indisputably release to the Hudson River and will continue to do so for decades; (0476-1 [Amram, David] [Geist, Sheila])

Comment: Indian Point is environmentally destructive and runs afoul of various coastal policies, Entergy should not get a coastal consistency certification because of: b) The safety risks of storing thousands of tons of highly radioactive nuclear waste for decades, if not centuries, overly crowded leaking spent fuel pools and temporary dry cask storage structures; (0476-2 [Amram, David] [Geist, Sheila])

Comment: Indian Point is environmentally destructive and runs afoul of various coastal policies, Entergy should not get a coastal consistency certification because of: c) The 1.2 billion fish and other aquatic organisms killed annually by Indian Point's one-through-cooling water intake system, and the devastating impacts on the aquatic biota of nearby State and Federally designated Significant Coastal Fish and Wildlife Habitat in Haverstraw Bay. (0476-3 [Amram, David] [Geist, Sheila])

Comment: How is it possible that San Onofre power station will be used for a nuclear waste dump when we don't even know how much radiation was being released when it was fully operational? (0478-2 [Higgins, Kevin])

Comment: Spent fuel at San Onofre must be removed to MRS immediately. A waste policy for all nuclear plants must include looking at each individually. Nuclear waste is not like other dangers. A probability curve is crazy. Japan knew they should be safe until the not probable happened. San Onofre is in danger everyday due to firestorm from regular seasonal high winds, due to earthquake, tsunami, rising ocean levels, and terrorist attack. We are not a remote nuclear location. 8.4 million people will have to be relocated. (0481-1 [Magda, Marni])

Comment: Please do not continue to store nuclear waste at San Onofre. Please find an alternative. (0482-1 [Butler, Ruth])

Comment: SHOULD NUCLEAR WASTE BE STORED AT AT SAN ONOFRE FOREVER? I say no. (0487-1 [Giese, Mark M.])

Comment: First, if the US NRC is seriously concerned about the health and safety of the citizens living on the Central Coast of California, the NRC should (1) immediately suspend the operating license of the Diablo Canyon nuclear plant until it is brought into compliance with NRC safety regulations regarding earthquake threats; and (2) immediately move all of the nuclear fuel stored in spent fuel pools to an off-site location, not vulnerable to earthquake and tsunami risks, and subsequently transfer them to dry cask storage as soon as possible. (0501-1 [Brown, Jerry])

Comment: A recent report by the prestigious Union of Concerned Scientists, titled "Seismic Shift: Diablo Canyon Literally and Figuratively on Shaky Ground," found that "in the case of Diablo Canyon, the NRC is ignoring its regulations, unfairly exposing millions of Americans to undue risk." This is because Diablo Canyon, even after significant seismic upgrades in the 1980s, is not designed to meet current NRC safety regulations, given the unique, level of multiple, known earthquake threats surrounding the plant, including the Hosgri and Shoreline faults -- and given that, over the 40 year life of the plant, the chance that a large earthquake will occur at Diablo Canyon in any one year is about 1 in 6. One in six! This means that the NRC is playing radioactive roulette with the lives and livelihood of the people and businesses on the Central Coast of California. (0501-4 [Brown, Jerry])

Comment: That plant [Oyster Creek] never should have been built where it was and because it is the oldest in the nation, it was and is maintained at the lowest of all safety standards. To that, this area was hit by Storm Sandy last year and that plant wasn't even built to withstand a hurricane. The entire place needs to be leveled and cleaned up permanently. Manhattan would be the ultimate receiver of a disaster here because for most of the year the wind blows from the south and south west. (0510-2 [Holmes, Helen])

Comment: 6. Do not allow the storage of nuclear waste in Texas, which could impact the Oglalla Aquifer. (0515-11 [Stennes, Nancy])

Comment: We are, of course, particularly interested in issues regarding spent nuclear fuel now stored in our county at the Diablo Canyon Power Plant (DCPP) (0548-1 [Gibson, Bruce])

Comment: Our comments are informed by the location of the Diablo Canyon Power Plant in our county. This facility is sited in a tectonically-active region of the Pacific Coast and thus potentially subject to significant ground shaking from large-magnitude earthquakes. (0548-11 [Gibson, Bruce])

Comment: In the aftermath of the Fukushima disaster, our Board has considered a number of issues regarding DCPP, a facility that has long had major impacts on San Luis Obispo County. DCPP is a major component of our local economy and generates considerable tax revenue supporting both our schools and local government. At the same time, this nuclear power plant is sited in a tectonically active area and subject to considerable risk from earthquake ground motion. As you know, the earthquake risk to the plant in general is under active study through a process convened by the California Public Utilities Commission. (0548-5 [Gibson, Bruce])

Comment: The storage of spent fuel at DCPD is an ongoing concern for us. In particular, spent fuel pools are potentially vulnerable to natural disasters, human-caused accidents, and sabotage. The spent fuel pools at DCPD have also been reconfigured, and now contain more than twice the number of fuel assemblies that they were originally designed to hold. While we are assured by PG&E that risks of this configuration are completely mitigated, but we believe this issue is worthy of extensive review. (0548-6 [Gibson, Bruce])

Comment: Fermi 2 has an over crowded fuel pool with 600 tons of spent fuel. It is the largest GE Mark 1 reactor. It is at risk for weather events, loss of coolant, or terrorist attack. Like Dai-ichi reactors and all 23 GE Mark 1 reactors in the U.S., it's cooling pool does not have back up cooling. It has no diesel generators for cooling pool water circulation to rely on in loss of electrical grid emergency. There are 1,331 highly radioactive irradiated spent nuclear fuel assemblies in Fukushima Daiichi Unit 4's storage pool. Fermi 2's high-level radioactive waste storage pool contained 2,898 irradiated nuclear fuel assemblies by spring 2010, according to U.S. Department of Energy projections documented in the Yucca Mountain Final Environmental Impact Statement (Feb. 2002, Table A-7, Proposed Action spent nuclear fuel inventory). Fermi 2 could generate another 443 irradiated nuclear fuel assemblies between spring 2010 and spring 2014, meaning by next spring, a total of $2,898 + 443 = 3,341$ irradiated nuclear fuel assemblies. So, by next spring, Fermi 2's storage pool could hold 2.5 times as much high-level radioactive withdrawn fuel rods than Fukushima Daiichi Unit 4's pool! (0552-2-13 [Macks, Vic])

Comment: Building the proposed Fermi 3, and its high-level radioactive waste storage pool, right next to Fermi 2, and its high-level radioactive waste storage pool, is akin to the multi-unit Fukushima Daiichi site, where the meltdown and hydrogen gas generation at Unit 3 contributed directly to the explosion at Unit 4 which now imperils the Unit 4 high-level radioactive waste storage pool. Thus, Fermi 3's combined Construction and Operations License Application (COLA) should be rejected by NRC. So should Fermi 2's bid for a 20-year license extension, which Detroit Edison is poised to apply for next year. (NRC has rubberstamped 73 of 73 reactor 20-year license extensions applied for across the U.S. thus far!) The risks, and inevitable environmental impacts over time, of the high-level radioactive wastes that would be generated at Fermi 3, and at Fermi 2 during a 20-year license extension, are just too great, and therefore should be deemed unacceptable under the National Environmental Policy Act. (0552-2-14 [Macks, Vic])

Comment: NUCLEAR NEAR-MISSES IN 2012 THAT PUT AT RISK THE REACTORS AS WELL AS ONSITE STORED HIGHLY RADIOACTIVE SPENT FUEL: Reactor & Location; Owner; Highlights: SIT=10x increase in risk of reactor core damage, AIT=100x increase in risk of reactor core damage. Brunswick Steam Electric Plant, Unit 2, Southport, NC, Progress Energy: SIT: Excessive leakage of cooling water from the reactor vessel, determined to have been caused by the improper installation of the reactor vessel's head, led to an emergency being declared and the reactor being shut down. Byron Station, Unit 2, Byron, IL, Exelon Generation Co., LLC: SIT: Equipment failure in the switchyard triggered an automatic shut-down of the reactor. A design deficiency caused emergency equipment to be de-energized until workers took steps to isolate the problem and restore power from the emergency diesel generators. Catawba Nuclear Station, Unit 1, York, SC, Duke Energy Corp.: SIT: After an age-related problem caused one of four reactor coolant pumps to fail, the Unit 1 reactor and turbine automatically shut down as designed. Due to a design error in a recent modification, the decreasing voltage output by the main generator caused electrical breakers to open that disconnected Units 1 and 2 from the offsite power grid. One of the emergency diesel generators started but failed to supply electricity to safety equipment due to another design error when it was installed in 1984. Farley Nuclear Plant, Units 1 and 2, Dothan, AL, Southern Nuclear

Operating Company, Inc.: SIT: Security problems prompted the NRC to conduct a special inspection. Details of the problems, their causes, and their fixes are not publicly available. Fort Calhoun Station, Omaha, NE, Omaha Public Power District: SIT: The NRC investigated a fire that disabled half of the 4160 volt and two-thirds of the 480 volt power supplies for emergency equipment at the plant and triggered the declaration of an Alert-the third most serious of the NRC's four emergency classifications. Fort Calhoun Station, Omaha, NE, Omaha Public Power District: SIT: Security problems prompted the NRC to conduct a special inspection. Details of the problems, their causes, and their fixes are not publicly available. (0552-3-1 [Macks, Vic])

Comment: NUCLEAR NEAR-MISSES IN 2012 THAT PUT AT RISK THE REACTORS AS WELL AS ONSITE STORED HIGHLY RADIOACTIVE SPENT FUEL: Reactor & Location; Owner; Highlights: SIT=10x increase in risk of reactor core damage, AIT=100x increase in risk of reactor core damage. Harris Nuclear Power Plant, Raleigh, NC, Progress Energy: SIT: As the reactor was being shut down for a scheduled refueling outage, workers tested the closing time of the three main steam isolation valves. These valves are designed to close within five seconds during an accident to limit the amount of radioactivity released to the atmosphere. The NRC dispatched an SIT after it took one valve 37 minutes to close and another 4 hours and 7 minutes. Palisades Nuclear Plant, South Haven, MI, Entergy Nuclear Operations, Inc.: SIT: Workers shut down the reactor about a month after they detected a small cooling water leak. The NRC sent an SIT to the site after the source of the leak was determined to be a location where any leakage required the plant to be shut down within six hours. Palo Verde Nuclear Generating Station, Units 1, 2, and 3, Wintersburg, AZ, Arizona Public Service Company: SIT: Security problems prompted the NRC to conduct a special inspection. Details of the problems, their causes, and their fixes are not publicly available. Perry Nuclear Power Plant, Perry, OH, FirstEnergy Nuclear Operating Company: SIT: Security problems involving failures to prevent unauthorized individuals from entering secure areas of the plant prompted the NRC to conduct a special inspection. River Bend Station, St. Francisville, LA, Entergy Operations, Inc.: AIT: The operators manually shut down the reactor on May 24 after an electrical fault on the motor of a feedwater pump caused it to stop running. A failed relay prevented the electrical breaker for the motor from opening to isolate the electrical fault. The fault propagated through the electrical distribution system, causing the breaker supplying power to the 13,800 volt electrical bus to open. Due to another electrical cable problem on May 21, all of the plant's circulating water pumps and non-emergency cooling water pumps were being powered from this single electrical bus. Its loss caused the plant's normal heat sink to be lost and stopped the supply of cooling water to equipment in the turbine building and to some emergency equipment. San Onofre Nuclear Generating Station, Units 2 and 3, San Clemente, CA, Southern California Edison Company: AIT: Operators shut down the Unit 3 reactor following a leak inside a steam generator replaced less than a year earlier. The NRC dispatched an AIT after eight steam generators tubes failed pressure testing and inspections identified extensive and unusual degradation in the steam generators of both units. Wolf Creek Generating Station, Burlington, KS, Wolf Creek Nuclear Operating Corporation: SIT: Erratic performance of an emergency diesel generator during a routine test prompted the NRC's special inspection. The SIT determined that an improper fix to another problem four months earlier impaired the emergency diesel generator's control system. Wolf Creek Generating Station, Burlington, KS, Wolf Creek Nuclear Operating Corporation: AIT: After one electrical fault in the switchyard caused the main generator to shut down automatically, a second electrical fault disconnected the plant from its offsite electrical grid. (0552-3-2 [Macks, Vic])

Comment: I would like to submit a public comment pertaining to the thousands of fuel assemblies now in wet storage at the Pilgrim Nuclear Power Plant in Plymouth, MA, facility. Please note I am the author of *Fukushima Daiichi:Nuclear Information Handbook* (380 pages),

which contains a lot of information about the similarity of the design of the spent fuel pools at Fukushima and at Plymouth. This text is available for purchase on amazon.com. I would like to make the following comments: Reactor operations at Plymouth should be stopped as soon as possible due to the extreme hazard the plant, and especially its spent fuel pool, poses to public safety. The Plymouth plant shares the same "subprime real estate" design as the Fukushima plant. My first choice for storage of Plymouth-derived spent fuel wastes would be at the Yucca Mountain facility in Nevada. Since that will not be built in the foreseeable future, the next safest alternative would be onsite dry cask storage similar to that now used at Wiscasset, Maine for the fuel assemblies of the decommissioned Maine Yankee Atomic Power Plant facility. I would also like to note that opposition to any dry cask storage facility by well-meaning environmentalists often results in what I have called in my publications, the "least safe storage" of fuel assemblies, i.e. as now typified by the storage of the fuel assemblies at the Plymouth plant. As of 2002, there were 2274 assemblies at Plymouth (see pg. 111 of Fukushima Daiichi: Nuclear Information Handbook). Currently the number now exceeds 3,000. Comments on safe alternatives to dry cask storage would be welcomed. (0554-1 [Brack, H.G.]

Comment: Diablo Canyon, 250 miles to the north of SanO, is even more dangerous than SanO: Its freshest spent fuel is dozens of times more radioactive than anything at San Onofre -- now that SanO has been shut for nearly 2 years. And the fuel that's still inside DC's reactors is thousands of times more radioactive than that! (0562-11 [Hoffman, Ace])

Comment: The spent fuel at San Onofre, that is NOT being removed, can certainly do that. Each time Edison does a transfer to dry casks, that operation is about a million times more dangerous than this RPHV transfer, but there are no announcements warning about those operations. It just goes on daily, about one new cask per month, until the job is done and Edison can walk away, leaving southern Californians with a pile of waste which can destroy our paradise at any moment, for who-knows-how-many-generations. Edison has NO plans for removing the nuclear waste, and neither does the NRC. Outrageous! (0562-3 [Hoffman, Ace])

Comment: SanO is one of them. I say "randomly" because the sites were never picked because they would be waste dumps at all, let alone appropriate ones: When the reactors were built, the public was told the waste would be removed within a few MONTHS after it is discharged from the reactor! Instead, virtually all of SanO's used reactor cores remain on site. (0562-7 [Hoffman, Ace])

Comment: Is San Onofre a good location for a nuclear waste dump, permanent or not? Hardly! Earthquakes, tsunamis, sabotage, large surrounding population, poor egress, no radiation emergency supplies to speak of anywhere in the nearby counties to handle a spent fuel fire resulting from an airplane impact... and it's upwind from the entire United States, so everyone in the country will be contaminated if there is an accident at SanO. (0562-9 [Hoffman, Ace])

Comment: Do not allow the storage of nuclear waste in Texas, which could impact the Oglalla Aquifer. (0566-11 [Tocornal, John])

Comment: We in South Carolina are sitting on overcrowded commercial spent fuel storage sites that could explode if not tended continuously with water. We are behind the projected cleanup of the Cold War legacy waste at the SRS and in fact are dealing with leaks from that tank farm. (The tanks are almost 60 years old and we were told they would last 50 years). We are having budgetary constraints that are impacting the cleanup and frankly CSRA citizens through Don't Waste Aiken and the SC citizens through Conservation Voters are waking up to the fact that the NRC has no policy in place for this waste since Yucca Mountain was removed. (0571-2 [Young, Jane])

Comment: We want the spent nuclear fuel to be taken away from San Onofre as soon as possible. If San Onofre has to keep spent nuclear fuel on site, then some kind of process to make the nuclear fuel 'dry' is absolutely needed. My family and I are San Clemente residents. Thank you for your consideration. (0584-1 [Babski, Mark])

Comment: Having lived within a 30 mile radius of San Onofre Nuclear radiation repository (and directly downwind, as the residents of Belarus would testify) these past ten years, I feel no more safe than I felt when the plant was in full operation. Please empathize with someone who cannot afford to sell their home and relocate permanently far away from such an impending invisible toxic calamity. Remember the fact that the plant was build long before the much recent discovery of the local off shore earthquake fault. (0589-1 [Broska, Robert])

Comment: The unique combination of these precipitous factors conjure SONGS into an unprecedented cauldron of genetic devastation for the 8.5 million residents and their progeny who plan on living within the 50 mile radius. How can we foresee even a temporary evacuation plan? Let us activate a plan of waste removal to model for the rest of the 100 reactors in our country by being the first penguin to leap into the waters of peace and safety. Please give SONGS the exceptional priority of waste relocation that it uniquely deserves. Let us finally rest when this unnecessary threat is removed. (0589-3 [Broska, Robert])

Comment: As residents of San Clemente, CA, my wife and I are disappointed that the NRC chooses to neglect our city's dangerous nuclear waste problem and prefers instead to handle the San Onofre closedown in typical bureaucratic fashion. From the information that has been provided, there appears to be real danger here; and NRC does not seem to be acting accordingly. (0591-1 [Lange, Howard])

Comment: I did not speak up that evening as I thought the main points spoken about in opposition to plans for Fermi-3 were covered and I endorse all of them. I emphasis my support for what Vic Macks wrote in the "Fall 2013" issue of Peace Action of Michigan's newsletter, FLASH on page 8. Of special note is: "Monroe County, MI: During the period 1979 to 1988, Monroe had 21.2% fewer cancer deaths than the U.S. as a whole. During the period 1989 to 2005, correlating with Fermi 2 being online, Monroe had 45.5% higher cancer deaths than the U.S, as a whole. This is reported in a study by The Radiation and Public Health Project which utilized Center for Disease Control statistics." Do NOT build Fermi-3 as it would be too dangerous for human health, our environment (especially Lake Erie) plants and animals. (0597-2 [Bergier, Kim])

Comment: I agree with all the points brought up in this fact sheet and will be sharing this with activists as we are determined to not let your lies and obfuscation choose money over people. <http://www.athf3.org/wp-content/uploads/2013/03/ATHF3-Fact-Sheet.pdf> (0597-4 [Bergier, Kim])

Comment: I did not speak up as I thought the main points spoken about in opposition to plans for Fermi-3 were covered and I endorse all of them. I emphasis my support for what Vic Macks wrote in the Fall issue of Peace Action of Michigan's newsletter, FLASH on page 8: "Monroe County, MI: During the period 1979 to 1988, Monroe had 21.2% fewer cancer deaths than the U.S. as a whole. During the period 1989 to 2005, correlating with Fermi 2 being online, Monroe had 45.5% higher cancer deaths than the U.S, as a whole. This is reported in a study by The Radiation and Public Health Project which utilized Center for Disease Control statistics." Do NOT build Fermi-3 as it would be too dangerous for human health, our environment (especially Lake Erie) and animals. (0599-2 [Bergier, Kim])

Comment: For Indian Point, these include: --More than 20 million people live within a 50 mile radius of Indian Point, which is the evacuation area the United States recommended during the Fukushima disaster. --Indian Point is near New York State designated significant fish and coastal wildlife habitats. --Radioactive nuclides such as tritium and strontium 90 have been leaking from two spent fuel pools since the 1990s into the groundwater and Hudson River. Tritium and strontium 90 have been found in water drawn from the Hudson by United Water New York's pilot desalination plant located 3.5 miles downstream from Indian Point. --The water supply for Rockland County is proposed to be drawn from the Hudson River by United Water New York downstream from Indian Point, while parts of New York City's water supply are less than 15 miles away from Indian Point. --Indian Point sits at the intersection of two active earthquake faults; these faults could produce upwards of a 7.0 magnitude earthquake, which Indian Point was not initially built to withstand. --The Spectra Energy Corporation's Algonquin expanded 42" natural gas pipeline is proposed to go under the Hudson River, enter Westchester and intersect with proposed mega-voltage electric lines near Indian Point's 40 years of spent nuclear fuel rods, all in close proximity to the Ramapo faultline. --Indian Point's spent fuel pools, which were never designed to hold the nearly 2,000 tons of toxic waste now stored at the plant, are highly vulnerable to terrorism and accidents. The planes which slammed into the World Trade Center on September 11, 2001, flew along the Hudson and passed directly over Indian Point. It does not seem possible to guard against this kind of terrorist activity. (0604-4 [Pisha, Gayla])

Comment: WHEREAS, San Clemente is home to 65,000 residents and is located entirely within the 10-mile Emergency Planning Zone for the San Onofre Nuclear Generating Station; and WHEREAS, in June 2013, following more than a year of investigation and analysis by both Southern California Edison (SCE) and the Nuclear Regulatory Commission (NRC), SCE determined that San Onofre should be permanently decommissioned; and WHEREAS, in response to Southern California Edison's decision to decommission SONGS, the City of San Clemente urges SCE and the NRC to ensure that public safety remains paramount during the decommissioning process and beyond; and WHEREAS, Congress assigned to the Energy Department the task of creating an underground repository for nuclear waste as a result of the Nuclear Waste Policy Act of 1982, however, that task has yet to be completed; and WHEREAS, the storage of spent fuel rods onsite at SONGS continues to be a concern to the residents of San Clemente; and WHEREAS, the Nuclear Regulatory Commission (NRC) controls the decommissioning of nuclear facilities to ensure that safety requirements are being met, and WHEREAS, the City Council of the City of San Clemente takes its responsibility to represent its citizens with utmost seriousness and, as such, desires to be included in the decommissioning process for SONGS. (0605-1 [Baade, Joanne])

Comment: The plant's [Pilgrim] age is also cause for concern, as former Nuclear Regulatory Commission member Peter Bradford explained at a recent panel on nuclear issues at the Massachusetts State House. (0607-4 [Messinger, Michael])

Comment: Thus I consider myself an ardent advocate and defender of the county and its riches as well as a reasonably well-informed citizen about the dangers it faces. The primary one being, the risks we run by living in proximity to the Diablo plant and the spiderweb of earthquake faults that surround it on land and underwater. No one can know when the next "big one" will hit. However, anyone can see that we also face a heinous short-term risk, a foolishly high one, posed by the growing pileup of spent fuel rods in the pools at Diablo. (0609-1 [Leon, Vicki])

Comment: We, the residents of SLO county, along with the Diablo plant, sit alongside a sea just as capable of producing a tsunami on this side of the Pacific Rim as the other. Diablo and

its hazards imposes a huge burden of anxiety on our communities. It puts us in extreme jeopardy---not merely us but generations to come. Life is full of risks--but this one can be sidestepped if you put human safety and welfare first. (0609-3 [Leon, Vicki])

Comment: Indian Point is less than 30 miles from Wall Street and is located on the banks of the historic Hudson River. George Washington defeated the British here. Washington and his soldiers was aided by the narrowness of the Hudson above Buchanan and the impossibility of escape from lower Hudson Valley without going through the narrow Ramapo pass along the Appalachian Trail. The geography of this region remains unchanged. Then, and now evacuation from this region is impossible. (0611-1 [Shapiro, Susan])

Comment: Indian Point also has the infamous distinction of being named by the NRC the #1 plant in the nation most likely to be severely damaged by earthquake. Indian Point is located on two intersecting earthquake faults (the Ramapo and Stamford faults) and has two 36" natural gas pipeline within 500 feet from the facility, without on-site shutoff valves. In addition in 2013 the Congressional Government Accountability Office ("GAO") reported that Indian Point is the nation's reactor site with the most safety violations. (0611-2 [Shapiro, Susan])

Comment: Indian Point currently has 2700 tons of high level radioactive waste and more being produced everyday, even with an expired license. According to physicist Michio Kaku, the average 1000 MW reactor produces about 30 tons of high-level nuclear waste in one year. If the NRC grants Entergy's application for a new 20 year license for each reactor will produce an additional 600+ tons of radioactive waste, including high burn up waste. (0611-3 [Shapiro, Susan])

Comment: There is no comprehensive, continuous, independent monitoring or on-going capture species studies even though strontium-90 has been found in the majority of fish sampled and at a pilot desalination plant, the Haverstraw Desalination Plant, located 3.5 miles downriver, 6 out of 10 samples of finished water have measurable levels of strontium-90. (see Exhibit C: attached except from DEIS; Exhibit D: aerial photograph of Desal intake; and, Exhibit E: Thermal heat plume Aerial Photograph Indian Point/Desal). (0611-36 [Shapiro, Susan])

Comment: Local authorities depend on Entergy to report and radioactive leaks. This is clearly the fox watching the hen house and does not provide adequate monitoring. (0611-37 [Shapiro, Susan])

Comment: Indian Point is not an 805 plant. Currently Indian Point continues to use defective fire insulation, which has degraded fire protection at Indian Point from 1 hour to only 24 minutes, in a location where all other mandated fire safety requirements had already been degraded. At Indian Point the spent fuel pools are so overly packed that there is a very real threat of a spent fuel fire which will melt the zirconium cladding. Aging Zircolloy cladding suffers from creep, erosion, corrosion, embrittlement and pyrophoricity. (0611-40 [Shapiro, Susan])

Comment: The Nuclear Regulatory Committee does not operate as an ordinary federal regulatory government body, as its name suggests. Rather, historically, though it is funded by federal taxation, it functions as a body that forwards the interests of the nuclear energy business. Unfortunately, as a result, in the state of Illinois, this has resulted in the highest number of nuclear reactors being built. The oversight of the power plants in the state of Illinois has been such that in the past decade, that with just one reactor, millions of gallons of radioactive water has been released into the public water ways. The mop-up operation of Braidwood's performance and also its state and federal response at the time of the radioactive

release shows that there is much danger in the protocol and functioning of both the engineers of the plant as well as state and federal response. (0612-1 [Takarabe, Tamae])

Comment: In particular, the chance of an earthquake causing ground motion at Diablo Canyon greater than 0.75g is 3.9×10^{-3} per year (NRC 2011). Put another way, such an earthquake is likely to happen once every 256 years. To put this value in context, the Diablo Canyon reactors are more than 10 times more likely to experience an earthquake larger than they are designed to withstand than the average U.S. reactor. Of the 100 reactors currently operating in the U.S., the two at Diablo Canyon top the NRC's list as being most likely to experience an earthquake larger than they are designed to withstand.... [T]he chance such a large earthquake will occur at Diablo Canyon over the 40-year lifetime of the plant is 40 divided by 256, or about 1 in 6--which is a toss of a die.¹ [footnote 1 text: "Seismic Shift: Diablo Canyon Literally and Figuratively on Shaky Ground," UCS, http://www.ucsusa.org/assets/documents/nuclear_power/diablo-canyon-earthquake-risk.pdf] The GEIS states that the NRC in March 2012 requested information from all U.S. nuclear power plants, and "these assessments may make use of new consensus seismic hazard estimates for the power plants in the central and eastern United States." This is of little use to residents in the vicinity of a nuclear plant on the coast of California. Nor does the accompanying statement -- "In the 2010 assessment, the NRC chose seismic core damage frequency as the appropriate risk metric to changes in the seismic hazard" -- offer reassurance on the issue of seismic hazard to spent fuel pools, which, as seen at Fukushima, present a risk of disaster as great or greater than a core meltdown. (0614-2 [Christie, Andrew])

Comment: This criteria, the basis of seismic risk assessment in the GEIS, does not apply to our reactor community. Alone among U.S. nuclear facilities, Diablo Canyon has been allowed to operate outside its design basis. In 2008, the NRC was informed of a previously unknown earthquake fault line that runs as close as 2,000 feet from Diablo Canyon's reactors and could cause more ground motion during an earthquake than the plant was designed to withstand.² [footnote 2 text: "Several other important aspects of the Shoreline fault remain poorly characterized and therefore subject to uncertainty. These uncertainties include (1) the surface or subsurface rupture length of the fault, (2) structural relationships of the Shoreline fault to other faults, in particular the faults of the San Luis Bay fault zone, and (3) whether the Shoreline fault is capable of producing large enough earthquakes to affect the hazard at the DCP." Confirmatory Analysis of Seismic Hazard at the Diablo Canyon Power Plant from the Shoreline Fault Zone, NRC, Oct. 2012.] Since this fault was discovered, the NRC has not demonstrated that the reactors meet NRC safety regulations. Per UCS, "At other facilities, the NRC enforced its safety regulations and protected Americans from earthquake threats. Today, in the case of Diablo Canyon, the NRC is ignoring its regulations, unfairly exposing millions of Americans to undue risk." (0614-4 [Christie, Andrew])

Comment: When the PIN GP was originally licensed in the 1970s, it was assumed that the spent nuclear fuel would be sent to the Department of Energy's ("DOE") West Valley facility for reprocessing (at that time it was called the Nuclear Fuel Services Processing Plant.² [footnote 2 text: Final Environmental Statement Related to the Prairie Island Nuclear Generating Plant, US Atomic Energy Commission, May 1973, Docket Nos. 50-282,50-306, page V-37.] There was no other mention of PINGP spent nuclear fuel in the May 1973 Final Environmental Statement Related to the Prairie Island Nuclear Generating Plant. When the ISFSI at Prairie Island was initially proposed, in the early 1990s, it was to be temporary measure, only for a few years, to keep the plant running and plant personnel working, until the national repository (legislatively mandated to be at Yucca Mountain) could be opened. The Tribe, along with countless others, expressed concerns regarding the *long-term* storage of spent fuel in dry casks and the possibility that the waste would never leave Prairie Island. We understood then that the ISFSI

was to be an *interim or temporary* solution until the national repository could begin accepting waste. The NRC's EA for the Prairie Island ISFSI states that the TN-40 dry casks are designed to provide storage for spent nuclear fuel for at least 25 years.³ [footnote 3 text: US NRC, Environmental Assessment Related to the Construction and Operation of the Prairie Island Independent Spent Fuel Storage Installation, July 1991. Docket 72-10. ML090260415 at page 2.] The Purpose and Need (of the NRC action) was to allow the PIN GP 1 and 2 to operate until 2013 and 2014 by approving on-site spent nuclear fuel storage. The implication in the EA was that the ISFSI was for a short duration. Minnesota law requires approval from the Public Utilities Commission ("PUC") and the State Legislature before a utility can use on-site dry cask storage. During the process to evaluate NSP's application for a Certificate of Need ("CON") for the Prairie Island dry cask storage facility by the PUC, hearings were held before Administrative Law Judge Allan Klein in November and December 1991. In April 1992, Judge Klein recommended that the PUC deny the CON because of the likelihood that the Prairie Island ISFSI would not be temporary. In his Findings of Fact, Conclusions, and Recommendations, ALJ Klein stated that the essentials of the Findings and facts of the CON could be summarized as:

1. If we knew that the dry cask storage would be temporary, then it is a reasonably safe and cost effective way to deal with the storage problem, and would be eligible to receive a Certificate of Need. In particular, the radiation from the casks would be negligible, and would not pose a health risk to any person.
2. Unfortunately, the past delays in federal siting efforts raise questions about whether the dry casks storage will be temporary or will end up being permanent.
3. There has not been any substantial attempt to evaluate the Prairie Island storage site as a permanent location, nor has there been any comparison of this site with other sites in the state to determine which could be the preferable location for a permanent storage facility. The same is true for the method of storage-dry cask storage has not been evaluated as a permanent method.
4. The likelihood that the dry cask storage would become permanent is so great that it is appropriate to require legislative authorization if the project must go forward immediately. Neither the Commission nor NSP can control the timing or direction of the federal siting effort. Once the casks are in place, the path of least resistance is to leave them there indefinitely.
5. A reasonable alternative would be to wait and see whether the federal government can, in fact, progress its effort to the point that the Commission can be satisfied that the dry cask storage will be only temporary. It is possible to stretch-out Prairie Island and use other alternatives to meet energy needs while we wait and see how the federal effort is progressing. However, the cost of this wait and see approach is greater than the dry cask approach, but that cost has not been fully developed in this record.⁴ [footnote 4 text: State of Minnesota, Office of Administrative Hearings, In the Matter of the Application of Northern States Power Company for a Certificate of Need for the Construction of an Independent Spent Fuel Storage Facility. Findings of Fact, Conclusions, and Recommendations. April 10, 1992. 6-2500-5462-2, E-002/CN-91-9.](0619-1-2 [Mahowald, Philip R.]])

Comment: Despite these findings and conclusions, the Public Utilities Commission rejected Judge Klein's recommendation and ruled that NSPM could store the waste, but the MN Legislature reduced the number of casks allowed from 48 to 17 (NSPM initially sought a CON for 48 dry casks, the amount of casks permitted by its current NRC license). Subsequent Legislative action in 2003 lifted the 17-cask limit. The 1992 legislative hearings for the Prairie Island ISFSI were highly contentious and divisive. It is highly doubtful that NSPM would have received state approval then if legislators and the public believed that the waste would be on-site for an additional 60 or 100 years after reactor operations cease, or indefinitely, as the draft GEIS now contemplates. As mentioned previously, NSPM has filed an application seeking a 40-year license extension for the PINGP ISFSI. A draft EA was issued in November of 2013. The

stated purpose and need of the proposed action (i.e., the PINGP ISFSI license renewal) "is to provide an option (emphasis added) that allows for the continued temporary storage of spent nuclear fuel generated by the PIN GP Units 1 and 2."⁵ [footnote 5 text: US NRC Draft Environmental Assessment for the Proposed Renewal of the Prairie Island Independent Spent Fuel Storage Installation, November 2013. Docket 72-0010. ML13205A120.] Given that the Yucca Mountain national repository has all but been abandoned, and that there seems to be no action on siting and developing a different repository location, the Tribe does not believe that the continued storage of spent nuclear fuel at Prairie Island is either optional or temporary. (0619-1-3 [Mahowald, Philip R.]

Comment: Prairie Island is the Tribe's homeland, and the Tribe is unwilling to now or in seven generations bear the risks and costs associated with a nuclear waste dump it has never supported. (0619-2-10 [Mahowald, Philip R.]

Comment: As a citizen of San Clemente, and a professional hydrogeologist, I am concerned about the proposed long-term storage of spent nuclear fuel rods at the closed San Onofre nuclear power generating station. Storage of the spent fuel rods is not a safe long-term location, but simply the result of the inability of the United States and California government agencies to decide upon and implement a long-term storage location for spent nuclear fuel within the United States. Long-term storage of the spent rods at San Onofre was not planned when the nuclear power plant was constructed, and long-term storage should not be implemented at San Onofre just because another permanent nuclear storage site has not been identified. The citizens of San Clemente should not be subjected to the potential health risks of radiation release and loss of property value due to radiation release from an unexpected event such as an earthquake, tidal wave, or terrorist attack. If the U.S. does not plan on constructing a long-term storage facility for spent nuclear fuel within the continental U.S., then an intermediate storage facility should be identified somewhere in California that is not so close to a population center. San Clemente should not bear the risk of potential radiation release that could occur from an unforeseen event. (0632-1 [Dolegowski, John])

Comment: No Fukushima's in southern California! We DO NOT want the nuclear waste of San Onofre stored on site! It is the worst possible place to store radiation. On a fault line and at the ocean's edge. You are public servants & need to put the public's safety first. Costs to industry pale in comparison to costs of a nuclear accident in the backyard of 8 million people. (0658-1 [Jennings, Stephanie])

Comment: We are grateful that the City Council of San Clemente with its 60,000+ residents; and encouraging nearby Emergency Zone cities, did Approve and Pass their Resolution No. 13-53 requesting that the Nuclear Regulatory Commission; D.O.E. and responsible agencies prioritize San Onofre nuclear plant's radioactive waste storage and removal, when safe to do so. (0665-1 [van Thillo, Grace])

Comment: Likewise, to carry out San Clemente's SAFETY MANDATE, with the decommissioning plant in its front yard, the City MUST be financially supported, along with independent expert assistance to be included in the decommissioning process. Through the years, so-called utility and industry "experts" talked about safety BUT it has been many informed citizens, the on-going horror of Fukushima, the NRC, the CPUC, GAO & Congressional Investigations, which ALL exposed San Onofre's realities - TODAY THE NUCLEAR PLANT IS CLOSED, and we the people are LEFT with the radioactive WASTE! (0665-6 [van Thillo, Grace])

Comment: NO FUKUSHIMA IN SAN CLEMENTE OR CALIFORNIA! GET THIS NUCLEAR WASTE OUT OF HERE! YOU CREATED IT, PUT IT IN YOUR BACK YARD! HOW WOULD YOU LIKE THAT! THINK ABOUT IT! (0668-2 [Gordon, Mark] [Gordon, Michelle])

Comment: IF THERE WERE TO BE AN ACCIDENT OR ATTACK OR FORCE OF NATURE AT SAN ONOFRE RESULTING IN A MELTDOWN TOTAL DEVASTATION WOULD FOLLOW FOR THE PEOPLE AND THE ECONOMY OF CALIFORNIA. OUR LIVES, WEALTH & HEALTH REST ON YOUR DECISIONS. PLEASE DO WHAT IS RIGHT FOR THE PEOPLE. (0673-2 [Massey, Jennifer])

Comment: We are concerned for our safety due to the lack of responsible decisions by the NRC. *The report from the Union of Concerned Scientists ("Seismic Shift") states the lack of enforcement by the NRC of the Safe Shutdown Earthquake requirement found in Diablo Canyon's license. As the Union of Concerned Scientists report points out, of the 100 reactors currently operating in the U.S., the two at Diablo Canyon top the NRC's list as being most likely to experience an earthquake larger than they are designed to withstand. (0678-2 [Georgi, Carol])

Comment: The approximately 600 tons of highly radioactive spent fuel generated at our local nuclear plant [Seabrook Nuclear Generating Station], most of which is still underwater, is expected to end up in casks behind a simple chain-link fence in a former parking lot, across from the plant's visitors center and no more than 100 yards from the shoreline. With sea level rising and our coastline being increasingly eroded away, this existing arrangement appears woefully inadequate to secure these deadly wastes many decades into the future. Your GEIS and rulemaking should at the very least acknowledge and address these sort of shortcomings in existing waste management. (0680-2 [Bogen, Doug])

Comment: Diablo Canyon NPP needs to close immediately. (0686-12 [Malboeuf, Simone])

Comment: It is true that if DCNPP were closed, those employees would be out of work. I submit that if PG&E should stop promoting the continuation of an outdated system of the production of nuclear power, and started becoming a leader in solar, wind and wave power. Let them lead the way not just in the US but in the world to a new and better standard of producing needed electrical power for the world's population that is not as toxic and potentially dangerous as nuclear power. This discourse is wasting valuable time. It is time now to take our heads out of the sand. Admit the shortcomings and negatives of the nuclear power industry. Step up to the opportunity to become leaders with a bold mission to develop renewable energy sources that hold real promises for the future. The time is NOW. If PG&E cannot accomplish this on their own, then the courts and the NRC need to order them to do this. (0686-20 [Malboeuf, Simone])

Comment: Direct PG&E to also begin the process of finding the safest possible process of way of dealing with the radioactive waste. The only "safe" nuclear power plant is one that is not operational. As long as the radioactive waste is still at the site, it needs to be taken care of and monitored by PG&E, whether its cost effect or not. These costs should be absorbed by PG&E's corporation/share holders and not pushed upon the tax payers of California or the United States. (0686-22 [Malboeuf, Simone])

Comment: [I] recommend the decommissioning and closing of Diablo Canyon Nuclear Power Plant in San Luis Obispo, CA immediately. (0686-7 [Malboeuf, Simone])

Comment: We already have ongoing leaking radioactive tanks leaking directly into groundwater near the Columbia River, one of the most radioactive rivers in the world. (0690-8 [Eisman, Val])

Comment: From 1985 through 1987, the state of New Hampshire was one of seven eastern states embroiled in a public debate with the U.S. Government's Department of Energy over the site selection and characterization for a high-level nuclear waste repository in a portion of the Cardigan Pluton, a crystalline rock body that runs under seven towns in "The Granite State." The federal government dumpsite selection and characterization effort coincided with the ongoing federal effort to issue an operating license to the Seabrook nuclear power station in New Hampshire, then a would-be nuclear waste generator. A broad and significant portion of the New Hampshire public reasonably recognized and duly acted upon the hazardous environmental and unacceptable societal impacts from generating high-level nuclear waste and the creation of dubious national sacrifice areas for nuclear waste management. The New Hampshire public reasonably demonstrated their objection and their lack of confidence in government policy and efforts with the adoption of identical town warrant articles in local town meetings throughout the state in March 1986 "to oppose the burial, storage, transportation and production of high-level nuclear waste in the town of _____ and the State of New Hampshire." The identical warrant article popularly appeared in town meetings such as Article 21 of the March 10, 1986 Town Meeting of Rye, NH¹ [footnote 1 text: Town Report for 1986, Rye, New Hampshire, March 10, 1986, p.78

http://www.archive.org/stream/annualreportofto1986ryen/annualreportofto1986ryen_djvu.txt] and similarly Article 29 in the March 11, 1986 Town Meeting of Stoddard, NH where, "After much debate Art. 29 carries unanimously".² [footnote 2 text: Town Report for 1986, Stoddard, New Hampshire, March 11, 1986, p. 45

http://www.archive.org/stream/annualreportsoft1986stod/annualreportsoft1986stod_djvu.txt] Throughout New England, the debate over the inclusion of reviewing the production of nuclear waste into the management of nuclear waste received much media attention. As an example, the Boston Globe reported the popular public opposition and the subsequent "no confidence" vote in a March 12, 1986 article entitled "NEW HAMPSHIRE TOWN SPEAKS OUT AGAINST STUDY ON NUCLEAR DUMP SITE."³ [footnote 3 text: "NEW HAMPSHIRE TOWN SPEAKS OUT AGAINST STUDY ON NUCLEAR DUMP SITE John Milne, Boston Globe, Metropolitan Section, p. 25] (0691-10 [Gunter, Paul])

Comment: The Associated Press wire service similarly reported on the disingenuous political effort by promoters of nuclear power to disassociate the hazards of nuclear waste generation from the unresolved and long-lived adverse environmental impacts once the nuclear waste is generated. The AP news report, "Sununu Says Seabrook and Dump Not Linked", points out "Sununu, an opponent of a New Hampshire dump but a proponent of nuclear power, had urged voters to amend the resolution to delete the word 'production.' Seabrook plant officials backed the governor."⁵ [footnote 5 text: "Sununu Says Seabrook And Dump Not Linked," Michael Mokrzycki, AP, Concord Monitor, March 27, http://www.beyondnuclear.org/storage/waste/waste-confidence-decision/geis-comments-12202013/nhdump_sununnu.JPG] The Seabrook nuclear power proponents were saying that linking nuclear waste production to unresolved adverse environmental consequences with waste management was a "mistake" and "clouding the issue." However, Governor John Sununu and the nuclear industry were unsuccessful in persuading New Hampshire Town Meetings to disassociate waste generation from waste management. The news article reports that at least 92 of 137 towns adopted identical language "to oppose the burial, storage, transportation and production of high-level radioactive waste" in New Hampshire. (0691-11 [Gunter, Paul])

Comment: •TVA does not currently use MOX fuel at any of its nuclear plants, but TVA has considered possible future use of MOX fuel. (0694-2-19 [Shea, Joseph])

Comment: Please reread you own Special Inspection Report On ANO One[.] They dropped 250 ton Management job was Dumb dumb dumb dumb[.] (0699-2 [Lee, Michel])

Comment: (Tune: "Jingle Bell Rock") Nuclear, Nuclear, Nuclear Waste[.] Nuclear, nuclear, nuclear waste It blows in the air It blows in your face Tritiated water Makes a great baste It's just nuclear It's just nuclear It's just nuclear waste[.] What a bright dump It's the right dump For the bank of the Hudson River An alpha particle Is the right particle To ingest in your liver[.] (0699-4 [Lee, Michel])

Comment: (Tune: "Have a Holly Jolly K-I Pill") Have a Holly Jolly K-I Pill[.] Have a holly jolly K-I pill At the ready throughout the year[.] I don't know If Indian Point will blow But it's better to have K-I near[.] Have a holly jolly K-I pill And when you walk down the street Say hello to friends you know And give K-I to all you meet[.] Oh ho radiation could blow With poisons you cannot see But you can protect your thyroid at least With this simple remedy[.] Have a holly jolly K-I pill And in case you didn't hear Change your family's supply Of this iodide Every 5 year[.] (0699-6 [Lee, Michel])

Comment: (Tune: "Rocking Around the Christmas Tree") Rocking Around the Reactor Core[.] Rocking around the reactor core At the Indian Point power plant Nuke waste lovers just adore The nuclear power plant[.] Rocking around the reactor core At the Indian Point power plant Nuke waste lovers just adore The nuclear power plant[.] A new nuke dump is being built To hold the overflow The spent fuel pool is so tightly packed The water is aglow[.] You will get a sentimental feeling when you hear The NRC saying Just keep a praying For 20 more year[.] Rocking around the reactor core Have a radioactive day Everyone fleeing hysterically When the core starts to melt away! (0699-7 [Lee, Michel])

Comment: The Diablo Canyon Nuclear Power Plant is near two faults. The plant is built over the Hosgri Fault and is near the San Andreas Fault. The plant is built to withstand the expected earthquakes and the spent fuel is stored near by. That could be hazardous at times in the short term, but for long term storage the spent fuel should be moved a short distance to the east of the San Andreas Fault. The Pacific Plate is sliding north along the San Andreas Fault. No one can predict what will happen to the spent fuel in the distance future. The Hosgri Fault was an unknown fault until it had an earthquake. Diablo Canyon should be shutdown, mothballed and decommissioned. (0701-10 [Wilson, Greg])

Comment: The movie "San Andreas Fault" is on the series "How The Earth Was Made" on The History Channel. This movie explains the fault line that all of the West Coast Nuclear Power Plants are built on. The San Andreas Fault runs right under the San Onofre Power Plant. The movie explains how two bends in a dry river bed is evidence that the Pacific Plate is moving north at one inch per year as it slides against the North American Plate. The sliding occurs during earthquakes in a very dramatic manner. The next quake is coming soon and it may be a huge earthquake, the narrator said Huge! The Pacific Plate moves one inch per year. The last San Andreas fault earthquake was 300 years ago. The Pacific Plate could slide 300 inches or 25 feet north. Whatever part of the plant that is on the Pacific Plate could move 25 feet north and away from the other half of the plant. Both parts of the plant will collapse during a very powerful earthquake and first responders may not be able to respond to the tragedy. Many of the bridges and roads may be destroyed. Los Angeles could be devastated in the next San Andreas quake. Where the fault line runs in a straight line a shock wave is produced that

spreads off the fault in a cone shape, just like a jet plane breaking the sound barrier and creating a sound wave. The cone shaped shock wave spreads the fault line shock wave out covering a much larger area as demonstrated during the Great 1906 San Francisco Earthquake. (0701-7 [Wilson, Greg])

Comment: But Illinois has even more in common with Fukushima than just four Fukushima twin reactors that need to be shut down for safety inspections. At the same time that Fukushima is about to start the high-risk, high-level radioactive-waste fuel transfers out of Unit 3, the Zion Nuclear Generation Plant, 40 miles north of Chicago and midway between Chicago and Milwaukee, is about to start its own fuel transfer operation. In 2014 over 1,000 tons of radioactive waste, two and a half times the 400 tons being transferred at Fukushima, will be transferred to dry casks at Zion, Illinois. This is the largest scale decommissioning in history. (0708-3 [Lewison, Linda])

Comment: 4. *Seismic Conditions at Indian Point*[.] A 2008 study by seismologists at Columbia University's Lamont Doherty Earth Institute revealed that the area around Indian Point is not an inactive seismic area, as previously thought. Instead, the study found that, in addition to the Ramapo earthquake fault that Indian Point sits directly on top of, there is another, previously unknown earthquake fault, labeled the Stamford-Peekskill seismic line, that runs just slightly north of Indian Point. The study concluded that the area where Indian Point is located is susceptible to an earthquake of up to 7.0 in magnitude,²³ [footnote 23 text: Lynn R. Sykes, John G. Armbruster, Won-Young Kim, & Leonardo Seeber, Observations and Tectonic Setting of Historic and Instrumentally Located Earthquakes in the Greater New York City–Philadelphia Area, *Bulletin of the Seismological Society of America*, Vol. 98, No. 4, pp. 1696–1719, August 2008; see also The Earth Institute, Columbia University, “Earthquakes May Endanger New York More than Thought, Says Study: Indian Point Nuclear Power Plant Seen as Particular Risk,” Press Release Posted on The Earth Institute website, August 21, 2008, *available at*, <http://www.earth.columbia.edu/articles/view/2235> (last visited December 19, 2013).] even though the plant was not built to withstand an earthquake of this magnitude.²⁴ [footnote 24 text: The Environmental Impact Study conducted for Indian Point's original construction and operation presumed that the site was located in an inactive seismic zone, and thus was built to withstand an earthquake from 3.0 to 5.0 on the Richter scale.] Furthermore, an NRC report from August 2010 (in conjunction with supplemental data regarding power plants not reviewed in the report) indicated that Indian Point Unit 3 has the *highest* risk of seismic related core damage than any other nuclear power plant in the country.²⁵ [footnote 25 text: See Generic Issue 199 (GI-199), Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants Safety/Risk Assessment, August 2010, at Appendix D (Seismic Sore-Damage Frequencies), *available at*, ADAMS Accession Nos. ML100270639, ML100270756; Bill Dedman, *What are the odds? US nuke plants ranked by quake risk*, March 17, 2011, *available at*, http://www.msnbc.msn.com/id/42103936/ns/world_news-asia-pacific/ (last visited Dec. 19, 2013).] (0710-6 [Brancato, Deborah] [Musegaas, Philip])

Comment: From a safety and security perspective, Indian Point is a highly mismanaged plant that poses an incredible risk to the region. Indian Point consistently operates in an unsafe manner, including pursuant to many regulatory exemptions, such as fire safety exemptions, which reduce critical safety margins at the plant. Notably, Indian Point was recently determined to be the plant with the highest number of violations of any operating reactor in the country.²⁶ [footnote 26 text: Associated Press, *Report: NY Plant Had Most Nuclear Violations in US* (Oct. 15, 2013), <http://online.wsj.com/article/AP5fc1534dab524315b3ccdf1ec8ec79cc.html> (last visited Dec. 19, 2013).] The plant is highly degraded, with components consistently succumbing to breakdown and malfunction: in 2001 a steam generator tube ruptured causing Indian Point

Unit 2 to remain shut down for almost a year; in 2007 a degraded transformer of Unit 3 exploded and just two years later in 2010, a Unit 2 transformer exploded;²⁷ [footnote 27 text: See NRC Information Notice 2009-10: Transformer Failures-Recent Operating Experience, *available at*, <http://pbadupws.nrc.gov/docs/ML0905/ML090540218.pdf> (“Indian Point, Unit 3—On April 6, 2007, while operating at 92-percent power, a fault occurred on the No. 31 main transformer resulting in an automatic reactor trip and transformer fire.”); NRC Event Notification Report 46400 (November 7, 2010), *available at*, <http://pbadupws.nrc.gov/docs/ML1101/ML110190640.pdf> (“At 1849 EST, the licensee declared an Alert due to an explosion in the 21 Main Transformer. As a result of the loss of the transformer, Unit 2 experienced a reactor trip.”).] and over the past twelve years both reactors have suffered numerous unplanned shutdowns. As the plant continues to operate, aging related degradation will continue to occur and, in accordance with the bathtub curve principle, actually accelerate. Security at the plant is, likewise, abysmal. Recent analyses have adjudged Indian Point to be vulnerable to and inadequately protected against intentional terrorist attacks.²⁸ [footnote 28 text: See, e.g., Lara Kirkham & Alan Kuperman, Protecting U.S. Nuclear Facilities from Terrorist Attack: Re-assessing the Current “Design Basis Threat” Approach, Nuclear Proliferation Prevention Project (Working Paper #1 August 15, 2013), *available at*, <http://blogs.utexas.edu/nppp/files/2013/08/NPPP-working-paper-1-2013-Aug-15.pdf>; (acknowledging “that NRC licensees might be unable to provide adequate security measures to satisfy” design basis threats “due to economic or statutory constraints” and arguing that the government needs to “provide the necessary supplementary security, which currently does not occur in many cases, rather than to reduce artificially the posited threat as now is done.”).] A 2007 Report by Gordon Thompson, Ph.D. related to the risks of continuing to operate Indian Point explains the vulnerability of the spent fuel pools at Indian Point to intentional attacks, the credible threat environment, and the likelihood of acts of malice occurring at Indian Point.²⁹ [footnote 29 text: Gordon Thompson, Risk-Related Impacts from Continued Operation of the Indian Point Nuclear Power Plants (Institute for Resource and Security Studies, 2007), *available at*, <http://pbadupws.nrc.gov/docs/ML1209/ML120970089.pdf> ((hereinafter “Thompson, Risk-Related Impacts”).] Likewise a 2004 report by Edwin Lyman, Chernobyl on the Hudson: the Health and Economic Impacts of a Terrorist Attack at the Indian Point Nuclear Plant, explains the justified concerns about a potential terrorist attack at Indian Point.³⁰ [footnote 30 text: Edwin S. Lyman, Chernobyl on the Hudson? The Health and Economic Impacts of a Terrorist Attack at the Indian Point Nuclear Plant (September 2004), *available at*, http://www.ucsusa.org/assets/documents/nuclear_power/indianpointhealthstudy.pdf (hereinafter “Lyman, Chernobyl on the Hudson”).] Importantly, Indian Point faces a uniquely high probability of attack due to the location of the plant.³¹ [footnote 31 text: For example, the 9/11 Commission Report revealed that the mastermind of the 9/11 attacks had originally planned to hijack additional aircrafts to crash into targets, including nuclear power plants, but wrongly believed the plants were heavily defended. See Nat’l Comm’n on Terrorist Attacks Upon the U.S., *The 9/11 Commission Report* (2004), *available at*, <http://www.9-11commission.gov/report/911Report.pdf>, at 154. This report indicates that the terrorists were considering attacking a specific nuclear facility in New York, most likely Indian Point, which one of the pilots had seen during a familiarization flight near New York. *Id.* at 245.] (0710-7 [Brancato, Deborah] [Musegaas, Philip])

Comment: In addition, numerous current and former Indian Point employees, including security staff, have come forward as whistleblowers recently, highlighting inadequate training and deficient security systems and procedures that clearly leave the plant susceptible to human error as well as malicious acts. Repeated reports of faulty security systems, failed security exercises, and overworked guards found asleep at their posts raise grave concerns about the susceptibility of the facility, particularly the unhardened spent fuel pools, to terrorist attack.³² [footnote 32 text: See My Fox New York Staff, *Guards raise concerns about security at Indian*

Point (Nov. 14, 2013), <http://www.myfoxny.com/story/23975312/guards-raise-concerns-about-security-at-indian-point> (last visited Dec. 19, 2013); Roger Witherspoon, *NRC Probes Security Failings at Indian Point* (Nov. 22, 2013), <http://www.newjerseynewsroom.com/science-updates/nrc-probes-security-failings-at-indian-point-power-plant> (last visited Dec. 19, 2013); Shawn Cohen, *Second Indian Point worker charged in copper wire theft* (Jan. 26, 2013), <http://www.lohud.com/article/20130127/NEWS02/301250115/Second-Indian-Point-worker-charged-copper-wiretheft> (last visited Dec. 19, 2013).] In addition, there have been several instances of Entergy employees being prosecuted for theft and falsification of records related to the safe operation of the plant.³³ [footnote 33 text: For example, see the following: Shawn Cohen, *Second Indian Point worker charged in copper wire theft* (Jan. 26, 2013), <http://www.lohud.com/article/20130127/NEWS02/301250115/Second-Indian-Point-worker-charged-copperwire-theft> (last visited Dec. 19, 2013); *Ex-supervisor at Indian Point nuclear plant charged with fabricating fuel tests*, NY Daily News, July 23, 2013, <http://www.nydailynews.com/new-york/ex-supervisor-indian-point-nuclearplant-charged-fabricating-fuel-tests-article-1.1406963>; *Indian Point Nuclear Plant Worker Pleads Guilty After Attempt To Cover Up Diesel Fuel Contamination*, AP, Oct. 17, 2013, http://www.huffingtonpost.com/2013/10/17/indian-point-nuclear-diesel-cover-up_n_4115227.html, also <http://www.justice.gov/usao/nys/pressreleases/July13/WilsonDanielComplaint.php>; *NRC: Indian Point Worker Falsified Background Check Letter*, Hudson Valley Reporter, Nov. 21, 2013, <http://hudsonvalleyreporter.com/westchester/buchanan/2013/11/nrc-indian-point-worker-falsified-backgroundcheck-records/>.] (0710-8 [Brancato, Deborah] [Musegaas, Philip])

Comment: Instead I have had to study, participate in public meetings, write, and worry about just one radioactive waste site --- here in St. Louis --- namely, the West Lake Landfill. West Lake contains what many people recognize as some of the oldest radioactive waste of the Atomic Age. The landfill is located in the floodplain of the flood-prone Missouri River, just upstream from the Missouri/Mississippi rivers' confluence --- and upstream from the drinking water intakes for many St. Louisans and others farther downstream. And most recently, to the surprise and concern of the St. Louis public, we have learned that the West Lake Landfill contains not only historically significant and highly radioactive nuclear weapons wastes, but it is also the site of an advancing "underground smoldering event" --- that is, a fire. Starting in April 1942, engineers, scientists, and other workers at the Mallinckrodt Chemical Works (MCW), a mile from Downtown St. Louis, began to generate tons of extremely radiotoxic, long-lived uranium and thorium wastes for the Manhattan Project. MCW processed uranium and generated radioactive waste at the Downtown plant for fifteen years, and then for another ten years at the Weldon Spring plant, across the Missouri River, in St. Charles County. Amazingly enough, it had taken MCW only fifty days in 1942 to figure out how to purify the requisite tonnage of highly pyrophoric uranium that was then used for the world's first self-sustaining nuclear chain reaction. On December 2, 1942, in the Fermi reactor, under the University of Chicago's football field --- using Belgian Congo uranium purified here in St. Louis --- the Atomic Age was born. (0715-2 [Drey, Kay])

Comment: The decommissioning of the nuclear reactor in Zion, Illinois, is the largest decommissioning of a nuclear reactor in history with almost a billion-dollar budget. The project is scheduled to start the fuel transfer of the irradiated waste into dry casks next month. One thousand metric tons of irradiated fuel will be transferred into dry casks over the course of the next twelve months. HARDENED ONSITE STORAGE hasn't even been on the table. This fuel transfer of 1,000 metric tons of radioactive waste is TWO AND HALF TIMES the 400 metric tons currently being transferred at Unit 3 at Fukushima, Japan. Since the Zion decommissioning began, there have been two license transfers approved through the NRC. Now Zion Solutions,

LLC, a privately held company, has been granted authority by the NRC to manage the decommissioning. As a privately held company, Zion Solutions is legally entitled to take a profit. When I, along with others ConEd ratepayers, contributed to the public funding of this project, through a charge on our monthly electric bills, we expected that, if there were any funds left over, they would be rebated back to the public. There are precedents for this in the last twenty years when, through the assistance of Citizens Utility Board, millions of dollars were rebated back to the ratepayers in a settlement negotiated with ConEd.. According to the NRC, the NRC's only responsibility is to see that there is enough money to cover the cost of the project. At this point, those costs include a profit margin. Even if it turns out there is no profit to be made from the Zion decommissioning, the precedent is set for a privately held company to manage public funds and build a profit into the budget. As a ConEd ratepayer, I did not agree to this "public-private ownership" model. As a ConEd ratepayer, I did not agree that the public could legally be prohibited from access to the records of a privately held entity. There is already one lawsuit in the courts challenging the Zion project. There may be more in the future. At the last sham of a public meeting of the Zion Community Action Panel (a group of local people appointed by Zion Solutions who were not elected in a public process, and whose backgrounds do not encompass the expertise required for the oversight of a billion-dollar radioactive waste decommissioning project), Pat Daly, who has been managing this decommissioning up until now for Zion Solutions, announced that he was leaving the post and going back to Tennessee. He introduced the new executive, who will be starting now. Pat Daly, having made all the arrangements over the past eight years for this fuel transfer, is leaving at the most critical and vulnerable time, when the fuel transfers are due to start and when we, the millions of people who live in the Chicago/Milwaukee metropolitan areas within 50 miles of the reactor, will be at the most risk. How can we possibly have CONFIDENCE in the government agency, the NRC, that is charged with protecting the public, when it allows these things to happen? Whatever the next executive's fine credentials may be, it is not "best practices" to change management at this critical time.. This is not the best way for this decommissioning to occur, and by not intervening and postponing the fuel transfers, the public is put at needlessly higher risk. (Maybe Daly knows something we don't and we should all leave town!!) We do not oppose the fuel transfers; we oppose the process that is going on at Zion. And we are very concerned about the role (or the lack of role) of the NRC. We are all in clear and present danger here. It is the NRC's job to protect and safeguard the public, not turn a deaf ear. (0717-1 [Lewison, Linda])

Comment: QUESTIONS FOR NRC: •How was this budgetary figure arrived at? •How can we see the evidence supporting this budget at the NRC? •What contingencies (such as the different characteristics of high burn up fuel and if the fuel rods drop and an "inadvertent criticality" event occurs and there is a partial or complete drainage of the pool, unexpected power outage, and more) have been considered during the fuel transfer? •What are the preparations, emergency plans, extra boron on hand, and more that have been made to respond to them? •Since there only a few dry cask manufacturers and since there is a history of some defective casks, what was the process of testing and quality control for these dry casks? •Was this an open bid process? Was there an open bid process for the rest of the contracts let out – since such large sums of money are being spent – at Zion? If not, what was the process and what were the criteria used to select the contractors? •Why was HARDENED ONSITE STORAGE not considered as part of the decommissioning – when it is seen as "best practices" by so many experts? •What were the damages of the fuel rods – 1,500 of them – that were reported to have been repaired at Zion? What were the repairs? Why is it a good idea for the damages/repaired fuel rods to be in the same dry casks as the other fuel rods? •What is the amount and age of the high burnup fuel at Zion? •What special arrangements are being made in the fuel transfer? It is my understanding that high burn up fuel CANNOT BE MOVED!! It is too dangerous. It is my understanding that HIGH BURNUP FUEL needs to be stored in fuel pools for much longer

periods than the rest of the fuel rods. What special arrangements are being made with these constraints in mind? •What is the plan and time frame for keeping these dry casks onsite at Zion? •What is the plan for the safe monitoring of them 24/7? •What is the plan to keep terrorists away? To provide camouflage from the many flights going over Zion, which is on the flight path to and from O'Hare airport to the East Coast? (0717-4 [Lewison, Linda])

Comment: Questions for the NRC: •Why did the NRC allow for these license transfers from Exelon to Energy Solutions and Zion Solutions as part of the Zion decommissioning project? What was the process that allowed this to occur? What was the rationale behind the arrangements? •What is the authority of the NRC that allowed it to hand over almost a billion dollars of public trust fund money to a privately held entity? •How does it protect the public, to legally prohibit public oversight, accountability and transparency from the operation? •What is the profit? •What is the story behind the \$200 million dollar "line of credit" which was taken out of Northern Trust bank and put in a bank in New York? Why does this project even need such a line of credit – on which the public is paying a fee (of millions of dollars/year)? What funds have been paid out to Exelon - as part of the decommissioning •expenses? What have they done to earn these fees? Where is the documentation? •Will the NRC, let alone the public, ever see the financial statements? •Zion Solutions – in the third year of the project – brought in a public auditor. Where are the auditor's reports? Will the NRC, let alone the public, ever see them? •Do we need to file a FOIA to do so or can you make them available on the NRC website? •What is the NRC's plan and what is the NRC's responsibility 1) if the funds run out before the project is completed and 2) in the case of an inherent criticality event or unexpected events causing mega-catastrophic damages - past the caps of the Price Anderson Act? (0717-5 [Lewison, Linda])

Comment: Questions for the NRC: •What is the profit in actual amount and the profit margin on the Zion decommissioning project? Who gets it? How is it paid out? Questions for the NRC: •What are the guidelines for fiscal matters for a decommissioning project? •Who owns the R& D and intellectual property – as well as the actual physical new equipment and tools that may need to be developed for the decommissioning? •Why should public funds pay for development expenses and then allow the private company to profit from their "proprietary" intellectual property rights? •How does the NRC evaluate what is proprietary? Questions for the NRC: •Does the NRC have any recourse in this matter? Can Pat Daly be forced to remain at Zion and manage the fuel transfers? Does the NRC have the power to postpone the fuel transfers until such time as there is a public trustee and public oversight of the project? Who does? Who can stop it? What role does the NRC play in the process? (0717-6 [Lewison, Linda])

Comment: Throughout this proceeding, New York has requested that NRC conduct a transparent, objective, and comprehensive site-specific severe accident mitigation alternatives analysis of spent fuel pool accidents at Indian Point – and conduct a site-wide analysis of severe accidents at Indian Point. (0718-1-1 [Sipos, John])

Comment: Fires[.] When fuel is removed from a nuclear reactor, it is extremely hot and continues to generate large amounts of energy. It must be submerged in cold water for five years so that it does not spontaneously ignite. The figures below, taken from a report prepared by Sandia National Laboratories,²⁸ [footnote 28 text: Sandia National Laboratories, *Mitigation of Spent Fuel Pool Loss-of-Coolant Inventory Accidents and Extension of Reference Plant Analyses to Other Spent Fuel Pools*, at 54 ("2006 Sandia Report") (Nov. 2006).] show that spent fuel can generate close to 10 MW of energy when it is first removed from a reactor and placed in a spent fuel pool. To put this amount of energy in perspective, one megawatt of capacity produced by a conventional generator (such as a coal plant) will produce enough electricity to provide for the annual electric needs of 400 to 900 homes.²⁹ [footnote 29 text: Bob Bellemare,

What is a Megawatt? (June 24, 2003). Available at: <http://www.utilipoint.com/2003/06/what-is-a-megawatt/>.] This considerable amount of residual or "decay" heat causes the temperature of the pool water to increase rapidly, and cooling water is required to constantly refresh the pool and replenish the water lost through evaporation so that the fuel assemblies do not overheat. [Figures inserted] Assuming that a reactor has a 23-month refueling cycle, the scenario depicted by the above figures could take place ten times during a twenty year operating license authorized by a renewed reactor operating license. For sites, such as Indian Point, that have two operating power reactors, this scenario could occur approximately twenty times during the additional twenty year operating period. (0718-1-13 [Sipos, John])

Comment: NRC Staff has already ordered that certain measures be taken at nuclear reactors in an attempt to address some of the environmental and safety problems associated with spent fuel storage. In its March 12, 2012 Status Report on Implementation of the Near-Term Task Force Recommendations Based on Insights from the Fukushima Dai-ichi Accident, NRC announced it had ordered that "strategies shall be developed to add multiple ways to maintain or restore core cooling, containment and spent fuel pool (SFP) cooling capabilities in order to improve the defense in depth of licensed nuclear power reactors" and "[l]icensees are ordered to install enhanced SFP instrumentation." *Id.* at 2-3. These recently- announced, first steps underscore the fact that NRC has now recognized that spent fuel pools represent a potential source of significant adverse environmental impacts for which corrective actions are needed. However, NEPA requires analysis of a full range of site specific alternatives and mitigation measures. Such a full range of alternatives has not been developed or analyzed for Indian Point. The State is aware of ongoing efforts by NRC to begin to address problems with the spent fuel storage, including the above-mentioned Orders regarding recommendations from the Fukushima Daiichi Near Term Task Force. It is not a satisfactory answer to the State's concerns for NRC to indicate that those efforts should be a substitute for consideration at this time in major federal rulemaking proceeding of the serious environmental damage that can be caused by the spent fuel pool use and alternatives to mitigate that damage. (0718-1-21 [Sipos, John])

Comment: We write to request additional information regarding NRC's examination of potential aqueous releases following a severe accident, both for the Indian Point facilities and on an agency-wide basis. As we discussed on our conference call yesterday, the severe accident mitigation alternatives ("SAMA") analysis for Indian Point does not consider aqueous releases. Significant new information shows that, in light of the ongoing aqueous releases at Fukushima, aqueous releases should be considered in both the analysis of the impacts associated with a severe accident at Indian Point and the SAMA analysis for Indian Point. On April 27, 2013, the State submitted supplemental comments on the draft supplement to the December 2010 Final Supplemental Environmental Impact Statement ("FSEIS").¹ [footnote 1 text: The State had previously submitted comments on March 28, 2012 and August 20, 2012.] The State's April 2013 supplemental comments identified and discussed new and significant information. The State requested that NRC Staff examine the new and significant information in the supplement to the environmental impact statement. The State's April 2013 comments cited a presentation by the Director of NRC's Research Office from NRC's March 2013 Regulatory Information Conference. Based on that presentation, it is clear that the MACCS2 computer code used to examine severe accidents lacks the ability to analyze the impacts to water resources and the environment resulting from aqueous radiological releases accompanying such an accident. International Session - Post-Fukushima Research, Brian Sheron, Director, NRC Office of Nuclear Regulatory Research (March 13, 2013).² [footnote 2 text: The document is available at https://ric.nrc-gateway.gov/m/Docs/Abstracts/sheronb_rev1-hv-w15.pdf.] In slide 7 of that presentation (reproduced below), NRC notes (1) aqueous releases occurred during Fukushima accident, and (2) current models do not address aqueous release pathways. The term "current

models," as used in the slide, would include computer codes such as MACCS2, which Entergy and NRC Staff used to analyze severe reactor accidents in connection with the applications for renewed operating licenses for the Indian Point facilities. (0718-6-1 [Sipos, John])

Comment: In addition to the March 2013 presentation, the State's April 2013 comments also included recent reports regarding continuing radiological aqueous releases at the Fukushima site—two years after the start of the severe accidents that damaged four of the Dai-ichi nuclear facilities. The State's comments explained that, although these releases had not been reflected yet in publically-available NRC documents, according to news articles, the receptacles holding radiation contaminated fluids at the Fukushima site have leaked and have released radiological material to the environment. See, e.g., *Damaged Nuclear Plant in Japan Leaks Toxic Water*, Martin Fackler, New York Times (April 6, 2013); *Japan Nuclear Plant Finds New Leaks*, Mari Iwata, Wall Street Journal (April 7, 2013); *Nuclear Plant in Japan Has Leak in Other Tank*, Hiroko Tabuchi, New York Times (April 9, 2013); *Fukushima Nuclear Plant is Still Unstable*, Japanese Official Says, Hiroko Tabuchi, New York Times (April 10, 2013). More recently, on August 1, 2013, NRC made the transcript of a December 2012 Advisory Committee on Reactor Safeguards ("ACRS") subcommittee meeting publicly available. July 30, 2013 Memorandum to ACRS Members regarding Certified Minutes of the ACRS Reliability and PRA Subcommittee Meeting on Level 3 PRA on December 4, 2012 (ML13211A477) (*ACRS Transcript"). At that meeting Alan Kuritzky from NRC's Office of Research, Division of Risk Analysis, explained [""]Aqueous transport and dispersion of radioactive materials, this is something very big given the Fukushima event, but something we simply are not going to address in our study, but the Agency as a whole is looking into it.[""] ACRS Transcript at 43:17-21. An article appearing in today's New York Times further underscores the importance of the issue. *Fukushima Plant Has 300-Ton Water Leak*, Associated Press, New York Times (Web Edition) (August 20, 2013) ("The operator of Japan's tsunami-crippled nuclear power plant said Tuesday that about 300 tons (300,000 liters, 80,000 gallons) of highly radioactive water have leaked from one of the hundreds of storage tanks there—its worst leak yet from such a vessel."). Aqueous releases following a severe accident would be of particular concern at Indian Point, which sits on the Hudson River. Aqueous releases have the potential to contaminate the Hudson River's waters, riverbanks, riverbed and sediment, adjacent freshwater tidal wetlands, and fish and other aquatic organisms and impacts to the environment and human health could exceed the impacts flowing from the aqueous releases into the Pacific Ocean at Fukushima. The unique, site-specific conditions at Indian Point warrant an analysis of the aqueous release issue in the context of the SAMA analysis. (0718-6-2 [Sipos, John])

Comment: NRC's acknowledgement of the continuing aqueous releases at Fukushima and the importance of analyzing aqueous release pathways in the context of severe accidents constitutes new and significant information. Under 10 C.F.R. § 51.92(a)(2), NRC Staff is obligated to "prepare a supplement to a final environmental impact statement . . . if . . . [t]here are new and significant circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." See also 40 C.F.R. § 1502.9(c)(1)(ii); *Marsh v. Oregon Natural Res. Council*, 490 U.S. 360, 370-78 (1989) (even after initial approval of an environmental impact statement (*EIS"), an agency must continue to evaluate the environmental consequences of the project and supplement the EIS as necessary). The information is new because the presentation was made publically available after NRC Staff issued its FSEIS in December 2010. It is significant because an analysis of aqueous releases would lead to an increase in severe accident costs, which could lead to the consideration of mitigation measures designed specifically to address aqueous releases or render additional mitigation measures cost-beneficial in the SAMA analysis. NRC Staff's failure to identify and analyze the impacts and costs associated with aqueous release following a severe accident and the alternatives to

mitigate such impacts in the FSEIS supplement is not consistent with the National Environmental Policy Act. We appreciate your cooperation and look forward to receiving a description of NRC's analysis of aqueous releases in the wake of the Fukushima accidents. Please also indicate whether NRC plans to supplement the FSEIS for the renewal of the operating licenses for the Indian Point facilities to include a site-specific analysis of the impacts of aqueous releases flowing from a severe accident and the means to mitigate such impacts. Based on our conversation yesterday, we trust that you will forward this letter and our request to the appropriate individuals including Brian W. Sheron, Director, Office of Nuclear Regulatory Research and John Lubinski, Director, Division of License Renewal. (0718-6-3 [Sipos, John])

Comment: The State writes to request additional information regarding NRC's oversight and funding of offsite decontamination in the event of a severe accident at Indian Point. As we discussed on our conference call yesterday, it is not clear which federal agency is responsible for decontaminating the area surrounding Indian Point or whether the Price Anderson Act covers such decontamination costs. On March 20, 2012, NRC Staff announced that it was going to supplement its examination of the environmental impacts of the issuance of proposed operating licenses for the Indian Point Unit 2 and Indian Point Unit 3 facilities in the December 2010 Final Supplemental Environmental Impact Statement ("FSEIS"). 77 Fed. Reg. 16278 (Mar. 20, 2012). On March 28, 2012, the State sent a letter to NRC Staff regarding the proposed scope of the FSEIS supplement. See March 28, 2012 letter from J. Sipos to S. Turk (NRC), ML12090A609. In its scoping comments, the State urged NRC Staff to address, in a proactive way, the issue of how it deals with severe nuclear events that lead to significant environmental impacts including land contamination. *Id.* at 13. In Attachment I to the State's letter, the State raised the issue of funding for decontamination costs, noting that "according to documents prepared by staff at the U.S. Environmental Protection Agency ("EPA")" the NRC recently informed the EPA and the Federal Emergency Management Agency ("FEMA") that the industry-funded account established under the Price Anderson Act would likely not be available to pay for offsite decontamination in the event of a severe accident at a nuclear plant. *Id.*, Attachment I at 59 (discussing Douglas P. Guarino, *Agencies Struggle To Craft Offsite Cleanup Plan For Nuclear Power Accidents*, Inside EPA (Nov. 10, 2010), and attached emails disclosed pursuant to Freedom of Information Act ("FOIA") Request). On June 26, 2012, NRC Staff informed the public that the draft FSEIS supplement was available for public comment, however, the draft did not address the State's scoping comments. See Notice of Availability of Draft Supplement to Final Plant Specific Supplement 38 to the Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3, June 26, 2012, ML12178A660; Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 38 Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3, Draft Report for Comment, June 2012, ML12174A244. (0718-7-1 [Sipos, John])

Comment: On August 20, 2012, the State submitted comments on the draft FSEIS supplement to the NRC, identifying and discussing the issue of funding for environmental restoration following a major radiological release at Indian Point. See Comments by the New York State Office of the Attorney General on the Draft Supplement to Supplement 38 to the Generic Environmental Impact Statement For License Renewal of Nuclear Plants, Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3, Draft Report for Comment Dated June 26, 2012 ("State Comments") at 4, Aug. 20, 2012, ML12235A409. The State's comments cited a presentation by NRC Commissioner William D. Magwood, IV at the Health Physics Society Mid-Year Meeting on February 6, 2012. See Commissioner Magwood, Nuclear Issues in the Post Fukushima World - Presentation at the Health Physics Society Mid-Year Meeting ("Magwood Presentation"), Feb. 6, 2012, *available at*: <http://www.nrc.gov/about->

nrc/organization/commission/comm-william-magwood/testimonyspeeches.html. In the presentation, Commissioner Magwood noted that "[t]here is no regulatory framework for environmental restoration following a major radiological release." *Id.* at slide 15 (reproduced below). [figure inserted] Based on this information, the State commented that "it [is] not clear that NRC has the desire, capability, or financial resources to respond to a serve accident at Indian Point and ensure the thorough decontamination of the New York metropolitan area including, but not limited to, its water resources—and drinking water resources—in the wake of such an accident." State Comments at 4. In response to the State's comments, NRC Staff stated that "NRC has technical leadership for the Federal government's response to the event," but it also listed eight other federal agencies "who may respond to an event at an NRC-licensed facility, or involving NRC- licensed material." Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 38 Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3 Final Report, Supplemental Report and Comment Responses ("June 2013 FSEIS Supplement") at A-32, June 2013, ML13162A616. Staff's response did not address Commissioner Magwood's statement regarding the lack of a regulatory framework for environmental restoration following a major radiological release. Nor did Staff explain which agency is responsible for decontaminating the New York metropolitan area following a severe accident at Indian Point, or which agency's decontamination standards will apply to a cleanup. Staff noted that "[c]osts associated with nuclear incidents are governed by the Price- Anderson Nuclear Industries Indemnity Act" and that "[t]he main purpose of the Act is to provide prompt and orderly compensation to the public who may incur damages from a nuclear incident, no matter who might be liable." *Id.* Staff added that there is a combined level of protection under the Price Anderson Act of \$12 billion, and if a nuclear accident involves damages in excess of this amount, the Act "includes a provision that obligates Congress to take appropriate action to provide compensation for public liability claims." *Id.* at A-33. However, while Staff's response explains how the public will be compensated for damages incurred as a result of an accident, such as hotel stays, lost wages and property replacement costs, it does not explain how decontamination costs will be funded in the event of a severe accident at the Indian Point reactors or spent fuel pools. (0718-7-2 [Sipos, John])

Comment: Given the unique characteristics of Indian Point, the State believes it is especially important that the public have access to this information. The Indian Point reactors are located 24 miles north of New York City. More than 17 million people live within 50 miles of Indian Point, a total that is projected to grow to over 20 million by 2035. According to the Atomic Energy Commission, the NRC, and FEMA, more people live within 10 and 50 miles of the Indian Point reactors than at any other operating power reactor in the nation. The communities within the 50-mile radius around Indian Point also contain some of the most densely-developed and expensive real estate in the country, critical natural resources, centers of national and international commerce, transportation arteries and hubs, and historic sites. Thus, the decontamination costs of a severe accident at Indian Point have the potential to be larger than an accident at any other reactor in the country. Documents disclosed by the NRC and other federal agencies indicate that there are conflicting responsibilities of multiple federal agencies for offsite restoration after a nuclear incident and that NRC may not lead cleanup oversight in the event that an accident at a nuclear power plant dispersed radioactive contamination off the reactor site and into the surrounding area. See Douglas P. Guarino, *Agencies Struggle To Craft Offsite Cleanup Plan For Nuclear Power Accidents*, Inside EPA (Nov. 10, 2010), and attached emails disclosed pursuant to FOIA Request (reproduced in part below). [figures inserted] These documents also indicate that money set aside by the Price Anderson Act would not be available to fund decontamination. *Id.* If there is no regulatory framework or source of funding in place to decontaminate the New York metropolitan area in the event of a severe accident at Indian Point, that fact should be disclosed by NRC Staff to the public. Therefore, in light of Commissioner

Magwood's statements and NRC's statements to EPA, the State requests that the U.S. Nuclear Regulatory Commission answer the following questions: 1. Which federal agency is responsible for decontaminating radiation released offsite by a severe accident at the Indian Point reactors and spent fuel pools? 2. Would the Price Anderson Act fund decontamination in the event that that an accident at Indian Point caused radioactive contamination to be dispersed off the reactor site and into the surrounding area? We appreciate your cooperation and look forward to receiving additional information regarding NRC's oversight and funding of offsite decontamination in the event of a severe accident at Indian Point. Based on our conversation yesterday, we trust that you will forward this letter and our request to the appropriate individuals, including James Wiggins, Director, Office of Nuclear Security and Incident Response, and Robert Lewis, Director, Division of Preparedness and Response, Office of Nuclear Security and Incident Response. (0718-7-3 [Sipos, John])

Comment: In terms of our local nuclear power plant, Diablo Canyon... I am a rancher living only seven miles from the facility, so I have everything at stake here. I love this county and am very supportive of our community. I know many residents are happy with PG&E but I believe they can be providing jobs and electricity in much, much better ways. There are plenty of natural resources available (and many untapped) -- solar, wind, tidal -- that would make this county, and country, far safer. Let's not wait until a disaster occurs!! Let's take the lessons from Fukushima to heart. (0734-8 [Hisasue, Carole])

Comment: Please do not store this nuclear waste at San Onofre. Earthquakes happen frequently and could have a disastrous effect on waste not stored well and properly. It would be far preferable to have it gone somewhere. We live about 20 miles from there and we are very glad you shut that crippled reactor down, but we are left with all of the waste to continue to pollute our beautiful area. Help us to get rid of it, please. (0749-1 [Horne, Shari])

Comment: You allowed the plant to operate...Now it is time to get rid of the dangerous waste ASAP. Its presence puts millions at risk. Therefore, San Onofre waste should be put as a top priority for clean up. (0769-1 [Worthington, Juniel])

Comment: Nuclear waste at SONGS should be removed from this site, because of the threat of a tsunami or earthquake. With millions of people living within a 50 mile radius, this should be done ASAP. (0782-1 [Schlegel, Ed])

Comment: In addition, as outlined below, the actual ISFSI is located within the boundaries of the City [Red Wing, MN]. Thus, the City is and will continue to be impacted by the spent fuel that is located in the ISFSI. (0783-1-3 [Harlan, Thomas])

Comment: I am concerned about the thought of storing nuclear fission waste material indefinitely at San Onofre, CA, The reactor is no longer to be used, and the stored waste is just that, waste with no functional purpose. It must be constantly monitored. The material is within 5 miles of populated neighborhoods who have already been exposed to gaseous emitted radioisotopes for the duration of the operation of the former facility and have contaminated groundwater from the tritium water emissions that have been ongoing here. (0793-1 [Sauerheber, Richard])

Comment: We need to again become a green, organic Nation. By correcting this, cleaning the land in San Onofre and figuring out how to store the waste away from a population center or water source, is precisely how this return to a clean and well kept country begins. (0793-4 [Sauerheber, Richard])

Comment: Spent nuclear fuel should be removed from this ecologically sensitive coastal zone. The beaches and communities near SONGS are some of America's finest. Please do everything in your power to protect our future, America's future. (0795-1 [Carey, Kevin])

Comment: Please find a safe solution to the waste at San Onofre. Southern California (from San Diego County to Orange County to LA county and Riverside) is such a hugely populated area and beautiful area that it would be very irresponsible to leave the nuclear waste at the plant . Please act with this in mind. (0799-1 [Powers, Jim])

Comment: Your first target should be San Onofre. Please head the San Clemente City Counsel resolution. (0800-2 [Renzoni, Dante])

Comment: I'm a resident of Southern California; I urge you to responsibly, safely and as quickly as possible remove, and safely store long term the radioactive waste from the decommissioned San Onofre Nuclear Generating Station. Its location on a earthquake fault and at risk of Tsunami, - and with US Marines practicing day and night in the area at Camp Pendleton! - makes it absolutely too vulnerable, dangerous and too risky for millions of residents and future generations. I won't stop monitoring and voicing my concerns until it will be done. I haven't used my time and energy to pressure the decommissioning of the nuclear power plant in the past 2 years to allow nuclear waste to remain here and haunt us and our children. Thank you for your prompt attention to this matter[.] (0804-1 [Colfi, Alessandra])

Comment: it is absolutely vital to this region, the nation and the world, that you find ways to encapsulate all the necessary parts of Indian Point the absolute best way you know and close the plant down now[.] (0807-2 [Krimsky, Pam])

Comment: It is ludicrous. It is insanity. It is insulting to listen to you, the NRC, bulldoze forward with your lies and false assumptions that there will be a safe place to store the radioactive mess you have created and are not taking responsibility for. Diablo Canyon nuclear power plant must stop producing waste immediately. (0811-1 [Paulsen, Carol])

Comment: It is time to shift your focus toward safe, renewable energy. It is time to close Diablo Canyon because there is no safe storage on a multiple, active earthquake fault. (0811-4 [Paulsen, Carol])

Comment: I am opposed to relicensing the Diablo Canyon facility. (0817-2 [Munson, Marcia])

Comment: Certainly TVA is unlikely to exist 100 years from now. TVA is reeling from the apparently permanent decline in energy intensity and in TVA sales due to increased efficiency. As electricity costs rise, private actions to reduce consumption will increase, causing a permanent loss of demand even as population may grow. Likewise, the external investment in grid connected distributed renewable solar and the availability of inexpensive wind generated electricity are making TVA's model of centrally generation outmoded. This is true whether the generation is from coal or nuclear. (0821-12 [Paddock, Brian])

Comment: Moreover Sequoyah is still under scrutiny as to flood safety in the event of failure of one or more of TVAs upriver dams. TVA and NRC continue the checklist process for license renewal which looks only at the longevity of reactor parts and refuses to consider that these reactors are now directly adjacent to a large and fast growing (and greening) city. This is a risk and accident consequence factor that should cause both TVA and the NRC to consider decommissioning the reactors in light of the reduced need for electricity within the TVA fence

that has occurred steadily over the last eight years and is projected to last into the 2020's according to TVA. (0821-4 [Paddock, Brian])

Comment: In Wisconsin, the NRC granted license extensions to Point Beach nuclear plant's 2 reactors in Manitowoc County as well as to the Kewanee nuclear plant 27 miles south of Green Bay on the shores of Lake Michigan. Kewanee has recently closed due to financial costs. Kewanee has spent fuel rods stored in an on-site pool. The NRC granted both Point Beach and Kewanee license extensions, after dismissing, as inappropriate, citizen testimony that both plants were leaking tritium. The NRC did not mandate any stoppage of the leaks. Wisconsinites who knew about this causal acceptance found it unacceptable that some people have become, so to speak, sacrificial lambs to be harmed at the altar of nuclear power. This blatant causal acceptance consisted of a breach of the very safety that the NRC's oversight authority should have corrected, but it didn't. A test reactor exists at the University of Wisconsin-Madison. There is another closed plant south of LaCrosse, Wisconsin near the shores of the Mississippi River. Prairie Island is on an island between Wisconsin and Minnesota. (0823-10 [Michetti, Susan])

Comment: In one example, Prairie Island reactors are situated on an island that floods in the Mississippi River between Wisconsin and Minnesota. Public testimony prior to the licensing of Prairie Island reactors expressed grave concern about the vulnerability of that location on an island in the Mississippi River with a history of past flooding. Grave concern was expressed about that location's wetness in terms of its inability to hold back contamination from waters. Native Americans stated that licensing a nuclear power plant on Prairie Island would put into place the likelihood that their sacred drinking water would become contaminated with radioactivity. The NRC failed to scientifically assess and analyze this vulnerability correctly after the very environmental vulnerabilities were stated during public testimony as concerns with the potential to contaminate the Mississippi River with radiation. Today, contaminated drinking water has become a reality. The NRC's license approval process inadequately protects environmental and human safety when the environmental conditions present contain unique vulnerabilities, such as this location on a small island that periodically floods. The NRC did not deny that Prairie Island reactor license. The Prairie Island license warranted denial based on environmental vulnerability that predicted drinking water contamination in time. This [the licensing of the Prairie Island Nuclear Generating Plant] is an example of the harm being caused by failures and distortions occurring in the decision-making. Native American trust lands require being provided protection for their water sources, particularly their drinking water. All water runs together in uncontained ways. All water connects. Any water contamination reaches other water sources over time. (0823-33 [Michetti, Susan])

Comment: Washington's Columbia reactor is close to Columbia River and unacceptably contaminates drinking water[.] The Columbia reactor in Washington is located close to the Columbia River. It was predictable scientifically that Columbia would contaminate drinking water sources, and this has happened. This type of unscientific oversight and decision-making at the NRC is unacceptable. (0823-34 [Michetti, Susan])

Comment: Indian Point is unacceptably close to Hudson River which threatens safety[.] Indian Point reactors are located close to the eastern shore of the Hudson River near a huge population. This has unique environmental vulnerabilities. (0823-35 [Michetti, Susan])

Comment: Turkey Point is unacceptably next to fragile aquifers and Everglades National Park and threatens environmental safety[.] The Turkey Point reactors are located close to fragile aquifers next to Everglades National Park with unique environmental vulnerabilities. (0823-36 [Michetti, Susan])

Comment: Diablo Canyon unacceptably is in an earthquake zone that threatens safety[.] Diablo Canyon is located in a known earthquake zone with high seismic risk for a nuclear power plant with unique environmental vulnerabilities. (0823-37 [Michetti, Susan])

Comment: San Clemente is a very different place from what it was when SONGS 2 & 3 were approved. Our population then was about 25K, whereas today it is over 65K. Additionally, all surrounding communities have grown exponentially as well. We wouldn't have been able to successfully evacuate in 1980, and we certainly couldn't evacuate today. Terrorism was unheard of in 1980. Today, with political unrest and growing tensions around the world, and an influx of radical elements residing within the United States, it is of constant concern and a very real reality as evidenced by 9-11. Having a nuclear waste storage facility amidst such a highly populated area and not far from the border of Mexico that holds the potential to be an attack the United States would never forget, is daunting to even consider. When you now factor that the area is riddled with fault lines, a few holding the potential for very large seismic events, as well as tsunamis, the stark reality of this areas incompatibility for spent fuel storage is blatant. We have lived with the risks associated with having a now aging nuclear power plant at our back door for more than 30 years. The time has come to find a site that isn't near a major population hub, isn't on the coast with fragile ecosystems and is away from major fault lines. PLEASE...make the people and families of San Clemente and the surrounding communities your top priority. Relocate the spent fuel to another, more suitable, more sensible area. A San Clemente resident (0837-1 [Korsen, G])

Comment: We'd like to see the complete decommissioning of all nuclear power plants. Further we strongly oppose the storage of nuclear waste at San Onofre, California. We don't want that crap stored here! They've already proven they can't be trusted. (0848-2 [Whiting-Broeder, Pamela])

Comment: The decommissioned San Onofre generating station is but one of many such facilities in the U.S. Even if each and every unsafe reactor were to be decommissioned, we'd still be left with the problem of nuclear waste, an extreme hazard in and of itself. For that reason, which seems sufficient, I want to be assured by your Office that the nuclear waste problem isn't allowed to percolate and sit like a time bomb waiting to go off. (0857-2 [Anonymous, Anonymous])

Comment: I live in a Chicago suburb, I receive my water from Lake Michigan. We are being poisoned by bp dumping chemicals in Lake Michigan. Now another corporation wants to bury RADIOACTIVE waste under another Great Lake. Why do corporations get to abuse the privilege of being the earth's stewards by fouling our drinking water, air & soil? They ruin it for the common man while they laugh all the way to the bank! The Great Lakes are under assault by these corporations, & the government who is paid for by the peoples tax dollars keep buckling under to these corporations that take no ones rights into consideration! We do not want any more waste radioactive or other wise to be placed in or under or by these national treasures! The Great Lakes belong to everyone & should not be allowed to be fouled by these for profit corporations! Lets keep the integrity of the Great Lakes intact. Have you not seen what has happened to the Pacific Ocean because of radioactive water from the fukishama nuclear plant being released into the ocean? Wake up & smell the coffee this could happen to our great lakes, they could become a dead zone! Believe me these corporations will be long gone with their cash & won't take anyresponsibility for clean up. How many super fund sites are in this country already? that the peoples taxes cannot afford to clean up because the corporations skipped out on their responsibilities? I mean what could possibly go wrong? RIGHT?<http://thinkprogress.org/climate/2013/12/20/3096231/chevron-illegally-dumping-toxic-drilling-waste/>. (0858-1 [Selesky, Laura])

Comment: Although I have long been aware of environmental issues, once Indian Point opened I did not pay too much attention to it. Recently, however (even before the tsunami, earthquake, and meltdown at Fukushima Daiichi), I have begun to learn more about the Indian Point nuclear facility, and frankly what I have learned scares me. (0864-1 [Gellert, Sally Jane])

Comment: Indian Point lies on 2 fault lines; it is considered by some to be in the least safe site of any reactor in the country. We in the Hudson Valley and New York City metropolitan area, including northern New Jersey, live with possible disaster as a remote yet frightening possibility. In addition, of course, Indian Point leaks invisible radiation constantly, as well as heating the river water that it draws in vast quantity in everyday operation of the reactors and to cool the ever-increasing number of irradiated fuel rods. These day-to-day dangers are outside the scope of this hearing, but are affecting us every day, whether or not we acknowledge it publicly. (0864-3 [Gellert, Sally Jane])

Comment: NRC COULD TAKE ACTION AND DEMAND ALL SPENT FUEL RODS BE PUT INTO DRY STORAGE AND SHUT DOWN DIABLO. (0887-1 [Chappellet, Carissa])

Comment: As there is not much more one could say to this presently - paid NRC puppereria concerning the continuous catastrophic Devil's Armageddon which has destroyed & doomed our central coast, California & the Pacific Ocean. You must immediately shut down the Devil's bank account. (0905-1 [Schmidt, Otto])

Comment: The grave risks of DCR outweigh all arguments in favor. The risks are not only contamination by the ever-increasing, unprotected stores of spent fuel, but even more so the threat of a catastrophic meltdown when (not if) the active fault moves, on which DCR is built. You in Washington are safe from all this, Mr. Secretary. We, who live in DCR's shadow, are not. We will gladly pay more for our electricity to have the threat of a radiation catastrophe --brought on by an earthquake, a terrorist plane strike or simple operator error--removed from us. Please side with the people and not with PG&E, and have DCR closed down now. (0907-3 [Bethlenfalvay, Marina])

Comment: PETITION TO UPGRADE HEALTH AND SAFETY MEASURES AT INDIAN POINT The ongoing crisis at the Fukushima Daiichi Nuclear Power Plant in Japan brings home the disastrous consequences of a catastrophic release of high-level radiation from nuclear reactors or from spent fuel storage Indian Point Nuclear Power Plant. The measures embodied in this petition, if acted upon, would make us all safer, and are appropriate whether the plant is closed and decommissioned or is relicensed and continues to operate. Therefore, we, the undersigned, request that the following actions be implemented as soon as possible with regard to Indian Point Nuclear Power Plant: 1. Move spent fuel rods into hardened dry cask storage as soon as is safely possible 2. Provide full containment for the spent fuel pools and establish independent back up electricity and cooling for the spent fuel pools 3. Perform a comprehensive evaluation of the faulty inflatable gasket used in the exchange canal between the reactor and storage in fuel pool. 4. Extend the evacuation zone from 10 to 50 miles as the Nuclear Regulatory Commission recommended for Americans in Japan 5. Remedy the flaws and deficiencies regarding emergency evacuation raised by the James Lee Witt report; consider lessons learned from Fukushima and Hurricane Sandy in evacuation planning. Congress should hold hearings on the viability of evacuation around nuclear plants. 6. Consider all seismological data and upgrade infrastructure accordingly for continued operation. (0918-3 [Church of New York, The Riverside])

Comment: Because so much uncertainty surrounds the Yucca Mountain dump proposal, as well as other high-level radioactive waste proposals, Petitioners-Intervenors contend that waste generated at Palisades during the 20 year license extension could very well be stored at Palisades *indefinitely*, a scenario inadequately addressed by the applicant and NRC. [emphasis added; note that "Indefinite Storage" is exactly what NRC refers to in the WC DGEIS, on Page 1-12, as: "Assumes no repository becomes available; Indefinite storage and handling of spent fuel."] (0919-1-11 [Kamps, Kevin])

Comment: The more casks loaded on the storage pads at Palisades, the more risk of erosion to the sand supporting the pads, given the large weight of the casks themselves (well over 100 tons each), weather related erosion of the sand dunes, as well as the erosion that will occur due to more severe weather impacts from the global climate crisis and climate de-stabilization. Arresting erosion at both pads is important to safety and radiation containment over the long haul, given the proximity of the waters of Lake Michigan. The State of Michigan and the U.S. Army Corps of Engineers have designated the sand dunes upon which the older pad is located - so close to the waters of Lake Michigan -as a high-risk erosion zone. The Lake Michigan dunes are subject to "blow outs" where entire dunes are blown out during wind storms and lightning strikes. See F. Nori, P. Sholtz, and M. Bretz (Department of Physics, The University of Michigan), "Sound-Producing Sand Avalanches," Scientific American, Vol. 277, No. 3 (September 1997). (0919-1-12 [Kamps, Kevin])

Comment: The Palisades dunes could, in a wind storm or lightning strike, shift, blow and cover the dry cask storage area. As weather patterns intensify (as anticipated) this potential for erosion will increase. Additionally, the dunes and shore line are geologically prone to sand avalanche. A sand avalanche coupled with a seismic event could compromise the integrity of one or more casks at Palisades." (the entire REQUEST FOR HEARING AND PETITION TO INTERVENE is posted online at <http://www.nirs.org/reactorwatch/licensing/petition.pdf>) (0919-1-13 [Kamps, Kevin])

Comment: The contention regarding Consumers Energy's Palisades dry cask storage (now owned and operated by Entergy Nuclear) violating NRC earthquake safety regulations was prompted by a warning from NRC dry cask storage inspector for the Midwest Region, Dr. Ross Landsman, dating back to February 17, 1994. Dr. Landsman wrote to NRC's Chairman, Ivan Selin, warning him about the risk at Palisades that an earthquake could result in high-level radioactive waste storage casks falling into Lake Michigan, or being buried in loose sand. Dr. Landsman wrote: "Actually, [it's] the consequences that might occur from an earthquake that I'm concerned about. The casks can either fall into Lake Michigan or be buried in the loose sand because of liquefaction "It is apparent to me that NMSS [NRC's Nuclear Materials Safety and Safeguards department] doesn't realize the catastrophic consequences of their continued reliance on their current ideology." (0919-1-14 [Kamps, Kevin])

Comment: The Palisades reactor has no place to store its overflowing irradiated nuclear fuel inventory within NRC regulations. The indoor irradiated fuel storage pool reached capacity in 1993. But the outdoor dry cask storage pads at Palisades, both the older one nearer Lake Michigan and the newer one further inland, are in violation of NRC earthquake regulations. 10 CFR § 72.212(b)(2)(i)(B) requires that: Cask storage pads and areas have been designed to adequately support the static and dynamic loads of the stored casks, considering potential amplification of earthquakes through soil-structure interaction, and soil liquefaction potential or other soil instability due to vibratory ground motion. . . . According to Petitioners' anticipated expert, Dr. Ross Landsman, former U.S. Nuclear Regulatory Commission Region III dry cask storage inspector, the older pad violates the liquefaction portion of this regulation, and the new

pad violates the amplification portion of the regulation. Petitioners contend that neither the older nor new dry cask storage pads at the Palisades plant were designed in consideration of the factors contained in the cited regulation. (0919-1-6 [Kamps, Kevin])

Comment: In 1993, Consumers Power (now Consumers Energy) assured a federal district judge that if it encountered problems with loaded dry casks at Palisades, it would simply reverse the loading procedure and return the high-level radioactive waste to the storage pools. But the fourth cask loaded at Palisades, in June 1994, was shortly thereafter admitted by Consumers Power to be defective, having faulty welds. However, eleven years on, Consumers has yet to unload the defective cask, because it cannot. Petitioners state that Consumers perpetrated a fraud upon the court and the public, with the complicit support by the NRC, and has critically undermined its credibility as to any pledges about the safety of dry cask storage. The significance of this problem with cask #4 is considerable. For example, the configuration of the 18 to 19 dry casks currently stored on the older pad nearer Lake Michigan is such that the casks furthest back cannot be moved or unloaded until all other casks in front of them have been moved out of the way first. This configuration increases the risks, making it very difficult to address emergencies involving certain casks in the configuration in a timely manner. (0919-1-7 [Kamps, Kevin])

Comment: In the case of Vermont Yankee, NRC and industry eventually just assumed that the lost irradiated fuel was mistakenly shipped away, and buried in a ditch at Barnwell, South Carolina, mistaken for "low-level" radioactive waste, to dose workers, shippers, and residents downstream of the leaking dumpsite. At Humboldt Bay, NRC and industry eventually just assumed that the missing irradiated nuclear fuel was simply crushed beneath waste transfer casks weighing a hundred tons, and pulverized into particles which dissolved into the high-level radioactive waste storage pool cooling water, to clog filters and dose workers. (0919-2-16 [Kamps, Kevin])

Comment: Re: NRC's mention of "reinforced concrete pads" at line 35--At Palisades in MI, the pads are "reinforced" with 55 feet of loose sand underneath. That is, although they are three feet thick themselves, the pads are not anchored to anything. They are "floating" on top of 55 feet of loose sand. They are located right next to Lake Michigan, source of drinking water, and so much more, for tens of millions of people. This is a violation of NRC earthquake safety regulations, and a major risk to Lake Michigan. At Dresden in IL, the pads are "reinforced" with dirt, next to the river, thanks to an NRC regulatory exemption due to a bad pad pour. During a tour of nuclear industry and government regulatory officials conducted of Dresden's ISFSI in September 2001, as part of the PATRAM [Packaging and Transportation of Radioactive Materials] conference I attended, an Exelon spokesman overseeing the ISFSI pad admitted that NRC had granted an exemption do to the bad cask pour. (0919-4-21 [Kamps, Kevin])

Comment: On Page 2-26 (lines 32-35) to 2-27 (lines 1-2), NRC states: "The kinds of aging effects managed under an aging management program include, but are not limited to: concrete cracking and spalling; loss of confinement; loss of material; and reduction in heat transfer (e.g., by blocked air duct screens). The application of aging management programs may include structure monitoring; monitoring of protective coating on carbon steel structures; ventilation surveillance; welded canister seal and leakage monitoring programs; and bolted canister seal and leakage monitoring programs (DOE 2012b). It was just such meaningful oversight on aging degradation issues at Palisades ISFSIs that environmental interveners were seeking during the license extension proceeding, particularly in regards to the defective cask already identified there. But the interveners were rebuffed by NRC's ASLBP. (0919-4-3 [Kamps, Kevin])

Comment: I just hope that the new ownership, General Electric-Hitachi, decides to keep the heat turned on at its Morris ISFSI facility (well, the heat in the building, and the cooling water circulation in the pool storing the 772 tons of irradiated nuclear fuel, that is!). For just a half-mile away, at Dresden nuclear power plant, Commonwealth Edison decided to turn the heat off at Unit 1 after its permanent shutdown. Eventually this led to the freezing of pipes on service water systems in the winter time, leading to a large flood in the basement. Had vulnerable pipes and other systems, structures, and components frozen on the storage pool for high-level radioactive waste at Dresden 1, a pool drain down and high-level radioactive waste fire could have taken place, causing a radioactive catastrophe for Chicago downwind. It's interesting that even with 20 employees, GE Morris seemed unaware of a radioactive hot spot on the pool walkway that I discovered with a handheld RadAlert monitor in September 2001, on the same tour where I learned that NRC had granted Commonwealth Edison/Exelon an exemption due to the bad pad pour at the Dresden ISFSI. I was the only person on the GE Morris tour who had a real-time radiation monitor, although we all wore film badges. My RadAlert alarmed, revealing a reading of some 4,500 counts per minute, as I stood about midway down the walkway alongside the GE Morris pool. Others on the tour were surprised and even alarmed at the radiation levels my RadAlert was revealing. One of those 20 GE Morris employees, the one leading the tour, then rushed us along. My point is, I hope those 20 workers at GE Morris, and their counterparts at Dresden right next door, are very good at what they do. Between the two immediately adjacent nuclear facilities, there are some 3,000 metric tons of irradiated nuclear fuel, one of the biggest such concentrations in the entire country. This is a mother lode of radioactive risk, upwind of millions in the metro Chicago area. (0919-5-10 [Kamps, Kevin])

Comment: Re: Page 3-6, line 29 and following, it is disconcerting to learn that a mere 35 workers watch over more than 50 casks at the Maine Yankee site. It is even more disconcerting to learn that only 10 workers watch over 240 casks holding high-level radioactive waste at the Fort St. Vrain site in CO. Only a small number of whom, presumably, are security guards. How many on those teams are PR officials? What role do they play in securing and safeguarding the high-level radioactive wastes? (0919-5-11 [Kamps, Kevin])

Comment: At Page 3-15, in Section 3.5, Geology and Soils, NRC speaks confidently about earthquake preparedness and seismic safety. But what about Palisades' dry cask storage near Lake Michigan? What about its violation of NRC earthquake safety regulations, described above? (0919-5-12 [Kamps, Kevin])

Comment: I'd like to here finish a comment I was making that was interrupted by NRC's strict three minute rule at the Perrysburg, OH public comment meeting. I had pointed out that the War of 1812 had also raged in the Toledo area 200 years ago, begging the question, what does the next 200 years have in store for the high-level radioactive wastes stored on the surface at nearby Davis-Besse atomic reactor? And I was going to close with a comment about seismic risks in the area. Tecumseh, the great Shawnee War Chief who led a broad Native American confederation, and fought in alliance with the British against the Americans in the War of 1812, is reported to have predicted the New Madrid earthquakes of 1811 to 1813. Based on historical records of the time, such as news accounts in the eastern U.S., personal journal entries, etc., as well as physical evidence, the monster quakes have been calculated to have been around 8.0 in magnitude on the Richter scale, which would make them the largest quakes in North American recorded history. Epi-centered in New Madrid, MO, the powerful quakes reversed the flow of the Mississippi River; rang church bells as far away as Maine; and created giant waves on the Great Lakes; among many other impacts. Has the NRC analyzed the seismic risks of 8.0 magnitude, or larger, earthquakes on pool and dry cask storage in the New Madrid zone region? 200 years after those quakes struck, some seismologists are concerned they are overdue to

strike again. Of particular concern are the ISFSIs at Palisades, in violation of NRC earthquake safety regulations, and immediately adjacent to Lake Michigan, part of the Great Lakes drinking water supply for 40 million people in 8 U.S. states, 2 Canadian provinces, and a large number of Native American First Nations. (0919-5-13 [Kamps, Kevin])

Comment: Re: NRC's statement on Page 3-16, beginning at line 11, that "Commercial mining or quarrying operations are not allowed within nuclear power plant boundaries (NRC 2013a)"...this is odd, because it seems that natural gas fracking is being allowed, by NRC, and other decision making bodies, within a mere ¼ mile from the Beaver Valley nuclear power plant in Shippingport, PA. What are the seismic risks of this? On New Year's Eve, 2011, a nearly 4.0 quake struck Youngstown, OH. Fracking activities were suspected immediately, for Youngstown had never experienced such a quake before in recorded history. The Governor of Ohio acknowledged immediately that fracking activities were likely to blame. This has recently been confirmed to be the case: <http://www.nbcnews.com/science/fracking-practices-blame-ohio-earthquakes8C11073601>. (0919-5-14 [Kamps, Kevin])

Comment: Also at one New Jersey plant, a ground water cleanup of a diesel fuel leak was never required to monitor for radionuclides even though the cone of drawdown from the fuel cleanup was down gradient of a major plume of tritium contamination. The ground water pumped from the cleanup was discharged to the local sanitary sewer without any analysis. (0920-21 [Foster, Ruth])

Comment: At Oyster Creek there was an ongoing diesel fuel ground water cleanup which was down-gradient of the tritium leak. Neither NRC nor the plant sampled the effluent from the diesel fuel cleanup for tritium even though the effluent was being discharge to a sanitary sewer. (0920-46 [Foster, Ruth])

Comment: In the area of the Northeast that I live in, around the PNPS, there were major storms that were never seen in the recent history of the area because of the rising level of the ocean and were never taken into consideration in the original plan or presently, the building of a storage pad-----which was started without any proper permitting approval. The Entergy Corporation up to that time had to have a permit to build storage buildings and reception tents but not for the beginning of permanent waste storage. Nor is there to be allowed any public participation where the environment has been proven to be compromised. (0933-5 [Anonymous, Janet])

Comment: I want to address my remarks to bring attention tot what is going on 40 miles up the road at the Zion Nuclear Power Generation Plant, the site of the largest dismantling or decommissioning of a nuclear reactor in history. In 2014, over 1,000 tons of high-level radioactive waste is going to be transferred into dry casks, as reported by Pat Daley of Zion Solutions in August 2013. At Fukushima, Japan, the same fuel transfer of over 400 tons of radioactive waste is being carried out. What we have here is a situation where we who live in the Chicago-Milwaukee Metropolitan Area, over six million of us, are going to be exposed to comparative or greater risk - from a larger and dirtier radioactive waste fuel transfer than what is taking place at Fukushima. Both projects are expected to take a year to complete. Although everyone is doing their best at Zion Solutions, a shell company created for the express purpose of managing the Zion decommissioning, and funded by public trust funds of almost a billion dollars, this scale of decommissioning has never been attempted before. We, the people who live within a 50-mile radius of Zion, remain deeply concerned about our safety and we are aware that there really is no "safe" way to manage and isolate radioactive waste. Fuel transfer represents the "safest of the unsafe" solutions to this impossible problem. (0934-1 [Lewison, Linda])

Comment: Forty years ago in the suburbs of St. Louis, Missouri, the NRC allowed the unlicensed dumping in a now residential area of the largest amount of Thorium-230 in any actual nuclear waste disposal site in the country. It remains there today, one of the NRC's waste sites that cannot be delegated the proper remediation due to legal maneuverings at a time, the 1970s, when every aspect of the Federal nuclear program knew the risks to the public and yet allowed itself to transfer ownership of its waste in an intentional loopholed irradiation of a large population. (0935-1 [Uhls, Agnes])

Comment: Specific to this region and Lake Erie, is flooding potential. There is what is known as a seiche where you have straight line winds which blow the water out to Buffalo, and the water sloshes back. One specific concern that applies to Fermi, Davis-Besse, Perry is Lake Erie susceptibility to Seiche / flooding. Lake Michigan and Lake Huron have also had Seiche events. Pasted below are a just a handful of links to Lake Erie Seiche reports. Lake Erie flooding May 31, 2012 - Lake County - Madison, Ohio[;] Lake Erie 1942 - 8 people killed [;] Lake Erie 1882 - Tidal Wave [http://www.wkyc.com/video/1668105962001/1/3-teenagers-pulled-in-Lake-Erie-by-rareseiche-wave\[;\]](http://www.wkyc.com/video/1668105962001/1/3-teenagers-pulled-in-Lake-Erie-by-rareseiche-wave[;]) 2003 Seiche in Monroe at Fermi [http://www.glerl.noaa.gov/seagrant/glw/photos/Seiche/1113Storm/November2003.html\[;\]](http://www.glerl.noaa.gov/seagrant/glw/photos/Seiche/1113Storm/November2003.html[;]) 1848 Lake Erie Seiche [http://oceanservice.noaa.gov/facts/seiche.html\[;\]](http://oceanservice.noaa.gov/facts/seiche.html[;]) [http://www.dnr.state.oh.us/OhioGeologicalSurvey/tabid/23637/Default.aspx\[;\]](http://www.dnr.state.oh.us/OhioGeologicalSurvey/tabid/23637/Default.aspx[;]) [http://downtown.wgrz.com/news/people/71936-lake-erie-seiche-disaster-1844\[.\]](http://downtown.wgrz.com/news/people/71936-lake-erie-seiche-disaster-1844[.]) (0945-2 [Keegan, Michael J.]

Comment: In 1972, the Davis-Besse site was flooded for over a month. If the plant had been operating at that time, it would have been a disaster. (0945-3 [Keegan, Michael J.]

Comment: Kevin Kamps with Beyond Nuclear has expressed the following concerns, I enter our working communications into the record. Kevin Kamps writes: Fukushima scale releases (or order of magnitudes larger) into Lake Erie, from Fermi 2 (or 3) or Davis-Besse, due to a high-level radioactive waste storage pool fire, would be bad, at least for those millions downstream (including in the connecting rivers, Lake Ontario, the St. Lawrence River) who drink its water, boat or swim its waters, eat its fish, etc. Being so shallow, Lake Erie can't really "dilute" the radioactivity, like the Pacific Ocean can This is a site specific risk at Fermi and D-B. (0945-5 [Keegan, Michael J.]

Comment: In addition a 40 foot wave off of Lake Huron, due to the White Hurricane of Nov. 1912, one hundred years ago. The 1811-1812-1813 New Madrid quakes -- estimated as Magnitude 8 on the Richter scale, the largest in North American history could happen again. These earthquakes created giant waves on the Great Lakes. Even Superstorm Sandy created large waves on Lake Michigan - 30 footers -- which fortunately hit Michigan City, IN, and not Covert, MI (Palisades), Bridgman, MI (Cook), Charlevoix, MI (Big Rock Point, HLRW still there), or Zion, IL (two reactors permanently shutdown, but waste still there). If on Lake MI, why not Lake Erie. With climate destabilization, hurricanes on the Great Lakes could become more common. Then there are tornadoes: water spout near Zion a few weeks back [<http://www.beyondnuclear.org/nuclear-power/2013/9/12/water-spouts-on-lake-michigan-close-to-zion-hlrw-storage-poo.html>]; Davis-Besse of June 1998; Fermi 2 of June 2010. All risks to unleashing the HLRWs into the environment. (0945-7 [Keegan, Michael J.]

Comment: Also site-specific: both Fermi 2's Mark I containment, and Davis-Besse's cracked and cracking worse containment, are no containment whatsoever. Look what happened to the Mark Is at Fukushima Daiichi. Davis-Besse's containment could completely fail during a meltdown. These reactor risks are HLRW risks as well -- if the reactors meltdown, that could

directly cause the wastes to unleash into the environment, as well. Fukushima Daiichi Unit 4 is such a case in point -- the explosion at the non-operating Unit 4 reactor building could yet lead to a collapse of that reactor building, including the HLRW storage pool, as due to another large quake there. If that were to occur, and the cooling water was lost, then the radiological releases would dwarf what has already occurred to date due to the 3 reactor core meltdowns. Our pools - as at Fermi 2, as at Davis-Besse -- contain much more waste than Fukushima Daiichi Unit 4. (0945-8 [Keegan, Michael J.]

Comment: Indian Point's a nucle.ar power plant near here [SOLO SHOUT] Nineteen miles! That makes 50 tons of spent fuel every year. That waste is stored in poo-ools And because we are not foo-ools We know we have good reasons to be scared. If Entergy keeps spinning what it's spun, And their fight for relicensing is won, Fifteen million on the roads May flee their doomed abodes, A fifty-mi-ile race they'll have to run. A terrorist could hit it with a bomb. The earthquake in Japan gave us some qualms. Where will we find the answer To protectingfolks from cancer, Who haven't yet been blown to Kingdom Come? Bring us solar, bring us hydro, bring us wind. Bring us energy from sources that won't end. [SLOW] Before we could trust uranium, We'd need holes in our cranium. [RESUME SPEED] We haven't yet gone that far 'round the bend! (0959-1 [Grannies, Raging])

Comment: Oh, we are a gaggle of grannies Urging you off of your fannies. Indian Point Is a dangerous joint. Shut it down! With all that Entergy's spending To keep their license from ending. You'd think they'd go broke, With mirrors and smoke. Shut it down! The NRC approves of Waste storage by Entergy [SLOW] The NRC is a lapdog To the nuclear in -dus -try. So, we may be a gaggle of grannies, But we've gotten off of our fannies. Stop Entergy's spin! If they lose we win! Shut it down! We really mean it. Shut it down! And we mean business. Shut -it - down! (0959-2 [Grannies, Raging])

Comment: Oh, Entergy says not to worry. 'Cause earthquakes can't happen here, no. But under the Indian Point plant Lurks the fault zone that's called Ramapo Look at routes for evacuation If Indian Point should melt down. Go test-drive those roads for escapin' And learn you can't get out of town. CHORUS: Shut it down! Shut it down! Indian Point is unsafe, we know! Shut it down! Shut it down! Indian Point has to go! The nuclear waste that is stored here Is cause for us all to unite. If only we knew how to do it, We'd shut Indian Point down tonight. CHORUS Oh, NRC, rule as you ought to! You know you should issue a ban To save New York State from such horrors As the tragic events in Japan. (0959-3 [Grannies, Raging])

Comment: How will !!!leave town If Indian Point melts down? Hi-ho, if that place blows, We'll wind up underground. Imagine crowded roads When we leave our abodes. Hi-ho, this plant must go Before the thing explodes. (0959-4 [Grannies, Raging])

Comment: As a resident of Aiken, South Carolina, I know only too well the dangers of the waste that comes from the nuclear industry. Recently, the Savannah River Site Citizens Advisory Board voted no to storage of spent nuclear fuel, 70,000 tons that was supposed to be headed to Yucca Mountain. (0965-1 [Hall, Christopher])

9. Comments Concerning the Proposed Action & Purpose and Need

Comment: In the Scoping Decision, Staff rejected both of these alternatives: Interested parties submitted hundreds of comments that suggested the NRC should consider a cessation of all licensing activities or cessation of all nuclear power plant operations as an alternative. A variety

of other scoping comments suggested that the NRC should require the implementation of HOSS [hardened onsite storage] as an alternative. The NRC considered but ultimately dismissed these suggested alternatives for the purposes of this GEIS. Cessation of licensing activities and overall reactor operations does not satisfy the purpose and need for the GEIS. With regard to HOSS, the NRC is already considering implementing revised security requirements as part of the ongoing ISFSI security rulemaking effort. The rulemaking effort is described in the December 16, 2009, Federal Register notice (74 FR 66589), "Draft Technical Basis for Rulemaking Revising Security Requirements for Facilities Storing SNF and HLW; Notice of Availability and Solicitation of Public Comments." Staff Scoping Decision at 12. The Staff's conclusions directly conflict with well-established legal precedents and, most importantly, ignore the mandate of the Court of Appeals in *New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012). (0001-13 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: Although the Commission kept moving the date by which it was confident there would be a permanent and operational nuclear waste disposal facility, the existence of such a date-and thus a finite date for storage of spent fuel at the site following plant shutdown-was the key component of the Commission's confidence that there would be minimal environmental impacts of spent fuel storage at plant sites following cessation of plant operations. By concluding that there was no reasonable possibility of long-term, much less indefinite, storage of spent fuel at reactor sites, NRC concluded it never needed to consider alternatives to its plan to continue to authorize generation of more nuclear waste. All this changed when the Commission came to the realization that it was no longer possible to determine a date certain by which a permanent nuclear waste repository would be available. Thus, over 30 years after *Minnesota* was decided, the Court in *New York v. NRC* once again directed the Commission to consider the environmental impacts associated with there never being a permanent, safe, and adequate waste disposal facility: "We further hold that the Commission's evaluation of the risks of spent nuclear fuel is deficient in two ways: First, in concluding that permanent storage will be available 'when necessary,' the Commission did not calculate the environmental effects of failing to secure permanent storage-a possibility that cannot be ignored." *New York*, 681 F.3d at 473 (emphasis added). This holding effectively adopted what Judge Tamm said over 30 years earlier: "[I]f the Commission determines it is not reasonably probable that an offsite waste disposal solution will be available when the licenses if the plants in question expire, it then must determine whether it is reasonably probable that the spent fuel can be stored safely onsite for an indefinite period." *Minnesota*, 602 F.2d at 419-20 (Tamm, J., concurring) (footnotes omitted). By restricting consideration of alternatives and explicitly excluding the alternative of postponing further spent fuel generation until a permanent, safe, and adequate waste disposal facility exists, and excluding use of dry cask storage in lieu of spent fuel pools after spent fuel is 5 years old, the Staff is failing to provide the full environmental review mandated by the federal court. (0001-15 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: The Staff's failure to include all reasonable alternatives in its Scoping Decision stems initially from its failure to focus more precisely on the underlying reason for the GEIS. According to the Staff Scoping Decision, the GEIS will be used to update the Waste Confidence rule (Staff Scoping Decision at 38), the purpose of which "is to develop and implement a regulatory approach that efficiently evaluates the environmental impacts of spent nuclear fuel after the licensed life for operation of a commercial nuclear reactor and prior to ultimate disposal" (Staff Scoping Decision at 2). That description tends to obfuscate the true purpose of the GEIS, which is to provide a basis for NRC to determine whether to issue or renew licenses and, if it issues or renews a license, what conditions should be imposed in the license. As the D.C. Circuit recognized, NRC is required to analyze the environmental impacts of the temporary storage of spent fuel before it licenses or relicenses the operation of a nuclear reactor because

that operation will generate spent fuel for which there as yet is no permanent repository. New York, 681 F.3d at 473 (holding that the fact that permanent storage may never be achieved is "a possibility that cannot be ignored"); *see also id.* at 477 ("It is not only reasonably foreseeable but eminently clear that the WCD will be used to enable licensing decisions based on its findings."). If, as the D.C. Circuit held in *New York v. NRC*, the major environmental impacts that must be assessed are the impacts of long-term and indefinite storage of spent fuel at reactor sites, then the focus of the study of alternatives in the GEIS must be the alternatives that will reduce those impacts. And the Commission must look at "*all* reasonable alternatives." 40 C.F.R. § 1502.14(a) (emphasis added). (0001-16 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: Given the breadth and weight of scientific support for the proposition that there are significant environmental benefits from dry cask storage for all fuel that it is more than 5 years old, this reasonable alternative must be studied in the Commission's review of "*all* reasonable alternatives." 40 C.F.R. § 1502.14(a) (emphasis added). Although the Staff does not directly reject the advantages of dry cask storage, it seeks to avoid consideration of that option by noting that: NRC is already considering implementing revised security requirements as part of the ongoing ISFSI security rulemaking effort. The rulemaking effort is described in the December 16, 2009, Federal Register notice (74 FR 66589), "Draft Technical Basis for Rulemaking Revising Security Requirements for Facilities Storing SNF and HLW; Notice of Availability and Solicitation of Public Comments." Staff Scoping Decision at 12. This attempt to avoid addressing the mitigation potential of the dry cask storage alternative fails for several reasons. First, it is inconsistent with the Commission's directive in its Staff Requirements COMSECY-12-0016. Second, it violates NRC's regulations implementing NEPA. Third, it is contrary to well-established federal law which has been applied to the NRC in an analogous situation. (0001-18 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: There is also no indication that the rulemaking, if it proceeds, will include an environmental analysis of the impacts of the proposed action and alternatives to mitigate those consequences. In short, the pending potential rulemaking is not a viable substitute for the obligations imposed on NRC to conduct a thorough environmental review, including consideration of all reasonable alternatives, of the proposed action of allowing the generation of spent fuel to continue when there is not in place a permanent, safe, and adequate waste disposal facility. (0001-22 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: The sole basis offered in the Staff Scoping Decision for rejecting, as an alternative, cessation of further generation of spent fuel until a permanent, safe, and adequate nuclear waste disposal facility exists, is that "[c]essation of licensing activities and overall reactor operations does not satisfy the purpose and need for the GEIS." Staff Scoping Decision at 12. However, as already noted, this narrow view of the purpose and need for the GEIS stems from the misperception that it will become the basis for a "regulatory approach" to the temporary storage of spent fuel, rather than a prerequisite to licensing decisions that will result in the continued generation of spent fuel in the absence of any permanent repository for that fuel. *New York*, 681F.3d at 473. (0001-25 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: This rule has only ever served one purpose, which has been to streamline the licensing process for nuclear facilities and particularly nuclear power plants, and in fact that's stated very clearly in the documents that we're here to comment on today. And I want to, you know, sort of begin with the stated purpose of the proposed action and the Waste Confidence rule. And I'm reading from the generic environmental impact statement, although nearly verbatim statements are made in the other documents as well. "The purpose and need for the

proposed action are threefold: (1) To improve the efficiency of the NRC's licensing process by generically addressing the environmental impacts of continued storage; (2) to prepare a single document that reflects the NRC's current understanding of these environmental impacts; and (3) to respond to the issues identified in the remand by the court in the New York v. NRC decision." Now, to address these it was entirely unnecessary for the Commission to go back and re-institute the Waste Confidence rule. First of all, the second stated purpose here, to prepare a single document that reflects the NRC's current understanding of nuclear waste storage, doesn't require a rulemaking. That could be done in any other kind of technical document or environmental impact statement. And the third one, to respond to the issues identified in the remand by the court, the court did demand that the NRC do a more thorough credible evaluation of the consequences of nuclear waste storage after a reactor license expiration. That doesn't require the reinstitution of a Waste Confidence rule. The court was clear that it didn't say that the NRC shouldn't do that, or wouldn't be allowed to do that, but it's certainly not a necessary implication of the court rule. (0030-17-3 [Judson, Tim])

Comment: But, instead, you're taking away the environmental impacts and making them generic. The NEI representative was saying that you are not making decisions with this; we are only setting -- you know, it's not a licensing decision. But, actually, it's forcing the licensing decisions to not discuss all sorts of things. So it's very much a huge part of licensing. (0030-4-6 [Hoffman, Ace])

Comment: Have mitigation measures for these costs, risks, and impacts been explored in this GEIS? ---- Again, they have not. NRC's draft GEIS is completely devoid of such issues. Thus, the draft GEIS makes a mockery of NEPA, as well as the federal appeals court ruling in New York versus NRC. (0034-3 [Wagner, Jim and Virginia])

Comment: The Draft GEIS itself is overall a dishonest document: it is dishonest in structuring the alternatives considered to avoid real solutions to the issues of spent nuclear fuel. Its purpose really seems to be (and is so stated by NRC) grease to accelerate licensing and relicensing, and avoidance of site specific environmental analysis of SNF. (0059-9 [Andrews, Richard])

Comment: In addition, by asserting that the environment around spent nuclear fuel storage facilities is well understood and can be reasonably predicted, the Waste Confidence only provides generic determination on continued storage of spent nuclear fuel, instead of complex site-specific evaluations. The argument is merely based on excessive confidence in the U.S. operation experience of nuclear power plants and that the environment impacts are sufficiently understood. When it comes to safety, we should take a more skeptic attitude. (0210-4 [Individual, Anonymous])

Comment: The DGEIS has two responsibilities: (1). Analyze the human environment in a procedural manner for nuclear waste storage of spent fuels after license expiration and (2). Fulfill the order by the U.S. Appeals Court before a proposed rule on waste confidence can be made. (0219-2 [Olmstead, Stan])

Comment: My review determines that the purpose and need of the document should not be the improved efficiency of the NRC's licensing and that the document does not address the deficiencies of the U.S. Court of Appeals ruling by completing an appropriate Environmental Impact Statement. (0219-5 [Olmstead, Stan])

Comment: And then from there, the Executive Summary of the Impact Statement, the Purpose and Need for the Proposed Actions. Number 1: To improve the efficiency of the NRC's licensing process. Improve the efficiency of the licensing process? What's the purpose of the NRC? And Preliminary Conclusion is to provide because the efficiencies will be gained and reactor and spent fuel storage licensing reviews. We're not here for your efficiency -- licensing and reviews, we should be here to try to make us safe from these things. NRC should not be facilitating licensing of new or existing plants. (0244-6-3 [Steorts, Tim])

Comment: On February 18, 2011, Blue Ridge Environmental Defense League; Riverkeeper, Inc.; and Southern Alliance for Clean Energy filed a petition in U.S. District Court to reverse decisions by the U.S. Nuclear Regulatory Commission on Waste Confidence. As a result, in 2012, the U.S. Court of Appeals nullified the Nuclear Regulatory Commission's Waste Confidence Rule because it did not satisfy the National Environmental Policy Act. The Court's decision cleared the way for challenges at scores of commercial nuclear power reactors in the United States because it invalidated a broad Federal regulation which supports all U.S. nuclear power plant licenses. The old Rule presumed that waste stored at reactors would go to a waste dump someday. Following the landmark legal decision, many groups petitioned the NRC to ensure that the new environmental analysis is properly incorporated into the licensing of nuclear power plants. Blue Ridge Environmental Defense League has raised the Waste Confidence issue at several NRC licensing proceedings, namely, Bellefonte, North Anna, William States Lee, Vogtle, and Sequoyah, but until the court ruled in our favor, the Commission refused to even discuss this issue. (0246-7-1 [Zeller, Lou])

Comment: I think that there's an incorrect assumption that the NRC's mission is to enable licensure in an efficient manner, or to make licensure easy, efficient, or desirable for for-profit entities. I'm opposed, and I think that I speak for many people that we're opposed, to any aspect of this rulemaking which would facilitate, or make more efficient, or enable licensure of any new facilities, or the extension of any licenses at existing facilities. (0327-14-2 [Ellison, David])

Comment: The adoption of a Waste Confidence Rule will allow the NRC to operate more efficiently. Both fuel pools and dry storage systems have repeatedly been shown to have no impact on the local environment. Thus, it makes little sense to delay licensing or renewal of licensing of nuclear facilities by requiring environmental impact statements for every plant and storage facilities. (0327-31-4 [Dorans, Rob])

Comment: That's why our tribe has been actively involved in the Waste Confidence activities. We joined a Coalition of States in a successful challenge last year to the Waste Confidence Decision and temporary storage rule in the United States Court of Appeals for the District Court of Columbia. That successful challenge is why the NRC prepared the Waste Confidence Draft Generic Environmental Impact Statement, and why we're all here today. I'm proud of our Tribe's efforts to go forth with this. I'm also thankful for the invitation from the State of New York to join into this challenge. I'd also like to take this time to encourage the State of Minnesota to also get involved. (0328-1-5 [Johnson, Ron])

Comment: [T]he DGEIS claims that the cessation of licensing and operation of nuclear reactors would not satisfy the stated purpose and need for the DGEIS. This argument is without merit for several reasons. First, the purpose and need as contemplated by NEPA is the purpose and need for the proposed Federal action, not the purpose and need of the EIS. The proposed Federal action in this case is the promulgation of the Waste Confidence Rule, not the issuance of the DGEIS. Therefore, the purpose and need for the Federal action is to promulgate a rule that ensures that reactors are licensed so as not to be inimical to public health as the

statute requires, and that there is reasonable assurance that the activities authorized by the operating license can be conducted without endangering the health and safety of the public according to your own regulations. Because radioactive spent fuel is extremely dangerous and no one knows what to do with it, the purpose and need for the Waste Confidence Rule must include the alternative of making no more radioactive waste. (0328-4-6 [Taylor, Wallace])

Comment: Deep within the pages of the GEIS is this little ditty: "As described in Section 1.4 of this draft GEIS, the proposed action is for the Commission to issue a revised rule, 10 CFR 51.23, that generically addresses the environmental impacts of continued storage. This revision would adopt into regulation the environmental impact analyses in this draft GEIS. Further, the revision would state that because the impacts of continued storage have been generically assessed in the draft GEIS and codified in a rule, the NEPA analyses for future reactor and ISFSI licensing actions would not need to separately consider the environmental impacts of continued storage." (GEIS, 8-10) This is a highly suspect attempt to use a limited-scope (and severely flawed) GEIS to drastically alter the nuclear regulatory scheme. It has the appearance of an attempt to promote nuclear power and effectively shackle the nation to continued nuclear power as an energy source and the endless buildup of nuclear waste. (0341-2-16 [Mermelstein, Richard])

Comment: This flawed framing of Alternatives in the Draft GEIS precludes the GEIS from taking a "hard look" at environmental consequences. There are multiple issues associated with this flawed decision framework of the Draft GEIS: * Second, if the environmental impacts are assumed to be the same across Alternatives, the level of environmental effect (small, moderate, or large) does not influence selection of an Alternative. Even if the Draft GEIS identified a large or very large environmental impact (e.g., of postulated accidents), there would be no clear implication on NRC decision-making regarding continued storage under the current decision framework. This is because the impacts would be large regardless of whether they codify the findings of the Draft GEIS (Proposed Action) or undertake a site-specific analysis (No Action and Policy Statement Alternatives). The NRC asserts that, because a GEIS approach is more cost-effective administratively and there is no change in environmental consequences, development of a GEIS is the preferred approach. This rationale could be applied regardless of the findings with respect to the level of environmental consequences, makes meaningless the evaluation of environmental consequences and, and circumvents the purpose of evaluating environmental impacts of alternatives under NEPA.; This rationale also calls into question whether the Alternatives evaluated by NRC in the Draft GEIS encompass the full range of reasonable alternatives, given that the benefits under the NRC's Alternatives do not vary. The NEPA regulations require that an EIS examine "all reasonable alternatives" to the proposed action (40 CFR Part 1502.14). "Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant."¹ [footnote 1 text: 1 Executive Office of the President, Council on Environmental Quality. March 1981. Memorandum to Agencies: "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations."] NRC's structuring of the Alternatives such that environmental consequences of continued storage do not affect decision-making regarding the selection of an Alternative (as the consequences do not vary across Alternatives), indicates that the NRC avoided its responsibility to assess environmental consequences of the proposed action. (0473-1-10 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: This flawed framing of Alternatives in the Draft GEIS precludes the GEIS from taking a "hard look" at environmental consequences. There are multiple issues associated with this flawed decision framework of the Draft GEIS: * Third, while we understand the NRC's point

that the actual impact of an activity on the environment or economy does not change based on the method used to evaluate it, this is not the appropriate way to frame the question in comparing alternatives within NEPA. The appropriate framing of that inquiry would be whether the NEPA evaluation method for a particular activity (e.g., site-specific or generic) affects the level and quality of analysis such that it could change decision-making. The Draft GEIS does not address this question, assuming away the need to investigate. For example, more information, as obtained through site-specific evaluations, would support identification and implementation of the best approaches to mitigation. Site-specific information on locations of potentially affected populations, utility structures, and transportation infrastructure could improve mitigation strategies such as preparation and planning for evacuations at a given site in the case of a severe event. The Draft GEIS does not contain or consider such site-specific information that may be used to guide analysis of consequences and mitigation strategies. (0473-1-11 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The NRC structures the Proposed Action and the Alternatives such that they are entirely disassociated from the consideration of environmental consequences in the Draft GEIS. As noted above, the NRC's Proposed Action is to rely on the information in the GEIS to codify that continued storage is safe until a repository is available. An appropriate framing of Alternatives to the Proposed Action may therefore include different methods of managing spent fuel and mitigating environmental impacts in order to support a conclusion that it is safe. The only variation across the Alternatives, as they are defined by the NRC, however, is with respect to the level of administrative effort to comply with environmental analysis and reporting requirements (e.g., NEPA). Even in the case that the NRC's framing of the Alternatives around developing generic or site-specific NEPA documents were meaningful, the evaluation of environmental consequences in the Draft GEIS provides no real analysis of the relative benefits of across these Alternatives. (0473-1-3 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: This flawed framing of Alternatives in the Draft GEIS precludes the GEIS from taking a "hard look" at environmental consequences. There are multiple issues associated with this flawed decision framework of the Draft GEIS: * First, as noted above, as the NRC frames Alternatives and applies assumptions such that the evaluation of environmental impacts does not vary across Alternatives, the entire discussion of environmental impacts in the report serves no purpose. The D.C. Circuit Court would not have vacated the NRC's 2010 Waste Confidence Decision due to improper analysis of environmental effects if it didn't intend for the NRC to properly consider these potential effects in weighing relative impacts of Alternatives. The evaluation of environmental consequences, and identification of appropriate mitigation strategies are a central purpose of NEPA. As described in the regulation, the evaluation of environmental consequences requires discussion of means to mitigate adverse environmental impacts (40 CFR 1502.17). As it is, the additional information provided in the Draft GEIS to address environmental consequences is entirely symbolic and does not weigh into decision-making regarding the selection of an Alternative or identification of potential mitigation strategies across Alternatives or plant sites. (0473-1-9 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: THE DGEIS INCLUDES NO MITIGATION MEASURES AT ALL, IN VIOLATION OF NEPA AND NRC REGULATIONS: An EIS must also contain a detailed discussion of possible mitigation measures and the extent to which adverse effects can be avoided. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351-52 (1989). CEQ regulations require a discussion of mitigation measures. 40 C.F.R. § 1500.2(f) ("Federal agencies shall to the fullest extent possible . . . use all practicable means, consistent with the requirements of the Act and

other essential considerations of national policy, to restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions upon the quality of the human environment"); see also 40 C.F.R. §§ 1502.14(f); 1502.16(h), 1508.25(b)(3). NRC's own regulations also require discussion of mitigation measures, referred to as "alternatives available for reducing or avoiding adverse environmental effects." 10 C.F.R. § 51.71(d). The mitigation of impacts must be considered whether or not the impacts are significant. Forty Most Asked Questions and Answers on the CEQ Regulations, Number 19a. The "omission of a reasonably complete discussion of possible mitigation measures would undermine the 'action-forcing' function of NEPA. Without such a discussion, neither the agency nor other interested groups and individuals can properly evaluate the severity of the adverse effects." Robertson, 490 U.S. at 351-52.; But NRC has included no mitigation measures at all to offset any of the environmental impacts identified in the DGEIS. In a number of instances, however, NRC appears to assume that mitigation measures will be taken but without evaluating their likelihood or alternative mitigation measures that might work better or be more certain, including measures to prevent the adverse consequence from occurring. See, e.g., DGEIS at 3-12 ("Based on EPA's determination, the NRC recognizes that GHGs contribute to climate change, climate change can affect health and the environment, and mitigation actions are necessary to reduce impacts."); 3-19 ("Timely detection of leakage will allow licensees to identify and repair leaks and employ mitigation measures, as necessary, to minimize or eliminate any environmental impacts that would result from leaks."); 4-36 ("The severity of impacts associated with impingement and entrainment is dependent upon several factors including the amount of water withdrawn relative to the size of the cooling-water source, location and configuration of intake structures, type of waterbody from which water is withdrawn, conditions within that waterbody, proximity of withdrawal structures to sensitive biological habitats (e.g., spawning and nursery habitats), sensitivity of populations of impinged and entrained organisms to potential losses of individuals, and mitigation measures in place to reduce impingement and entrainment."); 5-15 ("For an away-from-reactor ISFSI, the NRC assumes that, if necessary, any site-specific permits would include appropriate mitigation to ensure that impacts would not be destabilizing to local air quality."); Despite acknowledging potential impacts in these areas (climate change, aquatic impacts, air pollution) and others, such as severe accidents including spent fuel pool fires, the DGEIS offers no mitigation measures at all. (0473-11-1 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: THE DGEIS SHOULD HAVE DIRECTLY EXAMINED EXPEDITED FUEL TRANSFER TO DRY CASKS AS A MITIGATION MEASURE OR AN ALTERNATIVE: The NRC has made a number of inconsistent statements about the expedited fuel transfer to dry casks. In the DGEIS, it says: Imposing new regulatory requirements, such as requiring licensees to ... reduce the density of spent fuel in pools, or expedite transfer of spent fuel from pools to ISFSIs, is outside the scope of this proposed action, which includes alternatives that improve the efficiency of the NRC's licensing process by generically addressing the environmental impacts of continued storage. ... [T]he NRC cannot impose new requirements or regulations on the duration of spent fuel storage in pools through this proposed action. In separate proceedings, the NRC is considering implementing revised security requirements as part of the ongoing ISFSI security rulemaking effort. The rulemaking effort is described in the December 16, 2009, Federal Register notice (74 FR 66589), "Draft Technical Basis for Rulemaking Revising Security Requirements for Facilities Storing SNF [spent nuclear fuel] and HLW [high-level waste]; Notice of Availability and Solicitation of Public Comments." This position is problematic for three reasons. First, this position is only potentially tenable if the federal action was properly cast as guiding agency efficiency, which, as discussed above, it is not. Second, the NRC is confusing its AEA obligations with its obligations under NEPA. Third, the NRC is, in fact, evaluating the

expedited transfer of spent fuel to dry casks in a document they intend to cite in the DGEIS; they are simply not doing it at the draft stage such that all parties can comment on it or by applying the NEPA standards for evaluating the alternative provided in 10 C.F.R. Section 51.103(a)(4). (0473-11-10 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The reasons why the federal action, Statement of Purpose and Need, and alternatives are artificially limited have been discussed above. A proper evaluation of the federal action and the impacts and alternatives to that action would lead to a discussion of alternatives and mitigation measures to address spent fuel pool fire risk that would naturally include moving fuel out of pools. (0473-11-11 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The NRC's justifications for not including this alternative are unpersuasive. First, the NRC insists "that additional requirements on spent fuel storage would not meet the purpose and need." DGEIS at xxvi. The NRC goes to state that "the draft GEIS is a NEPA review and not a licensing action; therefore, this draft GEIS would not be the appropriate activity in which to mandate new spent fuel storage requirements." *Id.* One purpose of a properly conducted NEPA review is to provide the agency with complete information "to ensure that the agency does not act upon incomplete information, only to regret its decision after it is too late to correct." *Duke Energy Corporation (McGuire, Units 1 and 2; Catawba, Units 1 and 2) CLI-02- 17, 56 N.R.C. 1 (July 23, 2002) at 10.* (0473-11-14 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The analysis of alternatives, 42 U.S.C. § 4332(2)(C)(iii), is the "heart" of an EIS and "should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice." 40 C.F.R. § 1502.14. Alternatives to be considered include the "no action" alternative, other reasonable courses of action, and mitigation measures (not in the proposed action). 40 C.F.R. § 1508.25(b). The alternatives that must be examined are bounded by the "purpose and need" for the proposed agency action. See 40 C.F.R. §§ 1502.13, 1508.9(b). By unreasonably limiting its purpose and need to paperwork reduction, the NRC impermissibly frames the alternatives in terms of paperwork also, avoiding the *Minnesota v. NRC* question of whether the NRC can continue to license nuclear power plants. The DGEIS's alternatives are: (1) GEIS-only; (2) Policy-Statement Alternative. The only comparison of these alternatives in the DGEIS is a cost-benefit comparison focused on the cost of paper used and staff time expended. There is no evaluation whatsoever of the relative environmental impacts of each alternative, as is required under NEPA. (0473-11-3 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: This is not an alternatives analysis. Case law is clear that an "agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency's power would accomplish the goals of the agency's action, and the EIS would become a foreordained formality." *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190 (D.C. Cir. 1991). This is precisely what NRC has done here. For example, by stating that "[t]he NRC also determined that additional requirements on spent fuel storage would not meet the purpose and need" (DGEIS at xxvi), the DGEIS explains one way the NRC used the unreasonably narrow purpose and need to artificially limit alternatives (0473-11-5 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: To remedy this deficiency, as discussed above, the DGEIS must identify the true federal action here, licensing and relicensing of reactors or storage installations that result in the generation and management of nuclear waste. Once the true federal action is correctly defined, the true purpose and need of the DGEIS can also be defined: analyzing the environmental impacts of continued fuel storage absent a permanent repository. Only then can the reasonable range of alternatives be adequately evaluated under NEPA -- including the non-generation of waste, as well as alternatives that mitigate the potential impacts of a severe accident, which the DGEIS acknowledges could be "significant and destabilizing." DGEIS at 4-68. These alternatives include the accelerated transfer of spent fuel to dry storage, which would reduce the risk of fire during the short-term timeframe and beyond (since, as discussed below, there is no basis for assuming that waste will be removed from pools by 60 years after the licensed life of a reactor) and beyond, as well as banning the use of high burnup fuel. (0473-11-6 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The NRC appears to believe that it is without authority to analyze the true no-action alternative of ceasing to license and relicense plants until a permanent repository is available. See, e.g., DGEIS at 1-9 ("Through the Atomic Energy Act, Congress has mandated that the NRC establish criteria to allow the licensing of nuclear power plants. Therefore, without Congressional direction to do so, the NRC may not deny a reactor license unless it determines that a license applicant has not met the NRC's regulatory standards for issuance of a license." (emphasis added)). That cannot be so. First, this sets up precisely the type of "foreordained" conclusion that the courts have rejected. 938 F.2d at 196; see also, e.g., *California v. Block*, 690 F.2d 753, 767 (9th Cir. 1982) ("[I]t is troubling that the Forest Service saw fit to consider from the outset only those alternatives leading to [its] end result."); *Calvert Cliffs' Coordinating Committee, Inc. v. U.S. Atomic Energy Commission*, 449 F.2d 1109, 1114 (D.C. Cir. 1971) ("Congress did not intend [NEPA] to be such a paper tiger.") (0473-11-7 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Second, even if the NRC were correct that the Atomic Energy Act somehow trumped the requirements imposed by a later Congress through NEPA, the NRC would still have to at least study the no-action alternative to provide a baseline for evaluating the environmental impacts of the proposed action. See, e.g., *Se. Alaska Conservation Council v. Fed. Highway Admin.*, 649 F.3d 1050, 1058 (9th Cir. 2011) (rejecting a " cursory" three-paragraph explanation of the no-action alternative). (0473-11-8 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Third, Congress' authorization to NRC to license nuclear plants is conditioned on the issuance of the license providing adequate protection for the public health and safety. Atomic Energy Act, § 182 (42 U.S.C. § 2232) (0473-11-9 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Finally, the DGEIS fails to identify the reasonably available alternatives to the storage of spent fuel at reactor sites or to assess the different environmental consequences that would arise from each of those alternatives. By failing to properly identify the major federal action and failing to properly identify the purpose and need for the proposed action, the DGEIS has failed to properly consider alternatives. (0473-12-6 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: In general, the DGEIS's complete lack of analysis regarding mitigation measures is wholly inadequate under NEPA. Although the DGEIS does not so much as include a section discussing ways to mitigate the present-day severe accident impacts the DGEIS discloses, the

DGEIS does, confusingly, discuss NRC's past efforts at "mitigation." Under DGEIS Section 4.18.2.1, the DGEIS states that "[i]n the event of even a long-term loss of normal pool makeup water capability at U.S. power plants, measures that were installed in response to the September 11, 2001 terrorist attacks, plus additional measures that are required as a result of the post-Fukushima March 12, 2012, mitigating strategies order, would ensure additional defense-in-depth protection for cooling of the spent fuel." The DGEIS, however, fails to (1) identify which specific post-September 11 and post-Fukushima "measures" it is referring to, (2) acknowledge that not all of these measures were implemented at all plants, and (3) quantify what "additional defense-in-depth protection" these unidentified measures provide, either generically or on a site-specific basis. Furthermore, it fails to identify, discuss, and evaluate other alternative measures that would mitigate the impacts of a severe accident at a spent fuel pool. Indeed, contrary to NEPA, it excludes the consideration of such other readily available mitigation alternatives. (0473-14-3 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: As the preceding comments demonstrate, the DGEIS fails to assess the environmental impacts of the proposed action and weigh the costs and benefits of that action. See *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350-351 (1989). The DGEIS is deficient due to its failure to properly frame the federal action being proposed, its failure to identify the appropriate purpose and need for the proposed action, its failure to properly evaluate the adverse environmental consequences that are likely to occur if the proposed action is taken and its failure to consider any substantive measures to mitigate those adverse impacts. Given the extensive nature of the deficiencies, NRC must issue a new draft DGEIS for public comment and cannot merely respond to the concerns raised here by issuing a final GEIS which will then foreclose any further meaningful public participation in the NEPA process. See, e.g., *Marsh v. Oregon Natural Resources Council*, 490 U.S. 360 (1989); 10 C.F.R. § 51.72. Thus, the States and the Tribe request that NRC's response to these Comments be published in the form of another DGEIS, with site specific supplements as discussed above, which includes a reasonable opportunity for public comment. (0473-18-6 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Under NEPA, the NRC is required to consider the full range of reasonable alternatives to the Proposed Action, as follows: a) Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated. b) Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits. c) Include reasonable alternatives not within the jurisdiction of the lead agency. d) Include the alternative of no action. e) Identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference. f) Include appropriate mitigation measures not already included in the proposed action or alternatives (40 CFR 1502.14). The Proposed Action is a revision to the Waste Confidence Rule. In addition to the Proposed Action, the Draft GEIS considers three Alternatives, as described above. However, the Alternatives do not consider alternate ways of modifying the Waste Confidence Rule, as one may expect of the scope of reasonable Alternatives. For example, Alternatives could be structured around the best ways to manage storage of spent fuel at given sites in order to support the NRC's decision to codify that continued storage is "safe" over the analytic timeframes. This would allow for a meaningful analysis of relative environmental consequences of the different Alternatives. Instead, the Alternatives (including No Action) center around the NEPA process employed to evaluate environmental consequences without revising the Waste Confidence Rule, with no variation in

the approach to managing spent fuel across Alternatives. The result is that the only difference in Alternatives is the administrative effort required to implement the NEPA process. As described above, this framework does not provide a foundation for a purposeful Alternatives analysis of measures to mitigate or eliminate the environmental consequences of continued and increased storage of spent fuel in spent fuel pools over indefinite periods of time. The Proposed Action incorporates the findings of the GEIS into future licensing decisions for plants in order to codify that continued storage is safe. In this way, the Proposed Action establishes that further discussion of environmental impacts of spent fuel storage is not required in connection with the issuance or amendment of an operating license for a nuclear power reactor. However, the Draft GEIS considers only limited methods of managing spent fuel. For example, it does not consider the potential for transferring the fuel to dry casks within the short-term time frame. While the NRC leaves open the possibility of evaluating other methods of managing spent fuel outside of the context of the Waste Decision Rule GEIS, codifying that continued storage is safe across indefinite time frames indicates the NRC is disinclined to fully explore the relative merits of different storage scenarios for given sites and in general. (0473-3-3 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Consistent with NEPA and the Court's remand, the NRC thus must address in this proceeding foundational questions, including whether the generation of further nuclear waste should be allowed and, if allowed, what mitigation measures are available to reduce environmental impacts, and what alternatives exist to the current practice of permitting nuclear wastes to be stored at individual reactor sites indefinitely and in spent fuel pools never designed for that purpose. (0473-5-2 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: However, the DGEIS and draft rule, as presented, fail to address these core issues as required by NEPA and the Court's remand by, among other means, miscasting the purpose and need for the DGEIS to focus on agency efficiency rather than environmental protection, by failing to consider a reasonable range of alternatives, including dry cask storage, to mitigate environmental impacts, and by failing to provide the States, the Tribe, and the public with a meaningful opportunity for site specific review of these issues in violation of the Court's mandate. (0473-5-3 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The NRC states that "[t]he Waste Confidence rulemaking is a major Federal action that requires a NEPA review." DGEIS at xxiii. While the States and the Tribe do agree that the development, justification, and promulgation of regulations are "federal actions" requiring NEPA review, here, the analysis of the storage of nuclear waste relates back to major federal actions resulting in the generation and storage of nuclear waste: the licensing and/or relicensing of nuclear power plants and waste storage installations, and the ongoing storage of nuclear waste at facilities no longer operational. (0473-9-1 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: In 1979 the preferred solution was reracking of spent fuel to allow more spent fuel to be stored at the reactor sites in spent fuel pools. NUREG-0575 evaluated that proposed action and considered a number of alternatives including dry cask storage and ending the further production of spent fuel. Today NRC's preferred solution is to allow more spent fuel to be generated and stored at reactor sites in spent fuel pools and for longer periods of time. It is that proposed action that the DGEIS must evaluate, including an analysis of alternatives to that proposed action, as well as measures to mitigate the environmental consequences of the proposed action. (0473-9-12 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: NRC faces the same type of issues it faced in 1979, when it explicitly recognized that it must analyze whether to allow the continued production of spent fuel and the continued storage of spent fuel at reactor sites in spent fuel pools. NRC must still answer, in the context of NEPA, the same question the Court ordered it to answer in the remand in *Minnesota v. NRC*: the court contemplates consideration on remand of the specific problem isolated by petitioners determining whether there is reasonable assurance that an off-site storage solution will be available by the years 2007-09, the expiration of the plants' operating licenses, and if not, whether there is reasonable assurance that the fuel can be stored safely at the sites beyond those dates.; *Minnesota v. N.R.C.*, 602 F.2d at 412. The Waste Confidence decision in 1984 was a direct outgrowth of that mandate, and NUREG-0575 was the principal basis for the NRC's conclusion that spent fuel could be safely stored at reactor sites in either spent fuel pools or dry casks: The Commission is confident that the regulations now in place will assure adequate protection of the public health and safety and the environment during the period when the spent fuel is in storage ("Final Generic Environmental Impact Statement on Handling and Storage of Spent Light Water Power Reactor Fuel," NUREG-0575, August 1979: Vol. 1, pp. ES-12, 4-10 to 4-17). 49 Fed. Reg. 34658, 34682, Final Waste Confidence Decision (Aug. 31, 1984). (0473-9-13 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Today, utilities continue to struggle with what to do with spent fuel, and NEPA requires that the NRC evaluate whether to let spent fuel continue to build up at reactor sites and remain in spent fuel pools. In addition to fully exploring the environmental consequences of such action, the NRC must examine all the reasonably available alternatives to that action, as well as mitigation measures if the proposed action is to go forward. Such alternatives and mitigation measures include not producing spent fuel, alternative methods for producing spent fuel (e.g., banning the use of high burnup fuel) and alternative methods for storing spent fuel (e.g., in dry casks after five years of pool storage) (0473-9-14 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Thus, contrary to the DGEIS's characterization of the proposed action and the statement of purpose and need, this DGEIS is the continuation of a process begun in 1979 to examine the environmental consequences of not having a permanent repository for spent fuel. The DGEIS must examine the full range of those previously examined issues in light of all the current available information if it is to fully examine the major federal actions NRC is considering, as well as alternatives and mitigation measures. (0473-9-16 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: While NUREG-0575 recognized the broad scope of environmental issues raised by the presence of spent fuel at reactor sites, at no time since 1979 has NRC undertaken a comprehensive look at the environmental implications of onsite spent fuel storage. Yet, if anything, the need for a comprehensive look is all the greater now due to: (1) increased amounts of fuel that is (2) more volatile because it is high burnup fuel and (3) may remain onsite indefinitely. Rather than undertake a comprehensive update to NUREG-0575, NRC has engaged in a handful of narrow examinations of some of the issues raised by the changes since 1979, several of which have occurred outside the procedural and substantive rights created by NEPA, without ever combining its analyses into a single environmental impact statement that addresses anew the now outdated analysis contained in NUREG-0575. (0473-9-17 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The issue of whether and how spent fuel should be stored at reactor sites and alternative ways to accomplish such storage is inexplicably intertwined with the issue of waste confidence. Whether the Commission ultimately concludes that it has a date certain by which a

waste repository will likely be available, as the current Staff prepared DGEIS proposes, or not, the Commission must still address the question of potential environmental impacts of spent fuel storage at reactor sites both during and following plant shutdown and must examine alternatives to mitigate those potential impacts. 10 C.F.R. §§ 51.30(a)(1)(ii) and (iii), 51.103(a)(4) and 42 U.S.C. §§ 4332(2)(C)(iii) and (E). In fact, a number of reactors are already shutdown and storing spent nuclear fuel at the reactor site. See 2013-2014 Information Digest, NUREG-1350 Vol. 25 (August 2013) APPENDIX C U.S. Commercial Nuclear Power Reactors Undergoing Decommissioning and Permanently Shut Down Formerly Licensed To Operate. (0473-9-18 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Under CEQ regulations, the EIS "shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action." 40 C.F.R. § 1502.13. Given that the NRC has miscast the federal action, it has necessarily also miscast the Statement of Purpose and Need. (0473-9-3 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The purpose and need relates back to the NRC's ongoing attempts, for more than three decades now, to address the safety and environmental impacts of nuclear waste storage when it licenses reactors. In 1977, NRC declared, in its denial of a petition filed by NRDC, that it "would not continue to license reactors if it did not have reasonable confidence that the wastes can and will in due course be disposed of safely" (42 Fed. Reg. 34391) (July 5, 1977). As Judge Tamm of the D.C. Circuit stated in 1979, "if the Commission determines it is not reasonably probable that an offsite waste disposal solution will be available when the licenses of the plants in question expire, it then must determine whether it is reasonably probable that the spent fuel can be stored safely onsite for an indefinite period. Answers to these inquiries are essential for adequate consideration of the safety and environmental standards of the relevant statutes." *Minnesota v. NRC*, 602 F.2d 412, 419 (D.C. Cir. 1979) (Tamm, J. concurring). Thirty-four years later, the NRC has still not made these determinations; the DGEIS is its latest attempt. (0473-9-4 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The NRC in the DGEIS states that it is "evaluating the continued storage of commercial spent fuel." DGEIS at xxiii. The proposed action the DGEIS purports to support is the issuance of a rule, 10 C.F.R. 51.23, that "generically addresses the environmental impacts of continued spent fuel storage by incorporating into rule the conclusions" of the DGEIS. DGEIS at ES.3, xxii. Accordingly, the NRC presents its Statement of Purpose and Need as follows: 1. to improve the efficiency of the NRC's licensing process by generically addressing the environmental impacts of continued storage; 2. to prepare a single document that reflects the NRC's current understanding of these environmental impacts; 3. to address the deficiencies in the 2010 Waste Confidence rule identified by the U.S. Court of Appeals for the D.C. Circuit. DGEIS at xxii. To begin with, the purpose of the federal action here is not to improve efficiency. Such a purpose and need turns NEPA on its head. It focuses on the impact of the NEPA review process on the agency staff instead of focusing on the environmental impacts of what the agency is authorizing--licensing and relicensing decisions that will result in continued generation and storage of spent fuel in the absence of a permanent repository. While NRC may certainly discuss the convenience of the federal agency, it cannot be the purpose of the NEPA analysis itself. (0473-9-5 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The NRC's job here is still to meet the requirements laid out by the D.C. Circuit in 1979 - the DGEIS needs to determine "whether there is reasonable assurance that an off-site solution [for spent fuel] will be available by 'the expiration of the plants' operating licenses, and if not, whether there is reasonable assurance that the fuel can be stored safely at the sites

beyond those dates." *New York v. NRC*, 681 F.3d at 474-75, quoting *Minnesota* 602 F.2d at 418. Insofar as the D.C. Circuit has ever expressed an opinion about the efficiency of the NRC's process, it has been secondary to the primary question of whether waste can be stored safely: [A]n agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency's power would accomplish the goals of the agency's action, and the EIS would become a foreordained formality. *Friends of Southeast's Future v. Morrison*, 153 F.3d 1059, 1066 (9th Cir. 1998) (quoting *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 196 (D.C. Cir.1991)). While it is true that courts afford the NRC and other agencies "considerable discretion" in defining statements of purpose and need (See e.g., *Friends of Southeast's Future*, 153 F.3d at 1066-67), courts have also made clear that an agency's discretion in defining a purpose and need statement is "not unlimited." See *Westlands Water Dist. v. U. S. Dep't of Interior*, 376 F.3d 853, 866 (9th Cir. 2004); *New York v. U. S. Dep't of Transp.*, 715 F.2d 732, 742 (2d Cir. 1983) ("An agency's selection of alternatives . . . is not insulated from review"). (0473-9-6 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The Waste Confidence DGEIS is required to provide an analysis of waste generation and storage that has been lacking from environmental analyses of proposed NRC actions since 1984, when the original waste confidence findings were issued, blocking any discussion of nuclear waste for the period after the licensed life of a facility. The States submit that the NRC's goal in promulgating 10 C.F.R. § 51.23 is to ensure, after considered notice and comment rulemaking, that onsite storage of nuclear waste in the period after the licensed life of a facility is safe and without significant environmental impacts, such that continued generation of spent fuel through the operation of commercial nuclear power facilities is warranted. NRC believes its goal to be precluding consideration of such issues on a site by site basis in the name of administrative efficiency. Even if promulgation of the regulation was the proper federal action, the statement of purpose and need is still inadequate and unreasonably narrow for the above stated reasons. (0473-9-7 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Statement Three of the Statement of Purpose and Need is Too Vague and Fails to Satisfy NEPA's Public Information Purpose: In addition to the above, the Statement of Purpose and Need is also impermissibly vague and fails to satisfy NEPA's public information purpose. In stating that it "address[es] the deficiencies in the 2010 Waste Confidence rule identified by the U.S. Court of Appeals for the D.C. Circuit," it does not provide sufficient information such that adequate alternatives can be framed. The Statement of Purpose and Need is critical to the EIS because it frames the range of reasonable alternatives the agency must consider or such that the public can understand the action NRC is undertaking in the DGEIS. (0473-9-8 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: NEPA has twin aims: it "places upon an agency the obligation to consider every significant aspect of the environmental impact of a proposed action," *Baltimore Gas & Elec. Co. v. Natural Res. Def. Council, Inc.*, 462 U.S. 87, 97 (1983). "[I]t ensures that the agency will inform the public that it has indeed considered environmental concerns in its decisionmaking process." *Id.* "Grudging, pro forma compliance will not do." *Lathan v. Brinegar*, 506 F.2d 677, 693 (9th Cir. 1974). Both the CEQ and NRC's own NEPA regulations underscore that EISs should be written for the public: Ultimately, of course, it is not better documents but better decisions that count. NEPA's purpose is not to generate paperwork—even excellent paperwork—but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment. 40 C.F.R. § 1500.1(c); see also 40 C.F.R. §

1500.2(b) ("Federal agencies shall to the fullest extent possible . . . emphasize real environmental issues and alternatives."); 10 C.F.R. § 51.70(b): The draft environmental impact statement will be concise, clear and analytic, will be written in plain language with appropriate graphics, will state how alternatives considered in it and decisions based on it will or will not achieve the requirements of sections 101 and 102(1) of NEPA and of any other relevant and applicable environmental laws and policies, will identify any methodologies used and sources relied upon, and will be supported by evidence that the necessary environmental analyses have been made.) In framing the purpose of this DGEIS by referencing a federal appellate court decision, NRC has failed to satisfy NEPA's public information purpose. (0473-9-9 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The purpose of NRC's Waste Confidence rule is to streamline nuclear plant licensing by ignoring the permanent, multi-billion dollar problem of what to do with radioactive waste. The only problem Waste Confidence solves is how to permit nuclear plants to continue making this waste when there is no solution for it. (0552-1-9 [Macks, Vic])

Comment: The NRC incorrectly changed the purpose of the GEIS from what the court ordered. The DC Circuit ordered NRC to do a GEIS as a prerequisite to licensing decisions that will result in the production of more spent fuel in the absence of a permanent repository (Ibid at 473). *It ordered a specific and narrow focus. NRC changed and broadened it to a need to do the GEIS so that it will become the basis for a regulatory approach to temporary storage of spent fuel.* (0556-1-6 [Lampert, Mary])

Comment: It seems to me that there is an irrational, CIRCULAR LOGIC being applied by the regulator. The NRC repeatedly emphasizes that the "Waste Confidence rulemaking is not a licensing action. It [(the rulemaking)] does not permit a nuclear power plant or any other facility to operate or store spent fuel. Every nuclear power plant or specifically licensed spent fuel storage facility must undergo an environmental review as part of its site-specific licensing process." (DGEIS, Executive Summary, p. xxvi). However, the point of the rulemaking is to apply the generic determinations of the DGEIS to individual licensing actions in order to help facilitate the approval of future license applications. So, the circular logic is clearly evident. True, the proposed Rule is not a licensing action or authorization for "continued storage," and, yes, site-specific reviews are still required as part of license applications; BUT, "the potential environmental impact of continued storage" would "not be considered in those proceedings -- due to the generic determination in 10 CFR 51.23(a)." (78 FR 56781 - 56782, Section III, A11). The generic determinations of the DGEIS which are codified in the proposed Rule are intended to fulfill the NEPA requirements for individual licensing decisions with regard to assessing foreseeable environmental impacts from "continued storage" of spent nuclear fuel. Therefore, it is reasonable to argue that the DGEIS is absolutely intended to be applied as a regulatory basis for supporting the expedited APPROVAL of all major relevant licensing applications in the future. In other words, the disingenuous and circular logic being applied by the NRC has all the appearances of a "con." The NRC has attempted to rationalize its paradigm of generic assessments in the Federal Register (78 FR 56781, Section III, A9). Unfortunately, the NRC's argument is ludicrous and lacking in credibility despite the research studies cited. Apparently, the NRC fails to see the madness and circular logic involved in relying on (global disasters) "lessons learned and knowledge gained from operating experience" in order to understand the "environmental impacts of operation" of "spent nuclear fuel storage facilities" for "continued storage" of spent nuclear fuel beyond the licensed life for operation of a reactor. How naive for the NRC to suggest that "[c]hanges in the environment . . . are sufficiently gradual and predictable to be addressed generically." A staggering degree of hubris accompanied with astounding recklessness form the foundation of any attempt to rationalize or justify such

determinations. Therefore, on behalf of the public interest and consistent with the Mission of the regulating agency, there is no rational basis for continuing to pursue the mistaken historical tradition of applying generic rules and criteria in order to address specific and unique situations. (0603-11 [Schonberger, David])

Comment: It is not clear why the NRC included licensing process efficiency improvements in the scope of the draft GEIS. As we understand, each licensing action must still meet the requirements of the National Environmental Policy Act (NEPA), either through an EIS or an EA during licensing actions (0619-1-7 [Mahowald, Philip R.])

Comment: In the GEIS Executive Summary, the stated purpose of this ruling is for the efficiencies that would be gained, minimizing expenditures and avoiding delays in licensing reviews. This apparent bias towards the industry seems to contradict the sole purpose of the NRC in protecting the public and the environment. (0660-2 [Headrick, Gary])

Comment: The purpose and need of the draft GEIS is too narrowly focused on improving the efficiency of the NRC's licensing process. This is to the detriment of encouraging public involvement and effectively conveying environmental information to the public and decision makers about potential effects of continued storage of spent fuel. (0669-1 [Walter, Joan])

Comment: NEPA requires agencies to follow a particular process in making decisions and to disclose the information and data that was used to support those decisions. Tiering⁵ [footnote 5 text: Tiering refers to the coverage of general matters in broader EISs with subsequent narrower environmental documents incorporating by reference the general discussions and concentrating solely on the issues specific to the subsequent project specific action. 40 C.F.R. Sections 1500 through 1508.28.] is appropriate when a sequence of EISs progresses from a general NEPA analysis to a site-specific NEPA analysis. Accordingly, the draft GEIS states that while some site-specific information is used in developing the generic impact determinations, the NRC does not intend for this draft GEIS to replace the NEPA analysis associated with any individual site licensing action. Notwithstanding, as a programmatic environmental document, the draft GEIS would be more effective if it included a meaningful discussion of the means to mitigate adverse environmental impacts⁶ [footnote 6 text: 40 C.F.R. Section 1502.16 (h).] to ensure that the environmental effects of the proposed Action are fairly assessed, and if it provided a summary of mitigating actions relied upon from other NEPA documents to reach conclusions about the significance of environmental effects resulting from the proposed Action. NRC regulations⁷ [footnote 7 text: 10 C.F.R. Part 51 entitled "Environmental Protection and Regulations for Domestic Licensing and Related Regulatory Functions, Appendix A to Subpart A, Item 7.] describe what should be included in an environmental impact statement, including a discussion of environmental consequences and mitigating actions, and specifically, the means to mitigate adverse environmental impacts. Yet mitigating actions are not provided in the draft GEIS. (0669-7 [Walter, Joan])

Comment: For example, Tables 8-1 through 8-3 summarize levels of environmental impacts, including unavoidable adverse impacts, for each resource area but the draft GEIS does not include any corresponding discussion of the means to reduce or avoid these impacts. The draft GEIS provides a figure illustrating a process for tiering off NEPA analyses for other NRC activities (Figure 1-2) and list of NEPA documents used in the draft GEIS preparation, but does not reference any mitigating actions from those documents. The draft GEIS states that it generically addresses the likely impacts of continued storage and that other aspects of spent fuel storage will either be addressed in site-specific analyses or are addressed generically elsewhere. However, it is unclear how the environmental consequences and mitigating actions

from the draft GEIS are supported by the numerous other generic EISs that the draft GEIS tiers off of. Under NEPA, environmental documents are provided to inform the public and other agencies who may be interested or affected by the proposed Action.⁸ [footnote 8 text: 40 C.F.R. Section 1506.6(b).] The lead agency must determine the proposed Action's full extent and may not divide it into smaller segments to avoid presentation of its full environmental effects. The draft GEIS fails to disclose information about or adequately identify mitigating actions for the likely impacts of continued spent fuel storage by relying on unspecified mitigating actions addressed generically elsewhere or by deferring mitigating actions to assumed future activities which "may" require monitoring programs or mitigation measures (see Attachment A for examples). (0669-8 [Walter, Joan])

Comment: NRC staff have repeatedly described nuclear waste management as "a small piece of the puzzle." On the contrary, nuclear waste could be the undoing of our civilization. It is quite obvious to those who are well-informed that the Nuclear Regulatory Commission (NRC) MUST assess the environmental impacts of nuclear plant operation in general in order to fulfill the requirements of the Waste Confidence Decision, as well as to fulfill the requirements of common sense and our common humanity. (0679-1 [Sorgen, Phoebe])

Comment: NIC concurs with the NRC intent of addressing Waste Confidence generically, through rulemaking, rather than on a site-specific, case-by-case basis. To do otherwise would be unnecessary, extremely inefficient and an inappropriate use of limited NRC budgetary resources. (0685-6 [Davis, Ed])

Comment: The DGEIS claims that the cessation of licensing and operation of nuclear reactors would not satisfy the stated purpose and need for the DGEIS. This argument is without merit for several reasons. First, purpose and need as contemplated by NEPA is the purpose and need for the proposed federal action, not the purpose and need of the EIS. The EIS evaluates the environmental impact of the proposed federal action. The EIS is not the federal action. (0688-10 [Taylor, Wallace])

Comment: Secondly, the federal action involved here is the promulgation of the Waste Confidence Rule. See, DGEIS § 1.4. The proposed rule, amending 10 C.F.R. § 51.23, states that the GEIS for waste confidence precludes the need for discussion of environmental impacts of spent nuclear fuel storage following the term of the reactor license or amendment thereof in any environmental report, EIS or EA in connection with the issuance or amendment of a reactor license. Therefore, the purpose and need for the federal action is to promulgate a rule that ensures that reactors are licensed so as not to be "inimical" to public health, 42 U.S.C. § 2133(d), and that "[t]here is reasonable assurance . . . that the activities authorized by the operating license can be conducted without endangering the health and safety of the public . . .," 10 C.F.R. § 50.57(a)(3). Because radioactive spent fuel is extremely dangerous and no one knows what to do with it, the purpose and need for the Waste Confidence Rule must include the alternative of making no more radioactive waste. (0688-11 [Taylor, Wallace])

Comment: An EIS must discuss reasonable alternatives "to the proposed action." 42 U.S.C. § 4332(2)(C)(iii). The alternatives analysis is the "heart of the environmental impact statement." 40 C.F.R. §1502.14. NEPA demands that the agency "rigorously explore and objectively evaluate all reasonable alternatives" so the agency can "sharply define the issues and provide a clear basis for choice among options by the decision maker and the public." 40 C.F.R. §1502.14. The "existence of a viable but unexamined alternative renders an environmental impact statement inadequate." Resources Ltd. v. Robertson, 35 F.3d 1300, 1307 (9th Cir. 1994). And the main point of examining alternatives is to avoid environmental harm. So even if an

alternative might be superior in non-environmental terms, an alternative can be reasonable if it avoids the environmental harm better than another alternative. Surfrider Foundation v. Dalton, 989 F.Supp. 1309 (S.D. Cal. 98), *aff'd per curiam*, 196 F.3d 1057 (9th Cir. 1999). (0688-5 [Taylor, Wallace])

Comment: •The deficiencies in the 2010 Waste confidence rule identified by the Court should have been the primary purpose of the GEIS-- environmental analysis of the failure to secure a repository, and of spent fuel leaks and of fires. (0693-3-11 [Warren, Barbara])

Comment: •A key problem with the NRC analysis is that it sought to fulfill another purpose: improving the efficiency of the NRC licensing process by generically addressing the environmental impacts of continued storage. We believe it would be more accurate to say improving efficiency by ignoring or avoiding analysis of the environmental impacts, based on what we see in the draft GEIS. On p. xxvi, NRC describes its efforts to elevate efficiency by minimizing expenditures on site-specific reviews and limiting the potential for lengthy project delays. In fact the Regulatory Analysis in the Federal Register Notice states there is no burden on licensees associated with this proposed action. (0693-4-2 [Warren, Barbara])

Comment: Separate from the agency's AEA obligations, NEPA requires that before licensing or re-licensing nuclear power plants, NRC must evaluate the environmental impacts of its licensing decision in an EIS. 42 U.S.C. § 4332(C); 10 C.F.R. § 51.20(b)(2). An EIS must address the environmental impacts of the proposed action and connected actions, including cumulative impacts. 10 C.F.R. § 51.71(d). It must also weigh the costs and benefits of a reasonable array of alternatives for avoiding or mitigating the consequences of the proposed action. *Id.* Thus, in proposing to license or re-license nuclear power plants, NRC must examine the environmental impacts of the SNF and radioactive waste generated by the plants. It must also evaluate the relative costs and benefits of alternatives for avoiding or mitigating those impacts, including denying or amending licenses so that the radioactive waste is either not produced or there will be some future limitation. *Id.* The environmental impacts that must be examined by NRC include the risks posed by SNF interim storage, permanent disposal and the failure to secure permanent disposal. With regard to the latter, the NRC is obligated to examine the potential environmental impacts should institutional control over surface storage of SNF be lost for an extended period of time. Since there is uncertainty regarding when loss of institutional control might occur, how often and for how long, this portion of the analysis should examine the impacts for a range of dates and time periods for loss of institutional control. (0706-1-11 [Fettus, Geoffrey])

Comment: In order to comply with these controlling precedents, as noted earlier, we ask NRC to withdraw the existing Waste Confidence Draft GEIS and commence with publishing a Scoping Notice with a clear description of the NRC action that leads to SNF storage and disposal impacts: licensing nuclear reactors. (0706-1-12 [Fettus, Geoffrey])

Comment: In short, *New York et al.* was the natural successor to a lawsuit NRDC brought in 1977 to force NRC to address the public health and environmental impacts of SNF and high-level radioactive waste ("HLW") storage and disposal. See *NRDC v. NRC*, 582 F.2d 166, 169 (2nd Cir. 1978). While NRDC's and Minnesota's original lawsuits had a measure of success as a policy matter by forcing the compromise embodied in the Waste Confidence decision – NRC will not license reactors without "reasonable confidence" in the progress and development of a permanent disposal facility and the ability to safely store SNF—at no point over the last 40 years had NRC prepared an EIS regarding the environmental impacts of SNF and high-level radioactive waste disposal. Moreover, NRC continued to assume in its licensing decisions that

SNF and HLW disposal caused no public radiation doses and had no appreciable environmental impacts, long after those assumptions were proven wrong. After years of work by NRDC and many others, those assumptions have now been vacated by the D.C. Circuit. However NRC has issued a first draft of a NEPA analysis of the environmental impacts of SNF storage and disposal where the agency inadequately contemplates the possibility that a final disposal solution may never be found. Unfortunately, NRC has gotten off on the wrong foot and must: (1) withdraw this first draft and the proposed rule; and (2) commence work on a draft EIS that complies with federal law. The agency must then present reasonable alternatives and subject them to NEPA's "hard look requirements" and rely on reasonable projections, forecasts and assumptions to formulate its alternatives and examine their reasonably foreseeable environmental impacts. (0706-1-14 [Fettus, Geoffrey])

Comment: Page 1-5. "*Proposed Federal Action*. The Commission proposes to issue a revised Rule, 10 CFR 51.23, that generically addresses the environmental impacts of continued storage. This revision would adopt into regulation the environmental impact analyses in this draft GEIS. Further, the revision would state that because the impacts of continued storage have been generically assessed in this draft GEIS and codified in a Rule, NEPA analyses for future reactor and spent fuel storage facility licensing actions would not need to separately consider the environmental impacts of continued storage." NRDC Comment[:]. As NRDC will describe in detail below, the impacts of continued storage have not been generically assessed in this Draft GEIS and NRC will in any event have to consider certain site specific impacts of long-term storage at nuclear facilities in future "tiered" NEPA analyses. The Draft GEIS misconstrues NRC's NEPA obligation to properly define the nature and scope of the "major federal action" – in this instance a rulemaking – that NRC proposes as a fundamental predicate to all pending and future licensing actions authorizing the production and storage of spent nuclear fuel. In so doing, the Draft GEIS ignores the DC Circuit's unambiguous language vacating *en toto* the Commission's 2010 iterations of the WCD and TSR – "we are invalidating the Commission's conclusions as a whole." *New York et al.*, at 482. Indeed, the DC Circuit rejected the very argument – "the WCD/TSR is not a licensing action" – NRC now employs to arrive at its cramped, unreasonable description of the Commission's purpose and need in seeking to readopt the now vacated WCD and TSR: "(1) to improve the efficiency of the NRC's licensing process by generically addressing the environmental impacts of continued storage; (2) to prepare a single document that reflects the NRC's current understanding of the environmental impacts; and (3) to respond to the issues identified in the remand by the Court in the *New York v. NRC* decision." Draft GEIS at 1-6. (0706-1-17 [Fettus, Geoffrey])

Comment: The failure to analyze meaningful alternatives is a direct result of an improperly framed proposed action and its cramped, unreasonable purpose and need section. Following the Court's guidance and a common sense reading of NEPA and its implementing regulations, a legally compliant definition of the proposed action would be the following: *The NRC proposes to reinstate, as a pre-determined stage of its individual licensing actions for nuclear reactors and Independent Spent Fuel Storage Installations, a binding rule that generically considers, and determines for the purposes of future licensing, reasonably foreseeable and cumulative environmental impacts of continuing to store on the surface of the earth for extended periods, including indefinitely, all spent fuel previously generated and requiring storage pursuant to past Commission licensing actions, and any spent fuel that would be generated pursuant to pending and reasonably foreseeable licensing actions the Commission may undertake in the future.* But in defiance of the DC Circuit's directions, NRC's Draft GEIS continues present its WCD and TSR decisions as "separate from the individual licensing decisions it enables," and even includes a special box in the Executive Summary to this effect, headlined, "The Waste Confidence rulemaking is not a licensing action." This box then asserts, "Every nuclear power

plant or specifically licensed spent fuel storage facility must undergo an environmental review as part of its site-specific licensing process," when the NRC knows full well adoption of the Draft GEIS conclusions would, as the DC Circuit noted, actually *preclude* further NEPA consideration of spent fuel storage issues at the licensing stage! Draft GEIS at xxvi. NRDC notes in passing that we find such mind-numbing doublespeak, on behalf of a Commission charged with safeguarding the public interest, to be regrettable. (0706-1-18 [Fettus, Geoffrey])

Comment: NRC's Proposed Action thus becomes "to adopt into regulation the environmental impact analyses in this Draft GEIS," and the alternative of No Action involves not codifying generic environmental findings at 10 CFR 51.23 and instead "addressing the environmental impacts from continued storage in each of its nuclear power plant and ISFSI initial licensing and license renewal proceedings." Draft GEIS at 1-6. Since addressing environmental impacts in the licensing proceedings has not been the agency's practice to date, and is therefore not part of the environmental status quo, this cannot lawfully comprise the "No Action Alternative." Despite the vast radionuclide inventories, geographic dispersion, temporal sweep, and potential hazards involved in the nuclear waste storage problem, there are just two "[O]ther Reasonable Alternatives" considered in this GEIS: (1) "Develop a GEIS without incorporating the results into a rule...allow[ing] the NRC to adopt these Draft GEIS findings into environmental reviews for future licensing activities, but without the effect of a rule;" and (2) "...issue a policy statement [that] would not bind licensees and applicants like a rule, but would provide notice of the Commission's intent to incorporate the findings of the GEIS into environmental reviews for future licensing activities." *Id.* at 1-7. We discuss the inadequacies of the presented alternatives below. (0706-1-19 [Fettus, Geoffrey])

Comment: Page 1-6. (Purpose of and Need for the Proposed Action) "The purpose and need for the proposed action are threefold: (1) to improve the efficiency of the NRC's licensing process by generically addressing the environmental impacts of continued storage; (2) to prepare a single document that reflects the NRC's current understanding of these environmental impacts; and (3) to respond to the issues identified in the remand by the Court in the *New York v. NRC* decision. The NRC intends to codify the results of its analyses in this draft GEIS at 10 CFR 51.23. NRC licensing proceedings for nuclear reactors and ISFSIs will continue to rely on the generic determination in 10 CFR 51.23 to satisfy obligations under NEPA with respect to the environmental impacts of continued storage." NRDC Comment[:] The Purpose and Need of NRC's "proposed" action under NEPA are improperly defined, as is the major federal action at issue. As the DC Circuit and the NRC have acknowledged, an EIS is necessary. See *New York et al.* at 476-477 (explanatory brackets inserted, emphasis added, citations omitted), ("Under NEPA, each federal agency must prepare an Environmental Impact Statement ("EIS") before taking a "major Federal action[] significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C). ... The issuance or reissuance of a reactor license is a major federal action affecting the quality of the human environment... the WCD rulemaking is a major federal action requiring either a FONSI or an EIS. *The Commission's contrary argument treating the WCD as separate from the individual licensing decisions it enables fails under controlling precedent.*"). So what is the purpose at issue here and why is an EIS necessary? An EIS is necessary not just because the Court directed there be one. An EIS is necessary to address the environmental impacts identified by the Court as necessary for evaluation under NEPA. We now explain what a proper purpose and need section might look like. (0706-1-20 [Fettus, Geoffrey])

Comment: As a result, the notice failed to give the public sufficient information on which to develop comments on the appropriate scope of the EIS proposed by the NRC, and not surprisingly, the Agency has brought forth a Draft GEIS with a scope of analysis that is woefully deficient. (0706-1-4 [Fettus, Geoffrey])

Comment: We are unclear how the Court could have been more direct in its language. The NRC action - licensing nuclear power plants - leads to the environmental impacts associated with SNF storage and a lack of disposal options and that is what must be considered under NEPA.⁸ [footnote 8 text: NRDC also responded at length in its scoping comments to the Chairman's assertion that scoping notices prepared under the Commissioners' discretionary authority found in § 51.20(a)(2) impliedly have no such obligations as those found in §51.27(a), as such restrictions apply only to scoping notices that are prepared under §51.26. First, nothing in § 51.20(a)(2) removes the Commissions' responsibility to comply with the whole of NEPA. Second, the Chairman's assertion conflicts with the agency's own Waste Confidence Scoping Notice—which at no point references §51.20 – but does, in fact, reference §51.26. 77 Fed. Reg 65138.] To comply with the Court's opinion and NEPA, we see no alternative but for the Commission to withdraw this Draft EIS and reissue it with a properly defined proposed action and reasonable alternatives for achieving the agency's purpose and need for action that are consistent with the purpose of NEPA to foster not "paperwork" but "excellent agency action" that "protect(s) the environment." 40 CFR § 1500.1 (c). In pursuit of this objective, the Agency must publish a new Scoping Notice that clearly articulates the scope of reasonably foreseeable environmental impacts flowing from all future agency actions that critically depend on the Proposed Action to license the production and storage of SNF. In the abundance of caution we will nevertheless comment in detail on the many manifest deficiencies in the current Draft GEIS. (0706-1-6 [Fettus, Geoffrey])

Comment: In its response to the scoping comments filed by NRDC and many others, NRC managed to both misconstrue and disregard them. We could belabor the point for pages, but we will cite the way one of our own comments was handled. First, NRC misconstrued NRDC's following observation regarding the major federal action and reasonable alternatives for implementing it: [NRC must] determine whether or how much additional SNF may be generated when there is no permanent, safe and secure waste disposal facility, no date certain by which such a facility will exist and the significant possibility that such a disposal facility may never exist. Further, if such additional SNF is allowed to be generated, what alternatives exist to the current practice of allowing nuclear wastes to be generated and stored at individual reactor sites indefinitely and in spent fuel pools for as long as the licensee chooses? And finally, regardless of how much new SNF may or may not be allowed to be generated, what are the long term storage alternatives and associated environmental impacts for the SNF and high-level radioactive waste that are already in existence? 10 C.F.R. § 51.27(a)(2). If one examines the "Alternatives" section of NRC's scoping summary document, at no point does NRC even acknowledge, much less respond in a substantive fashion to observations regarding the major federal action and reasonable alternatives for implementing it. Rather, NRC nonsensically suggested parties had submitted "alternatives to the Waste Confidence rulemaking ... such as stopping all NRC licensing activities, halting any further production of spent nuclear fuel, and shutting down all existing nuclear power plants." NRC Scoping Summary Document at 26-27 (emphasis added). Such a response trivializes and distorts the important NEPA compliance issues NRDC and others introduced. At issue is the arbitrary and contrived manner in which the agency has defined the scope of its Proposed Action for NEPA analysis, and the range of reasonable alternatives for avoiding, reducing, and mitigating environmental impacts it must consider before arriving at a final agency decision to pursue a particular course of action. (0706-1-7 [Fettus, Geoffrey])

Comment: As a result of all of the above, the agency must evaluate the environmental effects of all reasonable alternatives for on-site and off-site storage of waste during and after the period of extended operation; offsite land, water, and air use impacts of continued operations and the storage of additional spent fuel on the surrounding areas; evaluation of the long term impacts

and safety of the generation and long-term storage of radioactive waste; the comparative impacts of spent fuel storage in pools versus in dry casks; the implications of on-site storage of waste for decommissioning; the effects of spent fuel disposal and the effects of spent fuel storage and disposal in the event of extended delay or if no final disposal option or repository is ever identified; and alternatives to mitigate these impacts, among other issues. Many of these issues appear to be site specific and cannot be dealt with generically, but in any event we suggest a legally compliant definition of the proposed action in the next comment. (0706-2-1 [Fettus, Geoffrey])

Comment: In place of the required comparative NEPA analysis of reasonable alternatives for implementing the proposed action and mitigating environmental harms, like the one outlined above, we find instead a "Cost-Benefit Analysis" (Draft GEIS Section 7.0) confined to reviewing the legal, financial, and "public perception" costs and benefits of the four agency administrative options that could in some fashion render an the required analysis of the long-term impacts of prolonged surface storage of spent fuel. However, according to the Draft GEIS, these costs and benefits *"do not include the environmental impacts of continued storage, an activity that will occur regardless of the alternative that the NRC selects to consider its impacts."* Draft GEIS at 7-1, emphasis added. But NRC's NEPA obligation cannot be nonsensically reduced to the mere selection of a paperwork alternative for *considering* environmental impacts. Rather the Draft GEIS must analyze the environmental consequences of reasonable alternatives for actually *implementing* continued storage of spent fuel the Commission may authorize in future commercial power reactor and spent fuel facility licensing actions. (0706-2-16 [Fettus, Geoffrey])

Comment: And as a final matter, putting aside for a moment the broader question whether NRC's Draft framework used in this GEIS for analyzing its NEPA obligations complies with the statute and applicable regulations—it doesn't—and focusing on the narrower question whether these are even distinct and cognizable "alternatives" with discernible environmental impacts, NRDC is hard pressed to detect any meaningful difference between the proposed alternatives as all but one involve preparation of a Draft GEIS, but not its subsequent adoption into a proposed rule. However, "reasonable alternatives" are, by definition, alternative means (with greater and lesser environmental impacts) for *accomplishing the agency's purpose and need for action*—that is what makes them "reasonable"—and NRC's purpose and need is defined in this Draft GEIS as "improve[ing] the efficiency of the NRC's licensing process by generically addressing the environmental impacts of continued storage." Since neither of the two "reasonable alternatives" deemed worthy of detailed NEPA analysis could culminate in a discernible agency Record of Decision supporting an agency action that generically determines impacts to "improve the efficiency of the NRC's licensing process," they do not meet the threshold standard of being reasonable alternative means for achieving the agency's stated purpose and need for action. Both alternatives would leave NRC with "Draft GEIS findings" that have no have no legal status, which, if used, would be subject to challenge in site-specific licensing proceedings. In short, the NRC Staff is leading decision-makers and the public through a convoluted, rhetorical hall of mirrors in this Draft GEIS that has nothing to do with good-faith compliance with NRC's legal obligations. (0706-2-17 [Fettus, Geoffrey])

Comment: The Framing of the Proposed Action Leads to An Absurd Comparison of Alternatives. As established above, the issuance or reissuance of a reactor license is a major federal action affecting the quality of the human environment." *New York et.al. at 7*, (citing *New York v. Nuclear Regulatory Comm'n*, 589 F.3d 551, 553 (2d Cir.2009)). The instant DC Circuit ruling further held, "[w]e agree with petitioners that the WCD rulemaking is a major federal action requiring either a FONSI or an EIS. The Commission's contrary argument treating the WCD as separate from the individual licensing decisions it enables fails under controlling

precedent. ...The WCD makes generic findings that have a *preclusive effect in all future licensing decisions*—it is a *pre-determined 'stage' of each licensing decision*. NEPA..." *Id.* at 8, emphasis added. In this connection, the Court also noted, "It is not only reasonably foreseeable but eminently clear that the WCD will be used to enable licensing decisions based on its findings.... [the WCD] renders uncontestable general conclusions about the environmental effects of plant licensure that will apply in every licensing decision. See 10 C.F.R. § 51.23(b)." The failure to analyze meaningful alternatives is a direct result of an improperly framed proposed action. As we suggested above, following the Court's guidance and a common sense reading of NEPA and its implementing regulations, a legally compliant definition of the proposed action would be the following: *The NRC proposes to reinstate, as a pre-determined stage of its individual licensing actions for nuclear reactors and Independent Spent Fuel Storage Installations, a binding rule that generically considers, and determines for the purposes of future licensing, reasonably foreseeable and cumulative environmental impacts of continuing to store on the surface of the earth for extended periods, including indefinitely, all spent fuel previously generated and requiring storage pursuant to past Commission licensing actions, and any spent fuel that would be generated pursuant to pending and reasonably foreseeable licensing actions the Commission may undertake in the future.* (0706-2-2 [Fettus, Geoffrey])

Comment: Page 1-10. Comparison of Reasonable Alternatives. NRDC Comment[:] See Comment #5 above. NRC's inadequate paper alternatives result in the same minimal environmental impacts because the agency has failed to (1) identify the major federal action at issue – licensing nuclear reactors and allowing the production of spent nuclear fuel – and (2) evaluate a set of meaningful alternatives and potential strategies for mitigating the harms. As noted, the analytical framework adopted in this Draft GEIS blatantly subverts the essential purposes of NEPA. (0706-2-20 [Fettus, Geoffrey])

Comment: An understandable and coherent proposed action would result in meaningful NEPA process. By contrast, in the instant case the failure of this Draft GEIS to take account of the Court's finding the WCD/TSR represents a "predetermined stage of each licensing decision" is evident not only from the wide gap between the Court's plain language and the analytical constructs employed in the Draft GEIS, but also from the fact that the resulting analysis violates a fundamental principle of statutory interpretation: longstanding legal precedent admonishes us not to interpret a statute - NEPA in this instance - in a manner that yields futile results with little or no meaning.¹⁹ [footnote 19 text: See *Absurdity And The Limits Of Literalism: Defining The Absurd Result Principle In Statutory Interpretation*, Veronica M. Dougherty, *The American University Law Review*, Vol. 44:127 (1994) at 127, ("[I]t is a venerable principle that a law will not be interpreted to produce absurd results."), <http://digitalcommons.wcl.american.edu/cgi/viewcontent.cgi?article=1523&context=aulr>.] (0706-2-3 [Fettus, Geoffrey])

Comment: Specifically, NRC Staff has produced a Draft GEIS that, contrary to statute and regulation, fails to consider and compare the environmental impacts (and mitigation options) of a representative range of reasonable alternatives for ensuring prolonged but safe surface storage of spent fuel generated as a direct consequence of past, pending, and reasonably foreseeable future licensing actions of the Commission. The Draft GEIS thus yields, *in its own words*, the following "absurd and futile" result: "The environmental impacts of these three [NEPA] alternatives are substantially the same, and the *licensed activities under all three alternatives remain the same*. The alternatives *merely propose alternative means of analyzing* the environmental impacts of continued storage." Draft GEIS at 1-10, emphasis added. In other words, with a circular reasoning worthy of the famous BBC comedy series "Yes, Minister," this Draft GEIS sets its task as "analyzing alternative means of analyzing" the environmental

impacts of continued storage, rather than considering reasonably foreseeable *action* alternatives for *implementing* continued storage that could potentially minimize environmental risks and impacts, as the agency is required to do by law. "NEPA's purpose is not to generate paperwork -even excellent paperwork-but to foster excellent *action*." 40 CFR § 1500.1 (c). We are aware of no comparable instance in which a Federal Agency proposing a major federal action - much less one responding to specific NEPA direction from a Federal Court - has sought to substitute a *cost-benefit comparison of alternative procedural pathways for NEPA analysis* in place of the required substantive and searching *environmental impact comparison of reasonable alternatives* required under NEPA. See NEPA, 42 U.S.C. § 4321, *et seq.*; see also 40 C.F.R. § 1502.14 and 10 C.F.R. 51.85 and § 51.10-125 and App A. CEQ's regulations governing implementation of NEPA direct that Federal agencies "shall to the fullest extent possible....(b)...emphasize *real environmental issues and alternatives*...(e) Use the NEPA process to identify and assess the *reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions* upon the quality of the human environment." 40 C.F.R. §1500.2 (emphasis added). (0706-2-4 [Fettus, Geoffrey])

Comment: NRC Has Not Plausibly Defined the Alternative of No Action, or Provided Reasonable Alternatives for Comparison. In setting out the fundamental purpose of an EIS, CEQ's regulations also state, "It [the EIS] shall provide full and fair discussion of significant environmental impacts and shall inform decisionmakers and the public of the *reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment*. Agencies shall focus on *significant environmental issues and alternatives*..." 40 C.F.R. §1502.1(emphasis added). Satisfying these requirements is a non-discretionary duty of the NRC's NEPA process and obligations under the law. But the analysis of reasonable alternatives in this Draft GEIS fails to meet these requirements. It fails to consider "real environmental issues" *in the context* of "reasonable alternatives to proposed actions that would avoid or minimize adverse impacts," and instead compares the *non-environmental* costs and benefits of codifying its environmental analysis with three alternative procedural pathways for completing NEPA review, an approach fails to comply with NEPA's basic requirements, and *delivers the absurd result of literally performing NEPA analysis on ways to carry out NEPA analysis*. Since NRC's framework for NEPA analysis fails at this fundamental level, it stands to reason that this Draft GEIS fails many other specific regulatory standards for a legally sufficient EIS. The analysis of "alternatives, including the proposed action...is *the heart of the environmental impact statement*....it should present *the environmental impacts of the proposal and the alternatives in comparative form*, thus *sharply defining the issues and providing a clear basis for choice among options* by the decisionmaker and the public..." agencies *shall rigorously explore and objectively evaluate all reasonable alternatives ... and devote substantial treatment to each alternative considered in detail* including the proposed action so that *reviewers may evaluate their comparative merits*." 40 CFR §1502.14 (emphasis added). These requirements affecting the environmental analysis of the proposed action and reasonable alternatives are substantially echoed in the Commission's own regulations at § 51.71 (d) and § 51.125, Appendix A paras (5) and (7). (0706-2-5 [Fettus, Geoffrey])

Comment: But in this Draft GEIS, the required rigorous and objective exploration of all reasonable alternatives, providing an environmental evaluation of their "comparative merits" to identify those that "would avoid or minimize adverse impacts," is reduced to less than 2 pages, *none of which actually describe or compare environmental impacts!* See Draft GEIS Subsection 1.6.2 "Other Reasonable Alternatives," p. 1-7. The subsection comparing "reasonable alternatives" is comprised of two short paragraphs, barely 10 lines of text in total. Draft GEIS Subsection 1.6.4 , "Comparison of Reasonable Alternatives§ at 1-10. This is cursory treatment for the supposed "heart of the environmental impact statement." This Draft GEIS is unable to

provide such comparative environmental analysis, because it fails to define, consider, and compare the environmental consequences of a range of reasonable alternatives for implementing continued and potentially indefinite storage of spent fuel arising from future licensing actions, including the mandated alternative of No Action. Logically, the latter should be defined in this Draft GEIS, as in thousands of other federal NEPA documents, as the *continuation of the policy and environmental status quo assuming the Agency does not undertake the Proposed Action, or any of the action alternatives assessed in detail and determined to be reasonable.* (0706-2-6 [Fettus, Geoffrey])

Comment: In contrast to the above posited scenario, NRC's Draft GEIS arbitrarily and capriciously defines its "No-Action Alternative" as one in which "the NRC would take no action to *generically address the environmental impacts* of continued storage." Draft GEIS at 1-6, line 24. The agency is literally stating that it is comparing the environment impacts arising from not preparing a "generic analysis" to the impacts of preparing one! As if this were not sufficiently absurd by itself, the bogus character of this alternative is further exposed by the fact that preparation of the Draft GEIS *is obviously itself an action* that "generically address[es] the environmental impacts of continued storage." In other words, even within its cramped and noncompliant NEPA decision framework, this purported "No Action Alternative" already embodies a major component of the agency's Proposed Action, which by law and judicial precedent it is barred from doing. The Draft GEIS then compounds its NEPA noncompliance by noting that under the No Action Alternative, which by law must assume the absence of the Proposed Action, the Commission would nonetheless be "likely" to pursue the *same objective* (of making a generic environmental determination) by "first construct[ing] complete analyses of the issues previously addressed by earlier Waste Confidence proceedings resulting in the adoption and revision of 10 CFR 51.23 [i.e. the WCD/TSR] for use in site-specific NEPA reviews, and then incorporat[ing] by reference the applicable findings from the first few published environmental documents that used the analyses. This approach could ultimately lead the NRC *to consider the issue through a generic and replicable analysis.*" Draft GEIS at 1-6, line 32 (emphasis added). In short, this capricious and self-interested framing of the "No Action Alternative," which already fails for being devoid of environmental content, also turns out to be a bureaucratic ruse, and just another route to achieving a "a generic and replicable analysis" of spent fuel storage that can be invoked at will into future licensing actions. (0706-2-8 [Fettus, Geoffrey])

Comment: The Alternatives Analyzed In the Draft GEIS Are Arbitrary and Capricious. By statute, a "major federal action" warranting preparation of an EIS is one "significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(c). The minor bureaucratic act of selecting among four alternative pathways for completing NEPA documentation on continued spent fuel storage obviously does not, in and of itself, rise to the level of a "major federal action significantly affecting the quality of the human environment," and therefore it cannot legitimately serve as the appropriate decision analysis framework for this Draft GEIS. Not surprisingly, the Draft GEIS tacitly reaches the same conclusion by failing to quantify, compare, contrast, and qualitatively discuss the environmental impacts (including mitigation) of its two supposed "reasonable alternatives." Indeed, in place of the required comparative NEPA analysis of reasonable alternatives for implementing the proposed action and mitigating environmental harms, we find instead a "Cost-Benefit Analysis" (Draft GEIS Section 7.0) confined to reviewing the legal, financial, and "public perception" costs and benefits of the four agency administrative options that could in some fashion render an the required analysis of the long-term impacts of prolonged surface storage of spent fuel. However, according to the Draft GEIS, these costs and benefits *"do not include the environmental impacts of continued storage, an activity that will occur regardless of the alternative that the NRC selects to consider its impacts."* Draft GEIS at

7-1, emphasis added. But NRC's NEPA obligation cannot be nonsensically reduced to the mere selection of a paperwork alternative for *considering* environmental impacts. Rather the Draft GEIS must analyze the environmental consequences of reasonable alternatives for actually *implementing* continued storage of spent fuel the Commission may authorize in future commercial power reactor and spent fuel facility licensing actions. This analysis must embrace a range of reasonable surface storage alternatives with greater or lesser environmental impacts, over a relevant range of time periods extending from an initial 20-year license renewal to indefinite storage. For more distant time periods, the analysis must consider the consequences for the human and natural environment in the absence of institutional controls. (0706-2-9 [Fettus, Geoffrey])

Comment: The problem is that the NRC's expressed confidence that there would soon be a permanent disposal site has repeatedly been empirically disproven. In 1977, a couple years after its establishment, NRC issued a finding that it was confident that the wastes produced by reactors "can and will *in due course* be disposed of safely."¹ [footnote 1 text: 42 FR 34391, 34393; July 5, 1977, *pet. for rev. dismissed sub nom., NRDC v. NRC*, 582 F.2d 166 (2d Cir.1978)), as cited in 78 FR 56776,78, Proposed Waste Confidence Rule.] (emphasis added) With no such facility having opened or even under construction underway by 1984, NRC issued a waste confidence rule that said there would be a functioning HLW disposal facility open and operating by 2007-2009. When it was clear that wouldn't happen, it revised its confidence statement in 1990 with a new expected date of the first quarter of the 21st century. When that also turned out not to be in the cards, NRC stopped giving dates by which it was confident there would be such a site and instead found that the Commission was confident there would be a HLW geological repository open "when necessary." The Court of Appeals for the District of Columbia struck down that rule, concluding that it was not clear such a disposal site would in fact ever open, and directed NRC to prepare an Environmental Impact Statement analyzing the environmental impacts of high level radioactive waste if no geological repository became available.² [footnote 2 text: This history is summarized in the NRC notice of the Proposed Waste Confidence Rule, 78 FR 56776.] (0738-5 [Hirsch, Daniel])

Comment: Under section ES.2, page xxiv, lines 5-7, the Draft GEIS needs to include a mitigation analysis (including emergency preparedness) to meet its NEPA requirements. The failure to do so is an assumption that there will not be an incident at any storage facility, wet or dry, for which a response will be required. This assumption is not appropriate in an environmental impact statement and, fundamentally, defies common sense. There must be a mitigation analysis. (0783-1-13 [Harlan, Thomas])

Comment: Under section ES.16 .2, page lix, lines 15-35, there is no reference whatsoever to any mitigation, emergency response or emergency preparedness. All of these factors must be included within in an analysis of the spent fuel fire – or any other analysis of an incident or threatened incident. To merely rely on general statements of the robustness of the container or "mitigation measures implemented by licensees as a result of NRC orders" are insufficient. This does not analyze any impact of the proposed action because it assumes there will be no impact of the proposed action. This assumption, then, foregoes any analysis under NEPA. The Draft GEIS should set out the necessary mitigation to control or contain any incident. (0783-1-19 [Harlan, Thomas])

Comment: In order for the EIS to meet NEPA, an analysis of mitigation through emergency preparedness and/or emergency response must be included. The core concept of NEPA is to evaluate a certain activity and its potential impact on the human and natural environment. As part of that, there are a number of alternatives that are examined including how certain adverse

impacts may be avoided. The inclusion of possible mitigation measures serves one of NEPA's basic functions. See *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351-52, 109 S.Ct. 183 (1989). Mitigation is defined as measures that are intended to avoid and, minimize, rectify, reduce, or compensate for environmental impacts. See 40 CFR § 1508.20. Not only is a federal agency, or in this case, the NRC, obligated to discuss possible mitigation measures as part of the scope of its Draft GEIS but it should discuss alternatives to the proposed action and the consequences of the same and as alternatives. In other words, it needs to address how mitigation plays out in the Draft GEIS. See 40 CFR § 1505. (0783-1-7 [Harlan, Thomas])

Comment: The purpose of the Draft GEIS is to evaluate the impact of continued storage over the stated periods of time. It is also to evaluate, as it does to a great extent with spent fuel pools, the impact of potential release into the environment and the impact it would have on the human and natural environments. The general discussion of the robust nature of the storage systems is not a substitute for evaluating mitigation. Indeed, it is the systems themselves that must be evaluated for release and potential release-and then mitigation as a result of that activity. Mitigation here comes in the sense of a response and effort to contain or potentially stop any release. The emergency preparedness of any first responder is required as part of the reasonable assurance that each is required to provide annually. Accordingly, the failure to include a complete discussion and analysis of mitigation, which would include emergency preparedness and certain base levels for the same, defeats the very goal the NRC set out to accomplish: the creation of an EIS that meets NEPA qualifications.³ [footnote 3 text: It could be said regarding the new Waste Confidence Rule that is being proposed: the only true measure of confidence is to include an analysis about what will happen in the event of an incident, whether radiological or non-radiological, at a storage facility. To be confident that nothing is going to happen and no response will be needed is not confident or reassuring at all. It is naïve. The probability may be small but if there is an incident and no appropriate response, the results will be catastrophic.] Mitigation and an evaluation of emergency preparedness need to be included in the Draft GEIS. (0783-1-8 [Harlan, Thomas])

Comment: Under section 1.3, page 1-5, lines 16-21, the Draft GEIS should add that past licensing has been based, in part, on the Waste Confidence Rule. This Waste Confidence Rule was done or completed without the benefit of an EIS or any determination of long-term impact. There was simply the assumption that continued storage was safe. As it currently exists, the Draft GEIS is exactly the same. The City [Red Wing, MN] hopes its comments are appropriately weighed so that any final report avoids this flaw. (0783-2-2 [Harlan, Thomas])

Comment: The Draft GEIS, on page 3-41, should include a new section on mitigation. Mitigation is a specific and necessary requirement for an appropriate NEPA analysis. This section would include, but not be limited to, a general description of the necessary emergency preparedness steps and requirements. This can relate back to the impact of the ISFSI or storage system on the host community. The failure to include any analysis, mitigation efforts, or even to address it, is a fatal shortcoming of the Draft GEIS. (0783-2-23 [Harlan, Thomas])

Comment: Under section 6.4.16 and 6.4.17, running from pages 6-53 – 6-57, an analysis of mitigation needs to be set forth. Mitigation is a necessary NEPA component that must be addressed. A failure to do so is a flaw that may result in a challenge to the Draft GEIS or the GEIS in its final form. (0783-3-15 [Harlan, Thomas])

Comment: The summary of environmental impacts, overall, needs to be modified to include the City's [Red Wing, MN] recommended modifications to the Draft GEIS. In addition, the summary should, as a separate section under the same, include an analysis of mitigation. (0783-3-16 [Harlan, Thomas])

Comment: Under section 8.7, page 8-12, the Draft GEIS, and the NRC recommendation, is to select the proposed action. The City [Red Wing, MN] agrees with this recommendation. However, the necessary changes in the Draft and Final GEIS, as described by the City, should be included. (0783-3-19 [Harlan, Thomas])

Comment: Under section 4.17, starting on page 4-64 and carrying over to page 4-66, the Draft GEIS addresses public and occupational health. The Draft GEIS should be modified to include an analysis regarding mitigation. There is nothing to establish or support that there would be any mitigation in the event of an incident. The inclusion of this must be analyzed in order to meet NEPA requirements. (0783-3-7 [Harlan, Thomas])

Comment: The following Analytic Assumptions are asserted: Institutional controls, i.e. the continued regulation of spent nuclear fuel, will continue. • A DTS will be built (and used) at each ISFSI location • A 100 year replacement cycle for spent fuel canisters and ISFSI • Aging management and maintenance will continue • "Sufficient low-level waste disposal capacity will be made available when needed[.] Asserting these Assumptions in order to avoid -- rather than engage - mitigation strategies is wholly incompatible with both the court order and with NEPA: "The purpose of environmental Mitigation must be considered for all impacts, regardless of their significance". The failure to provide mitigation for the required analysis is in direct defiance of NEPA and the CEQ Guidance document on Mitigation adopted in January, 2011: http://energy.gov/sites/prod/files/NEPA-CEQ_Mitigation_and_Monitoring_Guidance_14Jan2011.pdf (0820-10 [Eide-Tollefson, Kristen])

Comment: Furthermore, the construction of the GEIS Assumptions, undermines the very pre-conditions that would ensure safe storage over indeterminate periods of time. This makes it impossible for states to implement planning or require utilities to fund mitigation strategies for indeterminate storage. This is stated as one of the express purposes of the GEIS, to avoid Implementing Additional Regulatory Requirements (1.6.3.2) (0820-11 [Eide-Tollefson, Kristen])

Comment: Mitigation development: The GEIS-only alternative could provide the NRC with a mechanism through which to develop a set of mitigation strategies to address the unknown, and unknowable future of nuclear waste. For this to happen, NRC would need to reformulate the "Analytic Assumptions" as a set of "Pre-Conditions" for storage which would protect the public health and safety. And proceed to review, adapt and develop tools*, frameworks and strategies, as in the recommendations following. *Hazardous Substances Pollution Contingency Plan and Community Right to Know provisions. <http://www.gpo.gov/fdsys/pkg/CFR-2001-title40-vol24/pdf/CFR-2001-title40-vol24-chap1-subchapJ.pdf> International Radiation Protection Association - recommendations for Public Stakeholder involvement in radiological education and protection. <http://www.ncbi.nlm.nih.gov/pubmed/21979548> Health Physics Society endorsement of Guiding Principles for Radiation Protection Professionals on Stakeholder Engagement developed by the IRPA - Adopted January, 2010. http://hps.org/documents/stakeholder_engagement_ps024-0.pdf (0820-14 [Eide-Tollefson, Kristen])

Comment: The NRC has defined the proposed action as a rule (a revised TSR) that codifies the agency's generic determination on the environmental impacts of continued (i.e., interim) storage of spent nuclear fuel at, or away from, reactor sites beyond a reactor's licensed life, pending disposal at a repository. This definition accurately characterizes the proposed action. The D.C. Circuit itself concluded that the "*rulemaking* at issue here constitutes a major federal action."³⁶ [footnote 36 text: "*New York v. NRC*, 681 F.3d at 473 (emphasis added).] The TSR has always been based upon the Findings of the NRC's WCD and, as discussed below, should continue to reflect the conclusions from the GEIS and supporting record. The present

amendment to the rule would incorporate the results of the NRC's GEIS, which specifically includes the issues identified by the Court of Appeals. (0827-1-8 [Ginsberg, Ellen])

Comment: Page 1-11, Line 16-17. Interesting that you are using the guidance of NUREG-1748 regarding "LICENSING ACTIONS" when you have already said this document has nothing to do with licensing. Again, this underlines our assertion that indeed you are considering a change in the license, but are doing it in such a way to avoid the scrutiny of the license amendment process. Shame on you. (0836-34 [Davis, Anonymous])

Comment: The DGEIS overlooks the central problem by using a purpose and need statement that sidesteps the analytical issues raised by the task it is obligated to undertake. (0867-3-19 [Griffin, William])

Comment: After reading through the draft EIS document, my understanding is that the document acts as a template of continuity to ensure individual licenses will be evaluated consistently. With this continuity in place, will the final draft GEIS be as soft on facts and science? (0881-1 [Szymanowski, Jennifer])

Comment: In fact, the DGEIS flouts both NEPA and the Court's application of NEPA in *New York*, 681 F.3d 481 (D.C. Cir. 2012) in multiple ways: In violation of NEPA, the DGEIS makes no attempt to show how the environmental impacts associated with the proposed rule will be quantified and incorporated into cost-benefit analyses for nuclear reactors. Although spent fuel disposal and long-term storage costs are high enough to tip the balance of a cost-benefit analysis for reactor licensing away from licensing, nowhere does the NRC explain how it will take these costs into account in reactor licensing decisions. (0897-1-12 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In fact, the DGEIS flouts both NEPA and the Court's application of NEPA in *New York*, 681 F.3d 481 (D.C. Cir. 2012) in multiple ways: The NRC has splintered the analysis of environmental impacts associated with storage and disposal of spent fuel into an array of safety findings and environmental analyses. While the issues covered by these separate findings and analyses overlap and involve cumulative impacts, the NRC refuses to integrate them. The NRC also refuses to correct inconsistencies between them. (0897-1-13 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The attached declaration of Mark Cooper shows that these costs are not only significant, but they may tip the balance of a cost-benefit analysis away from licensing or re-licensing reactors to energy efficiency and other energy alternatives. (0897-1-16 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Finally, the DGEIS must show how the significant risks and costs of siting a reactor or failing to do so, plus the risks and costs of spent fuel storage, will be integrated into the cost-benefit analyses for individual reactors. (0897-1-17 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The proposed rule and DGEIS come at a critical juncture for the U.S. energy future. The costs of clean energy alternatives such as wind and solar are declining at the same time that costs of building new reactors and maintaining aging existing reactors are going up. Spent reactor fuel inventories, along with their storage costs and environmental risks, are also mounting at every U.S. reactor site -- and the prospect of a permanent repository grows more distant and costly with each passing decade. Under the circumstances, as demonstrated in the attached declaration of Mark Cooper, the costs of spent fuel management could tip the balance away from new or re-licensed nuclear reactors toward energy efficiency or clean

alternative energy sources. Thus it is important for the NRC to ensure that these energy choices are well-informed by full consideration of environmental risks and a weighing of reasonable alternatives, as required by NEPA. But the NRC has not even acknowledged its obligation to make that analysis, let alone shown how it plans to carry it out. (0897-1-18 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The Organizations respectfully request the NRC to revise and integrate all regulations that relate to the environmental impacts of spent fuel storage and disposal. Issues related to spent fuel storage and disposal impacts are now balkanized into separate rulemakings for spent fuel disposal impacts (Table S-3), safety and impacts of spent fuel storage and disposal from fuel generated during the license renewal period (Table B-1), safety and impacts of spent fuel storage after license termination (proposed 10 C.F.R. § 51.23), and safety and feasibility of siting a spent fuel repository (proposed 10 C.F.R. § 51.23). While the NRC has divided consideration of environmental impacts into piecemeal decision-making, they are in fact related. By considering them separately, the NRC ignores the interaction of impacts, cumulative impacts, and inconsistencies in safety and environmental analyses conducted in the separate decision-making processes. In order to comply with NEPA, the NRC should conduct a comprehensive review of these regulations and environmental studies, revise them to be consistent with the current state of knowledge, and integrate them into one cohesive regulatory framework. (0897-1-20 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In fact, the DGEIS flouts both NEPA and the Court's application of NEPA in *New York*, 681 F.3d 481 (D.C. Cir. 2012) in multiple ways: The DGEIS fails to acknowledge that the proposed rule is a licensing action, and therefore it distorts the statement of purpose and need for the proposed rule as relating to administrative rather than environmental concerns. As a result, the DGEIS also mischaracterizes the alternatives that must be considered. Instead of evaluating alternatives related to storage and disposal of spent fuel, the DGEIS examines alternatives related to the administrative question of how to prepare an environmental impact statement (EIS). The result is a farcical cost-benefit analysis that utterly fails to address alternatives for avoiding or mitigating the environmental impacts of storing spent fuel or siting a repository. (0897-1-8 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In other words, the purpose and need for the proposed action, as described in the DGEIS, is to justify a generic approach to the analysis of the environmental impacts of spent fuel storage, in lieu of a reactor-specific analysis. (0897-2-2 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Instead of avoiding or diminishing physical environmental impacts of spent fuel, the alternatives considered in the DGEIS "provide different approaches that the NRC could apply to future licensing activities that can satisfy the agency's responsibility to consider the potential environmental impacts of continued storage in deciding whether to issue certain licenses." DGEIS at 7-1. (0897-2-3 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The rationale offered by the DGEIS for failing to evaluate the costs of continued spent fuel storage is that this activity "will occur regardless of the alternative that the NRC selects to consider its impacts." DGEIS at 7-1. (0897-2-4 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The DGEIS lists a set of alternatives, proposed for consideration by members of the public, that could avoid or mitigate the adverse environmental impacts of spent fuel storage, but the NRC refuses to analyze them in the DGEIS: During the scoping period for the draft GEIS,

the NRC received many suggested alternatives to the Waste Confidence rulemaking, including calls for halting NRC licensing activities and shutting down operating reactors or imposing new requirements on nuclear power plants, such as storing spent fuel in special hardened onsite storage, reducing spent fuel pool density, and accelerating the transfer of spent fuel from pools to dry casks. The NRC determined that halting NRC licensing and closing nuclear reactors would not meet the purpose and need of the proposed rulemaking action. The NRC also determined that additional requirements on spent fuel storage would not meet the purpose and need. Further, the draft GEIS is a NEPA review and not a licensing action; therefore, this draft GEIS would not be the appropriate activity in which to mandate new spent fuel storage requirements.

DGEIS at xxvi. The DGEIS provides the additional rationale that: Although cessation of nuclear power plant licensing and operations would halt the future generation of spent fuel, other environmental impacts could result from the required development of replacement power sources or demand reductions. Even then, the environmental impacts of continued storage would not cease until sufficient repository capacity becomes available. (0897-2-5 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: THE DGEIS VIOLATES NEPA BY MISSTATING THE PURPOSE AND NEED FOR THE PROPOSED RULE AND THEREBY PROVIDING A MEANINGLESS ALTERNATIVES AND COST-BENEFIT ANALYSIS (0897-3-1 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Compounding the absurdity of the DGEIS' identification of alternatives as a choice among analytical methods, the DGEIS' cost-benefit analysis consists of meticulous cost estimates and comparisons of the human hours and quantity of paper required for each method. DGEIS at 7-3, H-2. The results are absurd, giving no information whatsoever about the relative costs and benefits of measures to avoid or mitigate the environmental impacts of the spent fuel that will be generated through future licensing decisions. These impacts are potentially significant and the costs of mitigating them are potentially great, as discussed in Sections V.F, VI.E, and VII below. (0897-3-11 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The NRC should have clarified that the proposed rule would not allow the shutdown of operating reactors and therefore it is not a viable alternative for consideration under NEPA. (0897-3-13 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The NRC Must Evaluate a Reasonable Array of Alternatives for the Avoidance or Mitigation of Spent Fuel-Related Environmental Impacts, Either in the DGEIS or Reactor-Specific EISs[.] NEPA requires that the NRC must analyze a reasonable set of alternatives for the avoidance or mitigation of the significant impacts of generation of spent fuel, and integrate those considerations into individual licensing decisions. *See Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351 (1989) (explaining that the “requirement that an EIS contain a detailed discussion of possible mitigation measures flows both from the language of the Act and, more expressly, from CEQ’s implementing regulations”); *see also* 10 C.F.R. § 51.71(d) (an EIS must include an analysis of “alternatives available for reducing or avoiding adverse environmental effects”). Whether the NRC performs that analysis generically or on a reactor-specific basis is entirely up to the NRC’s discretion. *Baltimore Gas & Electric*, 462 U.S. at 96. But NEPA requires that it must be done. (0897-3-14 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: First and foremost, the NRC must consider the no-action alternative, i.e., the alternative of not permitting further generation of spent fuel through the licensing of new reactors and the re-licensing of existing reactors. *Calvert Cliffs*, 449 F.2d at 114 (the

alternatives requirement “seeks to ensure that each agency decision maker has before him and takes into proper account all possible approaches to a particular project (including total abandonment of the project) which would alter the environmental impact and the cost-benefit analysis”). As demonstrated in the attached declarations of Dr. Arjun Makhjani (Exhibit A), Dr. Gordon Thompson (Exhibit C), and David Lochbaum (Exhibit B), spent fuel storage and disposal have significant environmental impacts, and measures for mitigation of those impacts involve significant costs. As further demonstrated in the attached declaration of Mark Cooper (Exhibit D), the costs of managing spent fuel could be great enough to tip the balance against reactor licensing or re-licensing. NEPA requires a full analysis of the environmental impacts of spent fuel generation, as well as a weighing of the relative costs and benefits of alternative energy sources in relation to the significant costs associated with nuclear power generation and spent fuel management. NEPA requires such an analysis before the NRC can promulgate a final version of 10 C.F.R. § 51.23. (0897-3-15 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The NRC must also consider the relative costs and benefits of mitigation alternatives to reduce adverse environmental impacts. For instance, numerous options are available to reduce the radiological risk arising from management of spent fuel, including options for providing enhanced protection of ISFSIs from attacks. Thompson Declaration, par. XI-8. Use of such options at ISFSIs across the United States would also support a national strategy of protective deterrence. *Id.* Whether these alternatives are considered generically or in individual licensing cases, they must be carried out under NEPA. (0897-3-16 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In the DGEIS, the NRC purports to fulfill the key preliminary requirements for structuring the DGEIS and ensuring the completion of a meaningful analysis: defining the proposed action, describing the purpose and need of the proposed action, and identifying a range of alternatives to the proposed action. But the NRC taints the process by beginning it with the same legally erroneous premise rejected by the Court of Appeals in *New York v. NRC*: that proposed 10 C.F.R. § 51.23 is not a licensing action. Leading from this faulty premise, the DGEIS makes the absurdly circular assertion that the purpose and need for the DGEIS is to decide whether to address the environmental impacts of spent fuel storage generically or on a site-specific basis. The NRC then compounds its legal error to an even more absurd effect, by identifying a range of alternatives for *thinking about* the environmental impacts of spent fuel storage. The NRC conducts a comically detailed comparison of the costs and benefits of these alternative methods for analyzing environmental impacts of spent fuel storage, and finds that although none of these modes of thought have any adverse physical impacts on the environment, the generic mode of analysis is the “preferred alternative” for reasons of administrative efficiency. Thus, based on the NRC’s grossly erroneous structuring of the DGEIS, the DGEIS de-couples the environmental impacts of spent fuel from reactor licensing decisions and ensures that concerns about spent fuel storage or disposal impacts will never stop the issuance of a reactor license or result in the alteration of its terms. In short, the DGEIS is rendered meaningless. (0897-3-2 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In order to comply with NEPA, the NRC must correctly define the proposed action and its purpose and need, and must conduct a meaningful analysis of a reasonable array of alternatives. See 10 C.F.R. Part 51, App’x A (in an EIS, the NRC must “briefly describe and specify the need for the proposed action”), 10 C.F.R. § 51.71(d) (an EIS must include an analysis of “alternatives available for reducing or avoiding adverse environmental effects,” including “consideration of the economic, technical, and other benefits and costs of the proposed action and its alternatives”). See also 40 C.F.R. §§ 1502.13, 1502.14 (in an EIS, an agency must describe the “purpose and need for the proposed action” and “[r]igorously explore

and objectively evaluate all reasonable alternatives”). These alternatives must include the option of denying new reactor license applications and license renewal applications for existing reactors, as well as alternatives for mitigating the adverse environmental impacts of spent fuel storage and disposal such as prohibition of the use of high burnup fuel. Whether the NRC performs this analysis in a generic EIS or reactor-specific EISs is a matter for the NRC’s discretion, but NEPA requires that it must be done. *Baltimore Gas & Elec. Co. v. NRDC*, 462 U.S. 87, 97-101 (1983). (0897-3-3 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The DGEIS’s Description of the Proposed Action is Incomplete and Fails to Acknowledge that Proposed 10 C.F.R. § 51.23 is a Licensing Action[.] The DGEIS provides only a partial description of the proposed regulatory action in 10 C.F.R. § 51.23. The DGEIS defines the proposed action as: issu[ing] a revised Rule, 10 CFR 51.23, that generically addresses the environmental impacts of continued storage. . . . Further, the revision would state that *because the impacts of continued storage have been generically assessed in this draft GEIS and codified in a Rule, NEPA analyses for future reactor and spent fuel storage facility licensing actions would not need to separately consider the environmental impacts of continued storage*. DGEIS at 1-5 (emphasis added). In other words, proposed Section 51.23 generically resolves, for individual reactor licensing and re-licensing decisions and spent fuel storage facility licensing decisions, the question of whether storage of spent fuel would have significant impacts on the environment. While this definition of the proposed action is correct as far as it goes, it is incomplete. The DGEIS fails to acknowledge that the proposed rule makes other environmental findings generically applicable to all individual reactor licensing and re-licensing decisions and spent fuel storage facility licensing decisions. These findings are the following: • Proposed 10 C.F.R. § 51.23 makes generic safety findings with respect to the feasibility of safely storing spent fuel for an indefinite period and the feasibility of siting a repository for spent fuel disposal within 60 years. • Proposed Table B-1 makes an environmental impact finding that spent fuel disposal impacts are not large enough to require “that the option of extended operation under 10 CFR part 54 should be eliminated.” • Proposed Table B-1 makes an environmental finding that the NRC “has not assigned a single level of significance for the impacts of spent fuel and high level waste disposal.” (0897-3-4 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Equally important, the DGEIS fails to acknowledge that all of the provisions of proposed 10 C.F.R. § 51.23 and proposed Table B-1 listed above constitute licensing actions, because they enable the creation of spent fuel by resolving safety and environmental issues that are necessary to the licensing and re-licensing of reactors. As was true of the 2010 Waste Confidence Decision that was vacated by the U.S. Court of Appeals, the “action” of the 2013 proposed rule is to “allow the licensing of nuclear plants.” *New York v. NRC*, 681 F.3d 471, 478 (D.C. Cir. 2012). See also *id.* at 476 (finding that the waste confidence decision is a “pre-determined ‘stage’ of each licensing decision”). There is no doubt that if carried out, these proposed actions will result in adverse impacts to the environment through the creation of spent reactor fuel. Not only does the DGEIS fail to acknowledge the fact that the proposed regulations constitute licensing actions, it denies that fact: The Waste Confidence rulemaking is not a licensing action. It does not permit a nuclear power plant or any other facility to operate or store spent fuel. Every nuclear power plant or specifically licensed spent fuel storage facility must undergo an environmental review as part of its site-specific licensing process. DGEIS at xxvi (emphasis in original). (0897-3-5 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The DGEIS’ Statement of Purpose Violates NEPA Because it Bears No Relationship to the Environmental Harm Caused by the Proposed Action[.] Compounding the NEPA violation caused by the DGEIS’ defective description of the proposed action, the DGEIS’ description of the “purpose and need for the proposed action” strays even further off course into

the realm of the utterly fallacious. The statement of purpose and need bears no relationship to any physical effects on the environment and absurdly contemplates the relative merits of *thinking and writing about* environmental impacts in different ways. According to the DGEIS: The purpose and need for the proposed action are threefold: (1) to improve the efficiency of the NRC's licensing process by generically addressing the environmental impacts of continued storage; (2) to prepare a single document that reflects the NRC's current understanding of these environmental impacts; and (3) to respond to the issues identified in the remand by the Court in the *New York v. NRC* decision. DGEIS at 1-6. Thus, instead of addressing the purpose and need for licensing decisions that allow harm to the environment through the generation of spent fuel, the DGEIS addresses the purpose and need for making a licensing decision generically instead of on a reactor-specific basis. But the question of how to prepare an EIS has no bearing on what will be the physical environmental impacts of the NRC's decisions to allow reactors to generate spent fuel. Thus, the statement of purpose and need blatantly violates NEPA. The DGEIS' additional statement that the purpose and need for the proposed action is "to respond to the issues identified in the remand by the Court" does not bring the NRC any closer to complying with NEPA, because elsewhere the DGEIS clearly rejects the Court's decision that the safety and environmental findings in 10 C.F.R. § 51.23 constitute a licensing decision. As discussed above, the DGEIS asserts that "the Waste Confidence Rulemaking is not a licensing action." DGEIS at xxvi. Indeed, this repudiation of the Court of Appeals' decision is written in bold and placed in a text box for emphasis. Thus, the DGEIS' statement of purpose and need is impermissible under NEPA, because it fails to address the purpose or need for NRC to allow the environmental harm that would be permitted by the proposed action. See *Baltimore Gas & Elec. Co. v. NRDC*, 462 U.S. 87, 96 (1983) ("The key requirement of NEPA . . . is that the agency consider and disclose the actual environmental effects in a manner that will ensure that the overall process . . . brings those effects to bear on decisions to take particular actions that significantly affect the environment."). As a result, as further discussed below, the environmental harm caused by generation of spent fuel is "foreordained" and the DGEIS becomes a mere "formality." *Citizens Against Burlington*, 938 F.2d at 195. (0897-3-6 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The DGEIS Violates NEPA by Failing to Identify or Compare the Costs and Benefits of Reasonable Alternatives to Avoid or Mitigate the Adverse Environmental Impacts of Spent Fuel Generation[.] Not surprisingly, because the DGEIS' purpose and need statement bears no relationship to the actual physical environmental impacts of the proposed action, the range of alternatives identified in the DGEIS also bears no relationship to the physical impacts of the proposed action or their avoidance or mitigation. The NRC's failure to identify a meaningful array of alternatives violates NEPA. *Calvert Cliffs*, 449 F.2d at 1128 ("NEPA requires that an agency must -- to the fullest extent possible . . . consider alternatives to its actions which would reduce environmental damage."). (0897-3-7 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Instead of considering alternatives for avoiding or mitigating the environmental impacts of spent fuel that will be generated as a result of future licensing decisions, the NRC presumes that spent fuel production will continue and then considers alternative methods for analyzing the impacts of this spent fuel production. See DGEIS at 7-1 (each alternative "provides a means for the NRC to address, in its environmental review documents, the environmental impacts of continued spent fuel storage (continued storage) at a reactor site or at an away-from-reactor storage facility."). Thus, the two main alternatives considered in the DGEIS are whether to prepare a generic impact analysis or a set of reactor-specific impact analyses. DGEIS at 1-6. The NRC observes, without irony, that neither of these alternatives "noticeably alter the environmental impacts from continued storage." DGEIS at 7-1. In fact, the NRC's failure to identify any actual physical environmental effects from these alternatives is just

the "foregone conclusion" of the NRC's faulty analysis. *Citizens Against Burlington*, 938 F.2d at 195. (0897-3-8 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The NRC admits that commenters demanded consideration of actual alternatives to the proposed action, but the NRC refused, relying on its misplaced purpose and need statement: (0897-3-9 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In addition, the NRC fails to provide decisionmakers and the public with a reasonably comprehensive analysis of environmental impacts and how they could be avoided or mitigated through the avoidance of licensing or the imposition of reasonable alternatives. *Baltimore Gas & Elec. Co. v. NRDC*, 462 U.S. 87, 96 (1983) ("The key requirement of NEPA . . . is that the agency consider and disclose the actual environmental effects in a manner that will ensure that the overall process . . . brings those effects to bear on decisions to take particular actions that significantly affect the environment."). (0897-7-19 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Page 1-11, Line 16-17. Interesting that you are using the guidance of NUREG-1748 regarding "LICENSING ACTIONS" when you have already said this document has nothing to do with licensing. Again, this underlines our assertion that indeed you are considering a change in the license, but are doing it in such a way to avoid the scrutiny of the license amendment process. Shame on you. (0930-2-8 [Lutz, Ray])

Comment: The following are my comments on the Waste Confidence Generic Environmental Impact Statement. This is a pathetically vague document in its own bureaucratic reality. The GEIS is a document whose clear purpose are Points 1 and 2 under "Purpose and Need", basically to allow for rubber-stamping of further nuclear operation licenses while not offering a sufficient range of alternatives -- and offering no alternatives which can be useful in helping to gauge relative safety due to different methods and locations for storing radioactive waste. (0937-1 [Campbell, Bruce])

Comment: It is appalling, as indicated on page xxvi of the Generic EIS' Executive Summary, that alternatives such as "halting NRC licensing and closing nuclear reactors would not meet the purpose and need of the proposed rulemaking action." This may be the case, but only because the NRC came out with their purposes (in their points one and two under Purpose and Need) which was essentially to assist the nuclear industry in making it easier to obtain licenses. As stated before, those "purposes" have nothing to do with satisfying the remand by the D.C. Circuit Court of Appeals, but are just pandering to a sleazy disreputable industry. Halting NRC licensing and closing nuclear reactors should be offered as an alternative since it meets the "need" of the document -- which is to try to adequately address the remands from the court. Just because the desperate industry comes up with "purposes" to grease the skids for the nuclear industry does not mean that they are valid or legal purposes to pursue in the Generic EIS or otherwise. (0937-12 [Campbell, Bruce])

Comment: Once again, this document is highly inadequate, it does not meet the remand called for by the D.C. Circuit, its "purpose and need" is faulty and pandering to industry, it does not offer a reasonable range of alternatives, and it means close to nothing in the real world of radioactive waste impacting celled organisms. (0937-18 [Campbell, Bruce])

Comment: It is quite clear that the "Need" which precipitated this Generic EIS is the 3rd point under "ES.4 What is the Purpose and Need for the Proposed Action?" on page xxiv of the Executive Summary. This 3rd point reads, "3. to address the deficiencies in the 2010 Waste

Confidence rule identified by the U.S. Court of Appeals for the D.C. Circuit". Would this document have been prepared without the remand from the D.C. Circuit(?) -- of course not! Please note that the first point identified is aiming to streamline and allegedly "improve the efficiency" of the NRC's licensing process. This is the primary objective of the nuclear industry and their enabling rubber-stampers at the Nuclear Regulatory Commission. Since before the AEC became the NRC, promoting nuclear power has definitely been a larger concern for the agency than serious regulations of some impacts of this inherently dangerous energy source. So, that point 1 reads (under Purpose and Need): "to improve the efficiency of the NRC's licensing process by generically addressing the environmental impacts of continued storage". While some industry members may be pleased that the document is paving the way for many NRC rubber-stamps of nuclear proposals to come, yet there was no real assessment of environmental impacts of continued storage (and comparative risks) in the GEIS. (0937-5 [Campbell, Bruce])

Comment: Note that point 2 (under Purpose and Need) says, "to prepare a single document that reflects the NRC's current understanding of these environmental impacts". This is a sham assessment (which does not reflect the NRC's current understanding of environmental impacts of varying kinds of radwaste storage) which aims to grease the skids for approving poorly analyzed nuclear licenses in the future. (0937-6 [Campbell, Bruce])

Comment: Exelon supports the NRC's decision to continue its long-standing and Court-sanctioned practice of addressing waste confidence issues generically, rather than on a site-specific basis. This practice maximizes administrative efficiency, while ensuring that the environmental impacts of spent fuel storage are fully considered and disclosed prior to licensing or relicensing nuclear power reactors. Exelon agrees that a comprehensive general analysis is sufficient to examine onsite risks that are essentially common to all plants, particularly given the NRC's use of conservative bounding assumptions and the opportunity for concerned parties to raise site-specific differences at the time of a specific site's licensing. (0942-3 [Helker, David P.]

10. Comments Concerning Alternatives – General

Comment: In the current proceedings, inclusion of major alternatives in the environmental analysis, such as alternatives that can substantially mitigate the potential adverse environmental impacts of long-term or indefinite spent fuel storage at the sites of formerly operating nuclear reactors, will present an entirely different picture of the environmental consequences of long-term or indefinite spent fuel storage at reactor sites. In the case of license renewal proceedings, a grant of the proposed extension would often increase the amount of spent fuel stored by approximately 50%, an increase that would be avoided if the alternative of prohibiting spent fuel generation until an adequate, safe, and permanent repository was in place, and the impacts of which could be substantially mitigated if the spent fuel were stored in dry casks after 5 years. These alternatives could either eliminate any long-term or indefinite spent fuel stored at the site after plant shutdown by requiring that an available, safe, permanent, and adequate waste disposal facility be in existence before authorizing generation of new spent fuel, or substantially mitigate the environmental consequences of post operation onsite storage by requiring that all spent fuel that is more than 5 years old be placed in dry cask storage. Thus, absent immediate review of the erroneous Staff Scoping Decision, if it is ultimately determined that exclusion of these alternatives from the GEIS was an error, that error will only be correctable by the issuance of a supplemental draft GEIS. However, by promptly accepting review of the issues raised by Petitioners, the Commission can take corrective steps in a timely manner that will allow the Staff to modify its analyses and incorporate these further analyses into its draft GEIS. Since the draft

GEIS is not expected until September, there should be time for the Staff to make the necessary changes to the draft GEIS to meet that deadline. (0001-11 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: During the scoping process, Petitioners and others urged Staff to ensure that the NEPA alternatives analysis would include the alternative of requiring all spent nuclear fuel to be placed in dry cask storage rather than left in spent fuel pools and the alternative of suspending the further creation of spent fuel until such time as there is an available, safe, permanent, and adequate nuclear waste storage facility for the spent fuel to be generated. See, e.g., Comments Submitted by the Office of the Attorney General of the State of Vermont with the State of Vermont Department of Public Service, and by the Office of the Attorney General of the State of New York Concerning Scope of Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation (Jan. 2, 2013) at 15-16 & Letter from Matthew Brock to Sarah Lopas on behalf of the Commonwealth of Massachusetts joining in the Vermont and New York Comments (Jan. 3, 2013) (collectively, "States' Written Scoping Comments")². [Footnote 2 text: In this regard, Petitioners raise two concerns about the Staff Scoping Decision. First, the Staff Scoping Decision excludes recognition of even the existence of viable mitigation alternatives that the States have identified, such as the transfer of spent nuclear fuel from spent fuel pools to dry cask storage. Second, the Staff Scoping Decision does not explicitly recognize that-given the Staffs decision to exclude certain mitigation alternatives, such as the transfer of spent fuel from densely packed spent fuel pools to dry storage casks, and given the differences among plants and their siting profiles-those mitigation alternatives should be considered and evaluated as part of a site-specific environmental impact statement. During the initial public scoping meeting at NRC headquarters in Rockville, the State of New York raised this issue and requested that NRC undertake a site-specific severe accident mitigation alternatives analysis for the continued storage of spent nuclear fuel at the Indian Point nuclear site similar to the Severe Accident Mitigation Alternatives ("SAMA") analysis that NRC conducts for severe reactor accidents. See Oral Comments of State of New York Assistant Attorney General J. Sipos at Public Scoping Meeting for the Environmental Impact Statement to Support an Updated Waste Confidence Decision and Rule, November 14, 2012 1:00 P.M. EST, Transcript of Proceedings at 37-40 & State of New York November 14, 2012 Presentation Slides, ML12331A347. Such a spent nuclear fuel SAMA analysis would identify site-specific environmental impacts and site-specific mitigation alternatives to minimize or eliminate those impacts. See States' Written Scoping Comments at 16-18. (New York raised this issue again during the recent March 2013 NRC Regulatory Information Conference. See 2013 RIC Session TH30, Insights to the Future of High Level Waste Management.) Thus, in addition to identifying the alternative of requiring all spent nuclear fuel to be placed in dry cask storage rather than left in spent fuel pools and the alternative of suspending the further creation of spent fuel until such time as there is an available, safe, permanent, and adequate nuclear waste storage facility for the spent fuel, the scope of the GEIS must be expanded to identify and specifically reserve for further site-specific analysis, all reasonable alternatives to long-term or indefinite spent fuel storage at reactor sites, including alternatives that will mitigate the environmental impacts of that storage such as by placing all spent fuel in dry storage casks at particular sites. See *infra* Part II.] (0001-12 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: Proceeding with the GEIS without considering all viable alternatives to mitigate the adverse consequences of the proposed action, also violates long-standing NRC regulations. NRC requires that all reasonable alternatives be explored as part of the NEPA process: State whether the Commission has taken all practicable measures within its jurisdiction to avoid or minimize environmental harm from the alternative selected, and if not, to explain why those measures were not adopted. Summarize any license conditions and monitoring programs

adopted in connection with mitigation measures. 10 C.F.R. § 51.103(a)(4). By never addressing alternatives that could mitigate the adverse impacts of long-term or indefinite spent fuel storage at reactor sites after plant shutdown, the GEIS would not have considered, and NRC would not have taken, "all practicable measures within its jurisdiction to avoid or minimize environmental harm." The Staff's limited analysis of reasonable mitigation alternatives also violates federal case law. In *NRDC v. NRC*, 539 F.2d 824 (2d Cir. 1976), *vacated on grounds of subsequent mootness sub. nom. Allied-General Nuclear Services v. NRDC*, 434 U.S. 1030 (1978), NRC sought to rely on a draft generic impact statement on the use of mixed oxide fuels ("GESMO") to grant interim licenses even though the "draft GESMO did not fully address alternatives." 539 F. 2d at 842. NRC argued, as the Staff does here, that the rest of the analysis would be completed as part of an additional analysis at a later time. The Court rejected NRC's reliance on the draft GESMO as a basis for interim licenses, ruling that the draft GESMO was "a legally insufficient environmental impact statement" because "the consideration of alternatives and of special hazards to the public health, safety and welfare are vital to *any* impact statement." *Id.* (emphasis in original). Here, as well, the GEIS will be legally insufficient unless it fully considers all alternatives to the long-term use of spent fuel pools, rather than leaving the analysis of dry cask storage for a later date. (0001-23 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: I'm going to focus on a more narrow, but I think fundamental portion of the staff's analysis, and that's the definition of the proposed action in consideration of alternatives, particularly the staff's decision not to consider the cessation of reactor licensing or operation or the imposition of additional requirements as alternatives to the proposed action. The NEI agrees with the NRC's definition of the proposed action as promulgation of a rule that generically addresses the environmental impacts of used fuel storage making such consideration largely unnecessary in individual licensing proceedings. We also agree with the NRC's characterization of the alternatives to the proposed action which generally consists of different methods of assessing the impacts of used fuel storage during a continued storage period. (0030-16-1 [Bonanno, Jerry])

Comment: With respect to the alternatives involving imposition of new or additional regulatory requirements, NEI supports NRC's conclusion that imposition of such requirements is outside of the scope of the proposed action, which again is to explore alternatives that improve the efficiency of the licensing process through generic examination of safety and environmental implications of continued storage. (0030-16-5 [Bonanno, Jerry])

Comment: The NRC must now thoroughly review Environmental Impacts of onsite storage, and consider safer alternatives to nuclear when licensing decisions come up. (0143-2 [Arauz, Jorge])

Comment: Thirdly, I call on you to convene a gathering of experts in the fieldto include engineers, scientists, seismologists, meteorologists, non-governmental organizations, concerned citizens to study and discuss the safest methods for storing this poison for the long term ...for forever (0177-4 [Craig, Anne])

Comment: The US Court of Appeals for the District of Columbia DC ruled that the NRC's analysis was "not thorough enough" to support the waste confidence rule at 10 CFR 51.23. Yet on remand, the NRC has elected to pursue generic rule, a decision we believe is unwise. The NRC must account for the consequences of specific risks at varied sites. Therefore, all reactor sites must be included whether seaside, riverside, inland, etc. It is impractical for this to be done adequately to cover all sites and be completed within 24 months. And to artificially limit the alternatives is in contravention of the law. In order to satisfy the National Environmental Policy

Act (NEPA), the NRC must address the original agency action that caused the production of irradiated nuclear fuel and the resulting impacts: i.e., the licensing of nuclear reactors. (0222-8 [Zeller, Lou])

Comment: One good thing about the reporter in Fukushima. He has said that there is bacteria, a fungus of some kind growing on the reactor buildings that have been blown up, and that is a very hot, radioactive environment, and maybe the people that are looking at what to do with spent fuel rods can find out what kind of growth that is and use it to eat up the spent fuel rods. (0244-13-7 [Wilson, Greg])

Comment: So, I would propose, NRC, you make this a military issue. I would propose that you nationalize this issue. (0328-16-3 [Bonniwell, Colleen])

Comment: The third claim by the NRC to avoid examining this alternative is to say that the cessation of reactor licensing and operations would prevent the production of radioactive waste. Other environmental impacts could result from the required development of alternative power sources, or demand reductions. Significantly, however, the NRC does not even hint at what those other environmental impacts might be, that would still be there if nuclear plants are shut down. The NRC should still be considering how to mitigate the environmental impact of there being no solution to the storage of even more waste. (0328-4-8 [Taylor, Wallace])

Comment: And there is one reporter in Fukushima that is posting videos all the time. And Fukushima has lost three reactors three-quarters down into the ground, which is spewing out radiation. And I saw one video that has some kind of algae or mold or something growing in the area in this high-radioactive zone. And that could be possibly used to reduce the radioactivity in the spent fuel rods. I'm not real sure. You know, that is something that someone will have to investigate and see if it could be used to basically render spent fuel rods back to a safe level. (0329-24-2 [Wilson, Greg])

Comment: The second thing that is wrong with the GEIS, a second thing, is also in the alternatives. And clearly the fact that the NRC is proposing indefinite aboveground storage shows that it has essentially abandoned the fantasy of geologic storage. And engineered geologic storage has always been the preference of probably everyone who has looked at this, but, for whatever political, economic, geologic, engineering reasons, this has been abandoned, it seems to me. And the failure to treat it as an alternative to be fully and carefully analyzed really shows that we have an industry that is making a highly dangerous waste product, which cannot be managed and which there really is no way to manage. (0329-25-3 [Paddock, Brian])

Comment: In addition, NRC's draft EIS also fails to properly analyze all reasonable alternatives and all feasible mitigation measures that could reduce safety risks associated with on-site nuclear waste storage. For example, NRC has not considered, but should have, the possibility of not relicensing operating reactors so that no additional nuclear waste is produced. NRC has also improperly failed to examine how the expedited transfer of spent fuel from dangerously overcrowded pools to dry casks would substantially reduce safety and accident risks. (0465-7 [Commenters, Multiple])

Comment: Reconsider, re-scope and reformulate a technically feasible and economically, politically and ethically viable alternative that fully and genuinely complies with the official Mission of the NRC embodied by the official slogan "Protecting People and the Environment." (0603-6 [Schonberger, David])

Comment: [The NRC must] consider all feasible alternatives in order to adequately review the risks and environmental impacts of storing spent fuel centuries into the future. (0604-13 [Pisha, Gayla])

Comment: The draft GEIS is intended to provide an evaluation of the environmental impacts that may occur as a result of continued storage of spent fuel at or away from reactors, including the possibility that spent fuel may be stored for 60 years, 100 years or indefinitely. Because these time frames contemplate continued storage for generations to come, the NRC should seriously consider alternatives to the proposed Action that do not include a binding rule, which potentially serves to limit public involvement and the introduction of new information in future decisions. (0669-16 [Walter, Joan])

Comment: The draft GEIS should fully disclose mitigating actions that support conclusions about the significance of environmental effects resulting from the proposed Action, identify mitigating actions relied upon through incorporation by reference, and specify activities that will require further site-specific environmental evaluation. (0669-17 [Walter, Joan])

Comment: The purpose and need of the draft GEIS should be expanded to give equal importance to facilitation of public involvement in decisions and to provide meaningful analysis and consideration of alternatives that do not include a binding rule. (0669-6 [Walter, Joan])

Comment: In order to be an effective programmatic environmental document, the draft GEIS should be revised to: 1) fully disclose specific, tangible mitigating actions that reduce physical environmental effects to support conclusions about the significance of environmental effects resulting from the proposed Action, 2) clearly identify and summarize mitigating actions that are being relied upon through incorporation by reference from environmental documents, and, 3) specify and summarize those activities which would require further environmental evaluation in plant-specific supplemental EISs. (0669-9 [Walter, Joan])

Comment: The NRC claims that although cessation of reactor licensing and operations would prevent the production of radioactive waste, other environmental impacts could result from the required development of alternative power sources or demand reductions. Significantly, however, the NRC does not even hint at what those other environmental impacts might be. (0688-16 [Taylor, Wallace])

Comment: In this same vein, the NRC makes the snide comment that even if no more radioactive waste is produced, the environmental impact of continued storage of the existing waste would still be present. That may be true, but the NRC must still consider how to mitigate the environmental impact of there being no solution to the storage of even more waste. That is especially true when there is no foreseeable solution to the presently existing waste. (0688-17 [Taylor, Wallace])

Comment: Two weeks after the issuance of the EIS Scoping Notice, NRDC counsel and counsel for several other environmental groups wrote NRC Chairman Macfarlane requesting the withdrawal of the Waste Confidence Scoping Notice because it failed to satisfy two of the most basic requirements of NRC's regulations for notices of intent to publish an EIS: (1) the Scoping Notice failed to provide a "description of the proposed action;" and (2) the Scoping Notice failed to provide "to the extent sufficient information is available, possible alternatives." See 10 CFR § 51.27(a)(2) ("Notice of Intent") and Att. 3, November 8, 2012 letter from NRDC et al. to NRC Commissioners. As explained in our letter, NRC's Waste Confidence Scoping Notice gave no hint of the proposed agency action(s) that give rise to the risk of SNF storage environmental

impacts, and thus it required commenters to guess at the nature of the agency's proposed action and the reasonable alternatives it was contemplating to implement it. Moreover, we stated that what little factual information was presented in the Scoping Notice was likely to mislead commenters into viewing the proposed action and its alternatives as merely the generic assessment of some combination of methods for storing SNF, irrespective of the underlying agency actions authorizing creation of intrinsically hazardous SNF requiring safe storage for millennia. Such a truncated scope of alternatives is far too narrow to satisfy NEPA because it fails to address the underlying agency action—the licensing of nuclear reactors—that causes the production of spent reactor fuel and its associated environmental impacts. Therefore, as we stated in the letter, the scoping process would not lead to any analysis of some of the most obvious alternatives for the avoidance or reduction of SNF storage impacts: limitations on or cessations of reactor licensing until there is reasonable assurance of the availability of permanent disposal in a geologic repository. Nor did the scoping notice describe any proposed alternative configurations for prolonged surface storage of the reasonably foreseeable amounts of SNF that the NRC may authorize production of in the future. (0706-1-3 [Fettus, Geoffrey])

Comment: NRDC's Description of a Representative Range of Reasonable Alternatives. *Figure 1* presents an illustrative matrix of reasonable alternatives and the various factors for considering the impacts of each alternative. This matrix is intended to be neither definitive nor exhaustive, but rather indicative of the range of reasonable alternatives NRC must by law consider pursuant to its proposal to determine in advance the environmental impacts of future licensing actions that would authorize continued production and surface storage of SNF for extended periods, including indefinitely. It can hardly be stressed enough that under NEPA, *it is the agency's most important task to formulate a set of reasonable alternatives with greater and lesser environmental impacts that fairly represent the domain of plausible agency actions that could achieve its purpose and need for action while furthering the aims of NEPA*. Despite being made aware, during and immediately after the public scoping process, of its failure to define a representative range or indeed any reasonable alternatives for detailed environmental analysis, the agency rejected or ignored all these comments and in this Draft GEIS persists in its failure to subject a range of reasonable alternatives for agency action to detailed environmental analysis. In order to ensure NRC cannot claim commenters did not sufficiently describe the nature of the reasonable alternatives they believe must be considered and subjected to detailed analysis under NEPA, NRDC offers the following narrative descriptions of the alternatives outlined in *Figure 1*, beginning with the appropriate definition for the statutorily mandated evaluation of the consequences of taking "No Action." Each potential reasonable action alternative, whether these or others the agency may belatedly define after considering public comments on this Draft GEIS, must consider all the major factors that could cumulatively or collectively have a bearing on that alternative's environmental impacts. The range of such factors is indicated in *Figure 1* at page 32, and includes at a minimum consideration of the following: *Relevant timescales*, which are the "Licensed Lifetime of Facilities," "Short-Term Storage" for up to 60 years after license expiration; "Long-term Storage" for up to 160 years after License Expiration; and "Indefinite Storage." Detailed analysis may reveal technical limitations in surface storage technology and fuels that make other specific timescales relevant - for example, some fuels types may not maintain their cladding integrity for the full term of so-called "Short-Term Storage," which already implies a maximum irradiated fuel age of 140 years, and lesser terms will thus need to be considered, or specific mitigation actions proposed. (0706-2-10 [Fettus, Geoffrey])

Comment: *Reasonable Alternative One ("RA" #1)* is a "License Extension Only" alternative, based on current-licensed Spent Fuel Pool (SFP) and independent at-reactor dry cask storage installation capacities. It assumes the availability of a government-provided geologic repository

whenever the maximum license extension for each at-reactor surface storage facility, safely supportable within current NRC regulations, runs out. This time period can be expected to vary across facilities, and thus in analyzing this alternative, the NRC must construct a time vs tonnage profile of how much SNF would need to be transferred and when. Transfer to a Regional Consolidated Dry Storage (RCDS) or National Consolidated Dry Storage (NCDS) facility would not be possible under this alternative, as these would be new facilities requiring new licensing actions. Cask storage and transport options for each of the relevant fuel classes must be discussed with this timeframe in mind. Detailed analysis of this option could serve to identify future critical decision points and vulnerabilities built into the current spent fuel management structure that need to be addressed if extended surface storage is going to be implemented safely with minimal environmental impacts. If analysis of this option reveals a disconnect between the earliest plausible date for repository availability and expiring surface storage capacity, it could serve to guide NRC, DOE, other decision-makers, and the public to an understanding of how much RCDS or NCDS will be needed, and when. The agency could reasonably explore variants of this alternative, such as new licensing actions for at-reactor dry storage facilities only, to facilitate transfer of spent fuel to safer storage configurations than current SFP's. (0706-2-12 [Fettus, Geoffrey])

Comment: *Reasonable Alternative Two (RA #2)* is a "Near-Term Nuclear Growth" that extends and builds upon the analysis in RA #1 by considering the environmental impacts of SNF storage proceeding from new reactor and storage facility licensing actions based on the proposed revised WCD/TSR, with defined by the universe of COL application requests received by the NRC as of 12/31/2012 and assumed, for the purpose of NEPA analysis, to be granted before the end of 2030. This alternative requires analysis of the extended safe storage requirements and storage technology/facility options for the amount and types of SNF produced under a scenario that assumes a 60-year licensed lifetime for each newly licensed reactor and the same short-, long-, and indefinite storage terms already adopted for the DGEIS truncated analysis of environmental consequences, although in the course of detailed analysis the NRC staff may well uncover the technical and environmental significance of additional relevant timeframes, intermediate between those pre-selected for analysis. For example, certain types of fuel and cask combinations may have limited sharply lifetimes when it comes to preserving the "defense-in-depth" barrier against radionuclide leakage provided by preserving both continued fuel cladding integrity and the structural integrity of cask containment barrier. This option would also go beyond RA #1 in considering the safety and environmental requirements for, and impacts of new licensing actions authorizing the creation of one or more RCDS facilities, or a single NCDS site, and additional at-reactor storage sites. The analysis should seek to identify the environmentally superior configurations or combination of these options for extended surface storage. It would also generically describe the necessary, functions, capacities and technical features that would likely be common to all such facilities of a given type, discuss plausible alternative definitions of the geographic regions that might be served by each such facility (e.g. a single national RCDS site, two RCDS sites covering the Eastern and Western halves of the country, multiple RCDS sites geared to the different specific geotechnical, climate, and weather environments that prevail in different parts of the country, e.g. "Northeast/Mid-Atlantic," "Southeast" "Midwest" and "Western U.S." This analysis would identify those aspects of continued surface storage that are most sensitive to particular regional or site-specific conditions, such as seismicity, humidity, salinity, peak, low and average temperature ranges, flood-risk, tornado risk, hurricane risk, etc., and thus define the limits of environmental issues subject to resolution in a "Generic EIS," versus those that would need to be further considered in a tiered "regional" and/or site-specific EIS. (0706-2-13 [Fettus, Geoffrey])

Comment: Because the time frames and options for agency action are broader than the previous two alternatives, it will need to consider a wider range of cask/fuel combinations, SNF transport options, and alternative consolidated storage configurations, to identify the environmentally preferred sequence and combination(s) of extended pool storage, on-site drycask storage, and offsite consolidated interim storage that appropriately balance the prospective cost, complexity and technical risk of various continued surface storage options with their prospective benefits for public health and the environment. *Reasonable Alternative Three (RA #3)*: This alternative is based on the "Constant Nuclear Market Share Scenario," a widely perceived minimum nuclear growth scenario among proponents of nuclear energy and de-carbonization that posits nuclear power generation will grow at least enough to maintain its longstanding share of total U.S. grid-connected power generation at 20%. It assumes the RA #1 baseline inventory of SNF plus an added SNF inventory corresponding to a 20 % nuclear share of US power generation for the next 60 years. In connection with all modest-to-major nuclear growth scenarios occurring within the constraint of no geologic repository availability (this option and RA#4 below), it may prove both cost-effective and environmentally beneficial to consider a "Direct to RCDS" option that promptly transfers SNF five years after irradiation from Spent Fuel Pools directly to an RCDS or NCDS, skipping the intermediate step of on-site dry cask storage, which today is focused on freeing-up space in densely-packed SFP's to accept scheduled discharges of irradiated fuel from the reactor. It should also examine an "at-reactor storage only variant" that could prove cost-effective if a geologic repository is developed on a timeframe that makes interim consolidated storage unnecessary or uneconomic. Analysis of this alternative must also consider the potential impacts of new fuels and fuel cycles (examples are listed in the Table) on SFP, transport cask and long-term storage cask performance, in both normal storage conditions and accidents. (0706-2-14 [Fettus, Geoffrey])

Comment: *Reasonable Alternative Four (RA#4)*: This alternative, an aggressive "Major Nuclear Growth" scenario, represents a reasonably foreseeable upper bound on the amount of SNF that might be generated by a doubling of present annual nuclear output (measured in terawatt-hours of electricity produced) achieved by 2040, with 60 years of SNF discharges assumed for each new licensed reactor. Thus this scenario envisions sharply increasing nuclear fuel discharges in need of continued surface storage until the year 2100, followed by extended surface storage for periods of 60 and 160 years after this date. As shown in the Figure, analysis requirements are similar to RA#3, and this alternative, and indeed all extended storage alternatives beyond 30 years, must be subjected to the plausible constraint that institutional controls may begin to fail relatively soon after termination of an operating license for a variety of historically plausible reasons – financial incapacity, corporate dissolution or managerial malfeasance, institutional neglect, political gridlock, war, civil strife, etc. We suggest the historical record suggest 20 years following reactor license termination is an appropriately conservative figure - as noted, some stored fuel will be 80 years old at this point and in need of special measures that may not be forthcoming. But given that the minimum period for continued storage post-licensing considered in the current DGEIS is 60 years, the choice whether to set the dividing line for requiring consideration of partial-to-total "loss of institutional controls" at 30, 40, or 50 years is not crucial to the overall analysis, as long as this remains a significant component of the analysis for each extended storage option. (0706-2-15 [Fettus, Geoffrey])

Comment: Once NRC recognizes the potential significant environmental impacts that spent fuel storage will have at Indian Point, there are a wide array of mitigation measures and alternatives that it is obligated to consider as part of the NEPA review. First, NRC is obligated to assure that: ["the Commission has taken all practicable measures within its jurisdiction to avoid or minimize environmental harm from the alternative selected, and if not, to explain why those measures were not adopted."] 10 C.F.R. § 51.103(a)(4). Second, where, as here no legally

sufficient prior analysis of spent fuel pool severe accident mitigation alternatives has been completed, NRC is obligated to assure that such an analysis has occurred and that all reasonable severe accident scenarios and mitigation measures have been evaluated. On occasion NRC and its consultants have publicly recognized the much greater potential risk from events occurring in a spent fuel pool including criticality accidents and fire hazards. By way of example, the Sandia National Laboratories have recently acknowledged that reducing the volume of spent fuel in spent fuel pools would mitigate the risks posed by dense storage. See, e.g., *Investigations of Zirconium Fires During Spent Fuel Pool LOCAs* (Slideshow) (Feb. 7, 2012); see also *Responding to Fukushima-Daiichi* (Speech) (Jan. 31, 2012); *Responding to Fukushima-Daiichi* (Slideshow) (Jan. 31, 2012); *On Site Spent Fuel Criticality Analyses*, NRR Action Plan (September 19, 2011) ML11251A210; Sandia National Laboratories, *Mitigation of Spent Fuel Pool Loss-of-Coolant Inventory Accidents and Extension of Reference Plant Analyses to Other Spent Fuel Pools* (Redacted) (November 2006); NUREG-1738, *Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants* (Feb. 2001); NRC Reactor Safety Team (RST), *Assessment of Fukushima Daiichi Units*, ML11216A018 (Mar. 26, 2011, 2100h) (discussing ejection of fuel and damage to Daiichi facilities). There are a wide-range of alternatives and mitigation alternatives that should be considered to the current plan to continue to crowd more spent fuel into the spent fuel pools and to maintain their current configuration including suggestions from the National Academy of Sciences, *Safety and Security of Commercial Spent Nuclear Fuel Storage: Public Report*, The National Academies Press (2006), and by well-respected experts in nuclear power plant safety such as Robert Alvarez, et. al., *Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States*, Science and Global Security, Vol. 11:1-51. Among the many feasible and easily implemented measures that could significantly mitigate the environmental impacts of routine operation of spent fuel pools at Indian Point as well as significantly reduce the consequences of severe accidents are the immediate off-loading of all spent fuel that is at least 5 years old to dry cask storage, installation of safety grade spray systems in the spent fuel enclosures to ensure replacement water in the event of loss of coolant accident, re-arrangement of the spent fuel in the pools to allow for better circulation in the event of loss of coolant, to mention only a few of the recommendations contained in the reports identified in the Attachments to this letter. (0718-1-9 [Sipos, John])

Comment: NEPA requires a federal agency to prepare "to the fullest extent possible" an environmental impact statement ("EIS") regarding proposed "major Federal actions significantly affecting the quality of the human environment."¹³³ [footnote 133 text: 42 U.S.C. § 4332(2)(C).] An EIS must discuss, among other things, the adverse environmental impacts of the action and alternatives to the action.¹³⁴ [footnote 134 text: *Id.*; 40 C.F.R. §§ 1502.2, 1502.14, 1507.2, 1508.9.] "[O]ne important ingredient of an EIS is the discussion of steps that can be taken to mitigate adverse environmental consequences."¹³⁵ [footnote 135 text: *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351 (1989).] This directive that federal agencies meaningfully consider alternatives and mitigation measures to the proposed action is one of NEPA's hallmarks.¹³⁶ [footnote 136 text: 42 U.S.C. § 4332(2)(C),(E).] The requirement that alternatives be studied, developed, and described both guides the substance of agency environmental decision making and provides evidence that the mandated decision making process has actually taken place.¹³⁷ [footnote 137 text: *Calvert Cliffs' Coordinating Committee, Inc. v. United States Atomic Energy Comm'n*, 449 F.2d 1109, 1114 (D.C. Cir. 1971).] NEPA is not intended to simply confirm or insulate previous agency decisions or assumptions. Rather, NEPA forces federal agencies with discretionary regulatory authority to confront and publicly evaluate the environmental impacts of proposed action, the alternatives to that action, and the means to mitigate or minimize the adverse impacts of the final agency action.¹³⁸ [footnote 138 text: *Dep't of Transportation v. Public Citizen*, 541 U.S. 752, 768-69 (2004).] As discussed above

(p.15), if the water in a spent fuel pool boils or drains away, the zirconium cladding that forms the spent fuel rods may melt or catch on fire, potentially causing a major release of radiation. NRC does not dispute that a spent fuel pool fire could have catastrophic environmental impacts. Indeed, it has acknowledged that "a zirconium fire event can have public health and safety consequences similar to a severe core damage accident with a large off-site release."¹³⁹

[footnote 139 text: Nuclear Regulatory Commission, Policy Issues Related to Safeguards, Insurance, and Emergency Preparedness Regulations at Decommissioning Nuclear Power Plants Storing Fuel in Spent Fuel Pools (WITS 200000126), NRC SECY-01-0100, at 5 (June 4, 2001).] Therefore, NRC must consider alternatives to the current storage scheme that reduce the risk of a zirconium fire. Moreover, these issues must be considered on a site-specific Category 2 basis, since plant-specific factors may make facilities more or less vulnerable to such fires, may require different mitigative measures, and may lead to different environmental impacts.¹⁴⁰

[footnote 140 text: This fact was recognized by Congress when it directed NRC to implement the recommendations of the 2006 NAS Report on spent nuclear fuel storage. In particular, Congress asked NRC to prepare site-specific models to mitigate the risks associated with spent fuel storage. U.S. Congress, Conference Report 108-792, *Making Appropriations for Foreign Operations, Export Financing, and Related Programs for the Fiscal Year Ending September 30, 2005, and For Other Purposes*, at 982 (Nov. 20, 2004). Former NRC Commissioner Victor Gilinsky also recommended that spent fuel storage be examined on a site-specific basis in his *Separate Views Regarding Proposed Amendments to 10 CFR Parts 50 and 51, Waste Confidence Proceeding*, 48 Fed. Reg. 22730 (May 20, 1983) ("While I agree that there is no obstacle in principle to extended on-site storage, I think it is clear that each power reactor site will have to be examined in detail.")]. The State recommends that the following alternatives be considered in a site-specific review of a facility's spent fuel pool. (0718-2-16 [Sipos, John])

Comment: NEPA requires that NRC consider safer storage alternatives such as the thinning of spent fuel pools and the use of dry cask storage. These alternatives must be considered in a site-specific analysis that evaluates the unique features of each fuel pool and its surrounding environment. The State further urges NRC to ensure that the severe accident mitigation alternatives analyses rely on site-specific cost estimates and are reanalyzed at each operating licensing milestone. Moreover, given the importance of these issues, the NRC should revise the GEIS and implementing regulations as requested by these comments and apply the GEIS, as revised, to all license renewal applications that are currently pending. (0718-3-7 [Sipos, John])

Comment: Likewise, although an "informed and meaningful consideration of alternatives" is an "integral part" of the NEPA statutory scheme,²⁵ [footnote 25 text: *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1228 (9th Cir. 1988).] EISs need not discuss the environmental effects of alternatives that are "deemed only remote and speculative possibilities."^y [footnote 26 text: *Vermont Yankee Nuclear Power Corp. v. Natural Res. Def. Council*, 435 U.S. 519, 551 (1978).] Viable alternatives must be examined,^y [footnote 27 text: *Citizens for a Better Henderson v. Hodel*, 768 F.2d 1051, 1057 (9th Cir. 1985).] but to be considered viable alternatives must meet the purpose and need of the proposed action. (0827-1-5 [Ginsberg, Ellen])

Comment: Under NEPA, the definition of the proposed action dictates the alternatives that the NRC must consider. NEI concurs with the three alternatives to the proposed rulemaking evaluated by the NRC: (1) no-action, (2) GEIS-only (no TSR), and (3) policy statement. (0827-1-9 [Ginsberg, Ellen])

Comment: NEI agrees with NRC's determination that the rule would not impose any requirements on industry or have any "cumulative effect." NRC correctly states, "Adoption of a revised 10 CFR 51.23, supported by this draft GEIS, is not a licensing action, and does not

impose new requirements on licensees or applicants."¹⁰⁷ [Footnote 107 text: Draft GEIS, Section 1.6.3.2, Implementing Additional Regulatory Requirements, pp. 1-9, lines 29-31.] NRC's proposed action is to issue a revised rule, 10 CFR 51.23, that generically addresses the environmental impacts of continued storage. Whether or not the impacts are evaluated generically, in connection with a specific licensing action, or through some other alternative, the environmental effects remain the same. Because the proposed action is to make an administrative decision regarding how to evaluate environmental effects (i.e., generic evaluation), there are no cumulative environmental effects of implementing the proposed action or any alternative. As stated in Section 1.6.4, Comparison of Reasonable Alternatives, p. 1-10, lines 10 and 11, "The alternatives merely propose alternative means of analyzing the environmental impacts of continued storage." NRC's efforts simply improve efficiency of the licensing process without instituting any new requirements on licensees. (0827-5-7 [Ginsberg, Ellen])

Comment: A third option, use of the pre-existing WIPP facility, has not been addressed by the NRC. That facility is included in the discussion below to show how, if motivated, the NRC could have addressed the purpose and need by analyzing viable alternatives. (0867-1-15 [Griffin, William])

Comment: NPP were not designed to host and accommodate unlimited amounts of SNF inventory. They were not designed in this way because the original assumption was that the SNF would be removed from the power plant and reprocessed (EPRI p. 1-1). Since the United States has chosen to abandon reprocessing as an option, the only viable alternatives are to stop production of nuclear power or for storage of the by-products like SNF, first at the production site in wet storage and thereafter at a geological or dry storage facility. The problem then becomes the increasing inventories of SNF at the reactor sites. (0867-1-17 [Griffin, William])

Comment: The Waste Isolation Pilot Plant (WIPP) east of Carlsbad, New Mexico is currently accepting transuranic wastes, a by-product of the weapons production cycle. This salt basin based geological repository does not accept SNF but it may be an alternative to the failed Yucca Mountain project or PFS facility. Consideration of such an alternative was not part of the DGEIS and would require analysis of site specific characteristics if such an alternative was to be analyzed by the NRC. The use of such a pre-existing geologic repository site would overcome some of the objections to siting that would arise - it already exists, its environmental impacts are fairly well known and the political/social opposition to its existence has been addressed to date. Methodologically the technical issues of long term storage of the SNF would be easier to analyze since analogous wastes are currently stored at the facility, it is licensed to accept similar wastes and its operational characteristics are known. WIPP would be an interesting case study for the NRC to analyze since it has many of the characteristics needed for long term geological storage. The assumptions used by the DGEIS precluded analysis of such an alternative and thus that choice limited the viability of alternatives analyzed by the NRC. Those assumption choices likewise limit the DGEIS ability to address the courts desire for a purpose and need study. Ultimately, the ongoing failure of these various efforts to construct a permanent SNF site repository has led to the issues that should be addressed in the DGEIS. The study of an alternative like WIPP has not been done and thus another opportunity for alternatives was not explored. (0867-1-21 [Griffin, William])

Comment: The NRC fails in their choice of alternatives in the DGEIS and as discussed further on, the NRC fails to consider an appropriate range of conditions for those alternatives. This failure to take a hard look at the issues is evidenced by several examples that will act as a running commentary in this review of the DGEIS. (0867-1-4 [Griffin, William])

Comment: Because of these assumptions, the NRC did not examine a realistic set of alternatives or a realistic set of potential future conditions and the environmental consequences they would produce. (0867-3-23 [Griffin, William])

Comment: In addition the NRC fails to consider viable alternatives to on-site storage - for example, the WIPP geologic repository in New Mexico. Inclusion of such an alternative would have been reasonable. In other words, the assumptive choices made by the Commission and agency staff do not represent a hard look at the issues and thus NRC fails to meet its obligation under NEPA. (0867-3-28 [Griffin, William])

Comment: If there was a serious evaluation of a reasonable range of alternatives and actual proposals where one could evaluate relative risk from various methods of storage, it could be helpful material. There should be extensive discussion on how waste from "high burn-up fuel" complicates matters while a commercial nuclear reactor is operating, while the facility has an operating license and is storing radwaste, while a reactor is going through decommissioning phases, and when it is decommissioned. Yet, there is no serious addressing of alternatives nor of how radioactive waste can impact many aspects of real life for celled organisms such as human beings. (0937-16 [Campbell, Bruce])

Comment: we certainly need a thorough EIS with a reasonable range of alternatives -- rather than a skimpy Environmental Assessment. This current draft generic document shows that one can churn out a reasonable number of pages while purposefully saying very little about comparative risks of various modes of storage or otherwise. (0937-20 [Campbell, Bruce])

Comment: There needs to be a Full EIS of any waste storage alternative, particularly Transport and CIS Sites before Waste Confidence can be assured. (0938-15 [Sondheim, Steven])

11. Comments Concerning Alternatives – No Action/Site-Specific

Comment: Numerous participants in the GEIS and rulemaking proceedings publicly expressed their concern about the need for site-specific treatment of certain issues. *See, e.g.,* Staff Scoping Decision at 8-9, 14; States' Written Scoping Comments at 4-5, 16-18; *see also* discussion of New York's comments cited in footnote 2 *supra*. The Staff Scoping Decision recognizes that such issues may exist and states that "[t]he GEIS and Waste Confidence rule will identify those impacts that cannot be analyzed generically and therefore must be analyzed on a site-specific basis." Staff Scoping Decision at 50. But the Staff Scoping Decision says nothing about the need to amend §§ 51.23(b), 51.53(c)(2), and 51.95(c)(2). As noted, without amendments to those provisions, the opportunity to raise site-specific issues will be meaningless and will compel a party to go through the laborious and uncertain process of seeking a waiver of §§ 51.23(b), 51.53(c)(2), and 51.95(c)(2). Further, the Staff Scoping Decision offers no guidance on what criteria will be used to determine which issues are for site-specific consideration. Rather it merely states: The NRC received a comment requesting that the Commission establish a new procedure by which the public would have an opportunity to raise site-specific impacts of continued storage before the ASLB. The GEIS will generically analyze the environmental impacts of continued storage. The GEIS and Waste Confidence rule will identify those impacts that cannot be analyzed generically and therefore must be analyzed on a site-specific basis. Staff Scoping Decision at 50. Because the Staff Scoping Decision does not include any criteria that are to be applied in determining which issues will receive site-specific consideration, public participation is severely limited by the lack of an opportunity to develop evidence and arguments on issues that should be considered site-specific or should be

considered generic. The Staff Scoping Decision should have disclosed NRC's intentions regarding the criteria to be used for deciding whether an issue will be considered site-specific or generic. (0001-28 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: In my case I am particularly concerned about the generic aspects that the NRC wants to bring to this process. Each reactor site has its own unique signature and needs to be treated individually. In my case the Columbia Generating Station is in the agricultural center of Washington State. An accident threatens \$9.5 billion worth of products in Washington, and another \$6 billion in Oregon. This is besides having the populations of Seattle, Spokane, and Portland downwind based on what direction the wind blows. We also have the risk of contaminating the Columbia River, a national treasure, and we have the double jeopardy of having the Hanford Reservation next door where we have confidence in particular storage tanks that are now leaking. Safe storage of spent fuel needs to consider all of these risks for each one of the individual sites. There are also seismic and flood issues that need to be considered. (0030-12-4 [March, Leslie])

Comment: So when it comes to waste confidence, one of the gentlemen here mentioned it's a clear path to generic waste confidence. I don't understand. It's not very clear at all actually. And dealing with North Anna is very not site-specific. So I have problems with this. (0030-15-5 [Gray, Erica])

Comment: Cost and benefits and alternatives to nuclear plant licensing, including not issuing licenses or license renewals, is fully considered in the environmental reviews for individual plants; that is, consideration of not licensing a plant or allowing continued operation under a renewed license is appropriately addressed in the NEPA reviews conducted when licensing those specific facilities. As clarified in the Statement of Consideration published with the proposed rule, although the Waste Confidence EIS may inform these analyses, it's not the appropriate context to consider these types of no-action alternatives. (0030-16-3 [Bonanno, Jerry])

Comment: So, but the basis on which the NRC would reaffirm a Waste Confidence rule for issuing new licenses going forward is completely unrealistic and doesn't speak to the reality. And in fact, you know, in the proposed or the considered alternatives to the proposed action the first one is taking no action, not re-instituting a Waste Confidence rule. And what's the consequence of that? Not that the NRC couldn't license reactors anymore, as is its mandate under the Atomic Energy Act, but just that it would have to evaluate the impact of generating nuclear waste at each and every one of those proceedings. And NIRS feels that that is the appropriate course of action to be taken. We don't know what to do with this waste. There's no guarantee that there's any way to dispose of it and the risks that have been identified are so great that that would be the best course of action. (0030-17-7 [Judson, Tim])

Comment: All nuclear reactors and reactor sites are not created equal. A generic environmental impact statement for evaluating waste and waste storage at all reactors is an irresponsible and unscientific response to the challenges posed by long-term irradiated waste storage. Each reactor site has its own unique environment. Stated issues can range from those from being close to large population centers, being in a floodplain, and having seismic issues. A Generic EIS cannot paint a true picture of the impacts of waste generation and storage on a highly-radioactive spent fuel. Because the NRC generically rules it has confidence that there would be a solution for high-level nuclear waste, the dangers were never allowed to be considered at each site. (0030-21-9 [Carberry, Mike])

Comment: In my case, I am concerned about the generic aspects that the NRC wants to bring to this process. Each reactor site has its own unique signature and needs to be treated individually. (0045-11-6 [March, Leslie])

Comment: As a Generic EIS, NRC's current draft largely ignores site-specific risks. This must be fixed to ensure safety for each specific site. (0054-2 [Kurland, Miriam])

Comment: How can the NRC expect a generic environmental Impact Statement and Proposed Rule to apply to all of the 104 reactors in the United States? You are wasting the taxpayers' money with such an approach. The nuclear reactor sites all have different concerns and must be dealt with as a unique impact with rules that fit each site. (0063-1 [Magda, Marni])

Comment: SONGS would never have been approved for construction by the NRC with today's understanding of the dangers and the realization that the Federal Government has failed to remove the nuclear spent fuel to a safe location. In the 1960's we believed a way to use the spent fuel would be invented. It hasn't. MOX is unstable and not accepted for commercial use. California is an earthquake zone, with SONGS on a new fault, and we have yearly danger of out of control wild fires and global warming predicting rising ocean levels. Maps have been made. How far is the ocean at SONGS predicted to rise in the next 30 years? A new study has shown an Alaska tsunami could destroy the ocean areas of Newport Beach, Laguna Beach and San Clemente. We cannot afford to let the spent fuel stay at Songs for 30 years until the Cesium 137 has lost it power. That is only 45% of the spent fuel. What about the other 55%? Plutonium has a 24,000 year half-life. What is being done to protect 8.4 million people from a cooling pool accident? (0063-12 [Magda, Marni])

Comment: NRC needs a paradigm shift. Instead of wasting our tax dollars trying to convince us that a small risk outweighs an unacceptable consequence, maybe they should begin to regulate with the understanding that sometimes consequences are so unacceptable to the people and the environment that they outweigh even the smallest theoretical risk. That said, of the three alternatives presented, the No Action Alternative is the one I support. Decisions regarding highly irradiated fuel assemblies should be made on a site-by-site basis, with full transparency and maximum input from the public and the affected community. (0089-19 [Shaw, Sally])

Comment: The NRC must protect our communities and environment from radioactive waste. The NRC must adopt rules that will look at each nuclear plant closely. No nuclear plant should get an easy rubber stamp. (0091-1 [Capozzelli, J.])

Comment: I'd like to comment on the generic nature of this Environmental Impact Statement and urge the NRC to undertake a site-specific review of reactors seeking to continue to store spent fuel onsite. There are reactors like Pilgrim that should not be included in a Generic EIS because site-specific conditions make long-term fuel storage an incredible risky undertaking. (0112-13-1 [Byrne, Genevieve])

Comment: In the United States we have reactors located on major freshwater rivers, the Great Lakes, the Atlantic and Pacific Oceans, and in the Gulf of Mexico in 31 different states. The environmental impacts of long-term dry cask storage, or any fuel storage for that matter, are not essentially the same in each of those locations. (0112-13-3 [Byrne, Genevieve])

Comment: I support the no-action alternative decisions regarding highly irradiated fuel assemblies should be made on a site-by-site basis with maximum public input. (0112-18-8 [Shaw, Sally])

Comment: Although much has been made tonight and previously of the need for individualized determinations, the Supreme Court and the Court of Appeals have already said that the feasibility of interim or ultimate nuclear waste disposal solutions is one that is essentially common to all nuclear facilities. In our [Nuclear Energy Institute] view, it is most sensibly treated as such. (0112-19-6 [Ginsberg, Ellen])

Comment: I'm a little disappointed in this particular rule in a number of aspects. First, let's start off with the idea that it's generic. Having spent a little time in a dictionary today, generic, to most people, means that something applies equally to all members of the class. I would strongly doubt that anybody in this room in their heart of hearts believes that everything that's said in this draft GEIS or in the NUREG applies equally across the board to every nuclear power plant. Can you say it applies equally to every PWR and every BWR? Can you say it applies equally to a plant that is operating perhaps efficiently and certainly making money? And, also, to a plant like Pilgrim that is losing approximately \$30 million every year? That has had ten times as many shutdowns this year as the national average? That has had close to 20 unusual, quote, "events," closed quote? I doubt that every plant generically in this country is having this type of trouble. (0112-2-1 [Lampert, Jim])

Comment: Pilgrim Watch supports the no-action alternative obviously and for two principal reasons. First, as my husband talked about, it should be site-specific, not generic. The other reason is the foundation of the GEIS of the final document rests on the draft GEIS and the -- what I call the earthquake study that looks into pool fires [NRC-2013-0136]. (0112-3-3 [Lampert, Mary])

Comment: So it's impossible to ignore site-specific criteria and move them over to rulemaking and still protect public safety. (0112-31-5 [Johanson, Birgit])

Comment: I'm here to suggest that we need site-specific solutions. Nothing generic. (0112-34-5 [Chichester, Ben])

Comment: You know, at Seabrook we have about 600 tons of this high-level radioactive waste stored in a spent fuel pool and some in waste casks. We do not feel that it is secure in either of those locations. This waste cask storage site is a former parking lot. It's surrounded by a chain-link fence. It's across from the visitor's center so I guess you can all see it on your way into the place. But we don't think that's a secure location. It's a few feet higher than the plant, itself. We are on the coast, of course, in Seabrook. But it's still too close to the ocean. With the seas rising, storm surges are increasing, we really question whether that site would be good for another 100 years or even more. So, it's highly doubtful. (0112-5-2 [Bogen, Doug])

Comment: In the Indian Point community, the result of a spent fuel fire would put at risk the NYC water supply at the Kensico and Croton reservoirs. And if the financial capital of the world suffers a partial evacuation from which there is no return, what happens to the US economy? So let's just roll the dice and say the Waste Confidence approach is "probably good enough." (0136-13 [Shaw, Gary])

Comment: In terms of your one size fits all GEIS approach, how can you rationalize that the magnitude of risk is equal and that policy standards and protocols should be the same at all nuclear plants regardless of size, age and physical environment across the US nuclear fleet,

stretching from the Pacific Coast to the flooded Midwest to the East Coast stretching from Florida to New England. In terms of Indian Point, we have an intersection of two seismic faults, two large high pressure natural gas pipes between the faults and the plant, and during Superstorm Sandy, the plant came close to flood level from the Hudson River surge. It would seem to me that these characteristics might not be universal, so why should there not be site specific EIS perspectives rather than one universal policy paper? (0136-8 [Shaw, Gary])

Comment: Another element that makes Indian Point unique is that Indian Point has been ordered to install closed cycle cooling. If that order is affirmed by the courts and a large structure must be built, what impact does that have on the ability to expand cask storage space for what would be a 60 year accumulation of fuel assemblies? What procedures will be in place to conduct dry transfer of degraded fuel assemblies from the Holtec casks when they expire in 100 years or less? What about 200 years? What about 300 years? That is about how long it takes for Cesium137 to become benign? What about 240,000 years? That is the amount of time it takes for plutonium, the deadliest element known to man, to lose its ability to mutate human cells. (0136-9 [Shaw, Gary])

Comment: This proposed analysis concerns one of the most dangerous materials on the planet and a long-term storage of that material and spent fuel pools here in Westchester County and at other nuclear power plants around the nation. The Westchester storage site has the highest surrounding population of any site in the nation. More than 17 million people live within 50 miles of Indian Point, and there are critical water resources and infrastructure developments close to the site. (0163-1-2 [Schneiderman, Eric])

Comment: Generic review of accident risk at Indian Point is inappropriate because the consequences of spent fuel pool accidents in the densely populated area surrounding Indian Point are significantly greater than in the rural or less populated areas in which the reference plants are located. Either the NRC must conduct site-specific analysis of environmental impacts of a severe accident at the Indian Point spent fuel pools or use the Indian Point site and not less populated sites as its baseline for spent fuel pool accident risk nationwide. (0163-1-4 [Schneiderman, Eric])

Comment: The third point is the NRC assumes that the risks and the impacts are the same at all plants. We all know Indian Point is unique. We know why. I don't need to remind you all why. (0163-2-6 [Musegaas, Philip])

Comment: Indian Point lies on two fault lines and this goes to the fact that you can't do a Generic Environmental Impact Statement because not -- they don't all lie on fault lines. They don't all lie in an area as crowded as we are. (0163-20-2 [Gellert, Sally Jane])

Comment: In terms of -- in terms of a one-size-fits-all GIS -- GEIS, how can you rationalize that the magnitude of risk is equal so that policy standards and protocols should be the same at all nuclear plants regardless of size, age, physical environment across the U.S. nuclear fleet stretching to the Pacific Coast to the flooded Mid-West to the east coast stretching from Florida to New England. (0163-22-4 [Shaw, Gary])

Comment: In terms of Indian Point, we have an intersection of two seismic faults. We have two large, high-pressure natural-gas lines between the faults and the plants. During Sandy -- Super Storm Sandy, the plant came close to flood level from the Hudson River surge. It would seem to me that these characteristics might not be universal, so why would there be a Generic EIS. (0163-22-5 [Shaw, Gary])

Comment: [A]nother element that makes Indian Point unique is that it's been ordered to install closed-cycle cooling. If that order is affirmed by the courts and a large structure must be built, what impact does that have on the ability to expand cask-storage space for what would be a 60-year accumulation of fuel assemblies. (0163-22-6 [Shaw, Gary])

Comment: Indian Point contains almost three times the amount of radioactive material in the spent fuel pools that are causing so much trouble from Fukushima. Three times as much radiation in the spent fuel pools. But, on the other hand, Indian Point is number one. We're -- Indian Point is number one in safety violations of any plant in the United States. It's number one in the risk of earthquake damage of any plant in the United States. It's number one in the risk of flooding of any plant in the United States. It's number one in the most impossible evacuation plant -- plan of any plant in the state. It's number one in the most risk to the most people of any plant in the United States. And it's number one in risk to the United States economy of any plant in the United States. World Series night, Yankees alone is an over three billion dollar economic industry within this -- within the 50 miles, within 20 miles. There is nothing generic about Indian Point and if any of this rulemaking should address the worst-case scenario at Indian Point, what you do with this waste? Staying on the theme of waste, just segue way into "S*T happens." (0163-40-1 [Dengler, Allegra])

Comment: [T]here cannot be a Generic Environmental Impact Statement. It is not sufficient when there's a broad variety of different risks at different locations, so I reject the very basis of it..It's like the old -- what they used to say about computers, garbage-in, garbage-out. And when I look at this Generic EIS and I see line after line of small risk, small risk, small risk, it's their unsubstantiated assertions and conclusions based on those unsubstantiated assertions are necessarily false. (0163-42-1 [Fry, Mark])

Comment: I'm really shocked by the audacity that you have presented such a general document for Indian Point. (0163-51-2 [DeCrescenzo, Jocelyn])

Comment: The GEIS cannot be generic for a hundred plants throughout this nation who have different regional issues, different concerns, different populations, different operating histories, different geological issues, multiple different issues cannot be issued. Each plant must have its own evaluation. The postulation in Appendix S -- H is that this will be cost-effective. In fact, it will be the opposite of cost-effective. (0163-7-4 [Shapiro, Susan])

Comment: The NRC ignores the differences between reactors (in terms of age, type, site location, ownership, history of problems, accidents, violations). These differences should prohibit the NRC from taking a generic approach to a spent nuclear fuel storage proposal. Throughout the country, all the operating reactors present spent nuclear fuel management risks. These have been identified and described by numerous people commenting. However, the statements made and the evidence cited have been ignored. Each reactor should be considered in terms of its own problems. (0174-9 [Thomas, Ellen] [Thomas, Ruth])

Comment: In addition to many frightening past incidents and accidents, Indian Point came dangerously close to being flooded by Hurricane Sandy. My home is located approximately 12 miles north of Peekskill, NY and Indian Point. My house and lands are not only my most valuable single asset. It is where my children were born and raised. It is where I live and breathe clean country air and drink clear fresh untainted water from my well. It is an extremely valuable and unique property. I could not replace it, nor could I ever afford to, if it were to be made worthless due to a nuclear disaster at Indian Point NY. The fact is that in the event of a failure at Indian Point, NY, countless surrounding homes and properties would become uninhabitable.

Where could all those people live then? Where would their business go? The costs of such an event would be astronomical and are simply not worth the risk presented by relicensing Indian Point. Indian Point is environmentally destructive and runs afoul of various coastal policies. New York State should object to Entergy's proposed consistency certification and to the NRC Draft Generic Environmental Impact Statement (DGEIS) as part of the process of replacing the NRC's Waste Confidence Rule. In particular, the State of New York and the NRC must consider and address: --The utter impossibility of evacuating and relocating the exceedingly dense population area surrounding Indian Point in the event of an emergency. --The 1.2 billion fish and other aquatic organisms killed annually by Indian Point's once-through-cooling water intake system, and the devastating impacts on the aquatic biota of nearby State and Federally designated Significant Coastal Fish and Wildlife Habitat in Haverstraw Bay. --The effect of rampant and ongoing radioactive leaks from Indian Point that indisputably release to the Hudson River and will continue to do so for decades. --The safety risks of storing thousands of tons of highly radioactive nuclear waste for decades if not centuries in overly crowded leaking spent fuel pools and temporary dry cask storage structures. (0194-1 [Gerstein, Bill])

Comment: I don't think that there should be a general plan for the waste from the nuclear reactors, every site is different and located in different environmental areas so there should be plans for each of these. (0200-2 [Individual, Anonymous])

Comment: There isn't much of a place for emotions in government, which isn't lost on me, but the ability to put a blanket over a larger issue isn't lost on me either. Each of the waste sites need different regulations based on what materials they handle. Handing out one answer for many questions won't suffice. (0203-1 [Louise, Tiffany])

Comment: On September 13, 2013, the U.S. Nuclear Regulatory Commission (NRC) submitted a proposed rule concerning the current and future storage of spent nuclear waste. This rule is proposing a few changes to 10 CFR 51.23 including having a generic environmental impact statement (EIS) for all nuclear waste storage sites that supports the continued on-site storage of wastes until a nuclear waste repository is found within the next 60 years. This would be an improvement because, in the past, the NRC did not require an EIS at nuclear waste storage sites. Having a generic EIS available will ease and simplify the licensing process for nuclear reactors in the country. (0205-2 [Lyons, Laura])

Comment: In order to refine the determination of continued storage, the Commission should adopt site-specific methods as a supplement to the generic evaluation. At least some sites, such as research reactors, MOX fueled reactors, and high-temperature gas-cooled reactor (HTGR) should be evaluated using site-specific method. (0210-5 [Individual, Anonymous])

Comment: Without a federal repository for spent nuclear fuel, we are left with tons of high level nuclear waste for decades to come, sitting in our communities. A federal court said the EPA's environmental impact studies must be done on storage, which forced the NRC to halt new reactor licensing and relicensing "until it established a technical basis for its belief that high-level radioactive waste will always be safely stored." Do not create generic rules that treat all sites alike, whether the waste is on the banks of a river, lake, ocean, or on an earthquake fault. (0215-1 [Matsuda, Thomas])

Comment: As a resident of Escondido, CA., I am among at least 8.4 million other highly vulnerable citizens located within 50 miles of San Onofre (SONGS) reactors, who would realistically be exposed to far greater public safety risks, as well as being unwilling victims of a much more probable catastrophic scenario than the extent which was projected, analyzed, and

used as the basis in NRC's Proposed Generic Assessment of Risks of Storing Nuclear Waste in Our Communities, and NRC's Proposed Rulemaking. It's extremely important for NRC to recognize that conditions in reactor communities surrounding San Onofre (SONGS) are extremely UNLIKE the conditions assessed at the two nuclear reactor sites in rural, or low population areas where impacts of spent fuel pool fires, and a series of other significant public safety risks were either analyzed generically in NRC's proposed Draft EIS, or where large quantities of high burn-up spent fuel risks were unanalyzed, or ignored, or where spent fuel assemblies here are stored in spent fuel pools with overly dense fuel assembly rack configurations containing 4 or 5 times greater volume of spent fuel than the design basis, conditions which are more prone to pool leaks, cause thermal irregularities, and require greater separation and cooling for safe storage. In contrast, the population density of communities surrounding San Onofre (SONGS) in southern California are much more similar to the high population communities surrounding New York's Indian Point reactors. (0218-1 [Borchmann, Patricia])

Comment: A Generic Environmental Impact Statement (GEIS) is NOT acceptable for California ! (0218-5 [Borchmann, Patricia])

Comment: The NRC should completely eliminate the waste confidence rule. Because it is a general rule, it cannot apply to the 65 different commercially operated nuclear plant sites across the US. Each site is different and should be treated as such. There should be individual plant environmental impact statements. (0222-1 [Zeller, Lou])

Comment: The NRC's one-size-fits-all generic approach is unjustified. The Commission is abrogating due process required under the Constitution by abandoning its responsibility to allow public to participate in decisions which affects them. The NRC's summary of the proposed rule proposed waste confidence rule states: If this proposed rule is adopted as a final rule, the NEPA analyses for future reactor and spent-fuel storage facility licensing actions would not need to consider the environmental impacts of continued storage on a site specific basis. A generic decision to allow the creation of additional irradiated nuclear reactor fuel and other radioactive waste associated with the uranium fuel cycle should be accompanied by 65 well-supported and well-documented plant-specific safety findings. And it would need scores of credible, plant-specific environmental impact statements that fully assesses the health and environmental impacts of the uranium fuel cycle with a reasonable array of alternatives. (0222-5 [Zeller, Lou])

Comment: NRC staff has said it would take 7 years to properly complete the GEIS. Given varied power station designs, geographic features such as rivers, oceans, dams, flood zones, population, flight paths, SFPs inside or outside of containment, containments that cannot contain, et cetera, each reactor is unique. Therefore there should be no GEIS. Rather, every storage site should require a properly completed site-specific Environmental Impact Statement (EIS). (0230-6 [Garb, James])

Comment: The consequences of a loss of electricity would be catastrophic. We can't say that just because a tsunami is unlikely, a Fukushima disaster is unlikely here. Peachbottom to Baltimore's north is at risk of a sudden dam failure, like 34 reactors in our fleet (2). Calvert Cliffs is 3 miles from the largest liquid natural gas terminal on the east coast where a huge fire or explosion could occur. (0233-3 [Dubois, Gwen L])

Comment: What is this question of why not evaluate all the impacts on a site-specific as opposed to a generic basis? And this is where the question of efficiency comes in. Well, the

easy answer is the Court upheld NRC's right to do that, so, end of story. NRC does not need to reverse Court. But that -- that's an answer only a lawyer can love. (0244-11-5 [McCullum, Rod])

Comment: As experienced in Nebraska during the summer of 2011 at Fort Calhoun and Cooper Nuclear Stations, NRC must begin to focus upon reactors in a site-specific manner with scientifically based analysis. (0244-14-9 [Prescott, Lisa Marie])

Comment: For instance, several reactor sites in our region are in ecologically sensitive areas, including FP&L's Turkey Point near Miami, which is situated between the Everglades National Park and Biscayne Bay. Given Turkey Point's location, sea level rise and storm surges are real threats that must be considered. Can the NRC ensure that spent nuclear fuel can safely sit at Turkey Point even for 100 years, let alone indefinitely? Likewise, Southern Company's Plant Vogtle in Georgia is located on the endangered Savannah River. In addition to being in a sensitive ecosystem, Plant Vogtle, it is also located across the river from Savannah River site, yet no consideration was given to the cumulative impacts of having reactors and corresponding nuclear waste in such close proximity to a highly contaminated DOE radioactive waste site. Additionally, both Vogtle and Turkey Point are slated for more reactors and thus, if built, even more toxic radioactive waste would be generated. The NRC cannot turn a blind eye to the unique characteristics of each site and each community. (0244-3-5 [Hancock, Mandy])

Comment: I don't believe that the EIS is adequate to address the individual characteristics of, you know, individual sites across the country. Taking Turkey Point, because that's what I'm currently involved in, as an example, and as Mandy spoke earlier about. (0244-8-1 [Totoiu, Jason])

Comment: Miami is ground zero for that, Homestead. And so it's really surprising to me that a lot of money is being spent to put two more reactors in Homestead, and coupled with the long-term indefinite storage of spent fuel, within ten miles of two National Parks and Everglades National Park, which the country is spending billions, with a "B," to restore. And all the while we're proceeding right along, almost as business as usual. Additional issues. I don't think the EIS really -- you know, going back to this individual, you know, the consideration of some individual site-specific things. I think Florida has a unique geography and it has unique hydrology, especially South Florida, it can vary within just a few miles. I'm not sure if that's really adequately looked at in this Environmental Impact Statement, and how fuel leakage and how the interaction and the resulting effects. (0244-8-3 [Totoiu, Jason])

Comment: So, how can we ever capture one moment in time with something called GEIS and presume that it will capture what is happening in this ever-changing reality? Every reactor site is unique. If they were to drop one cask out at Zion, you could punch a hole in the bottom of the pool. It would partially drain and, in a worst case scenario, set fuel on fire in a few hours in an order of magnitude greater than Chernobyl. These are catastrophic risks and we cannot address them through this absurdity of a generic impact statement. And these are site-specific impacts in this very densely populated area that we need to take into consideration as we make our future plan. (0245-10-3 [Lewison, Linda])

Comment: So, the NRC incorporates the draft GEIS into every reactor license, the conclusion that spent fuel, excuse me, with the conclusion that spent fuel can be safely stored aboveground indefinitely with future analyses of spent fuel and reactor licensing actions like ours, silencing the concerns of growing populations around nuclear reactors. (0245-19-5 [Smith, Ed])

Comment: As all those involved in facilitating nuclear power seek to extend the time that nuclear waste stays in our communities, they also seek to reduce their own liability and responsibility to the public. Worse yet is they seek to silence us by including this Generic Environmental Impact Statement into the reactor licensing and effectively preventing the public from raising concern and being able to question the storage of nuclear waste forever onsite at individual nuclear reactor facilities in our home communities. (0245-30-3 [Snyder, Gail])

Comment: I work as a volunteer with Peoria Families Against Toxic Waste. We normally work with hazardous waste on heavy metals and PCBs and other things that stick around for a long time, but, boy, all of that pales in comparison with nuclear. When I reviewed the draft EIS, the first thing that I was taken aback by was the fact that it was a generic EIS and at some point we authorized that we can have one EIS that would cover what really is a relatively small number of nuclear plants, a discrete hundred or so. (0245-31-1 [Fox, Tracy])

Comment: I find the term "generic environmental" an oxymoron. Environment is the essence of site variability. So, I find the proposition absurd and reject any GEIS for nuclear waste. (0245-46-2 [Craig, Evan])

Comment: And if it [the NRC] is going to proceed with that [rulemaking], it needs to look at these on a site-specific basis. (0246-2-9 [D'Arrigo, Diane])

Comment: Absent a legitimate GEIS that fully evaluates the environmental impacts of failing to secure permanent spent fuel disposal, the NRC must not exclude consideration of the environmental impacts of nuclear waste from individual license proceedings in the future moving forward. (0246-22-5 [Fisher, Allison])

Comment: [T]here are so many different kinds of plants, there is plants with pools in the air, there is plants of different designs, there are plants near earthquake faults, near water. There is no way not to have to look at each situation when it comes around in order to judge things. (0246-26-3 [Sondheim, Steven])

Comment: And furthermore, the idea that this is a Generic EIS. Every reactor is located in vastly different -- they are vastly different from each other. I mean the San Onofre reactors are so different they put one in backwards because they didn't realize that the two reactors were opposite. One of them failed and they never really did figure out what was different about the other one. Populations are different. Egresses are different, the transportation, the roads, and so forth. The seismic situation, the tornado, the earthquake, the size of the airplanes. There might be slightly different reactors. The size of airplanes that were expected when the reactors were built versus what they are flying now, the viciousness of the terrorists. These are all things that have changed. Our own viciousness as soldiers when we go out and fight. The real effect of a generic EIS is to inhibit later on public discussion because that is what is decided in a generic EIS. We can't revisit it. And yet, we are talking about indefinite storage. I would say that indefinite is a terrible word to use with a generic EIS. (0246-29-7 [Hoffman, Ace])

Comment: One, the Nuclear Regulatory Commission should abandon the Waste Confidence Rule. Because it is a general rule, it cannot apply to the 65 different commercially operated power plant sites across the nation. Each site is different and should be treated as such. There should be individual plant Environmental Impact Statements for all 65. (0250-1-1 [Zeller, Lou])

Comment: One of the most distressing things in this Environmental Impact Statement is the fact that it is generic. This is a term which flies in the face of the facts of the matter, as I've just outlined. (0250-1-4 [Zeller, Lou])

Comment: First, it makes sense to evaluate generic issues on a generic basis. It's the most efficient use of our regulatory resources and we should use those resources efficiently. (0250-15-3 [Rodack, Tom])

Comment: We know the real risks of nuclear energy and its waste, and that is why we are asking you to abandon this general ruling and instead draft individual EISs for each location. (0250-28-7 [Embrey, Monica])

Comment: The draft GEIS does not address water safety issues as reactor site-specific, and does not include the necessary data collection needed to take a realistic look at our situation. The nuclear power stations Catawba and McGuire give us four nuclear reactors located on drinking water reservoirs within 20 miles of downtown Charlotte. They are the largest water users on the Catawba River, a river that has been ranked the fourth most stressed river in the United States by the Union of Concerned Scientists, and made the Southern Environmental Law Center's list of the top ten most endangered places in the southeast. Other reports have quoted by 2040 there will not be enough water in the Catawba River to meet all the water demands. Most people don't realize that more water is used to generate power for their home than is directly used in a household. The Oconee Nuclear Station shut down October 24th due to water issues. This plant faces serious dam issues, and has had 14 high-level violations since 2000. For those of you who don't know, that's a heck of a lot. It took an NRC whistle blower for Duke and the NRC to do anything about it. That doesn't give me confidence. And the proposed W.S. Lee Nuclear Plant in Gaffney; they have to really compensate for the small Broad River. That dries up in the summer. You can just walk across it. Yet, Duke and the NRC think it's okay to just build 20 miles downstream in Cliffside, then down to the south you've got three reactors at V.C. Summer and Jenkinsville. (0250-45-1 [Sorenson, Laura])

Comment: The NRC ignores the differences between reactors in terms of age, type, site location, ownership, history of problems, accidents, violations. These differences should prohibit the NRC from taking a generic approach to a spent nuclear fuel storage proposal. Each reactor should be considered in terms of its own problems. (0250-51-6 [Thomas, Ellen])

Comment: The American people do not accept the generic shortcut approach to environmental impact statements as equivalent to individual environmental impact statements for each license application. The Generic Environmental Impact Statement fails to provide detailed information concerning significant environmental impacts of proposed individual reactors. I'm speaking to a matter of public policy. Though less burdensome on the bureaucracy, the generic approach does not consider regional differences of scattered nuclear waste storage sites, preventing acquisition of complete and thorough information for the NRC to base key nuclear license decisions. And, more important, the GEIS process creates a swim upstream against the bureaucracy for communities with regional concerns that it becomes very difficult for a community to express their individual concerns. (0250-63-4 [Kasher, Brian])

Comment: If future nuclear plants are approved, then there will be between 8 and 10 nuclear reactors surrounding the City of Charlotte within 70 miles, 10 nuclear reactors surrounding the City of Charlotte within 70 miles. A generic Waste Confidence Rule that doesn't take into consideration these particular circumstances of our city, of our environment is not acceptable. We need to address that. (0250-64-2 [Gupton, William])

Comment: And I have just come to speak briefly in opposition to what I see as a one size fits all generic EIS for what we have is really a variety of plants in a variety of locations, a variety of environments. And I don't think you can have a one size fits all solution or a one size fits all environmental thing for that. (0250-69-1 [Rundle, Steve])

Comment: I question this idea of a one-size-fits-all impact statement . In South Carolina, we have such a diversity of reactors, with so many different conditions. For example, up at Oconee, which is in the northwestern part of the state, the NRC has determined that there's a safety risk there, because it sits on the edge of a lake that has an earthen dam. If there was an earthquake, and South Carolina is an earthquake-prone state - we just had one the other day actually - that dam would break, and a Fukushima-type event would happen. Oconee would be swamped. So I don't know how you can do a one-size-fits-all when you have so many different reactor sites and things going on. (0250-7-3 [Corbett, Susan])

Comment: As I look at what we're calling this, a G-E-I-S, and I like to take it personally. I say that because I left at home my lovely wife, who just had a total knee replacement. But thank God I didn't ask him for a generic doctor. I didn't ask him to send me to a generic pharmacy, and I didn't ask him to send me to anybody but the best. That's the same way I feel about this proposal. You're asking the future to live up to something that's going to fit everybody, doesn't matter where they live, who they are, where they come from or where they're going. You and I both know that is impossible. Savannah River site has leaking taking place as I stand. Camp Vogtle shut down last week and it was reported on national television, but locally, they said "Oh, it just shut off." Yet we're going to consider what I would call in kindergarten a pattern to fit all, when you cut one little cookie pattern, and it will fit everybody. (0250-8-1 [Uitley, Charles])

Comment: I have been concerned about the storage of nuclear waste at the DCNPP since before retirement I was the County Fire Chief in charge of emergency response to the plant. I also served on the County Nuclear Waste Management Committee chaired by a member of the Board Of Supervisors. The draft Waste Confidence Generic EIS is a troubling euphemism. We here in San Luis Obispo, feel risk not confidence. We feel there is unacceptable risk for several reasons. (0255-2 [Frank, Fred])

Comment: 1) A generic rule is inappropriate for the DCNPP because of unknown seismic risks. The plant is located on a web of known and perhaps unknown faults. The plant is now being operated under questionable seismic assumptions. 2) The spent fuel pools now contain over 1800 assemblies, many times the original design. The EIS stated that dry storage was the option of choice for safe storage but cost concerns dictated pools storage. 3) About 80% of the fuel stored in the pools are high burnup assemblies prone to cladding failure. 4) An accident, beyond design basis earthquake or terrorist attack could release orders of magnitude more radiation from the pools than from dry the casks. 5) All spent fuel will need to be moved to dry casks anyway, so the cost of early transfer will be offset to some degree, even if high burnup fuel dictate fewer assemblies per cask. Considering the above we feel that cost should not override safety and the NRC must rule that spent fuel assemblies be transferred from the pools to dry casks as soon as possible regardless of cost. (0255-3 [Frank, Fred])

Comment: I live in the state of Washington, where we have a very serious problem with nuclear waste here at Hanford Reservation. The tanks that supposedly were going to contain this virulent mess are leaking and eventually this radioactivity will reach the ground water and the Columbia River, if it hasn't already. Given the secrecy of this entire operation, it is likely there are already more problems than have been admitted with this reservation. While this is an example of something (creating atomic weapons) that we are probably not doing any longer, there are similar issues with the storage of wastes from commercial nuclear power plants around the country. (0269-1 [Gale, Maradel])

Comment: I was born and raised on the shore of Lake Michigan, part of the Great Lakes -- one of the greatest and largest inland, freshwater lake systems in the world . A nuclear incident on one or all of these lakes would have an unimaginable and irreparable impact. In your documents, you believe that one-size fits all -- that all of these nuclear power plants are the same or similar; and therefore, do not require site specific rules. However, the Palisades Nuclear Power Plant inspectors this past spring identified safety injection refueling water tank weld failures which caused a tritium leak into our precious Lake Michigan. Previously, the NRC staff had repeatedly insisted that the plant was taking "adequate" steps to ensure its safe operation. Then, we learn of weld failures. And, that brings into question the quality of the welds that have occurred on the spent fuel storage casks. How many of those welds were performed by the same contractors who did not know how to properly weld the safety injection refueling water tank? What kind of leaks may be occurring with the onsite high-level radioactive waste storage or any other storage or crucial infrastructure for that matter? (0277-7 [Pierman, Bette])

Comment: How can the NRC expect a generic environmental Impact Statement and Proposed Rule to apply to all of the 104 reactors in the United States? You are wasting the taxpayers' money with such an approach. The nuclear reactor sites all have different concerns and must be dealt with as a unique impact with rules that fit each site. (0280-1 [Magda, Marni])

Comment: SONGS would never have been approved for construction by the NRC with today's understanding of the dangers and the realization that the Federal Government has failed to remove the nuclear spent fuel to a safe location. In the 1960's we believed a way to use the spent fuel would be invented. It hasn't. MOX is unstable and not accepted for commercial use. California is an earthquake zone, with SONGS on a new fault, and we have yearly danger of out of control wild fires and global warming predicting rising ocean levels. Maps have been made. How far is the ocean at SONGS predicted to rise in the next 30 years? A new study has shown an Alaska tsunami could destroy the ocean areas of Newport Beach, Laguna Beach and San Clemente. We cannot afford to let the spent fuel stay at Songs for 30 years until the Cesium 137 has lost its power. That is only 45% of the spent fuel. What about the other 55%? Plutonium has a 24,000 year half-life. What is being done to protect 8.4 million people from a cooling pool accident? (0280-12 [Magda, Marni])

Comment: As a resident of Escondido, CA., I am among at least 8.4 million other highly vulnerable citizens located within 50 miles of San Onofre (SONGS) reactors, who would realistically be exposed to far greater public safety risks, as well as being unwilling victims of a much more probable catastrophic scenario than the extent which was projected, analyzed, and used as the basis in NRC's Proposed Generic Assessment of Risks of Storing Nuclear Waste in Our Communities, and NRC's Proposed Rulemaking. It's extremely important for NRC to recognize that conditions in reactor communities surrounding San Onofre (SONGS) are extremely UNLIKE the conditions assessed at the two nuclear reactor sites in rural, or low population areas where impacts of spent fuel pool fires, and a series of other significant public safety risks were either analyzed generically in NRC's proposed Draft EIS, or where large quantities of high burn-up spent fuel risks were unanalyzed, or ignored, or where spent fuel assemblies here are stored in spent fuel pools with overly dense fuel assembly rack configurations containing 4 or 5 times greater volume of spent fuel than the design basis, conditions which are more prone to pool leaks, cause thermal irregularities, and require greater separation and cooling for safe storage. In contrast, the population density of communities surrounding San Onofre (SONGS) in southern California are much more similar to the high population communities surrounding New York's Indian Point reactors. (0284-1 [Borchmann, Patricia])

Comment: A Generic Environmental Impact Statement (GEIS) is NOT acceptable for California ! (0284-5 [Borchmann, Patricia])

Comment: No one will be allowed to raise the question of whether the creation of additional wastes could be justified, even though there is no way of safely storing it. (0287-3 [Swanson, Jane])

Comment: [I urge that] the EIS be redone, with comprehensive and site-specific analysis of the conditions, problems, and risk associated with different reactor locations (0303-13 [Lamberts, Frances])

Comment: The Commission should perform a new environmental impact study. This should reflect site-specific conditions and risks, such as from possible evacuation need where reactor facilities are in densely populated areas. It should comprehensively meet NEPA standards of scientific impact assessment of all resources and operations involved, such as water and its potential scarcity; fail-save, longer-duration off-site electricity provision for spent-fuel cooling in case accidents; transportation hazards; aquatic and terrestrial species, and others. (0303-8 [Lamberts, Frances])

Comment: Also, considering the variables at each nuclear plant, this document needs to be site-specific rather than generic. (0309-8 [Green, Jeanne])

Comment: Anyway, as a resident in Escondido, I'm among at least 8.4 million other highly vulnerable citizens located within 50 miles of San Onofre reactors who will realistically be exposed to far greater public safety risks, as well as being unwilling victims of a much more probable catastrophic scenario than the extent which has been projected and analyzed in this Generic Environmental Impact Statement. The Draft Generic EIS has used as their basis of risks of storing nuclear waste in communities in Southern California and for NRC's proposed rulemaking. It's extremely important for NRC to recognize that there are conditions in reactor communities surrounding San Onofre that are extremely unlike those conditions that were assessed at the two nuclear reactor sites in rural and low population areas, where impacts of spent fuel pool fires, or a series of other potential safety risks were either analyzed generically, or where impacts were unanalyzed, or impacts were under-estimated. In contrast, the population density here in communities surrounding San Onofre, Southern California are much more similar to high population areas surrounding New York's Indian Point reactors. In 2012, New York's Attorney General successfully argued and led to a challenge on NRC's Rule which led to this Draft Environmental Impact Statement. (0325-11-1 [Borchmann, Patricia])

Comment: Please stop wasting our time and energy and your great minds on something that's generic. Generic won't work anywhere in this country. We have 104 reactors, we have to have a special solution for each place. (0325-12-7 [Magda, Marni])

Comment: I just want to say that the concept that you can reasonably assess the environmental impacts of 104 nuclear reactors across this country in a Generic EIS is laughable on its face. It's ludicrous. How can you possibly, possibly consider that the impacts at San Onofre on an eroding seashore adjacent to two known earthquake faults, adjacent to the major transportation artery between Los Angeles and San Diego, adjacent to one of the largest military installations on the West Coast, which also happens to be a military target, how can you possibly consider the impact that you generically identify for all nuclear reactors can adequately assess the impact at that location versus an impact in the middle of Nebraska? It's absolutely ludicrous, and I'm sorry but the NRC should be ashamed of itself. I certainly would be if I was a professional. (0325-20-1 [Sullivan, Martha])

Comment: San Onofre is not a generic nuclear power plant. I don't think there is such a thing, but we are not generic. We're graced with three earthquake faults, the plant is on the beach, we have really no real way to evacuate people. And right now with freeway construction coming up, it's going to close down the I-5 for two years due to a widening thing. Our beach communities are more vulnerable than ever for radioactive disasters. This planned major construction on the I-5 will be from 2014 through 2017. The widening is going to start from San Juan Creek Road and finish just south of Avenida Pico. The I-5 is our lifeline to evacuation. Should, God forbid, any natural or terrorist disaster occur to disrupt the tons of thermonuclear waste stored at San Onofre, we are trapped. It's bad enough when the freeway is open and running, but with it narrowing down, we haven't a chance. That freeway is the only possible way of escape from disasters to our stored nuclear waste, if any is possible, for people living in and visiting our beach communities, so it's up to the locals to stop any further freeway construction that would hinder evacuation from this power plant. And to call our situation generic is ridiculous. It's inhumane. I don't think any other plant has as many earthquake faults to contend with, and the other dangers. We need that waste out of here as soon as possible. We didn't ask for it to be there. We don't want it there. It's endangering all of us. (0325-23-1 [Kernahan, Mel])

Comment: I think everyone has made it plain that generic is not a word we like. And this one line in your additional issues for public comment, I would like to point out. "The Proposed Rule codifies the conclusions from the Draft Generic Environmental Impact Statement so that those determinations do not need to be made in individual actions." And I think those things need to be looked at very carefully because we do consider ourselves very special and significant. (0325-25-1 [Welty, Delores])

Comment: If you were to go back in time to when that plant was being designed and to when it was being proposed, I wonder if you could have gotten anyone in the community, anywhere in this state, anyone to say yes, we will be happy to have an atomic waste dump on our beautiful shore of California for 60 years, 100 years, 300 years, we don't know. And, also, we're going to give you a generic plan when we get to that point. Well, we're not a generic community. My kids are not generic, my family is not generic. (0325-27-2 [Davis, Patti])

Comment: The other word I'd like to speak about is the very first word we got stuck on at the first question, that's generic. The lady asked a question about this to the NRC and it was not answered, so we're stuck on the first part. So, here's a report which makes no distinction between storing nuclear waste in the middle of a metropolitan area, and storing it in the middle of an Arizona desert. It's a report that makes no distinction between storing nuclear waste on top of an earthquake fault, and one someplace that never has any earthquakes, same with tsunamis. So, this report is automatically suspect. It's not a serious report. This report is a whitewash. It's not considering the true facts, and as long as it's a generic report, this report is worthless. I think you better start all over and get rid of all the generic stuff. I think that's the message you should take home with you, revise the whole report and get rid of any generic analysis. (0325-31-2 [Johnson, Roger])

Comment: So, we've got airplane strikes, we've got terrorists, we've got 8 million people here in this county who have no benefit whatsoever from this nuclear waste and yet we've got it sitting here. And then what do they want to do? They want to make a generic, a Generic Environmental Impact Statement which means that anything unique about our situation, such as that we don't even have a reactor running, is going to be ignored. And not only that, but because it's generic, anything that doesn't get said now is going to be ignored. You're not going to be able to change anything. (0325-7-6 [Hoffman, Ace])

Comment: It shouldn't be a generic report at all. It should be a site and issue-specific. (0325-8-3 [Von Thillo, Grace])

Comment: I suggest that you use EISs for each nuclear power plant individually[.] (0326-15-7 [Schumann, Klaus])

Comment: The Draft Waste Confidence Generic EIS is a troubling euphemism. We here in San Luis Obispo County feel risk, not confidence. We feel this is an unacceptable risk for several reasons. Number one, a generic rule is inappropriate for Diablo because of unknown seismic risk. The plant is located on a web of known, and perhaps unknown, faults. The plant is now being operated under questionable seismic assumptions. Number two, the spent fuel pools now contain over 1900 assemblies, many times the original design. The EIS stated that dry storage was an optional choice for safe storage, but cost concerns dictated pool storage. Three, about 80 percent of the fuel stored in the pools are high-burnup assemblies prone to cladding failure; they are much higher temperature and higher radiation levels than conventional fuels. Cladding failure could release radioactive gases into the environment, since there is no containment over the pools. An accident beyond design basis earthquake, a terrorist attack, could release orders of magnitude more radiation than the pools -- from the pools than from dry casks. Five, all spent fuel pools will be needed to move to dry cask, so the cost of early transfer would be substantially offset, even if the high-burnup fuel dictates using more casks. Considering the above, we feel that the costs should not override safety and the NRC must rule that spent fuel assemblies be transferred to the pools to dry cask as soon as possible, regardless of cost. (0326-28-1 [Frank, Fred])

Comment: Now the most important thing that I wish to say is that the creation, the artificial creation of composite generic non-existent nuclear sites, is inherently flawed to perform qualitative analysis. You see, the geological, socio-political, geographic, environmental, and epidemiological considerations are unique to each site. Moreover, the mechanical operation of each of these plants and storage facilities is also unique. So you cannot make a generic plan based on things that are so inherently unique. There is not one generic nuclear power plant in the United States. They're all unique. So the people of San Luis Obispo reject this because it is scientifically invalid. (0326-56-7 [Homick, Nick])

Comment: I think it's a flawed GEIS. I'm very concerned about a generic approach with no chance to revisit at individual site re-licensing hearings. That makes no sense whatsoever. None. If that made sense then I would get to just have my business wherever I wanted it in San Luis, because there was one business they said was okay, so it must be okay for me to do it at my house. It's okay if they do it over there. It doesn't make sense for anyone. Why would it make sense for a nuclear power plant? (0326-61-6 [Henry, Anita])

Comment: So I agree with the two or three speakers talking about the generic issue. You know as well as I do that many U.S. nuclear power facilities are very unique. These are not cookie cutter facilities. Thus, you need specific site analysis for each nuclear power facility. (0326-63-1 [Campbell, Bruce])

Comment: [W]ithdraw the generic beast. And then also, obviously, facilities are unique as far as seismicity. A tornado hits a uranium enrichment facility in Paducah, Kentucky in the last few days and then there's flooding along the Missouri River. (0326-63-7 [Campbell, Bruce])

Comment: No one will be allowed to raise the question of whether the creation of additional radioactive waste should be allowed at any given site if this waste rule is adopted, so we object to it on that ground. (0326-8-3 [Swanson, Jane])

Comment: In your Draft GEIS, you say, "Storing highly radioactive spent fuel out onsite at Diablo Canyon is just the same as storing it at Prairie Island Nuclear Power Plant in Minnesota." Except, Diablo Canyon is built on the intersection of 13 earthquake faults on a fragile coastline on the ocean. Prairie Island is built on an island in the middle of the Mississippi River where there's been terrible flooding in the past few years. (0326-9-3 [Seeley, Linda])

Comment: 10 CFR 61, which deals with low-level radioactive waste has much more site-specific requirements than anything that is contained in these documents, either the GEIS or the rulemaking. (0327-11-8 [Kline, Connie])

Comment: In the Pandora myth, she ended up keeping hope. She did not release hope from her jar when she let out all the consequences, the punishments that were held inside that jar. And there's always been some ambiguity in interpretation of what it means that the hope was not released. Does it mean that hope has been held captive, or does it mean that there is hope to be had in that jar still? I would say that when the NRC, which is tasked to protect people and the environment, does things like saying that the environmental impacts of continued storage are generically addressed and will not be revisited in future site-specific licensing proceedings, that is holding hope captive in ways that we'll still be regretting and suffering from generations upon generations from now. And so Pandora is still with us. (0327-24-2 [Rivers, Alicia])

Comment: What these series of hearings indicate to me is that the NRC has finally come our way, that confidence is an importance in this process, confidence of the general public to make policy work, okay? So in policy, this rule that we're looking at, the rule changes are about making it more efficient to relicense operating nuclear reactors and plants, okay? So in all policy formations, you have to not just think of efficiency, but you must think of effectiveness and economy. So I would suggest that we have a no action, no action, no action in this process. The change is not good. The alternatives do not provide any increased efficiency or effectiveness. It may be more cheap, but the cheap is always bad. (0327-38-1 [Stansberry, Mark])

Comment: Now, when we started talking about the changes that are coming up, if this change would go through, any future licensing, any future licensing of a reactor would not have to have an EIS, an environmental impact statement. They would go from this generic non-site specific. So if you would just throw something out, we've been talking about Fukushima today, but, you know, Davis-Besse, all the other site-specific concerns would not be brought into the impacting or influencing the decision for future licensing, which we're talking about future 80 years of operation of already several decade-old facilities that we're talking about. (0327-38-2 [Stansberry, Mark])

Comment: I'm glad the NRC is starting to think about confidence as being part of this process and help build the confidence. Confidence building is very important, so thank you and let's go no action on this one. (0327-38-4 [Stansberry, Mark])

Comment: It's been stated, it's stated in the PowerPoint that you presented earlier that this GEIS is what it is, and we're not going to have environmental assessment, environmental review of individual storage facilities. That's an absurd position, and absurd conclusion because as various people have already pointed out, these facilities vary greatly one from another. The city in its comments has pointed out that the Red Wing nuclear parking lot is at such a level that it's

likely at some point in the future to be inundated by the Mississippi River. Now, I don't know whether the design basis of those casks makes provision for them to be flooded without significant harm occurring, but that's certainly something that would need to be looked at. A desert facility might have other issues, such as the degradation of elastomeric parts due to high heat. So, this is -- you need, in my opinion, to abandon the claim that any GEIS can be sufficiently adequate to give us comfort with regard to individual nuclear waste storage facilities. (0328-11-5 [Muller, Alan])

Comment: I think that cost should not be the measure. When you look at site-specific detail that should be required for every facility across this country... cost. (0328-6-1 [Foushee, Lea])

Comment: I think trying as hard as I can to be constructive to the attempt to protect society from the destruction associated with irresponsible or mismanaged irradiated fuel, in my attempt to be as respectful as I can to this process you're going through to try and make a rule to deal with the utter absurdity; well, I would encourage you to recognize that generic is out of the question. There is no generic here. There is no generic. (0328-7-7 [Crocker, George])

Comment: Every one of these sites, every one of these casks, every one of the fuel assemblies in the casks, every single fuel rod in every single assembly is unique with a unique set of stressors that have been acting on it over whatever period of time you care to assume. And those stressors on every rod, in every cask will cause every rod in every cask potentially to act differently than the others. And you need to account for that, or your rule is bullshit. (0328-7-8 [Crocker, George])

Comment: But the difficulty with this waste storage and the thought of permanent aboveground storage at reactor sites like Sequoyah is very troubling, and the Sequoyah re-licensing, which is pending, of course, is now suspended in terms of the possible issuance because of the process we're currently going through about whether we could have any confidence about the management and isolation from the environment of high-level radioactive waste resulting from the continued operation of the reactors. One of the difficulties with the proposal is that the regulation would essentially say that this is good enough to give us confidence for every reactor at every site, and it will no longer be an issue with respect to re-licensing of these reactors. That, I think, that's an unjustifiable step. (0329-12-2 [Paddock, Brian])

Comment: The Sequoyah site is still under investigation, and TVA is under directions from the NRC to be investigating both the seismic stability and the potential for destruction by flooding of the Sequoyah site. And for anyone to adopt a document that says, without even completion of those, we know that surface storage indefinitely, for hundreds of years perhaps, past the lifetime of the operation of the reactors is simply unsustainable and unjustifiable and contrary to all common sense. (0329-12-3 [Paddock, Brian])

Comment: I want to reiterate that a Generic EIS is just not wise or prudent. There are entirely too many idiosyncrasies of situations like some of the past people I've mentioned. (0329-14-3 [Sondheim, Steven])

Comment: And the next thing is that this is a generic, and it boggles the mind that any other state would be willing to let their requirements be the same as California's, which are bound to be much more strict because of our tsunami dangers and our earthquake dangers. Maybe that's a good thing if it really is going to be bounded by the worst possible case, but I just have a lot of trouble believing that that's going to happen. I think California is going to get shorted, that the protection is not going to be as good as we need. (0329-16-2 [Hoffman, Ace])

Comment: Right now, today, the Marine Corps is testing bombing runs on Camp Pendleton, and we're talking about storing waste at San Onofre essentially permanently. And we've been in wars almost permanently, which means the Marines are going to be testing bombing runs on the same area where San Onofre is going to store its waste permanently. Permanently. And I think this is all wrong. (0329-16-6 [Hoffman, Ace])

Comment: I just really wanted to briefly talk about generic EIS. Generic is just -- when you are talking with nuclear power, generic is a really dangerous thing. We all live in different areas of the country. All of these nuclear power plants with all their spent fuel, they all have different challenges, some of them weather-related, some of them -- just to name a few, we have flooding disasters, tornadoes, earthquakes, tsunamis, hurricanes, super storms, heatwave, drought. All of this spent fuel is really tied to water. And as we move into a climate change world, generic just isn't going to cut it. I happen to live in Iowa. I live downstream from, 33 miles from, Duane Arnold Energy Center Nuclear Power Plant. They have had issues of flooding. We have had three 100-year floods in the last 20 years. Fort Calhoun borders Iowa. We still have Fort Calhoun shut down. It was almost a major disaster there, almost a station blackout because of the Flood of 2011 on the Missouri River, which if you look into that, there are 7 dams on the Missouri River upstream of Fort Calhoun and also Cooper Station. A disaster like we had in Colorado this past year, where there was so much rain that deluged the Colorado Rockies and just basically tore away a few towns. If that were to happen on the upper Missouri River Basin, we could see a cascading dam failure that would send a wave of water down the Missouri River that would be unprecedented. And Fort Calhoun, some estimates say, would be 30 feet underwater, which would create a station blackout and a disaster of unimaginable proportions with spent fuel. So generic EIS does not cut it. I think we need environmental impact statements of all 100 existing reactors and all the reactors that have been recently closed or were scheduled to close. (0329-18-3 [Carberry, Mike])

Comment: [I support] Kevin's [Kamps'] comments and Steve's [Sondheim's] comments about the fracking issues. And there is no way that a generic environmental impact statement can cover this in one statement for each separate reactor. The point I want to leave you with is that in this new universe that we are entering of decommissioning, each site is different. And each arrangement to do the decommissioning in each site is different. And there is no way that that can be covered through one generic environmental impact statement. (0329-23-4 [Lewison, Linda])

Comment: I actually would like to provide a couple of specifics to support the speakers who request a separate environmental impact statement at each nuclear plant. For some reason, I actually consider it regulatory malpractice for NRC to have done this, but they have excluded Limerick Nuclear Plant from the outcome of NRC's nuclear waste study and new rules. Now, here are two reasons that we put on the record that that is really, really terrible. NRC's own, you know, documents for Limerick relicensing confirm that Limerick's fuel pool liners are corroding at up to ten times faster than what were anticipated. NRC told Exelon to recoat them immediately and then caved into Exelon in allowing them to wait for a decade to do that. Also, the actual storage, aboveground storage, there are also corrosion concerns about that. For example, in these documents for Limerick relicensing for nuclear plants that have cooling towers, they confirm that the steel onsite can corrode in 4 to 52 weeks. That's in NRC's own documents. They're overlooking all of these things. There could be times that we would have to pull some of those, some of the waste out of the cask. That might be impossible to do that because of the corrosion issues. We have been raising this with NRC since 2006. They have ignored, you have ignored, all of it. It's really frightening to us from the standpoint of what could happen here. (0329-26-1 [Cuthbert, Donna])

Comment: And we certainly encourage NRC to do these separate environmental impact statements at each nuclear plant and have every nuclear plant benefit from any protective decisions that are made after this study is completed. (0329-26-2 [Cuthbert, Donna])

Comment: [B]ased on the evidence that we've compiled, we are requesting that the NRC conduct a site-specific nuclear waste study at Limerick Nuclear Plant prior to completing the court-ordered nuclear waste study nationally. Our analysis is that this is about the public's long-term health and financial risks in terms of what needs to be considered. We would suggest that it would be safer to stop producing waste for which there is no current safe solution and for which financial responsibility has been passed off largely to the public, to taxpayers and ratepayers. (0329-3-2 [Cuthbert, Lewis])

Comment: So in conclusion I would respectfully suggest to the NRC that it is extremely important that you not exclude Limerick Nuclear Plant from the outcome of the nuclear waste study and new rules, as I believe is currently planned. And based on our investigation of Limerick's deteriorating and structurally deficient fuel pools and questionable casks with numerous design flaws and unanswered viability questions, it's imperative that you take a site-specific look and address a lot of the questions that we've previously put on the record and will continue to place on record. There is no safe solution to the problem of high-level radioactive waste, and we need to have a site-specific nuclear waste study done on Limerick before any decision is made. (0329-3-9 [Cuthbert, Lewis])

Comment: The draft GEIS is really kind of ludicrous. I have been reading it since you were here. I picked up a copy, and I have been reading it. And, you know, the whole idea of a generic environmental impact study for over 100 nuclear plants is absurd, to say the least. And other people have told you why. You have heard it from us. (0329-32-3 [Seeley, Linda])

Comment: I would like to expand my comments regarding the generic structure of the proposed rule as being perhaps the most insidious and alarming aspect of the policy. Apparently taking the lead from the NRC, the State of Michigan is demonstrating how establishing generic rules can be a game changer for the corporate stakeholders. I would like to read a few passages from a regulatory impact statement and cost-benefit analysis published in October 2013 by the State of Michigan Department of Environmental Quality pertaining to proposed generic rules governing environmental contamination response activity and cleanup criteria requirements for response activity, also known as remediation and redevelopment of brownfields, contaminated sites, and facilities. My comments are very applicable today, regardless of whether we are discussing the Rocky Flats facility in Colorado or the Waste Confidence Rule for continued storage of spent fuel. On page 4, part 3, number 2, it says, "Other states do not have generic cleanup criteria. A site-specific risk assessment must be conducted to determine environmental conditions and develop cleanup standards for each site. Generic criteria in Michigan provide a mechanism to quickly determine environmental concerns and provide information to parties involved in property transfers. Generic criteria facilitate property transactions, allowing financial institutions to make loan decisions regarding contaminated properties, allowing liability protection for a party not liable for the contamination." Now, on page 6, part 3, number 5, it says, "Purchasers of properties would not be able to limit their liability for cleanup of past environmental concerns if criteria are not available to assess the risk posed at a property and, therefore, would be less likely to purchase the property." Now, on page 9, part 3, number 18, it says, "An environmental assessment report to provide the information necessary to utilize the generic cleanup criteria is estimated to cost 5,000 to 20,000 dollars. If generic criteria were not an option, the cost of an environmental assessment report to provide the information necessary to develop site-specific cleanup criteria

would be 50 to 100 thousand dollars or more depending on the circumstances and nature of the site." And, finally, on page 9, part 3, number 21, "The proposed rules are designed to be less burdensome than the effort and costs to evaluate the Environmental concerns . . . in the absence of generic cleanup criteria." (0329-36-1 [Schonberger, David])

Comment: Perhaps the most insidious and alarming aspect of the Proposed Rule is its generic structure. If Michigan is any indication of emerging trends, citizens should be forewarned to expect generic rules and criteria coming to a state near you. (0329-7-4 [Schonberger, David])

Comment: The United States Forest Service (USFS) court challenges require only site-specific assessments of a timber sale at the time of project rather than the initial designation and establishment of entire forest plan. The USFS have utilized the deregulation of EA/EIS analysis for projects on national forest; however such postponed site-specific analysis letting overall plans stand as is have profound effects on the culpability of agency management and disguise the whole-picture plan of how each site may impact the human environment. This is the impact of a Forest Management Plane requiring an EIS only when a site-specific project occurs to cut and sell timber. This management regime in the nuclear waste sector is far more detrimental, far-reaching and uncertain. Though, NRC's determination was to improve agency efficiency, this management proposal poses greater question to NRC's thoroughness of safe storage and future prevention of ecological harm. (0339-1 [Wilmott, Emily])

Comment: The Waste Confidence rule and subsequent alterations, though applicable only to the period following the expiration of a licensed reactor, is a part of the EA for agency decision making on the relicensing of the nuclear reactor and independent spent fuel storage installations. These broader analyses may be appropriate for agency efficiency efforts when dealing with resources lacking such monumental consequences; however dealing with the wastes of nuclear power plants in this manner seeks to deregulate licensed reactors without updating the assessment of their waste impacts or informing the endangered public. (0339-3 [Wilmott, Emily])

Comment: Let's play it safe, look at each site carefully, individually. (0340-2 [Case, Ed])

Comment: Failing a national repository, the NRC has not studied the issue of waste storage for each individual reactor (age, type, site location, ownership, history of problems, accidents, violations) but instead has created a generic wish list for waste storage, lacking workable specifics. Each reactor must be considered on its own. (0348-3 [Agnew, David] [Roscoe, Lee])

Comment: Failing a national repository, the NRC has not studied the issue of waste storage for each individual reactor (age, type, site location, ownership, history of problems, accidents, violations) but instead has created a generic wish list for waste storage, lacking workable specifics. Each reactor must be considered on its own. (0352-3 [Roscoe, Lee])

Comment: I suggest, in the alternative, that the Commission not attempt to provide a "generic environmental impact statement" as each reactor site may very well contain different land use and socioeconomic features capable of being impacted disparately. (0354-1 [Oeser, Robert])

Comment: It is clear that the nuclear waste stored at Indian Point poses a unique risk, which warrants site-specific examination. The long term storage of waste so close to a major population center seems unwarranted. 1950s/1960s era technology needs to be updated. Please issue rules which bring this site into the 21st century - or close it entirely. (0356-1 [Klepner, Lou])

Comment: Do not use a GEIS but rather work with individual EIS' for each NPP. (0358-11 [Schumann, Klaus])

Comment: Failing a national repository, the NRC has not studied the issue of waste storage for each individual reactor (age, type, site location, ownership, history of problems, accidents, violations) but instead has created a generic wish list for waste storage, lacking workable specifics. Each reactor must be considered on its own. (0373-3 [O'Malley, Brian])

Comment: The draft GEIS ignores the obvious fact that each site is unique. The one-size-fits-all plan is especially irresponsible for Diablo Canyon given that it is underlain by multiple fault lines. (0375-1 [Wilvert, Calvin])

Comment: ACE made a list of requests. This includes a request for NRC to do a site-specific radioactive waste study at Limerick and for NRC to NOT exempt Limerick (as planned) from NRC's new waste rules. Over the past few years, NRC has failed to take responsible action regarding Limerick's on-site deadly radioactive wastes, and has even failed to respond to our specific questions and concerns. (0377-1-3 [Cuthbert, Lewis])

Comment: 1. Conduct a site-specific nuclear waste environmental impact study at Limerick Nuclear Power Plant, prior to completing this court-ordered nuclear waste study, based on all serious threats and concerns summarized in these written comments and other still unresolved waste concerns raised previously with NRC. (0377-1-6 [Cuthbert, Lewis])

Comment: NRC INEXPLICABLY IGNORES UNPRECEDENTED RISKS FROM LIMERICK'S FUEL POOLS AND REFUSES TO DO AN UPDATED REVIEW FOR LIMERICK'S SPENT FUEL STORAGE, DESPITE COMPELLING EVIDENCE PRESENTED TO NRC THAT CLEARLY IDENTIFIES THE NEED. Comprehensive evidence of Limerick's fuel pool risks was submitted in written testimony by ACE for NRC's public hearing record for Limerick's EIS 11-26-13, and updated in written testimony for NRC's public hearing record 6-24-13. Summaries were also provided in correspondence to NRC Commissioner Borchardt 8-5-13. In 2012, the federal court said NRC should consider potential environmental effects of leaks and fires involving spent fuel pools. Despite the inherent risks from Limerick's fuel pools identified and summarized by ACE, NRC is ignoring the order to re-think the environmental impact of storing radioactive wastes in Limerick's fuel pools. In 2013 NRC's Neil Sheehan said in an e-mail to the Mercury newspaper, that NRC's new rules about spent fuel storage are not likely to affect Limerick's Environment Impact Statement. He said: "There is no expectation that Exelon would have to conduct a new review of spent fuel storage at Limerick" (Mercury - March 8, 2013). "Limerick nuke plant relicensing unlikely to be affected by new spent fuel rules" (Mercury - March 13, 2013) (0377-3-14 [Cuthbert, Lewis])

Comment: WE CONSIDER IT REGULATORY MALPRACTICE FOR NRC TO EXCLUDE LIMERICK FROM THE OUTCOME OF NRC'S NUCLEAR WASTE STUDY AND NEW RULES: Given the extreme dangers and destruction faced by the entire Greater Philadelphia Region from storage of massive amounts of all of Limerick's deadly high-level radioactive wastes in fuel pools and casks on the Limerick site, NRC would be negligent to ignore these unprecedented long-term risks to the environment and dense population in Limerick's Environment Impact Statement. Risks at Limerick will continue to grow as Limerick produces 2 tons more of high-level radioactive wastes every year Limerick continues to operate. (0377-5-6 [Cuthbert, Lewis])

Comment: NRDC petitioned the Atomic Licensing and Safety Board, arguing, among other things, that the reactors should not be re-licensed without a new, site-specific environmental

impact review; IT IS INDEFENSIBLE FOR NRC TO USE A GENERIC EIS IN NRC'S DRAFT, WHEN THIS NEGLIGENTLY IGNORES THE KINDS OF SITE-SPECIFIC RISKS WE IDENTIFIED ABOVE FOR LIMERICK NUCLEAR PLANT; IT IS INDEFENSIBLE FOR NRC TO EXCLUDE LIMERICK FROM NEW RULES AS A RESULT OF NRC'S NUCLEAR WASTE STUDY; NRC CANNOT JUSTIFY IGNORING LIMERICK SPECIFIC ENVIRONMENTAL IMPACTS FROM MASSIVE AMOUNTS OF HIGH-LEVEL RADIOACTIVE WASTES STORED AT LIMERICK[.] (0377-5-8 [Cuthbert, Lewis])

Comment: WE ASK NRC TO DO A SITE-SPECIFIC NUCLEAR WASTE STUDY FOR LIMERICK'S HIGH-LEVEL RADIOACTIVE WASTE STORAGE, PRIOR TO NRC'S COMPLETION OF THE COURT-ORDERED NUCLEAR WASTE STORAGE STUDY (0377-6-8 [Cuthbert, Lewis])

Comment: NRC staff has said it would take 7 years to properly complete the GEIS. Given varied power station designs, geographic features such as rivers, oceans, dams, flood zones, population, flight paths, SFPs inside or outside of containment, containments that cannot contain, et cetera, each reactor is unique. Therefore there should be no GEIS, every storage site should require a properly completed site-specific Environmental Impact Statement (EIS). (0419-11 [Agnew, David])

Comment: The NRC must change its nuclear reactor licensing process to require an individual Environmental Impact Statement for each site determining the impact of creating and storing radioactive waste on each reactor site. The health and safety effects on communities and the environment in proximity to each site needs to be carefully considered in a site specific manner. (0421-8 [Clemons, Victoria])

Comment: It is urgent for the NRC to look into best practices for each specific site and not try to apply a convenient and unscientific solution to all nuclear power plants. (0423-3 [Graves, Caryn])

Comment: Moreover, as a generic statement, the analysis makes no distinctions among the dozens of sites covered by the EIS with regard to such factors as levels of seismic risk (earthquakes and tsunamis), regional population levels, size of site and isolation of site, and proximity to transportation corridors. Rather, it assumes an identical level of risk at all sites regardless of specific characteristics. (0431-11 [Pascall, Glenn] [Watland, George])

Comment: unsuitability of and failed utility of a generic EIS for over 100 unique and site specific situations involving SNF (0447-1-8 [Andrews, Richard])

Comment: This issue of management of SNF is site specific to each reactor and ISFSI. (0447-2-9 [Andrews, Richard])

Comment: I ask the Commissioners to step out of their shoes to view this issue as a citizen whose daily life is threatened by proximity of a nuclear facility, that perhaps they might see the absurd science fiction scenario of electricity produced by nuclear fission, and in particular, by the Diablo Canyon Nuclear Power Plant situated amid 13 earthquake faults within a ring of fire. Generic does not apply here. Here is my thinking as a citizen living 10 miles from Diablo Canyon. (0450-1 [Bast, Nancy])

Comment: The Waste Confidence Rule in the NRC Draft Generic Environmental Impact Statement (GEIS) is clearly inadequate to address the unique safety issues which exist at the Diablo Canyon plant. We doubt that it is adequate to address the safety issues at any number of

US plants as it is written as a generic one-size fits all plan for some fictional plant site. This is an extremely flawed approach to considering safety needs at nuclear power plants within this country--each with its own unique set of conditions which impacts the safety of each plant. This "cookie cutter" way of planning to deal with the nuclear waste in this country is grossly inadequate. (0451-2 [Rippner, Sharon] [Rippner, Thomas])

Comment: To be meaningful, waste storage plans must be uniquely written for each nuclear plant and this generic plan should be rejected in its entirety. (0451-5 [Rippner, Sharon] [Rippner, Thomas])

Comment: As a Registered Civil Engineer, I am baffled by your decision to even consider submitting a Generic Environmental Impact Statement (EIS). Proposing the same safeguards for stockpiled nuclear waste at all of the nuclear facilities throughout the country is irresponsible and unsafe! Establishing identical safety requirements for an isolated facility in a sparsely populated area in New Mexico, for instance, and the San Onofre facility, located within fifty miles of over 8.5 million people, next to known off-shore earthquake faults capable of 8.0 magnitude earthquakes and situated on eroding bluffs in a potential tsunami zone is reckless. The only evacuation route is Interstate 5, situated adjacent to the plant. It is even more frightening considering that the San Onofre nuclear facility is adjacent to Camp Pendleton, one of the largest military installations on the West Coast, a potential target for terrorists. This is madness! (0453-1 [Feathers, Jösan])

Comment: The proposed new Rule on Waste Confidence is deficient in the following three fundamental respects: 1. It does not require a site specific Waste Storage Plan for each existing or proposed nuclear power generating station. (0454-1 [Waldstein, Joe])

Comment: The operating assumption behind the new proposed rule is that Waste Storage at individual sites is intrinsically safe for as long as necessary (multiple generations) regardless of the environmental conditions and population density surrounding each plant. This seems to be an arbitrary assumption, conveniently concocted to deny risk and save money. The focus of any rule which speaks confidently to a given population should be the safety of the community. (0454-4 [Waldstein, Joe])

Comment: Environmental impacts are shown as "generic," no distinction is made of added risks at sites such as San Onofre that are in earthquake and tsunami zones on small and valuable pieces of land near major population centers and transportation corridors. (0464-4 [Nelson, Pam])

Comment: Importantly, the NRC should perform site-specific risk assessments and environmental impact statements for each U.S. reactor. The reason for this is perfectly exemplified by the Indian Point nuclear power plant, which is unique in several ways:

- Indian Point sits in a more densely populated area than any other U.S. plant, with more than 20 million people living within 50 miles.
- The plant sits adjacent and nearby to State designated significant fish and coastal wildlife habitats.
- Since at least the 1990s, radioactive toxins such as tritium and strontium-90 have been leaking from at least two spent fuel pools at Indian Point into the groundwater and the Hudson River. The pools at Indian Point are already compromised and are sure to continue causing environmental impacts in the future. For example, in January 2007 Strontium-90 was detected in four out of 12 Hudson River fish tested.
- Parts of New York City's drinking water supply, which provides 9 million New Yorkers with

unfiltered drinking water, are less than 15 miles away from Indian Point.

- Indian Point sits at the intersection of two active earthquake faults; these faults could produce upwards of a 7.0 magnitude earthquake, which Indian Point was not initially built to withstand.

- Indian Point's spent fuel pools, which were never designed to hold the nearly 2,000 tons of toxic waste now stored at the plant, are highly vulnerable to terrorism and accidents.

It is clear that the nuclear waste stored at Indian Point poses a unique risk, which warrants site-specific examination. (0465-8 [Commenters, Multiple])

Comment: It is urgent for the NRC to look into best practices for each specific site and not try to apply a convenient and unscientific solution to all nuclear power plants. (0472-3 [Sheridan, Paul])

Comment: 2. Even if the framework used were correct, the Draft GEIS provides no evidence for the assertion that environmental consequences do not vary across Alternatives. The NRC states that environmental impacts of continued storage scenarios will be the same regardless of which of the Alternatives described above is selected. The rationale provided is that because, under each Alternative, the NRC would analyze the environmental impact of continued storage (either site-specific or generically), the Alternatives provide for the same level of environmental protection (Draft GEIS, pg. xxvi, lines 5-11). Limited discussion is offered in the Draft GEIS to support this assertion; in fact, elements of the document suggest that site-specific information could improve decisions related to continued storage, as described below. The NRC's criteria for determining that a generic analysis is appropriate are, in this case, flawed. The rationale provided by NRC is that continued storage of spent fuel is a generic activity that is similar for all commercial nuclear power plants and storage facilities and, therefore, a generic analysis is an appropriate method of evaluating the environmental impacts of continued storage (Draft GEIS, pg. xxiv). The Court's standard for a generic evaluation is quite different, however, specifying that a general analysis would be sufficient, "...to examine on-site risks that are essentially common to all plants." (New York v. NRC, 681 F.3d 471 (D.C. Cir. 2012), pg. 16) Here, the Court describes that the appropriate comparison across sites to justify a generic analysis is the risk, whereas the NRC relies on a comparison of fuel-handling activities. While the design and regulation of continued storage facilities and activities may be similar across sites, the affected environment, and therefore relative resources at risk due to a severe event, may differ. For example, the setting of a given power plant, including its proximity to people, development, economic activities, and ecological and cultural resources, is an important consideration in evaluating environmental consequences of continued storage. Given this variation across sites, the public will likely raise site-specific issues associated with continued storage during licensing decisions that will need to be addressed. The GEIS does not include sufficient information to address concerns regarding site-specific risks and associated mitigation strategies, thus limiting its usefulness as a generic evaluation. An unequivocal example of the site-specific nature of environmental consequences considers the effects of postulated accidents or catastrophic events across sites. Environmental consequences of accidents and events in the Draft GEIS are calculated in part based on human health and mortality effects (as described in Appendix F), which are directly related to the magnitude of the population exposed. However, the Draft GEIS includes only limited discussion of the variability across sites with respect to the number of people residing in proximity to the plants. (0473-1-13 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The Draft GEIS states that the population density for a 50-mile radius surrounding more than 50 percent of the plants is fewer than 200 persons per square mile. In contrast, the largest population density, surrounding Indian Point Nuclear Generating Station in Westchester County, New York, is an order-of-magnitude greater than this, with 2,138 persons per square

mile within the 50-mile radius (Draft GEIS, pg. 2-4). The consequences of a catastrophic event would therefore be measurably greater at the Indian Point site than a rural site due to the size of the population exposed. The Draft GEIS identifies another example of the site-specific nature of impacts of continued storage. As described further below, following the earthquake and tsunami incident at the Fukushima Dai-ichi nuclear power plant in Japan, the NRC requested that all U.S. plants identify and address vulnerabilities and adequacies of monitoring and maintenance procedures, and re-evaluate the flooding and seismic hazards of the plants (Draft GEIS, pg. 2-11). This example indicates that the NRC does not have all of the information it requires to determine that environmental consequences are small across Alternatives, and that site-specific information is imperative to properly evaluate and address safety concerns and environmental impacts. According to the NRC's framing of Alternatives, under the No Action Alternative or Policy Statement Alternative, a site-specific evaluation of continued storage would weigh specific issues or vulnerabilities at a given site (such as discussed in these examples); on the other hand, the Proposed Action and GEIS-Only Alternatives would not. Therefore, even under the NRC's framework, the No Action or Policy Statement Alternative may lead to a different conclusion with respect to environmental impacts at a given site (e.g., large or moderate as opposed to small for postulated accidents), and promote consideration of appropriate site-specific management or mitigation needs. In this way, a site-specific approach to NEPA compliance has the potential to lead to improved environmental outcomes. Because the Draft GEIS has not demonstrated either that: a) consequences, probability of those consequences, are therefore risks, are common to all plant sites; or b) that site-specific analyses would not lead to different outcomes than a generic analysis, the NRC has not supported its proposal to follow a GEIS approach to evaluating impacts of continued storage (with no issues identified as requiring site-specific analysis). While this does not necessarily indicate that all sites would require site-specific analysis, generically codifying that continued storage is equally safe across all sites across all time frames would effectively preclude the need for careful consideration of important site-specific conditions, vulnerabilities, and mitigation needs. (0473-1-14 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The Draft GEIS fails to demonstrate that site-specific evaluations would not result in different findings than the GEIS with respect to environmental consequences. This demonstration is required to support the decision to follow a GEIS approach with no issues identified as requiring site-specific analysis. (0473-1-4 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The Draft GEIS only considers environmental impacts of limited storage scenarios and does not specify whether, and in what context, additional scenarios may be considered at a given site or in general. In short, while the Draft GEIS appears to conclude that site specific factors can be considered at a later time, the overall conclusion is that no such site specific analyses would be required with respect to environmental impacts of continued storage. (0473-1-6 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: THE DRAFT GEIS FAILS TO DEMONSTRATE THAT SITE-SPECIFIC EVALUATIONS WOULD NOT RESULT IN DIFFERENT FINDINGS THAN THE GEIS WITH RESPECT TO ENVIRONMENTAL CONSEQUENCES. THIS DEMONSTRATION IS REQUIRED TO SUPPORT THE DECISION TO FOLLOW A GEIS APPROACH WITH NO ISSUES IDENTIFIED AS REQUIRING SITE-SPECIFIC ANALYSIS. (0473-1-7 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: In response to the Court decision, the NRC incorporated additional timeframes (long-term and indefinite) into its Draft GEIS, and included additional discussion of high-consequence events (e.g., spent fuel pool fires, earthquakes, and acts of terrorism). This additional discussion in the 2013 Draft GEIS is, however, entirely ineffectual and plays no role in any real analysis. 1. The framework for and selection of Alternatives in the Draft GEIS does not provide a legitimate basis for evaluating environmental consequences. The Draft GEIS assumes that environmental impacts do not vary across Alternatives. Specifically, the NRC asserts that environmental impacts of continued storage scenarios will be the same regardless of whether the evaluation method is site-specific or generic. The conclusion that is reached in the Draft GEIS follows from this assertion: environmental impacts are not affected by the method of evaluation (i.e., whether generic or site-specific). In other words, the NRC asserts that the extent to which accidents at plants affect people and the environment is not influenced by the way NRC evaluates them. Importantly, however, the NRC's and the public's understanding of the nature and magnitude of impacts at a given site may be influenced by the method of evaluation. By not recognizing and evaluating the potential value of more information (e.g., on relative risk and socioeconomic context), the NRC assumes away any benefits of the Action Alternatives that would call for site-specific analysis. For example, as detailed later in this review, the probability of a seismic event or terrorist attack during the continued storage timeframes is variable by plant site. Site-specific information on the relative probability of such an accident and event, combined with information on the vulnerable population at the site, is required for an adequate evaluation of environmental impacts of such events. Because the Alternatives evaluated in the GEIS revolve simply around the decision to conduct or not to conduct site-specific analyses (as opposed to a real consideration of storage options), and the NRC simply assumes no benefit to integrating site-specific information, the consideration of environmental impacts in the Draft GEIS is rendered irrelevant to the selection of an Alternative. (0473-1-8 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: In the Revised GEIS for License Renewal issued earlier this year, NRC Staff states that: For severe accidents, the probability-weighted consequences of atmospheric releases, fallout onto open bodies of water, releases to groundwater, and societal and economic impacts from severe accidents are SMALL for all plants. However, alternatives to mitigate severe accidents must be considered for all plants that have not considered such alternatives. This is a Category 2 issue. NUREG-1437, Rev. 1 (Mar. 2013), ML13106A241 at S-17. This finding applies to nuclear power plants during their licensed life. And yet the Waste Confidence DGEIS treats this issue generically for the post-operation time period, with no indication why it is treating severe accident mitigation alternatives differently than the License Renewal GEIS does during a facility's licensed life. In addition, as noted earlier, in all previous analyses of spent fuel storage at reactor sites -- most notably NUREG-0575 and NUREG-1738 -- the NRC has concluded that there are factors that are inherently site-specific and require site-specific consideration. The DGEIS does not recognize these site-specific factors and does not provide for addressing them in future individual licensing proceedings. (0473-13-1 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: NRC has also historically treated severe accidents related to a spent fuel pool differently than severe accidents at an adjacent reactor. Early analyses of severe accidents focused exclusively on reactor accidents. WASH-740 (1957); WASH-1400 (1975). At the time these studies were developed, the Atomic Energy Commission's and the Nuclear Regulatory Commission's stated policy was that spent nuclear fuel would be quickly removed from the reactor sites and transported to a reprocessing or disposal facilities. The federal agencies told the public that reactor sites would not become radioactive waste storage sites. Given this policy there was no need for large spent fuel pools or dense storage of spent fuel in the pools. As a

result, given the minimal inventory anticipated for the existing spent fuel pools there was little perceived need to examine severe accidents in spent fuel pools. Even if that dichotomy in the approach to severe accidents was reasonable decades ago when a permanent repository was expected in some reasonable timeframe, it is no longer appropriate given the fact that fuel storage is occurring at different plants and different sites.²⁵ [footnote 25 text: 25 Limerick understood that generic analysis for permanent spent nuclear fuel disposal was only appropriate because there would be a permanent repository. *Limerick Ecology Action, Inc. v. NRC*, 869 F.2d 719, 738 (3d Cir. 1989) ("Given that the NRC's long-term storage plans did not provide for permanent storage at each individual site, the common storage of the wastes in bedded-salt repositories provided a generic basis for the regulation because the effect of long-term storage could be expected to arise from the situs of the waste, rather than from the particular characteristics of the plants at which the waste was generated."). Twenty five years after Limerick, the Nation is no closer to an operating permanent repository. At various sites, including, for example, Indian Point and Pilgrim, the spent fuel pools that are outside containment hold more potential source term of radiation than do the adjacent reactors that are inside the containment shell.] NRC's spent fuel pool exception to the requirement that mitigation of severe accidents be handled on a site-specific basis is no longer rational. *Limerick Ecology Action, Inc. v. U.S. Nuclear Regulatory Comm'n*, 869 F.2d 719 (3d Cir. 1989), requires a site-specific analysis of mitigation of severe accident risk. There, the Third Circuit held that NEPA requires NRC to examine the environmental effects of significant accidents at nuclear power plants and measures to mitigate those effects. The Limerick court recognized that "the potential consequences [of a severe accident] will largely be the product of the location of the plant." *Id.* at 738. "[T]he same probability of the same accident in a plant such as Limerick will produce a higher risk than that produced by the same accident at a plant not located within twenty-five miles of a major metropolitan area. Therefore, it is unlikely that severe accident mitigation can be treated as a generic issue. In fact, in its conclusion that severe accidents pose "no undue risk," the [NRC's] Final Policy Statement did not take into account the added risks of a plant located in a densely populated area." *Id.* at 738-39 (emphasis added). (0473-13-2 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Former NRC Commissioner Victor Gilinsky recommended that spent fuel storage be examined on a site-specific basis in his *Separate Views Regarding Proposed Amendments to 10 CFR Parts 50 and 51, Waste Confidence Proceeding*, 48 Fed. Reg. 22730 (May 20, 1983) ("While I agree that there is no obstacle in principle to extended on-site storage, I think it is clear that each power reactor site will have to be examined in detail."). Allan S. Benjamin et al., *Spent Fuel Heatup Following Loss of Water During Storage* (Sandia National Laboratory, NUREG/CR-0649, SAND77-1371) at 50 ("1979 Sandia Report") (Mar. 1979) ("The high density holders ... are the least well-suited to heat removal, as expected, particularly if the spent fuel is packed wall-to-wall so as to preclude a down-comer space at the edge of the pool."); see 2006 Sandia Report at viii ("[D]ispersed configurations [of spent fuel assemblies] provided additional time for mitigative actions before the release of fission products versus a non-dispersed configuration."); see also NAS Report at 103 ("[M]odifying the storage racks to provide for closer spacing of the fuel assemblies ... can make it more difficult to cool the freshly discharged fuel if there is catastrophic loss of the fuel pool water.") (0473-13-3 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: For example, they ignore the unique, site-specific consequences that would occur as a result of a severe accident at Indian Point. The ISR Report details why Indian Point needs to be examined on a site-specific basis, but some of the general conclusions are summarized here. * In the reference case of Peach Bottom used in the Spent Fuel Pool Consequence Study, the total population within a 50-mile radius is 5.7 million. By comparison, the total population

within a 50-mile radius surrounding the Indian Point site is 17 million. * The wind rose (i.e., probability of wind directions) of the site has a direct correlation to the probability of certain areas being contaminated and thus requiring mitigative actions. In the Spent Fuel Pool Consequence Study, the reference plant's wind rose was such that the predominant wind directions were towards lower population areas (Spent Fuel Pool Consequence Study, Section A.2). By comparison, the predominant wind directions at the Indian Point site are to the North/North-Northwest and to the South; the latter would affect the New York City metropolitan area, one of the most populated areas in the United States. * The value of nonfarm wealth (VALWNF) includes all public and private property not associated with farming that would be unusable if the region was rendered either temporarily or permanently uninhabitable. This value should include the cost of land, buildings, infrastructure, and the cost of any non recoverable equipment or machinery (MACCS2 manual). The value chosen for the Consequence Study, which uses the Peach Bottom site as the reference case, is \$210,000/person (2012 USD). By its definition, this value is site-specific. As a comparison, in its submission for a license renewal for Indian Point Units 2 and 3, Entergy calculated VALWNF to be \$209,000 (2004 USD). In 2012 USD, this value is approximately \$250,000, which is 20% higher than the value used in the Spent Fuel Pool Consequence Study. * The per capita cost of long-term relocation (POPCST) takes into account both personal and corporate income losses, as well as moving expenses, for a transitional period. The value chosen for the Spent Fuel Pool Consequence Study is \$12,000/person (2012 USD). This value is site-specific. For example, in the state of New York, the average per capita income is approximately \$32,000 (2011 USD). Using an interdiction period of 140 days as recommended in NUREG/CR-4551, the total amount of lost wages is \$12,600/person (2012 USD). With the addition of corporate income losses and moving expenses, this amount is expected to be higher than the value used in the Spent Fuel Pool Consequence Study. * The cost and time for decontamination, CDNFRM and TIMDEC respectively, are not site-specific, and do not take into account the differences in decontamination efforts required for varied land use surrounding the site (e.g., rural, semi-urban and urban). Table 1: Summary of site-specific MACCS2 input parameters relevant to Indian Point (0473-13-9 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: In many instances, NRC is not able to predict the environmental impacts of spent fuel pool leaks because these impacts are dependent on site-specific factors. The following are several examples of statements from the DGEIS where NRC indicates that impacts can be determined only on a site-specific basis: • "The impacts of a spent fuel pool leak on offsite groundwater depend on many factors, including the volume and rate of water released from the spent fuel pool, the radionuclide content and concentration and water chemistry of the spent fuel pool water, the direction of groundwater flow, the distance to an offsite groundwater receptor, the velocity or transport rates of radionuclides through the subsurface, and radioactive decay rates." DGEIS at E-16. • "Contaminants may enter an aquifer system and be transported with the hydraulic gradient. The direction and rate of contaminant transport will depend on the site-specific properties of the aquifer." DGEIS at 3-18 to 3-19. • "The concentrations of radionuclides in offsite surface waters will depend on the rate of release from the spent fuel pool, direction and rate of groundwater flow, the distance to nearby offsite surface waters toward which groundwater flows, the velocity of transport rates of radionuclides through the subsurface, and radioactive decay rates." DGEIS at E-17. • "The degree of offsite soil contamination will depend on the rate of release from the spent fuel pool, direction of groundwater flow, the distance to offsite locations, the velocity or transport rates of radionuclides through soils, and radioactive decay rates." DGEIS at E-18. Simply listing the site-specific factors that determine the impact of spent fuel pool leaks does not allow NRC or the public to reasonably anticipate what those impacts will be. Impacts may only be analyzed generically if they "do not involve particularized

situations." *Minnesota v. NRC*, 602 F.2d 412, 416 (D.C. Cir. 1979)) and only if they involve "on-site risks that are essentially common to all plants" (*New York v. NRC*, 681 F.3d at 480). NRC's inability to generically determine what the impacts of spent fuel pool leaks will be shows that this is a particularized situation that necessitates site-specific review. NRC must review the impacts of spent fuel pool leaks on a site-specific basis both because the consequences of such leaks vary from site to site but also because the probability of such leaks vary based on the specific characteristics of the spent fuel pool and spent fuel in the pool. Some factors that should be examined for each individual plant include: the geological landscape underlying the reactor and the spent fuel pool (including the composition of the subsurface, direction of groundwater flow, etc); the nature and uses of nearby resources (such as the proximity of wells supplying drinking water and the classification of local water bodies); the degree to which already existing groundwater contamination from past radiological leaks may affect the impact of new leaks; the ecology of local water bodies; the presence of nearby significant habitats and endangered species; and possible site-specific causes of leaks (tornados, earthquakes, flooding, etc). Factors relevant to the characteristics of the pool and its contents include the rack configuration used in the pool, the types of equipment and devices used to provide boron to offset the potential for criticality accidents, and the vulnerability of the fuel to leaks due to the presence of high burnup fuel in the pool. (0473-15-7 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Finally, as they did with severe accidents as discussed above, the NRC has taken internally inconsistent positions on whether leaks should be evaluated on site-specific or generic basis, evaluating them on a site-specific basis during the licensed life of a facility in the GEIS for License Renewal, but proposing to evaluate them generically here for the post-licensed life period of time. See NUREG-1437, Rev. 1 (Mar. 2013), ML13106A241 at 1-24 (stating that despite comments requesting generic review of leaks, "[r]adionuclides released to groundwater" remains a Category 2 issue). Neither DGEIS provides a basis for this inconsistent treatment of the same issue. (0473-15-8 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Overall, a more reasoned and informed approach would be for the NRC to consider site-specific event scenarios (e.g., seismic events, aircraft crashes, tornado missiles, spent fuel fires, cask drops, terrorist attacks, etc.), and describe the consequences of these events. While information on probabilities of these events may be important, the NRC has indicated that they do not have enough information to assess these probabilities across all event types and sites. However, site-specific analysis would allow NRC to gather and consider helpful information, such as site-specific vulnerabilities (as they have recently requested regarding seismic risks), and reference available site-specific information (e.g., locations of populations) in making determinations regarding environmental consequences. (0473-2-5 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: THE DRAFT GEIS ONLY CONSIDERS ENVIRONMENTAL IMPACTS OF LIMITED STORAGE SCENARIOS AND DOES NOT SPECIFY WHETHER AND IN WHAT CONTEXT ADDITIONAL SCENARIOS MAY BE CONSIDERED AT A GIVEN SITE OR IN GENERAL. IN SHORT, WHILE THE DRAFT GEIS APPEARS TO CONCLUDE THAT SITE SPECIFIC FACTORS CAN BE CONSIDERED AT A LATER TIME, THE OVERALL CONCLUSION IS THAT NO SUCH SITE SPECIFIC ANALYSES WOULD BE REQUIRED WITH RESPECT TO ENVIRONMENTAL IMPACTS OF CONTINUED STORAGE. (0473-3-2 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Overall, the Draft GEIS does not frame the Alternatives to the Proposed Action in a manner that promotes meaningful analysis of the environmental impacts of continued storage either at a site- specific level or in general. In structuring the Alternatives around the approach to complying with NEPA (i.e., developing a generic or site-specific analyses), and assuming away any benefit of site-specific evaluations, the NRC has reduced the comparison of Alternatives to the relative level of administrative effort required. Furthermore, the Draft GEIS does not sufficiently support the driving assumption in the document that there is no benefit to developing site-specific analyses of continued storage. As described in this review, site-specific evaluations can provide more and better information on relative risk of high-consequence events and appropriate mitigation strategies across sites, thus leading to improved environmental outcomes. (0473-4-1 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Finally, the Tribe expressed its concern during the December 4, 2013 public meeting in Minnetonka, Minnesota, that due to its close proximity to the PINGP and its ISFSI, its reservation homeland could be rendered uninhabitable by a spent fuel accident in the PINGP's spent fuel pool or dry cask storage installation. See Testimony of Tribal Council Member Ronald Johnson during the December 4, 2013; Waste Confidence Public Meeting in Minnetonka, MN December 4, 2013, Transcript of Proceedings at 17-22 (ML13344B149). The Tribe stated that this potential site- specific impact implicates the NRC's trust responsibility to federally-recognized Indian tribes, and cannot possibly be assessed generically. Id. (0473-6-3 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The DGEIS simply does not provide an environmental analysis that is sufficient to justify eliminating consideration of spent fuel disposal impacts or storage impacts from every licensing proceeding. (0531-1-14 [Morgan, Sally])

Comment: To continue to pursue licensing on the basis of Waste Confidence -- despite the new Generic Environmental Impact Statement and Rule -- is illegal and immoral. CWFNC calls to scrap the GEIS and hold the NRC accountable for individual EIS for each reactor that do not underestimate the likelihood and environmental damage of nuclear waste leakage. (0531-1-16 [Morgan, Sally])

Comment: The new GEIS does not properly analyze the environmental effects of permanent disposal. It continues to look in a generic fashion at risks across the board at nuclear plants, rather than by conducting a site-by-site analysis of each specific nuclear plant. A site-by-site analysis is necessary, because risks of leaks and fires, especially over the long term, are affected by site-specific factors, such as pool configuration, leak detection systems, and the location of the pool within the plant. (0531-1-6 [Morgan, Sally])

Comment: The DGEIS simply does not provide an environmental analysis that is sufficient to justify eliminating consideration of spent fuel disposal impacts or storage impacts from every licensing proceeding. (0531-2-24 [Morgan, Sally])

Comment: To continue to pursue licensing on the basis of Waste Confidence -- despite the new Generic Environmental Impact Statement and Rule -- is illegal and immoral. CWFNC calls to scrap the GEIS and hold the NRC accountable for individual EIS for each reactor that do not underestimate the likelihood and environmental damage of nuclear waste leakage. (0531-2-26 [Morgan, Sally])

Comment: The new GEIS does not properly analyze the environmental effects of permanent disposal. It continues to look in a generic fashion at risks across the board at nuclear plants, rather than by conducting a site-by-site analysis of each specific nuclear plant. A site-by-site analysis is necessary, because risks of leaks and fires, especially over the long term, are affected by site-specific factors, such as pool configuration, leak detection systems, and the location of the pool within the plant. (0531-2-6 [Morgan, Sally])

Comment: And because environmental impacts are shown as "generic," no distinction is made of added risks at sites such as San Onofre that are in earthquake and tsunami zones on small and valuable pieces of land near major population centers and transportation corridors. (0540-4 [Watland, George])

Comment: Overall, the proposed NRC Statement underrates risks at all sites, blurs or eliminates the fact of higher risk at some sites, and seeks to walk away from the search for less hazardous sites. (0540-7 [Watland, George])

Comment: The U.S. Court of Appeals rejected the current Waste Confidence Rule noting that, after decades of failure to site a repository, the NRC has no long-term plan other than hoping for a geologic repository. It is hence possible that the highly radioactive spent fuel will be stored at reactor sites on a permanent basis. The NRC must examine the environmental consequences of storing radioactive waste at reactor sites into the indefinite future. The NRC Draft Generic Environmental Impact Statement relies on the assumption that all reactor sites are alike. This flawed assumption makes one wonder how reliable the other parts of the GEIS are. Each site has unique geographical, environmental, geological, and epidemiological considerations. To wit, Diablo Canyon Power Plant on the central coast of California sits on many earthquake faults, a condition no other nuclear plant in the US faces. The creation of a one-size-fits all plan is scientifically invalid. (0541-1 [Justesen, Evelyn])

Comment: Start all over again by addressing each nuclear power plant as a separate identity each with its own unique problems. (0541-8 [Justesen, Evelyn])

Comment: The health risk assessment for a spent fuel fire was done using only three different nuclear power plants (Ginna, Surry and Zion), ignoring the idiosyncratic nature of each reactor in the US. Reactor sites all have different amounts of irradiated fuel that gives off different amounts of radioactivity. Fermi 2 has 600 tons of spent fuel in one overcrowded pool. The surrounding human populations are not equal nor are they distributed in the same way-- the dose calculations couldn't possibly be the same for all reactors. Realistic recognition of population numbers, local infrastructure, access roads, possible destinations, facilities for displaced populations, vary with each location of reactors. (0552-2-15 [Macks, Vic])

Comment: The seismic risks for the spent fuel pools in highly earthquake-prone areas are ignored. The seismic risk for Diablo Canyon, San Onofre and Columbia fuel pools were deliberately glossed over, by the NRC's own admission, since the one reactor used in the NRC's "Consequences Study" is in Pennsylvania (Peach Bottom). (0552-2-16 [Macks, Vic])

Comment: Because of the major variations in climate, geologic, and other conditions of the various elements and "activities" related to continued-storage sites across coterminous U.S., generic descriptions of environmental impacts can at best provide only a framework for selected types of impacts. The procedures for establishing a generic basis for impact assessment omit some critical sources of potential environmental impact and rationalize the safety of others on the basis of very limited data. (0553-2 [Wilshire, Howard])

Comment: The approach is stated in the Abstract, p. iii as follows: "For the resource areas considered, this draft GEIS attempts to establish generic impact determinations that would be applicable to a wide range of existing and potential future spent fuel storage sites," using "some site-specific information in developing the generic impact determinations..." And further, a goal is stated to "...identify the types and assessing the magnitude of environmental impacts where generic findings can be established." Comment: These statements provide no information on exactly what characteristics/activities/properties of all elements of ISFSIs do not qualify for generic findings, and how many sites have such disqualified characteristics. These must be specified as they may (and do for some known characteristics) represent sources of environmental impacts that are of overriding importance in establishing and maintaining integrity and safety of continued storage. Information should be supplied on the number of sites, including all time frames, to which the chosen set of generic findings do not apply [the language quoted above "...establish generic impact determinations that would be applicable to a wide range of existing and potential future spent fuel storage sites" implies that the determinations are not universal]. (0553-3 [Wilshire, Howard])

Comment: Most of the identified elements of affected environment are described as widely ranging, variable, many are site-specific, or occur only at certain sites. This being the case how can environmental impacts be reduced to generic assessment? (0553-5 [Wilshire, Howard])

Comment: The DGEIS treats environmental impacts generically. They should be evaluated on a site-specific basis. The potential impact on different reactors varies widely. The potential impact on a reactor like Pilgrim is far greater, in both consequences and likelihood, than NRC's "generic" conclusion. (0556-1-10 [Lampert, Mary])

Comment: The purpose of the proposed action according to NRC is "to improve the efficiency of the NRC's licensing process by generically addressing the environmental impacts of continued storage." (DGEIS, ES.4) However, efficiency is not NRC's AEC mandate; instead it is to protect public health and safety. PW shows that the potential environmental impacts vary from site to site and must be considered on a site-specific basis, not generically. If they were addressed on a site by site basis, PW shows that the impact would be far from small. *No two reactors are alike - they vary on likely environmental impact after license termination; 1.* Reactors vary in Location requiring site specific analysis: Whether reactors are located in regulated or deregulated electric markets; their susceptibility to natural events, impact of climate change on each reactor; impact proximity to a marine environment; groundwater issues; proximity to high population centers; susceptibility to acts of malice; proximity to cultural and historic resources; accessibility to LLRW disposal; number safety violations varies regionally; likely impact on public and occupational health. (0556-1-14 [Lampert, Mary])

Comment: Reactors vary from one another and individually over time in the likelihood of a severe earthquake. They should be examined individually. Pilgrim, for example, was once rated the second least likely to be damaged by seismic activity, but in August 2011 it was re-ranked as the second most likely. Therefore the damage analyses from an earthquake made when the pool and its structures were built underestimate the risk after operations cease. NRC Chair, Dr. Macfarlane said to the New York Times¹ [footnote 1 text: For New Nuclear Chief, Concerns Over Plant Safety, Matthew Wald, NYT, August 13, 212] that: "As a geologist, I also know that geological knowledge is constantly changing...The American industry recently began a re-evaluation of its earthquake vulnerability after the United States Geological Survey released a new estimate of the prospects for earthquakes in the eastern United States. And there may be more revisions in the future." Matthew Wald reported that "she considers the industry's

evaluation of earthquake vulnerability -- an issue that was once believed to be settled when a nuclear power plant was licensed -- to be inadequate." (0556-1-16 [Lampert, Mary])

Comment: Some reactor sites are in environments that are particularly vulnerable to adverse effects of groundwater contamination. Groundwater contaminations from spent fuel pool leaks may affect known drinking water sources and impinge on Native American trust lands. Examples are Prairie Island and Columbia. (0556-1-22 [Lampert, Mary])

Comment: A historically well-maintained reactor is likely to age better than one neglected and present less environmental risk over the 60 years after the license ends. For example, Pilgrim was poorly maintained in its early years. It was forced to shut down from 1987- 1990. In its later years, Entergy, unable to compete in a deregulated market with cheaper sources of electricity, cut maintenance and personnel. In 2013 alone Pilgrim had 18 event reports and 10 times more shutdowns than any other reactor. On November 6, the NRC announced that it had dropped Pilgrim's performance rating because of shutdowns with complications, placing it among 15 plants in the country requiring more oversight. And only a few days later, the NRC told Entergy that Pilgrim's rating is likely to drop again next month, placing it among the 8 worst performers. Therefore leaks and malfunctioning of systems required to maintain the water in the spent fuel pool have a much higher probability of failure than a reactor that does not have a history of financial distress, cut backs in maintenance/ personnel, and mismanagement. (0556-1-33 [Lampert, Mary])

Comment: Leakage from spent fuel pools varies from site to site; and at many sites, it is significant, especially when taken together with leakage from other parts of the reactor. These cumulative impacts must be evaluated on a site-specific basis. NUREG/CR-7111¹¹ [footnote 11 text: <http://www.nrc.gov/reading-rm/doc-collections/nuregs/contract/cr7111/>] provides a summary of aging effects and their management in reactor spent fuel pools. It lists (at 7.1.2) 10 sites that have *identified leaks*. At 7.2.1 it says that repairs in the reactor refueling cavity and spent fuel pool structures are difficult and sometimes impractical. Also, environmental impacts of leaks are likely to be more severe at reactors where NRC oversight has been weak or erratic. The NUREG shows the necessity to evaluate each individual reactor to determine the environmental impact from leaks. [THERE ARE THREE TEXT BOXES INSERTED HERE. ONE CONTAINS THE FIRST PART OF SECTION 7.1.2 SPENT FUEL POOL LEAKAGE FROM NUREG/CR-7111 THE SECOND ONE CONTAINS THE SECOND PART OF SECTION 7.1.2 AND THE THIRD IS SECTION 7.2.1] [Images of Text Boxes Submitted with Correspondence ML13354A021] (0556-1-34 [Lampert, Mary])

Comment: PW supports the need for NRC to address the environmental impacts of continued storage for the period after plant shutdown in site-specific licensing reviews, as discussed above. The rationale is simple. Reactors vary in location, design, history, and oversight by the responsible parties. (0556-5-10 [Lampert, Mary])

Comment: This conclusion is bolstered by the fact that a number of coastal nuclear plants are located in densely populated areas. Although the DGEIS states that the majority of U.S. nuclear power plant sites are located in relatively sparsely populated areas (DGEIS at 2-4), the Indian Point plant in New York, located on the tidal Hudson River and subject to storm surge from coastal storms, has the largest nearby population density in the United States, and among the highest in the world. Id.; Declan Butler, "Reactors, residents, and risk," *Nature*, Apr. 21, 2011, available at <http://www.nature.com/news/2011/110421/full/472400a.html>. Moreover, the DGEIS's blanket statements about low population density obscures the fact that many low-lying, potentially vulnerable plants are located in densely populated areas. For instance, several U.S.

coastal or riparian reactors located below ten meters in elevation have surrounding populations between 2 and 10 million people within 75 km, and one (Indian Point), has nearly 20 million.⁵ [footnote 5 text: Center for International Earth Science Information Network (CIESIN), Columbia University, Low Elevation Coastal Zone (LECZ) Urban-Rural Population and Land Area Estimates, Version 2, Palisades, NY: NASA Socioeconomic Data and Applications Center (SEDAC), available at <http://beta.sedac.ciesin.columbia.edu/data/set/lec2-urban-rural-population-land-area-estimates-v2>, accessed Dec. 17, 2013; Declan Butler, "Reactors, residents, and risk," *Nature*, Apr. 21, 2011, available at <http://www.nature.com/news/2011/110421/full/472400a.html>. See also Bobby Magill, "Sandy a Warning Rising Seas Threaten Nuclear Plants," *Climate Central*, Oct. 21, 2013, available at <http://www.climatecentral.org/news/sandy-a-warning-that-nuclear-plants-threatened-by-rising-seas-16622>] (0558-6 [Strell, Ethan])

Comment: In June 2012, the Court of Appeals for the DC Circuit ruled that the 2010 Waste Confidence rulemaking by the Nuclear Regulatory Commission did not satisfy the Commission's National Environmental Policy Act or NEPA obligations, identifying deficiencies in the 2010 Waste Confidence rule. Specifically, the Court stated: "...In determining that spent fuel can safely be stored onsite at nuclear plants for sixty years after the expiration of a plant's license, (and here I add emphasis), the Commission failed to properly examine future dangers and key consequences". This Draft Generic Environmental Impact Statement is the Commission's response to the Court's ruling and an attempt to address NEPA shortcomings in the 2010 Waste Confidence rule. However, as the DGEIS states, the responsibilities of Federal agencies under NEPA is to "Consider the environmental impacts in making decisions" and subsequently "Assess the environmental impacts of major Federal actions." Thus, the Commission cannot assess the environmental impact of its Waste Confidence rule if it doesn't consider all environmental impacts in making its decisions. Producing a Generic Environmental Impact Statement neither fulfills it NEPA obligations nor addresses the Court's concerns over "...future dangers and key consequences". Only by analyzing each individual nuclear site can the Commission ever hope to adequately address the unique aspects of the various sites and thus properly determine all environmental impacts the Waste Confidence rule will have. And only then can the Commission say it has: "...properly examined future dangers and key consequences." So, go back and review all environmental impacts the Waste Confidence rule will have on each and every site. (0576-1 [Blackburn, Lee])

Comment: in June 2012, the Court of Appeals for the DC Circuit ruled that the 2010 Waste Confidence rulemaking by the Nuclear Regulatory Commission did not satisfy the Commission's National Environmental Policy Act or NEPA obligations, identifying deficiencies in the 2010 Waste Confidence rule. Specifically, the Court stated: "...In determining that spent fuel can safely be stored onsite at nuclear plants for sixty years after the expiration of a plant's license, (and here I add emphasis), the Commission failed to properly examine future dangers and key consequences". This Draft Generic Environmental Impact Statement is the Commission's response to the Court's ruling and an attempt to address NEPA shortcomings in the 2010 Waste Confidence rule. However, as the DGEIS states, the responsibilities of Federal agencies under NEPA is to "Consider the environmental impacts in making decisions" and subsequently "Assess the environmental impacts of major Federal actions." Thus, the Commission cannot assess the environmental impact of its Waste Confidence rule if it doesn't consider all environmental impacts in making its decisions. Producing a Generic Environmental Impact Statement neither fulfills it NEPA obligations nor addresses the Court's concerns over "...future dangers and key consequences". Only by analyzing each individual nuclear site can the Commission ever hope to adequately address the unique aspects of the various sites and thus properly determine all environmental impacts the Waste Confidence rule will have. And only

then can the Commission say it has: "...properly examined future dangers and key consequences." So, go back and review all environmental impacts the Waste Confidence rule will have on each and every site. (0578-2 [Blackburn, Lee])

Comment: The stated purpose of the Draft GEIS is to generically analyze environmental impacts of spent nuclear fuel storage so that the NRC may revise its waste confidence rule, 10 C.F.R. § 51.23, to eliminate the need to conduct NEPA analyses for continued storage during future reactor and spent fuel facility licensing actions.⁷ [footnote 7 text: Draft GEIS at 1-5] To justify the implementation of the waste confidence rule, the Draft GEIS states that implementing the waste confidence findings as a GEIS only alternative or as a policy statement "could result in the considerable expenditure of public, NRC, and applicant resources" and that "licensing boards could be required to hear nearly identical contentions [on generic issues]."⁸ [footnote 8 text: Draft GEIS at 1-7.] The desire to improve the efficiency of NRC's licensing process by generically addressing environmental impacts is laudable. Nevertheless, irrespective of the amount of resources expended, it is NRC's statutory obligation to consider the environmental, safety and licensing aspects of individual storage proposals. Moreover, affected parties must have an the opportunity to participate in site specific licensing proceedings. Based on our experience in the PFS licensing matter, Utah recommends that the Commission take substantial precautions in determining what environmental impacts, if any, are eliminated from future consideration in site specific reviews. (0579-3 [Smith, Amanda])

Comment: Regarding the San Onofre nuclear power plant and waste storage, please make site specific approaches to storing nuclear waste and site-specific environmental reports and recommendations that take local conditions into account. Please take into account short term, long term, and very long term approaches to waste storage. Please apply the most strict and cautionary standards. (0585-1 [Marks, Lisa])

Comment: One subject of significant concern particularly to residents of Michigan and the Great Lakes Region is the issue of wet storage solutions for spent nuclear fuel, that is, actively managed pools. Appendix G "Spent Fuel Storage Facilities" (Pages G-1 to G-15) of the DGEIS specifically mentions Fermi, Unit 2 on Pages G-1 and G-4. The Fermi, Unit 2 nuclear fission reactor is located within a fifty-mile radius of Metro Detroit (MI), Ann Arbor (MI), Toledo (OH), Windsor (Ontario), and a large section of Lake Erie. Fermi, Unit 2's design is the notorious U.S. GE Mark 1 Boiling Water Reactor (BWR), and Appendix G notes that Fermi, Unit 2 has the largest spent fuel pool capacity of any operating BWR in the country -- hence, the potentially greater magnitude of consequences of severe leaks, fires, or other structural breaches of the pool. Why, then, does the NRC apply a generic analysis to "continued storage" in spent fuel pools for up to 60 (sixty) years after the end of the licensed operating life of a reactor? I submit that sixty years is a long time to live "on the edge." (0603-12 [Schonberger, David])

Comment: [T]he NRC must fully consider site-specific concerns[.] (0604-11 [Pisha, Gayla])

Comment: The most important problem with the GEIS is that it "considers the continued storage of spent fuel a generic activity that is similar for all commercial nuclear power plants and storage facilities." (Executive Summary, p. xxiv) It is vital that each plant have its own evaluation, even though that will result in a higher cost, as discussed in Chapter 7 of the GEIS. (0604-2 [Pisha, Gayla])

Comment: Under the proposed action of preparing a GEIS and revising 10 CFR 51.23, the "NRC does not undertake site-specific reviews of the continued storage issue in the course of individual licensing proceedings." (ES, p. lvii) However, sites such as Indian Point have unique

characteristics which bear on the environmental impacts of continued spent fuel storage. (0604-3 [Pisha, Gayla])

Comment: It is important that NRC consider plant specifics when assessing the environmental impact of waste storage. Various site specific factors can alter environmental impact, including a plant's proximity to hazards, sensitive ecosystems, and densely populated areas. A one-size-fits all approach, using an average plant, is simply inadequate for attaining a comprehensive understanding of environmental impact. (0607-2 [Messinger, Michael])

Comment: The No-Action alternative should not rely on the No-Action Alternative of the Yucca Mountain EIS for its conclusions or analysis. Among other things, the environmental impacts in the Yucca Mountain EIS No-Action Alternative were deliberately underestimated by the DOE. In the case the NRC does not issue a generic Waste Confidence rule, the No-Action Alternative should not presume that sufficient information exists to resume site-by-site licensing decisions. It does not. (0610-10 [Brechin, Vernon])

Comment: The No-Action Alternative as described in three paragraphs above should be the preferred alternative. (0610-11 [Brechin, Vernon])

Comment: Each of the nation's 103 nuclear plants have unique issues, are located in unique regions of the nation with different geological issues, have different operating histories, have different environmental considerations, and have different surrounding population densities and evacuation challenges. (0611-17 [Shapiro, Susan])

Comment: Therefore, supplemental EIS will be required at every site in the nation to address a multitude of site specific issues which are not and cannot be addressed in a generic review. (0611-20 [Shapiro, Susan])

Comment: A Generic EIS cannot adequately analyze seismic risk. The 100+ commercial nuclear reactors in the U.S. differ in their design, age, and siting. The GEIS offers a single analysis to assess the probability of an earthquake anywhere in the U.S. and its effects on a reactor, spent fuel pools or dry casks and the release of nuclear materials. The inadequacy of this approach is illustrated in a recent report by the Union of Concerned Scientists[.] (0614-1 [Christie, Andrew])

Comment: Should a comparable incident occur at the Diablo Canyon Nuclear Power Plant, California, the world's seventh-largest economy, would undergo a severe disruption and displacement of the population, with attendant environmental impacts, and suffer losses to the fishing, agriculture and tourism sectors of its economy measured in the billions of dollars.³ [footnote 3 text: The omission of any analysis of impacts to California's agriculture as the result of a radiological release is particularly unhelpful in light of the agricultural impacts of the Fukushima disaster, per Physicians for Social Responsibility: "80,000 farms in the Fukushima prefecture have been contaminated by the nuclear disaster, and crippling the local agriculture sector worth 250 billion yen. As of March 1, 2012, 25 percent of Japanese agriculture production or about 58 billion yen (\$694 million) had been lost. In 2011, the agriculture ministry reported that the cost of imported farm products jumped 16 percent to 5.58 trillion yen."] The omission of analysis of such impacts points up both the insufficiency of the GEIS and the error in considering a generic environmental review to be a substitute for the necessity of preparing a specific EIS for each facility. (0614-6 [Christie, Andrew])

Comment: The plan should be site-specific, not generic. The failure of the GEIS plan to make important distinctions based on particular situations is particularly troubling. How can the NRC write a report which states that earthquakes, tsunamis, human error, breakdowns, and terrorist vulnerability are trivial issues not worth worrying about? (0618-12 [Johnson, Roger])

Comment: Site-specific reviews (during subsequent licensing actions) would more accurately reflect NRC's current understanding of the environmental impacts of continued storage (at the time of the licensing action, rather than 60-100 years in the past). Rather than dismissing site-specific reviews because of the costs, the final GEIS should also include some discussion regarding the benefits of site-specific reviews. The environment of each ISFSI is unique and the benefits of evaluating the site-specific environmental impacts to these unique sites must be evaluated. (0619-1-21 [Mahowald, Philip R.])

Comment: Finally, if the potential health and environmental impacts associated with the storage of spent nuclear fuel in a permanent repository cannot be assessed generically, and therefore will necessitate a site-specific environmental impact statement, then the NRC ought not be allowed address generically the potential health and environment impacts of de facto permanent storage at multiple facilities around the country. Site specific analysis must be performed. (0619-1-22 [Mahowald, Philip R.])

Comment: Utilizing a "generic" environmental impact assessment, rather than requiring site-specific assessments, serves to further understate those risks. That it does not even require a site-specific prerequisite such as hardened on-site storage ("HOSS") containers with features known to safely extend their safe status and using "efficiency" (code word for "industry cost concerns") reflects the Commission's lack of independence from the industry it is supposed to oversee. (0620-7 [Rivera, Evelyn])

Comment: The impacts on tourism and commercial uses are not fully assessed in Sections 4.2 and 4.18 of the DGEIS. Tourism and commercial uses vary widely at reactor sites across the nation - a generic EIS cannot properly assess the impacts of long-term storage or of postulated accidents related to storage of spent nuclear fuel at all U.S. reactor sites. For example, Entergy's dry cask storage project at the Pilgrim plant in Plymouth, MA is being built approximately 100 feet from the shore of Cape Cod Bay (CCB). Marine based tourism in Massachusetts is largely dependent on CCB; it is an important economic driver for the state and for Plymouth and Barnstable counties in particular, which directly border the Bay.¹ [footnote 1 text: Massachusetts Department of Business and Technology. 2003. Massachusetts toward a new prosperity: Building regional competitiveness across the commonwealth.; Haughton J, Giuffre D, and Barrett J. 2003. Blowing in the wind: Offshore wind and the Cape Cod economy. Beacon Hill Institute at Suffolk University. ISBN-1-886320-19-5. 53 pp.] Marine tourism includes recreational fishing, boating, diving, swimming, sight-seeing, and whale watching. Stellwagen Bank National Marine Sanctuary, located about 3 miles (4.8 km) north of CCB, is a major destination for recreational fishing, boating, and whale watching. Several whale watching companies operate throughout CCB -including vessels out of Barnstable, Plymouth and Provincetown harbors. In 1996, it was estimated that the whale watching industry made US\$21 million in revenue for the state of Massachusetts.² [footnote 2 text: Massachusetts Ocean Management Task Force Technical Report (MA OMTFTR). 2004. Estuarine and Marine Habitat. 101-127.] Approximately six million tourists visit Cape Cod each year and Massachusetts is the eighth most popular U.S. destination for international travelers.³ [footnote 3 text: Massachusetts Department of Business and Technology. 2003. Massachusetts toward a new prosperity: Building regional competitiveness across the commonwealth.] Total annual output of the marine economy state-wide, based on 2004 data, was US\$14.8 billion with tourism accounting for US

\$8.7 billion of that total.⁴ [footnote 4 text: Coastal Zone Management, Massachusetts Office of (C.M). 2006. Report I - An assessment of the coastal and marine economies of Massachusetts. RFR #: ENV 06 CZM 09.] CCB is also important to commercial fishing operations (fin fishing, lobster fishing, and fishing charters), since a variety of commercially valuable species are found in the bay. To a lesser extent, CCB is also used for commercial ferry services, aquaculture operations, and for transportation for vessels going to and from the Cape Cod Canal.⁵ [footnote 5 text: Executive Office of Energy and Environmental Affairs (EOEEA). 2009. Draft Massachusetts ocean management plan. Volume 1. 141 pp] Impacts of continued spent fuel storage on tourism and commercial uses like those discussed above should be assessed by the NRC. (0622-1-15 [Vale, Karen])

Comment: This is extremely concerning and must be addressed with an individual EIS immediately. We support the "no action" alternative and at the very least believe that the NRC should perform site-specific reviews of the environmental impacts of continued storage at each facility in the nation. In particular, Pilgrim is located on the coast of Cape Cod Bay. The impacts of continued, long-term and/or indefinite spent nuclear waste storage and postulated accidents associated with an ISFSI or a spent fuel pool on such a unique and invaluable resource such as Cape Cod Bay - including its many diverse habitats and wildlife species upon which the region depends - needs to be properly assessed by the NRC. This has not been done with the subject generic EIS. (0622-1-3 [Vale, Karen])

Comment: The generic nature of the DGEIS results in a flawed assessment of environmental impacts associated with continued nuclear waste storage at individual plants. Our concern regarding the generic nature of the GEIS is discussed throughout this document. Plants have different equipment, differing ages of infrastructure, different environmental conditions and changes - it's much more complicated than could be covered by a generic EIS. For example, the Fukushima Daiichi disaster occurred largely as a result of location and elevation relative to the sea. Nowhere in the DGEIS does the NRC consider specific locations of individual plants. (0622-1-4 [Vale, Karen])

Comment: The DGEIS attempts to address globally significant superfund sites without consideration of site-specific challenges. To better understand the risks, the NRC should address questions such as: 1) Which reactors are within three miles of the east coast at an elevation below 100 MSL?, 2) Which facilities are on rivers with upstream dam/impoundments that could cause flooding if breached?, 3) Which facilities are on the west coast Pacific fault line?, 4) Which facilities could experience warming water temperatures, therefore cooling water failure?, and 5) Which facilities deal with corrosive salt water and air? (0622-1-5 [Vale, Karen])

Comment: Entergy has already started construction of its dry cask facility, without review of any external party, which raises many concerns. Knowing that Entergy's facility is being built with little oversight, and no apparent assessment of its vulnerability to sea level rise and other climate change effects, and before the NRC finishes addressing environmental impacts of continued spent fuel is very concerning and must be addressed with an individual EIS for Pilgrim right away. If the NRC's assessment of environmental impacts of continued storage of spent fuel does not apply to Pilgrim, then where is the EIS for Pilgrim's storage? If the NRC's DGEIS does apply to Pilgrim, then what specific aspects of the DGEIS would apply to its unique location? (0622-1-8 [Vale, Karen])

Comment: Furthermore, sea level rise and other climate change effects will likely cause changes to groundwater systems in coastal areas; sea level rise will affect groundwater level and flow, increase the fresh water table in many areas, and influence the chemical properties of

groundwater. However, no site-specific investigations on how these issues will affect contamination leaks at coastal nuclear plants have been done. A generic EIS certainly cannot assess these issues. For example, there is limited knowledge about the hydraulic gradient at Pilgrim's site. Existing contamination as a result of construction and other activities on the site over the past 40 years, as well as future contamination, must be evaluated in relation to the influence of Cape Cod Bay and the PCA on the groundwater as well as the capacity of the groundwater to migrate to the Bay and throughout the PCA. (0622-2-13 [Vale, Karen])

Comment: The construction of spent fuel storage sites, including earth clearing and foundation laying, could contribute to coastal erosion for plants located near the coast. According to a 2011 USGS study,⁶ [footnote 6 text: Hapke CJ, Himmelstoss EA, Kratzmann M, List JH, and Thieler ER. 2010. National assessment of shoreline change; historical shoreline change along the New England and Mid-Atlantic coasts. U.S. Geological Survey Open-File Report 2010-1118. 57 pp.] on average, the beaches in New England and the mid-Atlantic are eroding at about 1.6 ft/year. However, erosion was much worse in the southern Virginia area (60 ft/year). This shows that while the problem of coastal erosion is widespread in New England and the mid-Atlantic, erosion can vary widely depending on the location. A generic EIS cannot accurately assess the potential impacts of an ISFSI (and related construction) on erosion. (0622-2-2 [Vale, Karen])

Comment: Pilgrim should be required to file a site-specific environmental impact statement for public review immediately. (0622-3-6 [Vale, Karen])

Comment: Based on our comments above, we support the "no action" alternative, or at the very least request a supplemental EIS be done to address site specific concerns at Pilgrim and other facilities across the nation. We strongly believe that the NRC should perform site-specific reviews of the environmental impacts of continued storage. Given the fact that Pilgrim's spent fuel storage is located on the coast of Cape Cod Bay, the impacts on this irreplaceable resource -including its many diverse habitats and wildlife species upon which the region depends - needs to be properly assessed by the NRC. (0622-4-14 [Vale, Karen])

Comment: Only site-specific reviews can inform the NRC whether mitigation strategies - such as chillers -would be required to sustain the temperature of wet pools during extended heat waves. (0622-4-5 [Vale, Karen])

Comment: An EIS that is generic in nature cannot address how individual plants would be affected by climate change and other issues (sea level rise, flooding and storm surges, warming water temperature, increasing storm intensity, ocean acidification, etc.). Plants have different equipment, differing ages of infrastructure, different environmental conditions and changes: even coastal plants are located with differing vulnerabilities-some are behind barrier beaches, some nestled in salt marsh estuaries, but Pilgrim is on Cape Cod Bay facing northeast toward the ocean - these issues are much more complicated than could be covered by a generic EIS. (0622-4-8 [Vale, Karen])

Comment: The NRC should not implement a generic "one size fits all" approach to storing nuclear waste, but rather should make site-specific environmental reports and recommendations that take local conditions into account. (0632-2 [Dolegowski, John])

Comment: Each site has differences, so a blanket/generic plan may seem a cost-saver upfront but prove disastrous later. Each site needs a specific plan. (0636-4 [Bluestein, Bonnie])

Comment: In addition, the NRC considers the continued storage of spent fuel a generic activity that is similar at all commercial nuclear power plants and storage facilities. It fails to take into account individual considerations for individual sites such as reactors sited in geologically sensitive areas, coastal sites vulnerable due to sea level rise or those located near other sites housing nuclear waste, such as Department of Energy nuclear weapons facilities. The cumulative effects and unique characteristics of each site should be considered. A generic analysis is not appropriate or effective in evaluating the full range of environmental impacts from waste storage. (0646-18 [Hanson, Courtney])

Comment: Protecting the public means conducting a professional analysis of the individual site conditions and determining safety in light of hazards such as the possibility of earthquakes, potential dangers to populations in the area, to public transportation close to the facility, and other factors. You are supposed to do your due diligence in this regard, and I am appalled that you have not done so! Be prepared for lots of legal actions against you! We do not want you to jeopardize our children's future! DO YOUR JOB! (0649-2 [Imhoof, Christina])

Comment: It is just plain foolish to generically say there will be minimal environmental impact: 1. regardless of the site. Site specific EA and EIS need to be undertaken. (0652-1 [Maurer, William])

Comment: The analysis makes no distinctions among all of the nuclear power plants covered by the GEIS with regard to levels of seismic risk (earthquakes and tsunamis), regional population levels, proximity to transportation corridors, etc. (0660-1 [Headrick, Gary])

Comment: Abandon the generic "one size fits all" approach and instead, make site-specific environmental reports and recommendations[.] (0660-7 [Headrick, Gary])

Comment: [E]ach nuclear reactor has specific geographic, geologic and population realities. San Onofre's unique realities--its sensitive earthquake/tsunami zones; dense surrounding populations; major transportation corridors; and the Department of Navy's essential installation of USMC, Camp Pendleton, make such a "generic" statement impossible! (0665-3 [van Thillo, Grace])

Comment: Abandon the generic "one size fits all" approach to storing nuclear waste and instead, make site-specific environmental reports and recommendations that take local conditions into account. (0668-1 [Gordon, Mark] [Gordon, Michelle])

Comment: The draft GEIS recommends the proposed Action as the preferred alternative and rules out as inefficient² [footnote 2 text: Based on a lesser level of efficiency than the NRC would gain through a binding generic analysis measured by Council on Environmental Quality guidance for achieving efficiency and timeliness under NEPA.] other alternatives that would enable parties in licensing proceedings to raise contentions challenging the conclusions in the draft GEIS. (0669-3 [Walter, Joan])

Comment: As a binding rule, the proposed Action places an unfair burden on the public to show special circumstances through the waiver process³ [footnote 3 text: 10 CFR 2.335(b)] that the generic environmental determination doesn't adequately address impacts at a specific site. Important new information that could affect future NRC decisions may not be considered because of an inability of affected parties to meet this test. (0669-4 [Walter, Joan])

Comment: As a result, the two major purposes of the NEPA process, creating the opportunity for better informed decisions and promoting citizen involvement, are thwarted by the preferred alternative. Council on Environmental Quality regulations 4 state that EISs should highlight reasonable alternatives that would minimize adverse impacts and should be used to inform decisions -not to justify already-made decisions. Here, it appears that the presentation of alternatives is made solely to justify the preferred alternative.⁴ [footnote 4 text: 40 CFR Sections 1500-1508] (0669-5 [Walter, Joan])

Comment: Duke Energy concurs with the NRC intent of addressing Waste Confidence generically, through rule making, rather than on a site-specific basis. To do otherwise would be unnecessary and extremely inefficient. (0672-5 [Jamil, Dhiaa])

Comment: Site-Specific Analysis of Environmental Impacts of Waste Storage at New York Sites: The proposed rule and the proposed draft GEIS purport to examine some environmental impacts associated with the storage of spent nuclear fuel at reactor sites - and to do so on a generic, nation-wide basis. If the NRC proceeds with the proposed rule and draft GEIS as currently worded, NRC will preclude the State of New York as well as its citizens from raising site specific concerns in site specific licensing proceedings for nuclear reactors and storage facilities located in or near the State. Instead of relying on a generic analysis, the State requests that NRC conduct a site specific environmental impact statement and examine the environmental impacts that would result from a severe accident at the spent fuel pools or the dry storage cask facilities. (0681-9 [Peterson, Alyse])

Comment: I am writing as a concerned U.S. citizen affected by the environmental, economic, and public health and safety risks associated with operating and closed nuclear power plants across the nation. A problem at any of these plants has the potential to affect the entire nation, although adequate protection against such problems requires site-specific analysis and measures. As a resident of Raleigh, NC, I am particularly affected by the risks at the nearby Shearon Harris plant, which houses a massive inventory of used nuclear fuel posing clear and present radiological risks. Any transportation of those materials would entail further risks. (0684-1 [Kinsella, William])

Comment: Attempting to address any of these complex sociotechnical systems by way of a generic environmental impact analysis and a generic regulatory rule is grossly inadequate to the task. The specificities of particular sites are essential to understanding the risks. Without such specificity, the proposed regulatory framework is only a thin simulation; the risks are too great to leave the local particularities unexamined. (0684-3 [Kinsella, William])

Comment: This perennial problem is made worse by a generic approach to rulemaking and other regulatory procedures. Assessing sites individually, case by case, with broad-based participation by local communities is one way to address this disjunct between affected parties and parties engaged in the regulatory conversation. (0684-5 [Kinsella, William])

Comment: Accordingly, I disagree with the statement in the draft GEIS that the no-action alternative "is not consistent with Council on Environmental Quality guidance for achieving efficiency and timeliness under NEPA." (0684-7 [Kinsella, William])

Comment: The U.S. Court of Appeals rejected the current Waste Confidence Rule noting that, after decades of failure to site a repository, the NRC "has no long-term plan other than hoping for a geologic repository." Therefore it is possible that spent fuel will be stored at reactor sites "on a permanent basis." The NRC must examine the environmental consequences of storing

radioactive wastes at reactor sites into the indefinite future. The NRC Draft Generic Environmental Impact Statement (GEIS) relies on the fundamentally flawed assumption that all reactor sites are the same. On the contrary, they each have unique geographic, environmental, geological, climactic, and epidemiological considerations. The creation of a one-size-fits-all plan is scientifically invalid. (0686-1 [Malboeuf, Simone])

Comment: In this case, the public is deprived through a "generic" environmental impact statement that averts a public and expert review of the adverse environmental impacts of expanded nuclear generation and denies the impacted communities their due process under the National Environmental Policy Act (NEPA) and the Atomic Energy Act. This effort runs contrary to the principles of democracy and the legal process, exacerbating and aggravating the lack of public confidence in government and industry siting policy and environmental management practices for radioactive waste. (0691-13 [Gunter, Paul])

Comment: [T]he nuclear waste generators do not have site specific environmental impact statements as required under the National Environmental Policy Act for indeterminate on-site storage. (0691-3 [Gunter, Paul])

Comment: This lack of public confidence and societal objection is made more "reasonable" given that under the current reframing of the Waste Confidence Decision and the associated rulemaking the public hearing rights for site-specific issues raised by the expansion and extension of nuclear waste generation would be forfeited. (0691-9 [Gunter, Paul])

Comment: IV. We support only the No Action Alternative, described in the GEIS for the following reasons: •The No Action Alternative is the only alternative that ensures that there will be site-specific analysis of continued storage of spent fuel. Site-specific information and analysis is essential to making sound decisions about safe storage of spent fuel. •Other alternatives allow for NRC to substitute its judgment for detailed factual analysis[.] (0693-2-13 [Warren, Barbara])

Comment: •Lessons learned from Fukushima are only beginning to be addressed by NRC. Future site-specific analyses are the only means to ensure that these lessons will be incorporated into storage plans. (0693-2-15 [Warren, Barbara])

Comment: The Fukushima lessons learned about spent fuel and any new analyses should provide information for site-specific environmental analyses in the future that this deficient GEIS cannot provide. (0693-2-17 [Warren, Barbara])

Comment: There is nothing in the draft GEIS or the rule that includes an appropriate opportunity for the public to be involved in decisions related to how on-site storage of spent fuel would be managed at specific sites and for what time periods. In fact NRC does not adequately describe the methods or protections that would be provided, instead deferring to licensees in a laissez-faire approach. (0693-3-8 [Warren, Barbara])

Comment: •The NRC states its preference for generic analyses of environmental impacts despite what the Fukushima Near Term Task Force had to say: Because the regulatory framework has evolved over time, "the licensing bases, design and level of protection from natural phenomena differ among the existing operating reactors in the US, depending on when the plant was constructed and when the plant was licensed for operation." (p. 28 The Near Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident, July, 2011) Given this information related to licensing it is pretty clear that there is no uniformity for the existing

reactors and thus generic analysis for spent nuclear fuel will be inadequate. (0693-4-7 [Warren, Barbara])

Comment: Turkey Point, St. Lucie, and the closed Crystal River Nuclear Power Plants in Florida are a completely different scenario from the Nuclear Power Plants in the other 47 states and their spent fuel must be dealt with in a different manner. South Florida is all flat land with an aquifer under the swamp. High ground is north of Lake Okeechobee which contains densely populated areas...Crystal River is not in the range of the Cumbre Vieja tsunami but an asteroid strike in the Gulf of Mexico or a methane gas bubble could cause a devastating tsunami that will destroy the short term storage at the power plant. (0701-13 [Wilson, Greg])

Comment: There is not any one solution that can be applied to every Nuclear Power Plant. (0701-9 [Wilson, Greg])

Comment: 3. Federal Register Vol. 78, pp. 56780-81. Oh! And there you answer my last question for me. Or rather the NRC does not. It does tell all about the technical ways and means of spent nuclear waste, but not a single mention of the environmental impact that happens in the existing facilities. The problem with using a generic formula for nuclear issues -- the nature of nuclear science. When exposed to radiation, EVERY single eco-system is going to respond soooooo differently based on material compounds of the water -- I mean, seriously, has anyone taken a sample of the #Fukushima #nuclearizedwater and mixed it with some of that #NorthAtlantic #radioactivewater? I mean, seriously, what is going to happen up there in the Arctic Ocean?! I hope someone else really smart who studies the impact of nuclear waste radiation on the things like viruses and fungi in specific locations near different radioactive sites has submitted some thoughts on this whole Generic Thing. I completely understand the need for it, the Generic Rule, but the question I have is: Has the NRC really gotten to the root issues for implementing a Generic Rule that does not undermine the Common Defense? I would have to say, based on the fact that I could not find in all of those words in the Federal Register anything that gave me confidence that THIS industry here in the United States of America would not do the same thing their peer did in Japan. In which case, this NRC Generic Rule MUST be way more detailed in the specifics than it currently is. (0703-14 [Vandel, Nikohl] [Vandenberg Clermont, Elaine])

Comment: Federal Register Vol 78, p. 56776, "The analysis in NUREG 2157 ..." I guess the only problem with the generic environmental approach is the reality of emergencies, and I think that is what everyone outside of the industry is objecting to -- how do you have a generic approach to such different realities? And, the truth is, every nuclear facility is unique. But I do think that the NRC did its best to associate apples with apples and oranges with oranges in order to make generic the consistent ways nuclear waste imposes its threat on the natural environment. However, when the generic level of waste management parameters are so low as to pose such a considerable risk across the board, not even broaching into the emergency realm, this is where the NRC does disservice to its mission, the industry and most definitely the Stakeholders. The quality acceptable to the Commission is simply too dependent on industry self-regulation, and in our current corporate climate, that is too hazardous for history to say "we did it right." (0703-9 [Vandel, Nikohl] [Vandenberg Clermont, Elaine])

Comment: Defining and Evaluating the Alternative of "No-Action:" NRDC's example. Logically, and as a matter of law, the alternative of "No Action" should be defined in this Draft GEIS (as it is in thousands of other federal NEPA documents) as the continuation of the policy and environmental status quo assuming the Agency does not undertake the Proposed Action, or any of the action alternatives assessed in detail and determined to be reasonable. In the instant

case, the environmental status quo already includes substantial continued surface storage of spent fuel generated pursuant to previous NRC licensing actions and licenses that remain in force, but does not include the storage of spent fuel arising from pending and future licensing actions that would be enabled by the proposed reinstatement of a revised WCD/TSR. Thus a NEPA compliant analysis of the No-Action Alternative would encompass the environmental consequences of continuing to store on the surface for various terms the different extant types, ages, and "burn-ups" of spent fuel that fit within this bounding condition, based on the existing licensed pool storage and dry cask capacities and currently licensed technologies required to responsibly manage this amount of spent fuel under existing licenses and allowable amendments thereto. Such an analytically meaningful No Action Alternative would delineate quantitatively the current and projected types, characteristics and volumes of spent fuel that have been and will be produced over time under the authority of existing operating licenses until their currently applicable dates of expiration, the environmental risks and reasonably foreseeable impacts of continuing the current practice of transferring older spent fuel to dry casks only when pool storage capacity is on the verge of being exceeded, and options for mitigating these impacts that the Agency could reasonably be expected to take under its existing rules in the absence of implementing its Proposed Action. Under current law the Federal government will hold nominal title to this spent fuel. Thus, NRC must consult with other agencies (e.g. DOE EPA, and DOT)²⁰ [footnote 20 text: Indicative of NRC's haste to finalize this proposed rulemaking and GEIS, NRDC notes with significant surprise that NRC notes "there are no formal cooperating agencies identified in the Waste Confidence Environmental Review." Draft GEIS at xxvii. Given the major roles assigned to DOE, EPA and DOT in the management, storage, transportation and standard setting for SNF we find such lack of formal cooperation nothing short of astonishing.] and describe the range of reasonably foreseeable actions that these agencies could undertake that could alter the environmental risks and impacts from future storage of this spent fuel prior to its transport and disposition in a permanent geologic repository. Under No Action the DGEIS must evaluate the environmental impacts of the storage of SNF authorized by existing licenses. The no action alternative assumes the agency undertakes no further new licensing actions or license extensions, and instead relies solely on its existing regulatory authorities to approve license amendments and require installation of safety upgrades. (0706-2-11 [Fettus, Geoffrey])

Comment: The "No Action Alternative" is Not a "No Action Alternative" And It Leads to An Arbitrary and Capricious Result. As a first point, the environmental status quo already *includes* substantial continued surface storage of spent fuel generated pursuant to previous NRC licensing actions and licenses that remain in force, but *not* the storage of spent fuel arising from pending and future licensing actions that would be enabled by the proposed reinstatement of a revised WCD/TSR. Thus a NEPA compliant No-Action Alternative would encompass the environmental consequences of continuing to store on the surface the different extant types, ages, and "burn-ups" of spent fuel that fit within this bounding condition, based on the existing pool storage and dry cask capacities and currently available technologies required to responsibly manage this amount of spent fuel under existing licenses and allowable amendments thereto. This analytically meaningful No Action Alternative would delineate quantitatively the current and projected types, characteristics and volumes of spent nuclear fuel that have been and will be produced over time *under the authority of existing operating licenses until their currently applicable dates of expiration*, the environmental risks and reasonably foreseeable impacts of continuing the current practice of transferring older spent fuel to dry casks only when pool storage capacity is on the verge of being exceeded, and options for mitigating these impacts that the Agency could reasonably be expected to take in the absence of implementing its Proposed Action. Since the Federal government now legally holds nominal title to this spent fuel, NRC must consult with other agencies (e.g. DOE and EPA) and describe

the range of reasonably foreseeable actions these agencies could undertake that would alter the environmental risks and impacts from future storage of this spent fuel prior to its disposition in a permanent geologic repository. (0706-2-7 [Fettus, Geoffrey])

Comment: In particular, the operation of the Indian Point nuclear power plant implicates a variety of site- specific concerns that have not been adequately accounted for or analyzed in the DGEIS. The Indian Point facility faces a unique set of circumstances and challenges which exacerbate concerns related to nuclear waste storage at the site. Yet, such issues have not been adequately “bounded” or otherwise accounted for by the discussion in the DGEIS. A. Site-Specific Considerations at Indian Point[.] 1. Plant Location[.] Indian Point is located in Buchanan, Westchester County, NY just 24 miles north of New York City proper and 35 miles north of midtown Manhattan. The 50-mile radius around the plant encompasses NYC, which has a population of over 8 million people.⁸ [footnote 8 text: See Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3 (NUREG-1437, Supplement 38), *available at*, <http://pbadupws.nrc.gov/docs/ML1033/ML103350405.pdf>, at p.2-1 (“The area within a 50-mi (80-km) radius of the site includes parts of New York, New Jersey, and Connecticut. New York City, located approximately 24 mi (39 km) south of the plant, is the largest city within 50 mi (80 km) with a 2006 population of approximately 8,214,426 (USCB 2006).”).] With over 17 million people living within the 50-mile radius of Indian Point, the plant has, by far, the, highest surrounding population density of all the nuclear power reactors in the United States.⁹ [footnote 9 text: Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3 (NUREG-1437, Supplement 38), *available at*, <http://pbadupws.nrc.gov/docs/ML1033/ML103350405.pdf>, at p.2-124 (“Approximately 16,791,654 people live within 50 mi (80 km) of IP2 and IP3”); See also Bill Dedman, *Nuclear Neighbors: Population Rises Near US Reactors*, NBC New.com, http://www.nbcnews.com/id/42555888/ns/us_news-life/t/nuclear-neighbors-populationrises-near-us-reactors/#.UrNSx8Kx7IU (last accessed Dec. 19, 2013).] Thus, Indian Point is situated just minutes from one of, if not, the world’s leading financial, cultural, and socio-economic centers. Various affluent areas surround or are in the vicinity of the plant, which command high property values. In addition, two of New York City’s most important drinking water reservoirs are located less than ten miles and approximately twenty one miles from Indian Point.¹⁰ [footnote 10 text: The New Croton Reservoir is approximately 9.4 miles from Indian Point, and is the primary reservoir for the “East of Hudson” water supply for New York City. The Kensico Reservoir, which serves as the terminus surface water storage reservoir for the entire East and West of Hudson water systems for New York City, is approximately 21 miles from Indian Point. See NYC DEP, Kensico, http://www.nyc.gov/html/dep/html/watershed_protection/kensico.shtml (last accessed Dec. 20, 2013).] Nine million people depend on the safety of that water supply every day. (0710-2 [Brancato, Deborah] [Musegaas, Philip])

Comment: The GEIS on “Waste Confidence” (NUREG 2157) does not pass the laugh test: the federal court ordered NRC to assess the environmental impact of extended waste storage, not environmental impact of writing a GENERIC document; yet NRC focuses on the cost of writing one document vs many. Even if a summary is in a report, there is zero rational basis to exclude highly radioactive waste storage impacts from specific licensing actions. We reject the Generic approach whole-cloth. Use of a “reference” site has further reduced the public’s confidence in the NRC, if that was possible. A final decision from NRC that it “has confidence” in a generic approach to the existing waste or confidence in continued generation, management and storage of highly radioactive spent nuclear fuel by energy corporations, will confirm our conclusion that this is nothing more than a “Waste CON;” as in a “CON game.”ⁱ [footnote I text: From Wikipedia:

A confidence trick (synonyms: confidence scheme and scam) is an attempt to defraud a person or group after first gaining their confidence, in the classical sense of trust. A confidence artist (or con artist) is an individual, operating alone or in concert with others, who exploits characteristics of the human psyche such as dishonesty, honesty, vanity, compassion, credulity, irresponsibility, naïveté, or greed... A confidence trick is also known as a con game, a con, a scam, a grift, a hustle, a bunko (or bunco), a swindle, a flimflam, a gaffe or a bamboozle. The intended victims are known as "marks" or "suckers", and when accomplices are employed, they are known as shills.] Radioactive waste is far from a "game;" and NRC's failure to fully engage with the site-specific and technical bases of this problem is potentially fatal to us and our progeny. (0711-2 [Olson, Mary])

Comment: Do you understand that if there is a future reactor, the purpose of this GEIS is to ensure that the people who would be impacted by any fuel pool fire if their "number came up" will have no right to raise any concerns about that possibility during the licensing of that reactor? (0711-26 [Olson, Mary])

Comment: [A]mend the NRC licensing and re-licensing process to require an individual Environmental Impact Statement for waste at every individual nuclear plant. (0712-4 [Schimmelpfennig, Pamela Y.])

Comment: *The above discussion demonstrates that the local variability of circumstances among US reactors argues against a generic policy, and generic assumptions on the part of NRC regarding spent fuel management.* At the Oak Brook, IL NRC Waste Confidence hearing on November 12th, 2013, Sierra Club group chair Evan Craig made a critical observation to NRC, which we are sure went totally ignored. He said (we paraphrase) that "generic environmental" is an oxymoron. There is NOTHING generic about the environmental, which is a dynamic, constantly changing and evolving set of near infinite interactions and possibilities. As such, he dismissed the NRC's "generic environmental" impact statement as an exercise in both futility and unreality. It would describe nothing but severely limited self-fulfilling prophecies, not the real world. NRC would be wise to understand this fundamental flaw in issuing a DGEIS. (0716-17 [Kraft, Dave])

Comment: There is no way that a generic environmental impact statement can address the unique and ever-changing realities of each reactor and site in one blanket statement for all reactors. Even the seemingly "common elements" have different ways of wearing out at each site. As one philosopher has put it: You never put the same foot in the same river twice. All the factors of any given situation and at any reactor site are constantly changing. That is the law of the physical universe as well. Things are constantly changing and breaking down - ultimately into entropy and chaos. Eventually even good machines wear out, and this is certainly true of complex systems like nuclear reactors.. The point I want to leave you with is that in this new universe of decommissioning, each reactor site is different. And each arrangement to do the decommissioning is different and will require its own GEIS, more than one, at different points in time. There is no way that such ever-changing realities can be covered through one generic environmental impact statement. (0717-2 [Lewison, Linda])

Comment: Spent fuel pools have different designs and liners, and some are located at ground level while others are located above the ground. The design and placement of spent fuel racks, air circulation and convection mechanisms, type of reactor, and amount of heat generated by the fuel itself also differ from plant to plant. Unlike nuclear power reactors, which are located within containment shells, spent fuel pools are not protected by thick concrete domes,²⁶ [footnote 26 text: *NAS Report* at 40.] making them susceptible to radiological release as a result

of fires or leaks. Their susceptibility, however, is affected by the site-specific differences between the pools.²⁷ [footnote 27 text: *Id.* at 8, 31, 40-43.] (0718-1-12 [Sipos, John])

Comment: Concerned about the implications of the Alvarez article and NUREG-1738, the United States Congress directed NRC to seek independent technical advice from the National Academy of Sciences ("NAS") on the safety and security of spent fuel storage.⁴⁴ [footnote 44 text: U.S. Congress, Conference Report 108-357, *Making Appropriations for Energy and Water Development for the Fiscal Year Ending September 30, 2004, and for Other Purposes*, at 191 (Nov. 7, 2003).] In response, NAS confirmed the potential for a pool fire that could result in the release of a substantial portion of a fuel pool's radioactive inventory.⁴⁵ [footnote 45 text: *NAS Report* at 1. NRC actions delayed the release of the public version of the report. *Agencies Fight Over Report on Sensitive Atomic Wastes*, New York Times (Mar. 30, 2005). The public version of the NAS Report was release on April 6, 2005.] The NAS report also agreed with NUREG-1738 that the risk of spent fuel pool fires cannot be determined on a generic basis: "[t]he potential vulnerabilities of spent fuel pools to terrorist attacks are plant-design specific. Therefore, specific vulnerabilities can be understood only by examining the characteristics of spent fuel storage at each plant."⁴⁶ [footnote 46 text: *NAS Report* at 8.] The NAS report also found that sabotage of spent fuel pools is possible and that under some conditions, a terrorist attack that partially or completely drained a spent fuel pool could lead to a zirconium cladding fire that would "propagate"—i.e., spread from the spent fuel rod or assembly that initially caught fire to other assemblies—and cause the release of large quantities of radioactive materials to the environment.⁴⁷ [footnote 47 text: *Id.* at 38-39, 48.] Following the completion of the NAS Report, Congress directed NRC to develop site-specific mitigation models for different spent fuel sites.⁴⁸ [footnote 48 text: U.S. Congress, Conference Report 108-792, *Making Appropriations for Foreign Operations, Export Financing, and Related Programs for the Fiscal Year Ending September 30, 2005, and For Other Purposes*, at 982 (Nov. 20, 2004).] (0718-1-16 [Sipos, John])

Comment: There is substantial new evidence that there is earthquake risk that NRC did not take into consideration when approving operation licenses for existing reactors and spent fuel storage facilities. In 2004, United States Geological Survey ("USGS") told NRC that earthquake hazards in the Central and Eastern United States ("CEUS"), the portion of the lower 48 states east of the Rocky Mountains, were higher than previously understood. In May 2005 NRC staff acknowledged that earthquake risk for reactors and spent fuel storage in CEUS may be greater than NRC assumed when it approved operating licenses for these facilities. See, e.g., May 26, 2005 NRC Staff memorandum re: Identification of a Generic Seismic Issue (available at ML051450456). NRC staff's response to the new USGS earthquake hazard information was to consider issuing a "generic letter" on the subject of "Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States." June 9, 2005 NRC staff memorandum Generic Issue 199, "Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States" (available at ML051600272). This memorandum contained an estimate that "the initial screening technical analysis will be completed within three months of receipt of the necessary information from [NRC's Office of Nuclear Reactor Regulation]." *Id.* The summary of the February 6, 2008 NRC staff public meeting relates that a seismologist working on Generic Issue 199 stated that for some CEUS areas the current earthquake frequency estimates were several times larger than those used in the 1980's, and that revised ground motion predictive equations generally produced higher estimates of uncertainty about the effect of earthquakes at these sites. February 8, 2008 NRC staff memorandum Subject: Summary of February 6, 2008, Category 2 Public Meeting with the Public and Industry to Discuss Generic Issue 199, "Implications of Updated Seismic Hazard Estimates in Central and Eastern United States on Existing Plants," p. 2 (available at ML080350189). ⁴ [footnote 4 text: The summary also related that a representative of the Electric

Power Research Institute ("EPRI"), a private organization funded by the electric power industry, stated that it had "calculated mean seismic spectra for the 28 sites used in [NRC Regulatory Guide] 1.165." *Id.* However, EPRI has prevented public review of information and has delayed NRC's reassessment of earthquake hazards. See, e.g., February 1, 2008 Screening Analysis for GI-199, "Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants," p. 2 (available at ML073400477) (EPRI unwilling to share a report with NRC contractor.).] (0718-1-5 [Sipos, John])

Comment: Need for Objective Site-Specific Analysis. Given the combination of site-specific characteristics, the decontamination costs and resource replacement costs following a severe accident at Indian Point have the potential to be substantially larger than an accident at any other reactor in the country. Furthermore, in light of the site-specific characteristics and the considerable costs associated with a severe nuclear accident in the New York metropolitan area, mitigation alternatives are likely to be more cost effective at the Indian Point facilities. (0718-1-6 [Sipos, John])

Comment: Lack of Site-Specific Analysis of Severe Spent Fuel Pool Accident. Given their regulatory history, the three power reactors and their spent fuel pools located at Indian Point were not subjected to a severe accident mitigation alternatives analysis when AEC and NRC issued the construction permits and operating licenses for those facilities. According to AEC and NRC documents, the Consolidated Edison Company ("ConEd") received the following construction permits and operation licenses on the following dates: [Table inserted] Source: Federal Register and NRC Information Digest.⁵ [footnote 5 text: See 21 Fed. Reg. 3,085 (May 9, 1956); 31 Fed. Reg. 13,616-17 (Oct. 21, 1966); 34 Fed. Reg. 13,437 (Aug. 20, 1969); NUREG-1350, Volume 20, 2008 - 2009 Information Digest, at 103, 113 (Aug. 2008).] When ConEd announced its selection of the Indian Point site back in March 1955 and filed an application for the necessary construction permit, the AEC did not have site selection regulations that addressed population or seismic issues. To place this initial siting decision in perspective, ConEd selected, and AEC approved, Indian Point as the site for a power reactor before the Windscale - Sellafield (1957), Three Mile Island (1979), Chernobyl (1986), and multi-unit Fukushima (2011) events. The 1955 selection of Indian Point also came before the enactment of NEPA (1970), the promulgation of CEQ regulations (1978), the Third Circuit's *Limerick* decision (1989), and NRC promulgation of the 10 C.F.R. § 51.53 regulation (1996) that collectively require an analysis of ways to mitigate the impacts of severe accidents at nuclear facilities. In addition, AEC approved the construction of the first reactor and spent fuel pool before Congress enacted in the Price Anderson Act (1957). (0718-1-7 [Sipos, John])

Comment: NRC confirms that severe accidents and consequences were not taken into account when selecting and approving the Indian Point site. In its 1979 Siting Study Report, NRC stated: [image] NRC, Report of the Siting Policy Task force, NUREG-0625 (Aug. 1979) at p. 10, ML12187A284. Moreover, severe accidents to spent fuel pools were not considered by AEC or NRC at the initial licensing stages for Indian Point -- and were not analyzed in the Siting Study Report. Storage and Accumulation of Spent Nuclear Fuel at Indian Point. When the federal government first licensed the operation of Indian Point Unit 2 and Indian Point Unit 3 it authorized each unit's single spent fuel pool to hold 241 spent fuel assemblies. NRC subsequently authorized the pools to hold five times (5x) the original limit. The following charts summarize how NRC has authorized increasing amounts of spent nuclear fuel to be stored in the spent fuel pools for Indian Point [table for Unit 2 inserted] ⁶ [footnote 6 text: Consolidated Edison, *Final Design Report for Reracking the Indian Point Unit No. 2 Spent Fuel Pool*, at 1, ML100200292 (May 1980); Consolidated Edison, *Supplemental Spent Fuel Safety Analysis*, at 3-1, ML100350310 (Nov. 1985); and Consolidated Edison, *Indian Point Unit 2 Spent Fuel Pool*

Increased Storage Capacity Licensing Report, at 1-2, ML100200114 (June 1989).] [table for Unit 3 inserted] ⁷ [footnote 7 text: USAEC, *Safety Evaluation Report by the Directorate of Licensing U.S. AEC In the Matter of Consolidated Edison Co. of New York, Inc. Indian Point Nuclear Generating Unit No. 3*, at 4-1, 9-2, ML072260465 (Sept. 21, 1973); USNRC, *Indian Point, Unit 3, Amendment 13, Authorizing Modifications to the Spent Fuel Pool, Increasing Capacity from 264 to 840 Fuel Assemblies*, attached to *Letter from A. Schwencer, NRC to New York State Power Authority*, ML003778668 (Mar. 22, 1978); and USNRC, *Indian Point, Unit 3, Amendment 90, Allowing for the Expansion of the Spent Fuel Pool Storage Capacity*, attached to *Letter from Joseph Neighbors, NRC to New York Power Authority*, ML003778816 (Oct. 12, 1989).] Indian Point currently has – and is expected continue to have – substantial amounts of radioactive spent nuclear fuel waste on site. During the May 8, 2012 site visit to the Indian Point facilities by the Atomic Safety and Licensing Board, Entergy representatives made the following statements about Entergy's plans for spent nuclear fuel at Indian Point: (A) All of the spent fuel generated during since the start of commercial operation of Indian Point Unit 3 remains in the Indian Point Unit 3 spent fuel pool (as of the date of the May 2012 site visit); (B) Entergy has no current plans to construct an additional dry cask storage area (in addition to the existing dry cask storage area); and (C) At the end of operation under any 20-year extension of the current operating licenses, Entergy estimates that the existing dry cask storage area would be filled to capacity and that the Indian Point Unit 2 spent fuel pool and the Indian Point Unit 3 spent fuel pool would be filled to capacity as well. This means that under Entergy's plan the site's two operating spent fuel pools will continue the site's dense pool storage practices into the future. All of these unique characteristics of the Indian Point site demonstrate why it is essential that a site-specific analysis of the potential environmental impacts from the storage of spent fuel at the Indian Point facilities and measures to mitigate those potential impacts must be addressed. (0718-1-8 [Sipos, John])

Comment: North Anna, Virginia[.] On August 23, 2011, a 5.8 magnitude earthquake occurred in Virginia with the epicenter located approximately 11 miles from the North Anna Power Station. The earthquake exceeded the spectral and peak ground accelerations that the plant was built to withstand and the plant temporarily lost power.¹²⁹ [footnote 129 text: Nuclear Regulatory Commission, *NRC Technical Audit Report of North Anna Post-Seismic Fuel Inspections*, at 3, ML11305A239 (Oct. 27, 2011).] The tremor was felt in various northeast cities, including Washington and New York. While initial review by North Anna's owner concluded that there was no major damage to the reactors or spent fuel pools, the incident highlighted the fact that U.S. nuclear facilities are also subject to beyond-design-basis earthquakes. As indicated by the figures below, many nuclear reactors in the U.S. are located in areas with potentially dangerous seismic activity. The first figure is the U.S. Geological Survey National Seismic Hazard Map, updated in 2008, showing the earthquake ground motion (peak acceleration or PGA) for a 2% probability over 50 years. The second image, from NRC, shows the locations of nuclear reactors in the U.S. [Figures inserted] On January 31, 2012, NRC, DOE, and EPRI released a new seismic study, revealing significantly higher earthquake risks in the central and eastern United States. According to NRC, "Calculations with the new model are expected to result in a higher likelihood of a given ground motion compared to calculations done using previous models."¹³⁰ [footnote 130 text: Nuclear Regulatory Commission, Press Release: New Seismic Model Will Redefine Hazard Analysis at U.S. Nuclear Plants, No. 12-010 (Jan. 31, 2012).] Nuclear power plants will use the new model to re-evaluate their seismic risk. The State urges NRC to change the draft revised DGEIS and proposed rule to allow seismic risks to be taken into consideration by conducting a site-specific review of seismicity risks for spent fuel pools. (0718-2-13 [Sipos, John])

Comment: No provision allowing site specific review is made in the DGEIS and the proposed rule. Given this absence, the DGEIS and the proposed rule should be revised to allow for such a site specific and site wide review. (0718-2-15 [Sipos, John])

Comment: San Onofre by the sea seems a poor choice for nuclear waste disposal. Abandon the generic "one size fits all" approach to storing nuclear waste and instead, make site-specific environmental reports and recommendations that take local conditions, such as earthquakes, into account. (0726-1 [Allerton, George])

Comment: Please review each site individually to determine how waste should be handled. A one size fits all is dangerous and will not protect health or safety, as you are entrusted to do. (0727-1 [Peinado, Susan])

Comment: "Generic Address"--One cannot "generically address" the environmental impacts of spent nuclear fuel. One must be precise and far-sighted. A term like "generically address" does not specify future plan and/or historical repercussions on environment due to "spent nuclear fuel". Please be precise, clear, historically-accurate on future plans for environmental impact. (0728-1 [Anonymous, Anonymous])

Comment: Abandon the generic "one size fits all" approach and instead, make site-specific environmental reports and recommendations[.] (0728-5 [Anonymous, Anonymous])

Comment: Abandon the generic "one size fits all" approach and instead, make site-specific environmental reports and recommendations[.] (0741-2 [Giese, Mark M.])

Comment: [I believe the NRC must:] Abandon the generic "one size fits all" approach and instead, make site-specific environmental reports and recommendations[.] (0757-13 [Lynch, Laura])

Comment: Problems exist specific to the Indian Point Nuclear Power Plant that cannot be addressed by a "generic" set of regulations. For example, the Indian Point Nuclear Power Plant is 35 miles from the most densely populated area of the northeast - New York City. (Some areas of NYC are closer than 35 miles.) As Manhattan is an island with limited points of egress, evacuation on short notice would be impossible. Altogether, 20 million people live within a 50 mile radius of Indian Point. In addition, a new word is needed to describe this potentially necessary emergency process, as the word "evacuation" implies "return;" and, with nuclear contamination, as we have learned from past experience, there is no "return" (as in Chernobyl). For this reason, a "generic" set of regulations cannot be accepted. (0762-1 [Skopic, Catherine])

Comment: Generic Environmental Impact Statement – NOT acceptable for California. •California didn't "sign up" for permanent (100+ years) nuclear waste dumps. (0764-3 [Gilmore, Donna])

Comment: The NRC needs to abandon the generic "one size fits all" approach to storing nuclear waste and instead, make site-specific environmental reports and recommendations that take local conditions into account. (0767-1 [Harris, Kate])

Comment: I am very concerned that the waste confidence plan does not adequately address the specific risks at the San Onofre site, especially considering the proximity to major population, the large amount of waste material, and the extended period for containing special highly radioactive fuel. Coastal Southern California is one of the worst places to store nuclear waste. (0770-1 [Maher, Ed])

Comment: The analysis makes no distinctions among all of the nuclear power plants covered by the GEIS with regard to levels of seismic risk (earthquakes and tsunamis), regional population levels, proximity to transportation corridors, etc. (0774-11 [Revilla, Oscar])

Comment: Abandon the generic "one size fits all" approach and instead, make site-specific environmental reports and recommendations. (0774-7 [Revilla, Oscar])

Comment: Protecting the public means conducting a professional analysis of the individual site conditions and determining safety in light of hazards such as the possibility of earthquakes, potential dangers to populations in the area, to public transportation close to the facility, and other factors. You are supposed to do your due diligence in this regard, and I am appalled that you have not done so! Be prepared for lots of legal actions against you! We do not want you to jeopardize our children's future! DO YOUR JOB! (0776-2 [Kuttler, Eugen])

Comment: We have a unique geographical problem with limited egresses and no way out for a population of over 8 million people. We must have a separate EIR. (0785-2 [Korsen, Alan])

Comment: Abandon the generic "one size fits all" approach and instead, make site-specific environmental reports and recommendations[.] (0789-2 [Salto, Don])

Comment: You must treat nuclear waste disposal on a case by case basis. Separate EIRs, take into account earthquake fault lines, aquifers[.] There is no one size fits all. (0794-1 [Amthony, Elizabeth])

Comment: Because of the major variations in climate, geologic, and other conditions of the various elements and "activities" related to continued-storage sites across coterminous U.S., generic descriptions of environmental impacts can at best provide only a framework for selected types of impacts. The procedures for establishing a generic basis for impact assessment omit some critical sources of potential environmental impact and rationalize the safety of others on the basis of very limited data. (0805-2 [Wilshire, Howard])

Comment: The approach is stated in the Abstract, p. iii as follows: "For the resource areas considered, this draft GEIS attempts to establish generic impact determinations that would be applicable to a wide range of existing and potential future spent fuel storage sites," using "some site-specific information in developing the generic impact determinations..." And further, a goal is stated to "...identify the types and assessing the magnitude of environmental impacts where generic findings can be established." Comment: These statements provide no information on exactly what characteristics/activities/properties of all elements of ISFSIs do not qualify for generic findings, and how many sites have such disqualified characteristics. These must be specified as they may (and do for some known characteristics) represent sources of environmental impacts that are of overriding importance in establishing and maintaining integrity and safety of continued storage. Information should be supplied on the number of sites, including all time frames, to which the chosen set of generic findings do not apply [the language quoted above "...establish generic impact determinations that would be applicable to a wide range of existing and potential future spent fuel storage sites" implies that the determinations are not universal]. (0805-3 [Wilshire, Howard])

Comment: Most of the identified elements of affected environment are described as widely ranging, variable, many are site-specific, or occur only at certain sites. This being the case how can environmental impacts be reduced to generic assessment? (0805-5 [Wilshire, Howard])

Comment: The GEIS would not take into account any site-specific concerns that have arisen such as the lack of confidence in the NRC to correct structural conditions of existing a nuclear power plant operator's ability to store safely waste material and spent fuel rods, especially in the case of operational malfunction, natural disaster, or deliberate malfeasance. (0816-2 [Stansberry, Mark])

Comment: The GEIS would not take into account any site-specific concerns that have arisen such as the lack of confidence in the NRC to fully disposition future license applications without a site-specific Environmental impact Study incorporated into the process. (0816-3 [Stansberry, Mark])

Comment: In the 2011 IRP, TVA included construction of one or more nuclear reactors at the Bellefonte (Scottsboro, AL) site to start in a specified time frame simply because the reactors otherwise could not be completed within the time allowed by (NRC restored) Construction Licenses. Since that time TVA has effectively abandoned plans to construct any reactors at Bellefonte though it has not relinquished either of the two construction licenses or the two COL licenses for AP1000 units. This history at Bellefonte and related issues at every other TVA reactor demonstrate the inappropriateness of applying the final DGEIS to all sites and all reactors as the actual waste generation to be dealt with is unpredictable. When the time and scale of actual reactor operations and spent fuel generation is complicated by issues like the (DOE proposed) use of MOX, the use of "high burn-up" fuel, and individual reactor designs and with varying lengths of refueling cycles, it is clear that a reactor by reactor EIS should be required under any plan for long term onsite irradiated fuel storage. (0821-1 [Paddock, Brian])

Comment: This need for a site by site and reactor by reactor EIS is re-enforced by the question of the suitability of each specific site. The example within TVA's ambit is Sequoyah. TVA has contracted for cask storage of irradiated fuel at Sequoyah. It is unclear whether this processing and detention is to serve only the two reactors located there or may involve transfer of irradiated fuel from Watts Bar and/or Browns Ferry. (0821-2 [Paddock, Brian])

Comment: As I mentioned in my oral comments, NRC cannot assume the security of stored irradiated fuel. The security performance for each reactor site must be considered. TVA's abysmal lack of reactor reservation site security is a matter of record. TVA has proven unable to provide consistent security from intrusions under both systems of use of contractors and use of TVA employed staff. (0821-8 [Paddock, Brian])

Comment: Leakage from spent fuel pools and from various other parts of each reactor contain cumulative impacts which require a physical site-specific evaluation with data maps for each site. Generic evaluation is inapplicable to physical world reality. (0823-40 [Michetti, Susan])

Comment: It is unacceptable for the Draft Generic EIS to depend upon regulations and guidelines created for other purposes without going through the full rigorous process of scientific thinking, assessment, methods, analysis, and practices in terms of spent fuel monitoring in on-site pools at each and every specific location with unique differentiating characteristics. This is another violation of scientific principles. (0823-49 [Michetti, Susan])

Comment: Overview analysis to determine any inadequacies in NRC's regulatory program for future leak detection requires a better tool than the Draft Generic EIS. As a conceptual tool, not a physical world tool, Draft Generic EIS fails to address unique, differentiating factors that arise from the full set of characteristics at a specific physical location. As a result, it is inappropriate to determine safety. (0823-51 [Michetti, Susan])

Comment: The Draft Generic EIS is seriously flawed by not addressing the actual specific unique circumstances of individual reactors. The "generic" concept fails to address the actual Physical World in which individual reactor sites are distinct, unique, and differentiated in assorted ways that contradict inaccurate broad sweeping generalized conceptualizations made in the Draft Generic EIS. The Draft Generic EIS is unscientific for these reasons, by definition. (0823-54 [Michetti, Susan])

Comment: The Physical World requires physical assessments for physical world rules, decisions, and solutions, which become not possible when using an imaginary "generic" concept. It is impossible to physically measure and test a conceptualized "generic" location which lacks actual specific measurable physical location because it is not part of the Physical World. The thought world is perceived under different laws that govern its much lesser density. The attributes of the Physical World has its own laws that do not tend to operate practically outside of the Physical World. The same applies to the thought world. The laws that operate within the Physical World emerge from its greater density. This very density lends itself to precision measurements upon which all knowledge about the physical world is based. Only by measuring and testing the facts pertaining to physical world density to the widest and deepest extent possible will we as a society begin to assess any case for safety for any specific nuclear waste storage solution location and its parameters. This happens because the unique, differentiating reality located in space and time with unique physical realities must be assessed first for its ability to maintain isolation of these most lethal substances on earth. It is impossible to skip this step and to claim "safety" with far too many unknowns with the most dangerous substances on earth. Integrity of safety claims must be supported by reliable facts derived from reliable, dependable research conducted with transparent open honesty and peer-reviewed. We expect that safety claims contain full integrity, particularly for the most lethal substances on earth. We expect that what has not been problem-solved remains out in the open, so to speak, on the table for discussion. (0823-57 [Michetti, Susan])

Comment: Generic conceptualization for safety is inappropriate and unacceptable. Physical storage and disposal remain an integral part of the safety case. Storage and disposal is an integral part of any solution. Generic conception does not lend itself to physical observation, measurement, and analysis of all unique, differentiating, surrounding environmental factors through the complete timeline of impacts. (0823-58 [Michetti, Susan])

Comment: Each specific operation has a location that requires its own unique EIS with scientific analysis that includes all impacts of any and all ionizing isotopes found on-site throughout their ionizing life spans. This analysis is required, particularly, in order to sufficiently identify "the potential environmental effects" of storing spent fuel onsite "on a permanent basis" at each nuclear power reactor site in the USA or any other proposed location, interim or permanent. (0823-64 [Michetti, Susan])

Comment: Each specific actual physical world location, as compared to a generic conceptualization with missing physical variables, is required to be scientifically assessed, measured, tested, and analyzed in terms of its complete set of physical properties, specifically including those which are unique and differentiated, particularly in terms of safety to the full environment and all living organisms. Scientific assessment requires thorough safety data: pertaining to actual physical sites for each individual reactor or repository; pertaining to physical interactions of each and all elemental isotopes emitting ionizing radiation with the various interactions among the various attributes and parameters of each specific physical site; pertaining to full identification of the full timeframe of all impacts within the complete parameters of the specific physical site including atrophy and interaction with specific elemental isotopes

emitting ionizing radiation over the complete life span required to expire all the cumulative half-lives involved; pertaining to radioactive and toxic leakage from structural weaknesses and other atrophy observed or predicted at that sited repository, including migration off-site, for the complete timeframe required to expire all the cumulative half-lives at that site; and pertaining to predicted or observed public health and environmental damages emerging from any leakage or non-containment of ionizing isotopes from that repository. This is not a complete list. (0823-66 [Michetti, Susan])

Comment: For accurate safety overview as well as safety assessments and safety analyses, separate rigorous and thorough full EISs are required to be conducted for the actual physical world's characteristics at each unique individual and differentiated nuclear plant, particularly including spent fuel disposal or storage impacts, in order to determine if any physical world feasibility actual exists to justify the continuation of operations generating these lethal toxins. Full identification of impacts, including cumulative impacts, through the entire timeline of ionizing radiation of each identified isotope, are required for adverse public health impacts; adverse environmental impacts to healthy well-being; adverse reproductive and genetic impacts upon all living organisms, including "race" or "species" survival impacts; social and economic impacts upon various populations; financial impacts; adverse impacts to water forms and water quality, atmospheric issues and air quality, landforms and soil quality, climate changes and/or impacts, and adverse impacts to property and its values. The value of human life and environmental criteria is required to be equal in value to that used by other federal agencies. (0823-67 [Michetti, Susan])

Comment: Specific on-site independent rigorous assessments strictly using scientific analysis, methods, and practices are required at each reactor site to thoroughly identify each site's unique attributes and parameters identified in its specific physical location, size, and volume on planet earth to discover critical safety information that is impossible to discover with any generic conceptualization. Differentiated, tested, and measureable site attributes and parameters are required for each reactor site and for each storage site to quantify any "safety" claim. This is not a complete description of all variables to be assessed for safety. By inaccurately shifting actual physical location to a "generic" conception, information that belongs to the actual physical world but missing in the "generic" thought world introduces unacceptable distortions, or suppressions, of the actual facts. These distortions that arise from generic conceptualization convert all dependent assessments, conclusions, and rule-making into that which is unreliable, undependable, and untrustworthy. By definition, suppressed information does not qualify to be considered as open and transparent, rigorous, thorough scientific methods that can be peer-reviewed or studied by any academic. (0823-68 [Michetti, Susan])

Comment: This low prediction of fatalities does not compare with the huge quantities of stored spent fuel in each pool at San Onofre. According to a report authored by Robert Alvarez entitled "Reducing the hazards of high-level radioactive waste in Southern California" published by Friends of the Earth, if only 30% of one of the San Onofre spent fuel pools was released by a fuel pool fire, the resulting fall out dead zone could be more than 10 times the size of the Chernobyl accident resulting in a dead zone five times the size of the state of New Jersey, where people would never return to Southern California. In light of Mr. Alvarez's estimations of the impact of a spent fuel fire of one of the San Onofre spent fuel pools, the 55 Billion dollar economic impact stated in Draft NUREG-2157's Table F-1 would not even come close to the real estate losses of a successful terrorist aircraft attack on a San Onofre spent fuel pool. Yet alone the personal loss of time, economic loss of industrial production or the impact on the world economy. The NRC needs to be more realistic in their fatality predictions as a service to

the public and to begin to acknowledge the severe impact one fully fueled jet aircraft could have on our nation. (0826-24 [Morgal, Rick])

Comment: Because the WCD and the related TSR do not in themselves authorize individual licensing actions, the NRC need not consider alternatives to licensing, or renewing licenses for, nuclear power plants in this GEIS. A "no licensing" alternative is not reasonable under NEPA for the present rulemaking because that approach is beyond the scope of the proposed action (which does not involve licensing a plant) and would not serve the purpose of the proposed action. Although the Court of Appeals found the WCD rulemaking to be a major federal action, the TSR and WCD comprise just one element in the agency's NEPA analysis for operating licenses, combined licenses, and renewed licenses. Alternatives to specific proposed licensing actions (including "no action") are considered separately in site-specific environmental reviews for the particular proposed projects or proposed actions. (0827-1-10 [Ginsberg, Ellen])

Comment: With respect to the alternatives considered, NEI agrees that the "no-action" alternative is not preferred to the proposed action. No action would require the NRC to perform site-specific reviews of the issues identified by the Court. As discussed in Section 7.0 of the draft GEIS, repetitive reviews of continued storage issues would be time-and resource-intensive, and extremely inefficient. The environmental impacts of continued spent fuel storage can readily be resolved on a generic basis. The generic approach is also consistent with the Council on Environmental Quality (CEQ) guidance for achieving efficiency and timeliness under NEPA.⁴² [footnote 42 text: See Memorandum from N. Sutley, Council on Environmental Quality, to All Heads of Federal Department and Agencies, "Improving the Process for Preparing Efficient and Timely Environmental Reviews Under the National Environmental Policy Act" (March 6, 2012).] (0827-1-13 [Ginsberg, Ellen])

Comment: Although the GEIS-only alternative would provide limited additional efficiency when compared to the no action alternative, it would still leave open the issue for individual licensing actions. Hence, the environmental impacts of continued storage would be subject to site-specific consideration, and could be challenged by petitioners in individual cases without a waiver under 10 C.F.R. § 2.335. As discussed in the draft GEIS, the temporary storage issues can and should be resolved through a rulemaking. Furthermore, NEI agrees with the NRC that site-specific analyses of these impacts would likely not reveal any new information that cannot be addressed in a generic analysis.⁴³ [footnote 43 text: Draft GEIS at 7-10.] (0827-1-14 [Ginsberg, Ellen])

Comment: Should new and significant information arise for a particular site, it still could be presented in a petition under Section 2.335. (0827-1-15 [Ginsberg, Ellen])

Comment: The NRC's generic approach to the environmental review of a discrete set of issues common to all reactors will obviate duplicative and inefficient site-specific reviews of continued spent fuel storage issues. Certainly, as is discussed further below, the issue of the "no repository scenario" affects all sites similarly. The GEIS includes well-supported bounding analyses for these issues that encompass all reactor sites and operations.³⁵ [footnote 35 text: Bounding analyses have also been previously accepted for NEPA reviews. See, e.g., *Baltimore Gas & Elec. Co. v. NRDC*, 462 U.S. at 107; *Natural Res. Def. Council v. NRC*, 685 F.2d 459, 486 (D.C. Cir. 1982).] Moreover, no evidence has been presented that would require that potential spent fuel pool leaks or fires necessitate site-specific consideration. The GEIS includes well-supported bounding analyses for these issues that encompass all reactor sites and operations. (0827-1-7 [Ginsberg, Ellen])

Comment: There is not enough consideration for those site-specific issues which may be different at specific NWO sites. We expect explicit enumeration of issues that will need to be considered at each site to deal with site-specific issues. There is no section of this type, although throughout the document, you say that the situation may vary at each plant. All of these variances should be summarized in a list such that users of the GEIS will know exactly what areas they will likely need to resolve for their site-specific situation. For example, section 3.15 "Transportation" on 28 page 3-37 says in Lines 12-16 that "Local and regional transportation networks in the vicinity of nuclear power plant sites may vary considerably depending on the regional population density, location, and size of local communities, nature of economic development patterns, location of the region relative to interregional transportation corridors, and land surface features, such as mountains, rivers, and lakes." You go on to say that most have only one access road. We note that San Onofre has a 10-lane freeway going through the exclusion zone, however. Now, this is just one example where it is likely that the term "generic" does not encompass all situations, and the GEIS must be supplemented with a site-specific EIS to be complete. For this document to be most useful to practitioners and so that the public will know what issues actually DO vary (outside of the term "generic") these should be enumerated explicitly. (0836-14 [Davis, Anonymous])

Comment: We reject the notion that this GEIS can adequately address the needs of each specific site situation, and therefore, the assertion that 10 CFR 51.23 could be revised to "state that because the impacts of continued storage have been generically assessed in this draft GEIS and codified in a Rule, NEPA analyses for future reactor and spent fuel storage facility licensing actions would not need to separately consider the environmental impacts of continued storage."¹ [footnote 1 text: Waste Confidence Draft GEIS Page 1-5] -- NO! NEPA analyses must still occur because the GEIS addresses only GENERIC concerns! (0836-25 [Davis, Anonymous])

Comment: There is no enumeration of issues that are likely to need to be resolved on a site-by-site basis. This must be included. (0836-67 [Davis, Anonymous])

Comment: A generic answer covering all nuclear power plants cannot be found for a question so complex, diverse and dangerous. Concerns such as earthquake faults, proximity to oceans and waterways, etc. must be considered with each and every relicensing request. (0846-2 [Wells, Gerald])

Comment: Abandon the generic "one size fits all" approach to storing nuclear waste and instead, make site-specific environmental reports and recommendations that take local conditions into account. (0860-1 [Headrick, Gary])

Comment: Abandon the generic "one size fits all" approach and instead, make site-specific environmental reports and recommendations (0860-7 [Headrick, Gary])

Comment: We know that the risk of a serious problem at a nuclear reactor is small, but the consequences can be so severe that it would be dangerous and irresponsible to ignore them. I realize that the courts have ruled that it is acceptable to create a Generic Environmental Impact Statement; to me, this implies not a reactor in a perfect, low-population rural area, but considering a worst-case scenario-which Indian Point embodies in many ways. If-and it is a big IF-we can be confident about nuclear waste at Indian Point, then (and only then, in my opinion) can we be confident about nuclear waste at other nuclear power plants. (0864-2 [Gellert, Sally Jane])

Comment: The Mayor and City Council from City of San Clemente just recently adopted a Resolution on December 17, 2013 which resolves : "City of San Clemente appreciates information in 2013 Waste Confidence Generic Environmental Impact Statement, however City requests a site specific study be done for SONGS (San Onofre) that recognizes; a) the geographic conditions unique to SONGS, B) the dense population surrounding SONGS, and c) that SONGS is being decommissioned. City of San Clemente formally requests the Energy Department create a dry cask storage facility in an area remote from high populations areas to provide safe storage of nuclear waste. Once complete City of San Clemente requests that spent fuel rods stored onsite at SONGS be relocated to the repository as soon as it is safe to do so. City of San Clemente requests to be included in the SONGS decommissioning process, and also requests NRC to conduct a SITE SPECIFIC IMPACT STUDY at SONGS. San Clemente believes such a study would demonstrate the need for the accelerated removal of nuclear waste to a permanent repository." (0866-2 [Borchmann, Patricia])

Comment: Each site has unique geological, socio-political, geographic, environmental and epidemiological features. Moreover, each nuclear reactor has a unique construction and mechanical operation - not a generic design. (0869-4 [Homick, Nick])

Comment: Also, a generic EIR is crazy give that Diablo is underlain by multiple fault lines! Conditions vary from plant to plant. (0872-8 [Wilvert, Calvin])

Comment: THE GENERIC WASTE CONFIDENCE DRAFT IS A JOKE. YOU CAN'T HAVE A GENERIC DOCUMENT TO REPORT ON ALL NUCLEAR PLANTS. (0887-2 [Chappellet, Carissa])

Comment: DIABLE IN AN INDIVIDUAL CASE AND SHOULD BE LOOKED AT INDIVIDUALLY. (0887-3 [Chappellet, Carissa])

Comment: NRC's SFP leaks impact analysis violates NEPA and the Court's decision in *New York v. NRC* because the bounding parameters used by NRC are not broad enough to cover a number of site-specific concerns[.] Although the Court in *New York v. NRC* found that a generic analysis of environmental impacts of spent fuel storage may be appropriate, whether generic or site-specific, the analysis must be "thorough and comprehensive." *New York v. NRC*, 681 F.3d 471, 481 (D.C. Cir. 2012). The Court accepted the NRC's bounding assumptions in the 2010 waste confidence rule, considering them to be "conservative" and finding the risks associated with the waste confidence decision to be "essentially common." *Id.* at 480. However, in the DGEIS, the NRC fails to use conservative bounding assumptions and as a result, the NRC fails to fully consider several site-specific concerns.²⁴ [footnote 24 text: 24 Bounding estimates are especially important here, where in its proposed rule, NRC states that site-specific concerns regarding future reactor and SFP storage facilities cannot be brought up during individual licensing actions. See Waste Confidence- Continued Storage of Spent Nuclear Fuel 78 Fed. Reg. 56804 (Sept. 13, 2013) (amending 10 C.F.R. pt. 51); see also Proposed Regulation 10 C.F.R. § 51.23(b).] (0897-6-1 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: NRC's generic analysis of radioactive contamination in groundwater from spent fuel pool leaks is deficient because that issue is most appropriately addressed in a site-specific manner as explained in the recently finalized update to the License Renewal Generic Environmental Impact Statement. There, the NRC determined that impacts surrounding "radionuclides in groundwater" should be addressed as a site-specific, rather than generic basis because: This new Category 2 issue evaluates the potential contamination and degradation of groundwater resources resulting from inadvertent discharges of radionuclides into groundwater from nuclear power plants. Within the past several years, there have been numerous events at

power reactor sites which involved unknown, uncontrolled, and unmonitored releases of radionuclides into the groundwater. The number of these events and the high level of public controversy have made this issue one that the NRC believes needs a “hard look” as required by NEPA. *As a voluntary action, NEI 07-07 [Industry Ground Water Protection Initiative— Final Guidance Document; NEI 2007] cannot be enforced by the NRC.* As such, no violations can be issued against a licensee who fails to comply with the guidance in NEI 07-07. Furthermore, *the NRC cannot rely on a voluntary initiative as a basis to ensure that the nuclear power industry will have adequate information available for the NRC to determine whether a documented leak or spill does or does not have an adverse impact on groundwater resources.* Regarding the magnitude of impact, the NRC bases its determination of SMALL to MODERATE impact on a review of existing plants have had inadvertent releases of radioactive liquids. Even though the NRC expects impacts for all plants to be within this range, a conclusion of LARGE impact would not be precluded for a future license renewal review based on new and significant information if the data support such a conclusion. As reflected in the final GEIS and rule, “Radionuclides released to groundwater” remains a Category 2 issue. Generic Environmental Impact Statement for License Renewal of Nuclear Plants, at 1-24, NUREG-1437, Volume 1, Revision 1 (June 2013) (emphasis added).²⁵ [footnote 25 text: 25 Additionally, this provides another example of how NRC’s reliance on inappropriate, inapplicable, and voluntary programs fails to satisfy NEPA as discussed in Section VI.D.2.b of these comments. While in its June 2013 License Renewal GEIS, NRC found that reliance on a voluntary program could not serve as a basis for ensuring information will be available for NRC to determine whether a leak did or did not have significant impacts, here, in its waste confidence DGEIS, NRC relied on that exact same document to support the conclusion that leaks will not have significant impacts. See DGEIS at E-5–E-6. This is completely illogical and at a minimum, NRC must explain this discrepancy.] But here, in the DGEIS, NRC relies on that same voluntary initiative in support of its generic determination that SFP leaks will not cause significant impacts. DGEIS at E-5-E-7. NRC provides no explanation of why it deems the issue of radionuclides in groundwater site-specific in the license renewal context, but not in the waste confidence assessment of spent fuel pool leaks into groundwater and its generic treatment here is inconsistent with its recent License Renewal GEIS and illogical. (0897-6-2 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: And further, the NRC should have considered a number of other site-specific concerns that fall outside of its current bounding estimates. For example, it should consider SFP sites where multiple reactors and SFPs exist (e.g., Turkey Point nuclear plant in Florida). The NRC should have also considered SFP sites where other nuclear facilities or waste sites are in close proximity, such as Plant Vogtle and its proximity to the Savannah River Site. In addition, the NRC should have considered sites that are particularly vulnerable to flooding, such as the Oconee and Fort Calhoun nuclear plants. Dam Failures and Flooding at U.S. Nuclear Plants, Union of Concerned Scientists (October 2012); Perkins, Richard, et al., Screening Analysis Report for the Proposed Generic Issue on Flooding of Nuclear Power Plant Sites Following Upstream Dam Failures (July 2011). (0897-6-3 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Generally, in order to assess the probability of future SFP leaks, a consideration of site-specific factors is critical. For example, particular sites’ susceptibility to natural disasters including earthquakes, hurricanes, floods, etc., may affect the integrity of SFPs, and the probability that such events may occur can lead to or exacerbate existing SFP degradation and leaks. That is, NRC must take into account current information regarding seismicity in regions where nuclear power plants are located,²⁶ [footnote 26 text: In 2007, the NRC began examining new earthquake hazard information and found that various seismic hazard estimates have increased and required further analysis; NRC is currently continuing to update earthquake risk hazard estimates for U.S. nuclear power plants in light of newer information and seismic

models. See Generic Issue 199 (GI-199), Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants: Safety/Risk Assessments, August 2010, ADAMS Accession No. ML100270639; Memo from P. Hiland to B. Sheron Re: Results of Safety/Risk Assessment of Generic Issue 199, September 2, 2010, ADAMS Accession No. ML100270598. Site-specific consideration of such new information and analyses concerning regional seismology and hazards posed therefrom is necessary for determining risks of future SFP leaks at particular nuclear power plants. For example, a study by Columbia University seismologists in 2008 concluded that the area surrounding the Indian Point nuclear plant was not, as previously thought, an area of low seismic activity, and that, in fact, it was “quite possible” the region could experience upwards of a 7.0 magnitude earthquake, which the owner of the plant has admitted Indian Point is not designed to withstand. See Lynn R. Sykes, John G. Armbruster, Won-Young Kim, & Leonardo Seeber, Observations and Tectonic Setting of Historic and Instrumentally Located Earthquakes in the Greater New York City–Philadelphia Area, *Bulletin of the Seismological Society of America*, Vol. 98, No. 4, pp. 1696–1719, August 2008; The Earth Institute, Columbia University, “Earthquakes May Endanger New York More than Thought, Says Study: Indian Point Nuclear Power Plant Seen as Particular Risk,” Press Release Posted on The Earth Institute website, August 21, 2008, available at, <http://www.earth.columbia.edu/articles/view/2235> (last visited December 13, 2012). Any such new information must be considered in relation to the risk of future SFP leaks at particular plants as waste is stored in such pools during post-operation timeframes.] as well as the most current scientific knowledge regarding sea level rise and other impacts of climate change, including the increased frequency of severe weather events that result in storm surges, flooding, and extended power outages that could compromise safe storage of spent fuel at reactor sites.²⁷ [footnote 27 text: See, e.g., NRC Event Notification Report #48452 for Oyster Creek (October 29, 2012), available at, <http://www.nrc.gov/reading-rm/doc-collections/event-status/event/2012/20121030en.html> (Notice of unusual event declared due to high intake structure water level).] Site-specific review related to these kinds of external circumstances is necessary since new information reveals such issues can be problematic and since different regions in the U.S. face different geological conditions and weather patterns. (0897-6-4 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Moreover, in relation to foreseeable impacts to surface waters from SFP leaks NRC should consider the following: the nature of the affected surface water (that is, is it an estuary that flows back and forth versus a static man-made pond?); the presence of nearby significant habitats and endangered species in surface waters affected by SFP leaks; the relevant status of the aquatic ecology in a given waterway, such as whether the waterway is already degraded or contains stressed fish populations, such as the Hudson River;²⁸ [footnote 28 text: For example, in the Hudson River, which is adjacent to the Indian Point nuclear facility, study has shown that 10 out of 13 critical fish species are in long-term decline, largely as a result of entrainment, impingement, and thermal impacts from power plant cooling water intake structures. See *The Status of Fish Populations and the Ecology of the Hudson*, Pisces Conservation Ltd., April 2008, available at, <http://www.riverkeeper.org/wpcontent/uploads/2009/06/Status-of-Fish-in-the-Hudson-Pisces.pdf>; NYSDEC Hudson River Power Plants FEIS (June 25, 2003), Public Comment Summary at 57, http://www.dec.ny.gov/docs/permits_ej_operations_pdf/FEISHRPP5.pdf. NRC must consider how long-term exposure to radiological contamination from SFP leaks may impact already troubled fish populations.] the degree to which already existing radiological contamination of surface waters resulting from prior SFP leaks may affect the level and degree of exposure to future SFP leaks; how site-specific susceptibility to severe weather events and earthquakes, may affect the behavior, fate, and effect of radiological contamination in surface waters resulting from future SFP leaks; and the degree to which radiological contamination of surface waters

“threatens a violation of Federal, State, or local law or requirements,” (40 C.F.R. § 1508.27(b); 10 C.F.R. § 51.71(d)) such as whether and the extent to which radiological contamination of surface waters results in violations of applicable state water quality standards adopted pursuant to the Clean Water Act or state environmental protection laws (including prohibitions and limitations on the discharge of radiological materials to State surface waters,²⁹ [footnote 29 text: For example, New York State law contains a provision that prohibits discharges of high-level radioactive waste as well as any discharges not permitted by NYS rules and regulations. See New York State Environmental Conservation Law § 17-0807(1), (4).] designated best usages of surface waters, and other established surface water standards.)³⁰ [footnote 30 text: For example, it is common for designated best usages established pursuant to the CWA to include recreational activities such as swimming, fishing, boating, etc.; in New York, the Hudson River directly adjacent to the Indian Point nuclear power plant has been designated as suitable for recreational activities, including swimming and boating; State standards require that the discharge of deleterious substances shall not impair the waters for such best uses. 6 NYCRR § 701.11; 6 NYCRR § 700.1(a)(49); 6 NYCRR 700.1(a)(56); 6 NYCRR § 703.2. NRC must consider the degree and extent to which future SFP leaks may interfere with such designated uses of impacted surface waters. In this regard, NRC cannot narrowly examine compliance with NRC dose limits; as such limits do not necessarily reflect the pathways of exposure contemplated by water protection standards. For example, at Indian Point, the plant owner only considers one exposure pathway, i.e., the consumption of fish and invertebrates from the Hudson River, when calculating NRC-doses. Entergy Nuclear Operations, Inc. (Indian Point Unit 1, 2, and 3 Nuclear Power Plants Docket Nos. 50-03, 50-247, and 50-286), Radioactive Effluent Release Report: 2010, at page 33 of 49, *available at*, ADAMS Accession No. ML11124A031 (“Liquid offsite dose calculations involve fish and invertebrate consumption pathways *only*”) (emphasis added). This fails to capture exposure resulting from recreational uses of the waterway.] (0897-6-5 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In relation to foreseeable impacts to groundwater resources, NRC should consider site-specific factors as they bear upon the likely behavior, fate, and effect of radiological contamination plumes resulting from future SFP leaks, including the following: the varying geological landscapes underlying reactors and SFPs at different sites (e.g., the nature of the bedrock and the hydraulic gradient underneath and surrounding the site); the nature of nearby resources (including the presence of significant habitats and endangered resources); the degree to which already existing groundwater contamination resulting from past radiological leaks may affect the behavior, fate, and effect of any new groundwater contamination resulting from new SFP leaks; and how site-specific susceptibility to severe weather events and earthquakes, may affect the behavior, fate, and effect of radiological contamination plumes resulting from future SFP leaks. In addition, NRC must consider whether and the extent to which radiological groundwater contamination results in violations of applicable state water quality standards adopted pursuant to the Clean Water Act (“CWA”) or state environmental protection laws. See 40 C.F.R. § 1508.27(b); 10 C.F.R. § 51.71(d). This includes designated best usages of state groundwaters,³¹ [footnote 31 text: For example, the State of New York has designated the best use of the groundwater beneath the Indian Point nuclear power plant to be “as a source of potable water supply,” and requires that the discharge of deleterious substances shall not impair the groundwaters for such best uses. See 6 NYCRR § 701.18; 6 NYCRR § 701.15; 6 NYCRR § 703.2. This is regardless of whether such groundwaters are actually used for potable purposes.] and any other established groundwater standards. (0897-6-6 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Because NRC's bounding parameters are not broad enough to encompass a number of site-specific concerns NRC's DGEIS is insufficient. (0897-6-7 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In license renewal cases, the NRC refuses to consider the no-action alternative, which includes energy conservation. 61 Fed. Reg. 28,467, 28,471-73 (June 5, 1996). Yet, as described in the Cooper Declaration, energy conservation may be more cost-effective than paying for spent fuel storage and disposal. But the NRC's regulatory system provides no method for evaluating the effects of spent fuel storage and disposal costs on the choice of the no-action alternative. (0897-7-14 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Impacts on river systems may be bounded by sites that are quite different in character. For instance, large scale dispersal of radioactivity from spent fuel storage at Prairie Island could create long-term damage to the entire Mississippi River system, including agricultural lands around it, cities that are vulnerable to flooding on its shores, barge traffic that is a major artery of commerce, and so on. Agricultural impacts alone may be bounded by sites like Fort Calhoun in Nebraska or Duane Arnold in Iowa. Such impacts would be especially important to evaluate in the case of long-term storage and indefinite storage accompanied by loss of institutional control. (0898-5-11 [Curran, Diane] [Makhijani, Arjun])

Comment: It is impossible to bound critical ecological impacts in a generic manner. They will require site specific discussion. For instance, the Calvert Cliffs reactors in Maryland are situated in one of the most sensitive and unique ecosystems of the United States – the Chesapeake Bay. The impacts of a major radioactivity release into the Chesapeake Bay ecosystem are likely to be quite different than those of a similar release at Turkey Point in Florida, which has barrier islands and Biscayne National Park a few miles away or Diablo Canyon, in California, where a major release could severely impact oceanic ecosystems. It is important to remember in this context that the inventory of long-lived radioactivity in spent fuel pools in the United States is generally far larger than that in Chernobyl Unit 4, which had a severe accident and radioactivity releases in 1986. It is essential for the waste confidence GEIS to analyze critical ecosystem impacts on a site specific basis unless it can classify sites based on types of ecosystems and address bounding impacts for similar sites. (0898-5-12 [Curran, Diane] [Makhijani, Arjun])

Comment: From the above examples, it is clear that the NRC should create a list of site-specific issues that are excluded from the purview of the GEIS and therefore could be brought up in individual licensing cases. In the alternative, it must show that it has bounded the impacts in a generic manner for each type of impact. This is especially important for long-term storage and indefinite storage with loss of institutional control. A GEIS must include bounding estimates for (i) the number of cancers attributable in case of a worst case release of radionuclides; (ii) the worst case damage to riverine ecosystems, such as the Mississippi River or the Columbia River; (iii) the worst case loss of agricultural land and production; (iv) the ecosystem damage to each unique ecosystem, including the Chesapeake Bay, the Mississippi River Delta, the Columbia River, and oceanic ecosystems, and (v) the worst case property damage. These evaluations should include not just today's source terms but the projected source terms based on the dates of the expiry of the licenses and the total accumulated spent fuel at that time. (0898-5-13 [Curran, Diane] [Makhijani, Arjun])

Comment: While some storage impacts can reasonably be addressed on a generic basis, there are many that cannot. At the very least, it is essential for the NRC to group incommensurate site-specific impacts by category, such as high population density areas,

reactors on rivers that could affect large populations living along those rivers, and so on. (0898-5-23 [Curran, Diane] [Makhijani, Arjun])

Comment: I have also concluded that it will be necessary to carve out a number of issues for site specific consideration unless the NRC considers groups of sites and specific types of impacts in this GEIS. No single generic analysis can cover the issues presented by indefinite storage onsite. The facts presented above are true to the best of my knowledge and the opinions contained herein represent my best professional judgment. (0898-5-29 [Curran, Diane] [Makhijani, Arjun])

Comment: THE EIS SHOULD ACKNOWLEDGE THAT CERTAIN IMPACTS CANNOT BE ANALYZED IN A GENERIC MANNER. (0898-5-5 [Curran, Diane] [Makhijani, Arjun])

Comment: The Draft GEIS claims to have considered site specific issues sufficiently to draw generally applicable conclusions regarding waste confidence so that such issues could not be brought up during reactor or specific storage facility licensing cases.¹³⁶ [footnote 136 text: NRC 2013a, p. xxiv] 9.2. I would agree that some impacts are generic and can, given adequate data, be bounded on that basis. This is the case, for instance, with the on-site impacts of transferring spent fuel from one cask to another. But other issues cannot be analyzed in a generic manner. This is because different kinds of impacts are incommensurate with each other. Therefore, it is necessary to have a bounding analysis for each major type of impact. I provide several examples in the following paragraphs. (0898-5-6 [Curran, Diane] [Makhijani, Arjun])

Comment: Take the example of the storage of spent fuel at the Columbia Generating Station in Washington State. A realistic analysis, including loss of institutional control, indicates that there would likely be catastrophic impacts that would contaminate Columbia River and its fish, including salmon. Indefinite storage would have devastating cultural and environmental justice impacts that could no longer be brought up for that site once a generic determination is made regarding the safety of indefinite storage. The tribes who have Columbia River-related rights would be precluded from bringing up the issue for any future new reactor or storage licenses or license extensions. The Draft GEIS does mention plants of special significance in the vicinity of the Prairie Island reactors, but provides no specific impact analysis in case of indefinite storage and dispersal of radioactivity or in case of severe accidents with high burnup failed spent fuel bundles. (0898-5-8 [Curran, Diane] [Makhijani, Arjun])

Comment: The U.S. Court of Appeals rejected the current Waste Confidence Rule noting that, after decades of failure to site a repository, the NRC "has no long-term plan other than hoping for a geologic repository." Therefore it is possible that spent fuel will be stored at reactor sites "on a permanent basis." The NRC must examine the environmental consequences of storing radioactive wastes at reactor sites into the indefinite future. The NRC Draft Generic Environmental Impact Statement (GEIS) relies on the fundamentally flawed assumption that all reactor sites are the same. On the contrary, they each have unique geographic, environmental, geological, climatic, and epidemiological considerations. The creation of a one-size-fits-all plan is scientifically invalid. (0908-1 [Mikkelsen, Sara])

Comment: People in our community feel that the spent fuel pools at Indian Point pose a grave risk to our health and safety. This assessment is backed up with solid scientific evidence from many sources. We do not understand how the NRC can conclude that a generic study can address the highly unique impacts of Indian Point. (0918-1 [Church of New York, The Riverside])

Comment: NRC's dismissive remarks about rural economies, at Page 3-4, line 17 and following, leaves a bad taste. After all, it was the local concerned farmer at Clinton, IL, who not only educated me about NRC's Nuclear Waste Con Game, but prompted NRC's meeting facilitator, Chip Cameron, to have to remind his colleagues about the policy's existence. Of course, the impacts of nuclear power - including, relevantly here, its forever deadly highlevel radioactive wastes - are of LARGE significance to agricultural areas of this country that have the dubious "honor" of "hosting" them - from Clinton, IL to Kewaunee, WI and many other sites. (0919-5-2 [Kamps, Kevin])

Comment: At line 23, NRC's describing the Indian Point, NY and Limerick, PA areas as "semi-urban" is puzzling? There are 21 million people within 50 miles of Indian Point! That is the most urbanized geographical area surrounding any nuclear power plant in the U.S.! And Limerick has some of the highest casualty figures on the CRAC-2 charts! Again, the 50 mile radius surrounding Limerick's two reactors, and on-site irradiated nuclear fuel storage facilities, is amongst the most urbanized areas in the entire country! By the way, CRAC-2 refers to Calculation of Reactor Accident Consequences. The report is also known as the 1982 Sandia Siting Study or as NUREG/CR-2239. I specify this, because at the Davis-Besse license extension oral argument pre-hearings held in Port Clinton, OH on March 1, 2011 (yes, ten days before the Fukushima Daiichi nuclear catastrophe was to begin), FirstEnergy Nuclear's attorneys, as well as NRC's attorneys and staff, as well as the ASLB panelists themselves, claimed not to know what CRAC-2 referred to. (0919-5-3 [Kamps, Kevin])

Comment: In some cases, the environmental impacts of continued storage can be addressed through a generic environmental impact statement (EIS). In other cases, there may be site specific environmental issues that are not adequately addressed by the Generic EIS. Therefore, the NRC should require the licensees to verify that the Generic EIS adequately addresses the environmental impacts of continued storage at their facility, and if that is not the case, require them to provide a supplement to the Generic EIS that addresses the site specific issues. (0920-1 [Foster, Ruth])

Comment: It is indicated that "If the proposed Rule is adopted, the site-specific NEPA analyses for future commercial power reactor and spent fuel storage facility actions would not need to consider the environmental impacts of continued storage." The problem with this statement is that environmental impacts are extremely site and even time specific. Also, demographics around a facility can change significantly from the time the plant was originally being licensed until even the first license renewal. (0920-11 [Foster, Ruth])

Comment: Lines 9 to 11 indicate that revising the Waste Confidence rule would provide the same level of protecting the environment as a site specific EIS would. This is difficult to accept since each facility's impact on the environment would be different depending on the local geology, physiography, ecology and area water use. Also over time climate change due to global warming can alter a regions' water use, storm frequency and, as sea level rises, there will be impacts on coastal and estuarine facilities. (0920-12 [Foster, Ruth])

Comment: According to NRC's proposed Waste Confidence rule as indicated on p. xxiv of Section ES.3 a " ... site-specific NEPA analyses for future commercial power reactor and spent fuel storage facility actions would not need to consider the environmental impacts of continued storage." This storage could be anywhere from 60 years after the end of the license and two license extensions (short term), to 160 years after the license extensions (long term) or possibly forever (indefinite). If the facilities are not required to consider any future impacts of continued storage on the environment then any new or better understanding of geology, aquifers or

ground water resources near and under the facility does not have to be considered. (0920-15 [Foster, Ruth])

Comment: This section [1.3, p. 1-5] implies that by use of this GEIS site specific consideration of continued storage of spent fuel, the environmental impacts will not have to be considered for any continued operation of the facility. They justify this by 40 years of generic considerations of continued storage in proceedings and by the operating experience of spent fuel storage and licensing dating back to the 1950's, which they say supports the assessment. According to Table G-1, the first two reactors went on line December 1, 1969, so essentially the operating experience of spent fuel storage did not start until 1970, not the 1950's. Also, due to the fact that 17% of the spent fuel pools already have developed leaks, continued storage is not just a simple issue that can be decided by a generic GEIS, especially since one of their main premises is that spent fuel pools do not leak. The impacts of leaks at an individual site depend on the local climate conditions, demographics, water use (both ground and surface) and the geologic interpretations for the facility and area. All these can and will change over the life of the facility. (0920-23 [Foster, Ruth])

Comment: Under a provision in the Nuclear Waste Policy Act of 1982, the NRC can approve ISFSI's under a nuclear plant's general operating license. This means even the nominal safeguards for protecting the environment and involving the public --normally required for licensing a nuclear facility --are done away with no site-specific study is required, no environmental impact statement (EIS) is made, and no adjudicatory public hearing process is allowed. The original EIS for the reactor itself-prepared decades earlier, long before ISFSI's were even envisioned--is relied upon for licensing the dry cask storage site. An environmental assessment is issued by the NRC which automatically finds no adverse impacts on the environment based upon the earlier EIS. (0929-8 [Kamps, Kevin])

Comment: Concerned citizens and community groups regard this "generic licensing process" as a meltdown of democracy. Michigan's Palisades nuclear plant was the first in the U.S. to receive the go-ahead from NRC to set up an ISFSI under the reactor's general operating license. In May, 1993 NRC allowed Consumers Energy Company to install a dry cask storage site on a sand dune identified by the Michigan Department of Natural Resources, the Army Corps of Engineers, and the University of Michigan as a "high risk erosion zone" just 150 yards uphill from the waters of Lake Michigan, the source of drinking water for tens of millions of people. Whereas the Palisades reactor itself is anchored to bedrock, its two dozen dry storage casks fully loaded with irradiated nuclear fuel (each one weighing 120 tons) sit on a three foot thick concrete storage pad, anchored to nothing but shifting sand. In early 1994, an NRC inspector stated "it's the consequences that might occur from an earthquake that I'm concerned about. The casks can either fall into Lake Michigan or be buried in the loose sand because of liquefaction." He concluded "It is apparent to me that NMSS [NRC's office of Nuclear Materials Safety and Safeguards] doesn't realize the catastrophic consequences of their continued reliance on their current ideology," the generic licensing process. Over a decade later, these concerns have not been addressed. NRC continues to generically license ISFSI's, rubberstamping nuclear utility applications at an accelerating rate. (0929-9 [Kamps, Kevin])

Comment: We reject the notion that this GEIS can adequately address the needs of each specific site situation, and therefore, the assertion that 10 CFR 51.23 could be revised to "state that because the impacts of continued storage have been generically assessed in this draft GEIS and codified in a Rule, NEPA analyses for future reactor and spent fuel storage facility licensing actions would not need to separately consider the environmental impacts of continued

storage."[Waste Confidence Draft GEIS] -- NO. NEPA analyses must still occur because the GEIS addresses only GENERIC concerns. (0930-1-18 [Lutz, Ray])

Comment: There is not enough consideration for those site-specific issues which may be different at specific NWO sites. We expect explicit enumeration of issues that will need to be considered at each site to deal with site-specific issues. There is no section of this type, although throughout the document, you say that the situation may vary at each plant. All of these variances should be summarized in a list such that users of the GEIS will know exactly what areas they will likely need to resolve for their site-specific situation. For example, section 3.15 "Transportation" on 28 page 3-37 says in Lines 12-16 that "Local and regional transportation networks in the vicinity of nuclear power plant sites may vary considerably depending on the regional population density, location, and size of local communities, nature of economic development patterns, location of the region relative to interregional transportation corridors, and land surface features, such as mountains, rivers, and lakes." You go on to say that most have only one access road. We note that San Onofre has a 10-lane freeway going through the exclusion zone, however. Now, this is just one example where it is likely that the term "generic" does not encompass all situations, and the GEIS must be supplemented with a site-specific EIS to be complete. For this document to be most useful to practitioners and so that the public will know what issues actually DO vary (outside of the term "generic") these should be enumerated explicitly. (0930-1-7 [Lutz, Ray])

Comment: There is no enumeration of issues that are likely to need to be resolved on a site-by-site basis. This must be included. (0930-3-19 [Lutz, Ray])

Comment: The idea that the GEIS can be proposed as a GENERIC plan is absurd to begin with. Several plants in the NE and New York State area each have problems unique unto themselves. At Seabrook in New Hampshire, there is concrete degradation and perhaps not occurring in other places because of the type of concrete that is used (and there the corporate owners applied for a license renewal in 2012 from 2032, when it is set to expire, to 2052!). At Vermont Yankee in Vernon, VT there has tritium leaking for years and years, at Plymouth NPS, the water temperature of the Cape Cod Bay increase necessitated the plant be shut for days and the numerous plant shutdowns heads the list of number of unplanned shutdowns in the U.S. It was also cited as the second highest chance of earthquake occurrence in the U.S. This an example of another factor that has changed with the passing years of improved technology and geology study. (0933-6 [Anonymous, Janet])

Comment: So, how can we ever capture one moment in time with something called a Generic Environmental Impact Statement, and presume that it will capture what is happening in this ever-changing reality? Every reactor site is unique. If they were to drop one cask out at Zion, you could punch a hole in the bottom of the pool. It would partially drain and, in a worst-case scenario, set fuel on fire in a few hours in an order of magnitude greater than Chernobyl. These are catastrophic risks and we cannot address them through the absurdity of a generic impact statement. And these are site-specific impacts in this very densely populated area that we need to take into consideration as we make our future plan. (0934-3 [Lewison, Linda])

Comment: A Generic EIS is inherently ridiculous when one considers not only that each nuclear power facility and radwaste storage area is in a unique geographical, seismic, hydrologic, demographic, and other settings. Not only should there be thorough real world analysis of licensing actions at individual nuclear power facilities by developing a sufficient EIS for each of them, but these studies must also evaluate various options for storing fuel onsite and

beyond the site (including the complications involved with "high burn-up fuel"). (0937-10 [Campbell, Bruce])

Comment: Thus, the No-Action Alternative (Alternative 1) is the only alternative which appears that it may involve a thorough analysis before the NRC acts again with their well-worn "rubber-stamp" to approve various licensing actions at nuclear power facilities. This is the one sensible alternative offered which could actually involve adequate analysis of real world situations and alternatives. The "No Action Alternative" reads: "The NRC would take no action to generically address the environmental impacts of continued storage in individual, site-specific license reviews." (0937-11 [Campbell, Bruce])

Comment: Returning to the point mentioned under "E." in regards to UNIQUENESS of nuclear power facilities in the USA. Certainly each site at which there is a nuclear reactor and/or radwaste is unique. Yet in the USA, there are no cookie-cutter nuclear power facilities. There are many different configurations of nuclear power facilities (even if there is a similar type of reactor installed as at other sites) in the USA. Thus, it defies logic to claim that any sort of generic determination can be made when we are referring to uniquely sited facilities as well as unique facility determination and equipment being used. (0937-13 [Campbell, Bruce])

Comment: Let's examine the claim on page xxiv of the WC Generic EIS that, "The NRC considers the continued storage of spent fuel a generic activity that is similar for all commercial nuclear plants and storage facilities." How many licensed NRC facilities have received permission to store a greater concentration of radioactive waste than was originally intended? How many of these (and how many others) have their radwaste situation complicated by "high burn-up fuel"? Thus, there are many differences in radwaste storage configuration and timing (such as timing of putting some radwaste in dry casks, so the NRC's conclusion defies logic and, once again, is designed to help this highly toxic and beleaguered industry. (0937-14 [Campbell, Bruce])

Comment: Thus, the No-Action Alternative is the only alternative which could possibly involve sufficient analysis of alternatives for radwaste storage -- through site-specific EISs of individual nuclear reactor and radwaste storage sites. (0937-19 [Campbell, Bruce])

Comment: The GEIS risk analysis is not credible or adequate -- both in regards to "generic" risk and failures to differentiate between different sites even in regards to such basics as geography, seismicity, and proximity to large population centers and vital agricultural regions. It strains common sense that there appears to be no distinction drawn in the WC Generic EIS document between spent fuel in a region with millions of people in the immediate region versus the spent fuel being stored or permanently repositied / deposited at a site quite remote from population centers. (0937-23 [Campbell, Bruce])

Comment: Clearly there is not serious analysis of alternatives that could help contend with radioactive wastes in the real world. So, since this document is so vague and does not offer a reasonable range of alternatives, thus we need the more site-specific documents for a licensing action to be very thorough. Unfortunately, both the Nuclear Energy Institute (in their advice to the NRC during scoping comments for this Generic EIS) and the NRC have left open the possibility that such site-specific documents would be relatively skimpy Environmental Assessments rather than the often more thorough (in many cases -- yet this Generic EIS is neither thorough in analysis nor in offering a reasonable range of alternatives). (0937-7 [Campbell, Bruce])

Comment: The Waste Confidence Generic EIS has insufficient analysis and offers a pathetic range of alternatives, so this document was be seriously re-written in a "real world" way which offers a reasonable range of alternatives as NEPA calls for. So, not only do we need an adequate rather than this joke of a Waste Confidence Generic EIS, but all site-specific documents seeking nuclear licenses and permits need to go through the more thorough EIS process rather than merely undertaking an Environmental Assessment on these situations. (0937-9 [Campbell, Bruce])

Comment: All nuclear reactors and reactor sites are not created equal. A generic environmental impact statement for evaluating waste and waste storage at all reactors is an irresponsible and unscientific response to the challenges posed by long-term irradiated waste storage. Each reactor site has its own unique environment. Site issues can range from being close to large population centers, being in a flood plain and having seismic issues. A generic EIS cannot be a true picture of the impacts of the waste generation and storage of highly radioactive spent fuel. Because NRC generically ruled it had confidence that there would be a solution for high level nuclear waste, the dangers were never allowed to be considered at each site. (0938-12 [Sondheim, Steven])

Comment: And because environmental impacts are shown as "generic," no distinction is made of added risks at sites such as San Onofre that are in earthquake and tsunami zones on small and valuable pieces of land near major population centers and transportation corridors. (0944-6 [Pascall, Glenn] [Watland, George])

Comment: Overall, the proposed NRC Statement underrates risks at all sites, blurs or eliminates the fact of higher risk at some sites, and seeks to walk away from the search for less hazardous sites. (0944-8 [Pascall, Glenn] [Watland, George])

Comment: Abandon the generic "one size fits all" approach to storing nuclear waste and instead, make site-specific environmental reports and recommendations that take local conditions into account. (0947-1 [Abbott, Sandra] [Anonymous, Anonymous] [Anonymous, Jill] [Bandfield, Gary] [Bennett, Mary] [Clancy, Stephan] [Clig, George] [Evans, Michael W.] [Faunce, Stephanie] [Ferreira, Raul] [Foster, William] [Hafer, Sarah] [Kalama, Laura] [Pratt, Curtis] [Turner, D] [Van Leekwijck, Natalie] [Wigglesworth, Marilyn] [Yarrobino, Erin])

Comment: The U.S. Court of Appeals rejected the current Waste Confidence Rule noting that, after decades of failure to site a repository, the NRC "has no long-term plan other than hoping for a geologic repository." Therefore it is possible that spent fuel will be stored at reactor sites "on a permanent basis." The NRC must examine the environmental consequences of storing radioactive wastes at reactor sites into the indefinite future. The NRC Draft Generic Environmental Impact Statement (GEIS) relies on the fundamentally flawed assumption that all reactor sites are the same. On the contrary, they each have unique geographic, environmental, geological, climactic, and epidemiological considerations. The creation of a one-size-fits-all plan is scientifically invalid. (0951-1 [Commenters, Multiple])

Comment: I was an outreach/education specialist working for the Washington State Department of Health in a cooperative agreement partnership with the Agency for Toxic Substances and Disease Registry for five years. I specialized in fish advisories. If radioactive waste leaks into the Columbia River it will be an environmental disaster of epic proportions. The impact on human health and the fishing industry will run into billions of dollars. Please heed this message. Future generations are counting on you. (0993-2 [Henning, Marcia])

12. Comments Concerning Alternatives – GEIS Only

Comment: I am speaking almost exclusively to the third point that was made by the court of the need to evaluate the environmental effects of failing to secure permanent disposal. I'm very specifically addressing that. And I have an opinion about the alternatives, whether or not that the GEIS would be useful in creating a framework for scoping, and for addressing site-specific long-term storage issues. I'm confused about the fact that the GEIS-only alternative appears to do this but is named GEIS-only alternative. I have an enormous number of questions about this, but I think that a positive use of the GEIS process would be to begin to scope and establish some very essential parameters for addressing -- for responsible waste storage. (0328-12-2 [Eide-Tollefson, Kristen])

Comment: This comment supports the GEIS-Only Alternative for the following reasons: • It would not become part of the Waste Confidence rule, but would be used as a guidance document to support site specific license review; • This may prevent the GEIS from becoming an impediment to rational decision-making and effective planning and implementation of mitigation strategies; • It does not prevent the filing of contentions; • The GEIS findings and conclusions would remain open to challenge in site-specific review. • It would provide a middle ground of efficiency in review. Given the uncertain future of nuclear waste storage this alternative is a middle ground, that would allow for common features of analysis to be addressed by the GEIS, but would not inappropriately prejudice or bind site specific concerns to the conclusions of the GEIS. In addition, the GEIS-Only alternative would mean that the document would remain a tool, not a rule. This is appropriate, again, given the uncertainty of the future of nuclear waste storage. (0820-12 [Eide-Tollefson, Kristen])

Comment: COPS supports only the GEIS-only alternative, and require that any NWO that is to extend licensing past the decommissioning period of 60 years, must first accomplish a license amendment process, if not before. WE DO NOT SUPPORT THE NOTION THAT THESE ARE SAFE ENOUGH FOR USE AFTER THE 60-year DECOMMISSIONING PERIOD! (0836-26 [Davis, Anonymous])

Comment: Section 7.4 GEIS-Only Alternative. COPS supports ONLY this option, and than only for the short-term (decommissioning time) for each plant. This GEIS should not be used to allow unlimited and permanent ISFSI operation! (0836-63 [Davis, Anonymous])

Comment: COPS does not support a policy-statement approach, which will, without any site-specific review, hearing or study, allow NWOs to 4 persist on a permanent basis. We support only the use of a GEIS-Only alternative, and that, we support he approval of the use of co-located NWOs ONLY FOR THE SHORT TERM (60-year) decommissioning period. At that point, the canisters should be transported off-site to either a below- ground deep geologic repository or a surface repository in lower-risk areas, and allow plants to fully decommission and remove all traces of the ISFSI, and then return any balance of decommissioning funds to ratepayers. (0836-65 [Davis, Anonymous])

Comment: COPS supports only the GEIS-only alternative, and require that any NWO that is to extend licensing past the decommissioning period of 60 years, must first accomplish a license amendment process, if not before. WE DO NOT SUPPORT THE NOTION THAT THESE ARE SAFE ENOUGH FOR USE AFTER THE 60-year DECOMMISSIONING PERIOD. (0930-1-19 [Lutz, Ray])

Comment: Section 7.4 GEIS-Only Alternative. COPS supports ONLY this option, and than only for the short-term (decommissioning time) for each plant. This GEIS should not be used to allow unlimited and permanent ISFSI operation. (0930-3-15 [Lutz, Ray])

Comment: We support only the use of a GEIS-Only alternative, and that, we support the approval of the use of co-located NWOs ONLY FOR THE SHORT TERM (60-year) decommissioning period. At that point, the canisters should be transported off-site to either a below-ground deep geologic repository or a surface repository in lower-risk areas, and allow plants to fully decommission and remove all traces of the ISFSI, and then return any balance of decommissioning funds to ratepayers. (0930-3-17 [Lutz, Ray])

Comment: It is sad that page xxv of the Executive Summary under "2. The GEIS-Only Alternative" leaves the door open for more skimpy Environmental Assessments rather than thorough site-specific EISs on licensing reviews. (0937-21 [Campbell, Bruce])

13. Comments Concerning Alternatives – Policy Statement

Comment: Therefore, Utah strongly recommends that the Commission proceed according to the Draft GEIS proposed "policy alternative" - by issuing a policy statement that the finding of the GEIS could be incorporated into the environmental reviews of future licensing actions. Staff acknowledges that If the matter is truly a generic issue that the GEIS has adequately addressed, then, the GEIS could be incorporated into a site specific licensing proceeding.⁹ [footnote 9 text: Draft GEIS at 1-6] By proceeding with a policy statement, instead of a rule, the decision whether an environmental impact is truly generic will consider site specific licensing facts. While a party with standing may still file a contention raising a generic issue, Commission and licensing board case law and precedence would eliminate the rehearing of truly generic issues. Importantly, whether an issue is in fact generic would be considered along with site specific information and not be presupposed years, if not decades, in advance. Under a policy alternative, the Commission, indeed, will still achieve its desired goal of improving the efficiency of licensing proceedings if the issues are truly generic. (0579-4 [Smith, Amanda])

Comment: Lastly, the policy statement alternative, like the no-action alternative, would be inefficient in that it also would necessitate costly and time-consuming site-specific reviews. Therefore, NEI supports the recommendation in Section 8.7 of the draft GEIS that the proposed action - a rulemaking accompanied by a GEIS - is the preferred alternative. (0827-1-16 [Ginsberg, Ellen])

Comment: COPS does not support the "Policy-statement alternative," as described above, due to the fact that this circumvents site-specific public oversight, and assumes incorrectly, that a generic EIS is sufficient to deal with site-specific issues, which abound (but you conveniently forget to enumerate and acknowledge exist). (0836-27 [Davis, Anonymous])

Comment: COPS does not support the "Policy-statement alternative," as described above, due to the fact that this circumvents site-specific public oversight, and assumes incorrectly, that a generic EIS is sufficient to deal with site-specific issues, which abound (but you conveniently forget to enumerate and acknowledge exist). (0930-2-1 [Lutz, Ray])

Comment: COPS does not support a policy- statement approach, which will, without any site-specific review, hearing or study, allow NWOs to persist on a permanent basis. (0930-3-22 [Lutz, Ray])

Comment: The 3rd and last of the alternatives offered in the WC Generic EIS is "3. The Policy Statement Alternative" and is quite disturbing. It appears that the nuclear industry wants to leave the door open for an option where the inadequate joke of the environmental impact analyses in this generic EIS document can be incorporated into site-specific NEPA documents in order to avoid a more thorough site-specific evaluation. (0937-22 [Campbell, Bruce])

14. Comments Concerning Alternatives – Considered but Eliminated

Comment: One obvious and reasonable alternative that must be considered in the GEIS is dry cask storage as an option to storage in spent fuel pools. Although Staff may believe there is no environmental impact difference between spent fuel that is closely packed and stored in pools and spent fuel that is placed in dry cask storage once it is 5 years old, there is ample and technically competent disagreement with that conclusion. See, e.g., Robert Alvarez, Jan Beyea, Klaus Janberg, Jungmin Kang, Ed Lyman, Allison Macfarlane, Gordon Thompson, Frank N. von Hippel, *Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States* (Science and Global Security, 11:1-51, 2003)³ [footnote 3 text: This article was cited in a filing in these proceedings. See Comments by Alliance for Nuclear Accountability, et. al. (Jan. 2, 2013), Declaration of 2 January 2013 by Gordon R. Thompson: Recommendations for the US Nuclear Regulatory Commission's Consideration of Environmental Impacts of Long-Term, Temporary Storage of Spent Nuclear Fuel or Related High-Level Waste, Appendix A.]; Robert Alvarez, *Spent Nuclear Fuel Pools in the U.S.: Reducing the Deadly Risks of Storage* (Institute for Policy Studies, May 24, 2011). (0001-17 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: Petitioners [The State of Vermont with the Vermont Department of Public Service, the State of Connecticut, the State of New York, and the Commonwealth of Massachusetts] request that the Commission reverse the following errors that were made in the Staff Scoping Decision: Refusing to consider the alternative of requiring dry cask storage of spent fuel rather than continued use of spent fuel pools for spent fuel that is more than 5 years old. (0001-2 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: Another obvious and reasonable alternative that must be addressed in the GEIS is the option of not allowing additional spent fuel to be generated until a permanent, safe, and adequate nuclear waste disposal facility exists.⁴ [Footnote 4 text: [T]his alternative should be analyzed for all plants that are not yet licensed, that are up for relicensing, or that received operating licenses or license extensions on or after December 23, 2010, when the Commission formally abandoned the position that it could establish a date by which a permanent nuclear waste repository would be available. See 75 Fed. Reg. 81032.] The alternative of ceasing generation of additional spent nuclear fuel until a permanent, safe, and adequate nuclear waste disposal facility exists is not only a "reasonable alternative" that must be analyzed to meet the requirements of 40 C.F.R. § 1502.14(a), but is also required by 40 C.F.R. § 1502.14(d), which states that agencies such as NRC must include in their environmental analysis "the alternative of no action." The "no action" alternative must be analyzed before NRC can license the generation of additional spent nuclear fuel (and the resulting environmental impacts of such additional generation) at any nuclear facility. Because the GEIS is intended to support the environmental review of licensing actions and license renewal actions regarding environmental impacts of storing spent nuclear fuel, NEPA mandates that NRC examine the cessation of further generation of spent fuel until a permanent, safe, and adequate nuclear waste disposal facility exists. Indeed, the D.C. Circuit has already identified this alternative as a reasonable one by noting that it may be unreasonable to do anything else: "The lack of progress on a permanent repository has caused considerable uncertainty regarding the environmental effects

of temporary SNF storage and *the reasonableness of continuing to license and relicense nuclear reactors.*" *New York*, 681 F.3d at 474 (emphasis added). (0001-24 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: Petitioners [The State of Vermont with the Vermont Department of Public Service, the State of Connecticut, the State of New York, and the Commonwealth of Massachusetts] request that the Commission reverse the following errors that were made in the Staff Scoping Decision: Refusing to consider the alternative of not allowing further production of spent fuel until NRC determines that there is a safe and environmentally acceptable permanent waste repository to receive the additional spent fuel—a consideration that the U.S. Court of Appeals for the D.C. Circuit explicitly recognized to be reasonable in *New York v. NRC*, 681 F.3d 471, 474 (D.C. Cir. 2012). (0001-3 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: [T]he EIS should consider the option of not making any nuclear waste at all in the future by comparing the environmental footprint of nuclear from mining to long term waste disposal to that of renewables and energy efficiency. (0003-5 [Commenters, Multiple])

Comment: I really would like to see this Environmental Impact Statement looking at alternatives, alternatives like not making the waste at all. (0030-12-11 [March, Leslie])

Comment: I'm asking that the EIS thoroughly discuss spent fuel impacts for each reactor, following NEPA by considering alternatives for creation of future waste, including the alternative to continue the moratorium on relicensing and licensing reactors with the goal of phasing out all reactors by 2020 or sooner. If the Germans can do it, we can. (0030-12-5 [March, Leslie])

Comment: The EIS needs to look at renewables and energy efficiency as being an alternative to creating more nuclear waste. (0030-12-7 [March, Leslie])

Comment: As the Agency has consistently clarified, several people have mentioned today the waste confidence rulemaking is not a licensing decision, does not authorize construction or operation of nuclear power plants or the continued storage of used fuel at any specific site. Importantly the staff has correctly concluding that stopping nuclear reactor licensing or operations is not an alternative required to be addressed under NEPA in the waste confidence proceeding. It's not an alternative that serves the purpose of the present rulemaking, which are: (1) To improve the efficient of the NRC licensing actions through generic consideration of environmental impacts of continued storage; (2) to capture the review in a single comprehensive document; and (3) to respond to the court's remand. Consideration of halting reactor licensing or operation wouldn't further the NRC's ability to consider analyzing the environmental impacts of extended storage of used fuel at or away from reactor sites, nor does it necessarily reflect the environmental benefits of continued operation of nuclear power plants. (0030-16-2 [Bonanno, Jerry])

Comment: Unless and until permanent isolation of existing radioactive waste from the biosphere has been demonstrated, there should be no confidence in licensing waste production and the NRC should stop licensing new reactors and relicensing old ones. The NRC does not have the authority to license making more waste until it has proven that the waste can be isolated from the environment. We have no current working process to isolate or remove radioactive waste at all levels of our environment. The NRC is too closely involved with the nuclear industry to make an objective decision regarding waste generation. There should be no more licensing or relicensing of nuclear reactors until the permanent disposal of radioactive waste becomes a proven reality. Why should we condone continued licensing of new reactors

and renewing licenses from old reactors while we're facing the dilemma of not being able to safely dispose of 70,000 metric tons of commercial high-level waste already generated and the 2,000 metric tons being produced each year by the nuclear power reactors in the United States? The EIS should consider and analyze the option of not generating any additional waste. It should consider and evaluate phasing out nuclear reactors in the near future. Creating additional waste when there is no identifiable solution for its permanent disposition cannot be justified. There are other methods of generating electricity that do not generate radioactive waste. (0030-21-2 [Carberry, Mike])

Comment: Finally, the EIS should consider the option of not making any nuclear waste at all in the future by comparing the environmental footprint of nuclear from mining to long term waste disposal to that of renewables and energy efficiency. (0039-8 [Littlejohn, Nick])

Comment: The EIS needs to look at renewables and energy efficiency as being an alternative to creating more nuclear waste. (0045-11-10 [March, Leslie])

Comment: I am asking that the EIS thoroughly discuss spent fuel impacts for each reactor, follow an EPA by considering alternatives for creation of future waste including the alternative to continue the moratorium on re-licensing and licensing reactors with the goal of phasing out all reactors by 2020 or sooner. (0045-11-8 [March, Leslie])

Comment: We must look at the option of NOT generating any additional waste. We must evaluate phasing out nuclear reactors in the near future. (0065-2 [Payne, Gail])

Comment: Unless and until permanent isolation of existing radioactive waste from the biosphere has been demonstrated, there should be no confidence in licensing waste production, and the NRC should stop licensing new reactors and relicensing old ones. The NRC does not have the authority to license making more waste until it is proven that the waste can be isolated from the environment. We have no current working process to isolate or remove radioactive waste of all levels from our environment. The NRC is too closely involved with the nuclear industry to make an objective decision regarding waste generation. There should be no more licensing or re-licensing of nuclear reactors until the permanent disposal of radioactive waste has been determined, proven and funded. Why should we condone continued licensing of new reactors and renewing licenses from old reactors while we are facing the dilemma of not being able to safely dispose of the 70,000 metric tons of commercial high level nuclear waste already generated and the ~ 2000 metric tons being produced each year by nuclear power reactors in the US? The EIS should consider and analyze the option of not generating any additional waste. It should consider and evaluate phasing out nuclear reactors in the near future. Creating additional waste when there is no identifiable solution for its permanent disposition cannot be justified. Any EIS regarding nuclear waste storage must first and foremost consider alternatives to nuclear waste generation. There are other methods of generating electricity that do not generate radioactive waste. (0072-1 [Black, Ryan])

Comment: Nuclear plants are deadly. Considering the problem with the plant in Japan and that a number plants here in the United States use the same system, we are placing thousands of people in harms way. The cost of nuclear plants from the subsidies to build them, damage to the environments where the material is mined, cost of transportation, disposal of waste to the decommissioning of these reactors need to be compared to less dangerous alternative energy sources such as solar and wind. We do need to transition from fossil fuels and lets do so with a system that cost less and is safe for our communities. (0110-2 [Wolf, Ann])

Comment: I think NRC, at least, should implement a rule to nuclear power plant operators that unless the operators are capable of moving their spent fuel into dry casks from fuel pools, they cannot operate the reactors. (0141-1 [Tonohira, Yuko])

Comment: Any EIS regarding nuclear waste storage must first and foremost consider alternatives to nuclear waste generation. Creating additional waste when there is no identifiable solution for its permanent safe storage is not justified. (0143-4 [Arauz, Jorge])

Comment: [T]he first one is that this is an environmental review that the court ordered the NRC to do under -- under what's called NEPA. And when you do an environmental review under this Federal Law, you're supposed to look at the action that's taken, and here the action is how do we look at the -- look at the storage of nuclear waste and how do we allow licensing and nuclear reactors and the re-licensing of reactors like Indian Point to continue while this waste piles up with no solution in sight. The most obvious alternative to that, and they have to look at a whole range of alternatives, is to stop producing waste. (0163-2-3 [Musegaas, Philip])

Comment: Finally, the EIS should consider the option of not making any nuclear waste at all in the future by comparing the environmental footprint of nuclear from mining to long term waste disposal to that of renewables and energy efficiency. (0198-6 [Cerrito, Robert])

Comment: Require a low-density, open-frame layout for fuel pools: Fuel pools were originally designed for temporary storage of a limited number of irradiated fuel assemblies in a low density, open frame configuration. As the amount of waste generated has increased beyond the designed capacity, the pools have been reorganized so that the concentration of fuel in the pools is nearly the same as that in operating reactor cores. If water is lost from a densely packed pool as the result of an attack or an accident, cooling by ambient air would likely be insufficient to prevent a fire, resulting in the release of large quantities of radioactivity to the environment. A low density, open-frame arrangement within fuel pools could allow enough air circulation to keep the fuel from catching fire. In order to achieve and maintain this arrangement within the pools, irradiated fuel must be transferred from the pools to dry storage within five years of being discharged from the reactor. (0222-15 [Zeller, Lou])

Comment: The NRC's generic approach to the environmental assessment and rulemaking remains utterly inadequate to satisfy the requirements of both the Atomic Energy Act and the National Environmental Policy Act for the licensing decisions necessary for nuclear power plants. And the Commission fails to give due consideration to the alternative of shutting down nuclear plants and not producing any additional radioactive waste, an approach now taken by other advanced industrial nations. (0222-22 [Zeller, Lou])

Comment: In fact, within the context of the DGEIS, the most practicable alternative for preventing or mitigating high-level nuclear waste storage impacts is the cessation of further reactor licensing. (0222-9 [Zeller, Lou])

Comment: I recommend the Energy Reader, an anthology of informative and academic writings on energy and society, edited by Laura Nader. This tome elucidates many of the complex issues surrounding energy production and would be a fantastic resource to utilize when considering energy policy. Finally, the EIS should consider the option of not making any nuclear waste at all in the future by comparing the environmental footprint of nuclear throughout the production chain--from mining to long term waste disposal--to that of renewables and energy efficiency by design. These technologies already exist--and should be promoted, utilized and further developed. Let's make the United States the leader and envy of the world, by becoming

the most sustainable, and sustainably profitable country in the world. Imagine the possibilities: re-making our country to be efficient and ecologically sustainable is an enormous project that would generate countless jobs and billions of dollars. Many small start up companies are already innovating green product and service solutions-and this is a fast growing sector of the economy. Taking a stand on nuclear would send a clear message: the future has arrived, we will no longer stay the course with policies and technologies that are sending us into environmental disaster. Send the social and market signal that the time for green innovation and green bottom-lines, is here. (0241-4 [Nixon, Kerry])

Comment: The NRC should stop licensing new reactors and relicensing old ones until it has proven that the waste can be isolated from global ecosystem with long-term storage and sites secured. Only then can we truthfully express and experience waste confidence. The methodology by which our current society generates electricity must be managed in a responsible manner with health and stability of future generations in mind. NRC has the purpose and the responsibility of protecting public health. The NRC should provide clear, focused, site-specific analysis of nuclear plants as it determines adequate storage methods for spent fuel. (0244-14-12 [Prescott, Lisa Marie])

Comment: Should NRC be licensing and relicensing plants based on their grossly inadequate GEIS? The answer is a resounding NO! They must not be allowed to just say they are confident that waste will be safely stored without any basis in fact. NRC's response in their GEIS is not any better than their past position of just stating they were confident that waste could be safely stored. I don't feel safe. (0245-15-4 [McComb, Sandy])

Comment: It's not that I'm in favor of these things but I'm supportive of these alternatives. The first one is to implement dry spent fuel storage in hardened onsite casks, which was mentioned earlier. Immediate efforts should be made to transfer spent fuel sufficiently cooled from wet pool storage to onsite at-reactor dry storage and so-called hardened casks. This approach would avoid the need to have additional away-from-reactor interim spent fuel installations. And as recommended by Dr. Arjun Makhijani, the Federal government should purchase land adjacent to reactor sites to accommodate this process. (0245-29-1 [Shineflug, Marilyn])

Comment: It really is that simple. If you can't transform it, don't produce it. Radioactivity from atomic power will pose a threat to life on the Earth for the next million years. We are confident that NRC and the waste generators can never contain this waste for as long as it poses a hazard. But to continue making more of it is not just insane, it is irresponsible and should be illegal. NRC must abandon its waste confidence policy and stop using it to license nuclear power plants. There is no safe dose of radiation and to pursue licensing it on the basis of waste confidence is immoral. (0245-37-5 [Bilenko, Stephanie])

Comment: Without a waste solution, like everybody else has said, I oppose the creation of more nuclear waste. I see few in this room who will be around to fulfill the promises to replace casks in the 60 or 100 years, let alone 250,000 years. I've seen promises to protect the public abandoned in the face of extreme events, like the increasingly extreme weather events we can expect or more frequently -- gives me pause. NRC should stop jeopardizing future citizens without their consent and should not be allowed to issue new licenses or extensions. (0245-46-3 [Craig, Evan])

Comment: One of the things, when you look at engineering projects, and this is fundamentally what the argument here is, that we can engineer our way out of this issue. And as was stated before, in any engineering project there's a number of assumptions when you build something

to a particular set of specifications. And I think that with this particular issue, you can't set the assumptions at a point that's strong enough for us to have confidence that you could come up with, really, a solution that would justify keeping new plants being licensed. (0245-8-2 [Fox, Rick])

Comment: So the real issue here is whether or not to license new reactors, to extend the licenses of old reactors, and the preferred alternative in this EIS should be stop licensing reactors, stop making high-level radioactive waste, for which there is no solution. (0246-32-3 [Kamps, Kevin])

Comment: The only solution for nuclear waste is to stop producing it. We oppose this EIS, and any new operating licenses for nuclear plants (0250-28-8 [Embrey, Monica])

Comment: All plants should be shut down, so we need to get -- the confidence that we need is to get rid of operating nuclear plants, number one, because we have a big problem. We have to lie about the fact that all these problems are small. (0325-19-4 [Lutz, Ray])

Comment: So I've created this five-point plan. The five-point plan would be, number one, stop production. Don't go find a place to put nuclear fuel. That'll only let them keep making it. First, stop production. Second, move it all into dry cask storage. Third, remove that dry cask storage spent fuel from the Pacific Rim of fire. Then, number four, weld shut the sea water cooling intake pipe and save our sea life. And then five, prosecute all those responsible for this hideous crime against the future. (0326-12-2 [Racano, Joey])

Comment: You should withdraw the Draft Generic EIS immediately. But due to this generic situation I don't think it makes sense to even do a revision. But anyway, it should be withdrawn and if a revision is done I hope that these are two of the alternatives considered. One is analyze an alternative which halts the generation of additional radioactive waste from U.S. commercial nuclear power facilities. Another analyzed alternative should be a phase-out of nuclear reactors beginning with the west coast reactors along the Pacific Rim of Fire, while also including Vermont Yankee and other GE Mark I reactors, plus Salem, New Jersey and Indian Point, New York. And then move on to shut more reactors down. (0326-63-2 [Campbell, Bruce])

Comment: So make no mistake, folks, this is about a solution now when we are the most information-rich and resource-rich for all time, because I have a feeling future generations will not live as well, nor be as educated, and be as understanding about what to do with this enormous problem. There's one alternative that wasn't discussed, isn't being discussed, in the proposed Environmental Impact Statement. That is the alternative of stopping now. It's the only sane alternative, and it's not being considered. My strong recommendation is that the NRC go back to the drawing board, get real, and treat us like adults, and treat as though this is a democracy. (0327-13-4 [Lodge, Terry])

Comment: An accounting of public costs of reactors, from uranium mining through shielding and monitoring of nuclear waste forever, has not been done and must be included in the Generic EIS. That will demonstrate the better alternative: energy efficiency, conservation, wind, solar, and hydro. (0327-27-7 [Macks, Vic])

Comment: Even if the decision was to phase out all existing nuclear reactors in the United States today, we've still set ourselves up into eternity to require a technical and military elite whose job it will be to guard the 70,000-plus ton mountain of high-level radioactive waste. Isn't that enough of a job for the NRC to oversee into the future? (0327-39-5 [Izant, Carol])

Comment: [F]or all those reasons, we believe that the DGEIS in this case should thoroughly examine the alternative of making no more nuclear waste. (0328-4-10 [Taylor, Wallace])

Comment: We believe the DGEIS in this case fails to evaluate an important alternative that must be considered in the analysis of environmental impacts of radioactive spent nuclear fuel. That alternative is to stop licensing any new nuclear reactors and decommissioning all existing reactors so we are not creating any more radioactive waste. The important point to be understood, also, is that the Waste Confidence decision and rule are an integral part of the licensing process of nuclear reactors. Statutes, rules, and court decisions have said that an EIS must discuss reasonable alternatives to the proposed action. The alternatives analysis is the heart of the Environmental Impact Statement. NEPA demands that the agency rigorously explore and objectively evaluate all reasonable alternatives so the agency can sharply define the issues and provide a clear basis for choice among options by the decision maker and the public. The existence of a viable but unexamined alternative renders the Environmental Impact Statement inadequate. The main point of examining alternatives is to avoid environmental harm, so even if an alternative might be superior in non-environmental terms, an alternative can be reasonable if it avoids the environmental harm better than another alternative. (0328-4-2 [Taylor, Wallace])

Comment: The Sierra Club and others commented during the scoping process for this DGEIS that the DGEIS must consider the alternative of stopping the production of any more radioactive waste, but the DGEIS has eliminated this proposed alternative from consideration. In eliminating this alternative, the DGEIS posits three arguments in support of the decision to eliminate this alternative. (0328-4-5 [Taylor, Wallace])

Comment: The NRC's next argument in its attempt to avoid considering the alternative of terminating licensing and reactor operation is that the Atomic Energy Act requires the NRC to license nuclear reactors unless there is a threat to public health and safety, but as presented by the NRC this is a circular argument. The NRC states that it already has regulations in place to provide reasonable assurance of public health and safety, and consideration of the environment, but the regulation allegedly providing this assurance is the Waste Confidence Rule, which is the rule that's being amended and evaluated by the DGEIS. Therefore, the NRC's argument is circular and self-serving. It's important to note that the NRC has the authority to stop licensing or relicensing plants, and also to revoke the license of reactors already licensed and relicensed. 10 CFR Section 100 authorizes the NRC to revoke a license for conditions which would warrant the Commission to refuse to grant a license for an original application, and that would include any reason that would make it inimical to public health or that there's no assurance that the activities authorized will not endanger the public health, safety, and the environment. (0328-4-7 [Taylor, Wallace])

Comment: So, really, the NRC is complicit in allowing the industry to carry on for many, many years with no solutions. So I think it's just wrong. And so I do not believe that the NRC should allow the industry to continue until there's some real solution. And, frankly, I just reject this whole generic ruling. You guys needs to go back to the blackboard, and you all need to really get down to it and look at what we're going to do. But no new licenses, no renewals. I mean, North Anna got a renewal way ahead of time before its renewal was even up. We had a 1.9 earthquake a few miles down from the plant the other day. No. We don't need more plans for new reactors when you guys still haven't figured out what to do with 70,000 plus toxic waste that's already been created. (0329-17-4 [Gray, Erica])

Comment: [N]obody has any idea what we are going to do with the waste. And the draft GEIS does not address that. It is only sensible and logical and practical. From the eyes of anyone who just looks at the world in practicable ways that the only logical thing you can do is stop making the waste. There is nowhere to put it. Saying that we can safely store it onsite for the next 300 to 10 million years is the most, one of the most, absurd things that I have ever heard in my life. (0329-32-5 [Seeley, Linda])

Comment: One of the things that I would ask you to add to the EIS is the alternative that 175 environmental groups have been advocating for over the last couple of years. It's called the hardened onsite storage principles. And I think that probably most people are familiar with this document already. It was signed off in March of 2011. And 175 environmental groups who put public health and safety and environmental protection as number one have looked at the situation of waste management and have decided that the only thing that we can do that is possibly safe for people and for the environment is to keep it where it is, hardened onsite storage as close as possible to the site of generation as possible, until we have a final disposal plan ready to put into place. Interim storage doesn't do that for us. It just doesn't. It has too many risks involved in it. And the hardened onsite storage plan is missing from your EIS. I have emphasized a couple of times 135 environmental groups have signed onto these hardened onsite storage principles because they are independent of industrial concerns. They are independent of steam-making concerns. They are looking at public health and safety and environmental protection. And as an EIS, it should look at that as an alternative so that we can go into that alternative or whatever alternative we want to pursue with open eyes as to the pluses and minuses of every single alternative that is open to us. (0329-33-1 [Feldman, Jane])

Comment: Because there is no known safe storage for this toxic by- product, the only meaningful action for the NRC to take would be to adopt a rule that prevents any nuclear power plant from producing this waste until a safe means of disposal is achieved. Sadly, there is no language in this rule that proposes any such action. (0330-3 [Beccia, John])

Comment: [T]he GEIS should consider the option of not making any nuclear waste at all in the future by comparing the environmental footprint of nuclear from mining to long term waste disposal to that of renewables and energy efficiency. (0336-13 [Lish, Christopher])

Comment: Ending radioactive waste generation is the single most important step we can take to minimize the risks surrounding its storage, and the NRC should revise its Waste "Confidence" document to ensure the speediest possible end to that generation. (0336-15 [Lish, Christopher])

Comment: I would contest shutting down nuclear energy production cold turkey would be very problematic if not impossible and would kill more dreams than to let nuclear power companies continue operations as normal. (0347-3 [Morrow, Jon Paul])

Comment: Very real also, although perhaps hard to quantify, is the public health toll attributable to NRC's errant decisions. Any delay in deploying additional nuclear power stations necessarily means prolonged use of fossil fuel combustion for large-scale electricity generation. The resulting effluents translate directly to some number of additional cases of heart and lung diseases, cancers, prenatal neurological development problems owing to exposure to mercury in the womb, early onset asthma attributable to ozone, etc. Some fraction of these additional cases will result in premature deaths. Senator Jeffords' comments on the Senate floor on June 26, 2002 (see in the Congressional Record for that date, pp. S6052-S6053), provide a good summary of these untoward, power-plant-related health effects. (0355-4 [Skov, Jeff])

Comment: There should be no more licensing or re-licensing of nuclear reactors until the permanent disposal of radioactive waste has been determined, proven and funded. Any EIS regarding nuclear waste storage must first and foremost consider alternatives to nuclear waste generation. Creating additional waste when there is no identifiable solution for its permanent safe storage is not justified. (0357-2 [Daily, G. Allen])

Comment: I would like the following to be considered as my comments on the GEIS/Waste Confidence Plan: Please add a scenario in which there is no safe way to store nuclear waste. If this scenario is added to the plan, it would allow for the possibility of needing to wean our country from using nuclear fuel and work toward a less potentially dangerous substance for our energy needs. Considering the long-term effects that nuclear waste can have on the environment and human health and to be fair to the American people, we should propose this as an option. (0371-1 [Baker, Anna])

Comment: The NRC should consider alternatives to minimize the risks of storage of spent nuclear fuel and high level waste, including placement below ground level, elimination of the current practice of high-density storage of spent fuel in pools, and more robust designs for storage casks. (0377-5-20 [Cuthbert, Lewis])

Comment: We developed nuclear energy facilities without adequate thought regarding the potential consequences and making assumptions regarding safety that have proven invalid. Yet the NRC again fails give adequate thought to potential consequences and continues with these assumptions. It would compound the present dangers and problems by continuing to license more facilities to endanger even more populations and generate even more waste. There is no logic to such a proposal, and there is no such thing as safe nuclear energy regardless of design changes. (0402-4 [Gross, Cheryl])

Comment: For future safety, I urge the NRC to revise its Waste Confidence document to ensure the quickest possible end to the generation of radioactive waste. There should be no more licensing or re-licensing of nuclear reactors and existing facilities should be phased out as quickly as possible, replaced by truly clean, safe, sustainable energy sources. (0402-6 [Gross, Cheryl])

Comment: Ending radioactive waste generation is the single most important step we can take to minimize the risks surrounding its storage, and the NRC should revise its Waste "Confidence" document to ensure the speediest possible end to that generation. (0405-5 [Dugan, Pat])

Comment: Similarly, the NRC should not be allowed to issue licenses for new nuclear reactors or expansions of existing reactors until a permanent, deep-geological, high-level radioactive waste disposal facility is build and operating. (0406-2 [Gerleman, Douglas])

Comment: Until there is a proven, safe, and sound nuclear waste management system, the NRC should advocate the ending of radioactive waste generation. The NRC should revise its Waste "Confidence" document to ensure the speediest possible end to that generation. (0443-9 [Sabo, Betty])

Comment: In addition, no further licensing for new nuclear plants should be granted or current licenses renewed, until the waste storage problems--short, medium and long term/off site storage--are solved. If the NRC were primarily concerned about the safety of the public, it would curtail all further generation of nuclear energy immediately until these "nuclear waste" storage

problems were addressed and a permanent storage site identified and approved. (0451-6 [Rippner, Sharon] [Rippner, Thomas])

Comment: The GEIS fails to consider the need to: Reduce spent fuel pool density to design basis standards, without exemptions; (0490-5 [Chin, Rebecca])

Comment: Not only is there no long-term solution for atomic waste in hand or on the horizon, the shorter-term programs now in place are inadequate from a public safety standpoint, and do not offer the requisite confidence to allow continued generation of radioactive waste. (0491-2 [Commenters, Multiple])

Comment: Ending radioactive waste generation is the single most important step we can take to minimize the risks surrounding its storage, and the NRC should revise its Waste "Confidence" document to ensure the speediest possible end to that generation. (0491-6 [Commenters, Multiple])

Comment: No-action Alternative isn't Even Afforded Serious Considered: NRC does not even seriously consider the alternative of no-action (halting nuclear reactor operation) -- a legal requirement. The WCGEIS pays little more than brief "lip service" to this option. The WCGEIS needs to be revised to address this alternative particularly in terms of the reduced emissions, reduction in spent fuel and radioactive waste, and reduction in radioactive emissions, and enhanced safety. (0496-7 [Batobato, Alicia])

Comment: There should be no more licensing or re-licensing of nuclear reactors until the permanent disposal of radioactive waste has been determined, proven and funded. Any EIS regarding nuclear waste storage must first and foremost consider alternatives to nuclear waste generation. Creating additional waste when there is no identifiable solution for its permanent safe storage is not justified. (0507-1 [Giese, Mark M.])

Comment: The GEIS fails to consider the need to [r]educe irradiated/spent fuel pool density to design basis standards, without exemption[.] (0537-5 [Commenters, Multiple])

Comment: We are confident that NRC and the waste generators can never contain this waste for as long as it poses a hazard. NRC must abandon its Waste Confidence policy and stop using it to license nuclear power plants. (0552-1-5 [Macks, Vic])

Comment: PW disagrees with NRC's finding that spent fuel can be stored safely in pools over the short term, 60 years after the license to operate ends - when some fuel may be 160 years old. Instead, PW supports the alternative of requiring dry cask storage of spent fuel rather than the continued use of spent fuel pools for spent fuel that is more than 5 years out of reactor. There is an abundance of technically competent documents supporting this alternative, ignored by NRC's draft³⁴ [footnote 34 text: See, for example: Robert Alvarez, Jan Beyea, Klaus Janberg, Jungmin Kang, Ed Lyman, Allison Macfarlane, Gordon Thompson, and Frank N. von Hippel, *Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States* (Science and Global Security, 11:1–51, 2003) [deleted superscript 3]; Robert Alvarez, *Spent Nuclear Fuel Pools in the U.S.: Reducing the Deadly Risks of Storage*. Institute for Policy Studies, May 24, 2011; Environmental Impacts of Storing Spent Nuclear Fuel and High-Level Waste from Commercial Nuclear Reactors: A Critique of NRC's Waste Confidence Decision and Environmental Impact Determination, by Dr. Gordon Thompson, February 6, 2009; Report to the Massachusetts Attorney General on the Potential Consequences of a Spent Fuel Pool Fire at the Pilgrim or Vermont Yankee Nuclear Plant, by Jan Beyea, PhD., May 25, 2006; Risks and

Risk Risk-Reducing Options Associated with Pool Storage of Spent Nuclear Fuel at the Pilgrim and Vermont Yankee Nuclear Power Plants: A report for the Office of the Attorney General Commonwealth of Massachusetts, by Dr. Gordon Thompson, May 25, 2006.] Given the breadth and weight of scientific support for the proposition that there are significant environmental benefits from dry cask storage for all fuel more than 5 years old, this reasonable alternative must be studied more thoroughly in the Commission's review of "all reasonable alternatives." 40 C.F.R. § 1502.14(a). NRC's finding that storage in either spent fuel pool or dry cask was safe for 60 years after the termination of a license failed to consider that spent fuel pools vary in density, geometry, vulnerability, mitigation capabilities and consequences. NRC ignored or seriously downplayed the following. (0556-5-2 [Lampert, Mary])

Comment: PW supports NRC studying the alternative of not allowing continued production of spent fuel until NRC sufficiently shows that there is a safe and environmentally acceptable permanent waste repository to receive additional fuel generated. This consideration was found reasonable by the U.S. Court of Appeals for DC. The Circuit Court explicitly recognized it as reasonable in *New York v NRC*, 681 F.3d 471, 474 (D.C. Cir.2012). It said, "The lack of progress on a permanent repository has caused considerable uncertainty regarding the environmental effects of temporary SNF storage and the reasonableness of continuing to license and relicense nuclear reactors." Because the GEIS is intended to support the environmental review of licensing actions and license renewal actions regarding environmental impacts of storing spent nuclear fuel, NEPA requires that NRC examine the cessation of further generation of spent fuel until a permanent, safe, and adequate nuclear waste disposal facility exists. What NRC did instead was simply assume, with no factual basis, that all nuclear waste will be removed from the nation's nuclear power plants within 60 years after the plants are closed. (0556-5-9 [Lampert, Mary])

Comment: I would also love it if you could stop this "short term thinking" and put a moratorium on construction of any new operating facilities until you figure out a way to safely dispose of its waste, that would never ever put the future generations of humanity in danger. (0569-3 [Hulstrunk, Matt])

Comment: No more operating permits or extensions until us humans can safely control our waste stream. (0572-2 [Fisher, Peter])

Comment: The NRC has also improperly failed to examine how the expedited transfer of spent fuel from dangerously overcrowded pools to dry casks would substantially reduce safety and accident risks. Both of these possibilities certainly have a bearing on the environmental impacts of long-term storage of spent fuel, and should be considered as options. (0604-10 [Pisha, Gayla])

Comment: Finally, the NRC has not considered the possibility of not relicensing operating reactors so that no additional nuclear waste is produced. (0604-9 [Pisha, Gayla])

Comment: Our communities' safety and security also depend on implementing safe strategies that reduce the number of spent fuel rods stored in fuel pools. The use of spent fuel pools beyond their intended timeline or design capacity significantly increases risks of tragedy from plant failure, terrorism, natural disaster, or other hazards. We must move safely but swiftly to remove rods from pools to reduce our exposure. As one option, we strongly encourage the NRC to consider the environmental impact of requiring dry cask storage of spent fuel older than 5 years. (0607-5 [Messinger, Michael])

Comment: In the absence of an adequate EIS review, the NRC should have no choice but to continue to suspend all Licensing and re-licensing action for U.S. nuclear reactors. All licensing and re-licensing actions were previously suspended by the NRC until an EIS and revised Wasted Confidence Decision have been issued. (0610-2 [Brechtin, Vernon])

Comment: The EIS should have a no-action alternative that would be the non-issuance of a waste confidence decision and rule and a continued suspension of new reactor licensing and existing reactor license extension actions until data to make scientifically valid impacts estimates of the consequences of long-term storage of high burnup spent fuel are collected and analyzed. (0610-9 [Brechtin, Vernon])

Comment: --[The NRC has failed to fully examine] the mitigation alternative of ceasing production of additional nuclear waste, if and until, safe, secure and affordable nuclear waste storage solutions are identified, tested, sited and constructed. (0611-14 [Shapiro, Susan])

Comment: The GEIS improperly excludes reasonable mitigation alternative of cessation of production of additional waste, therefore the GEIS review is inherently fatally flawed. To satisfy NEPA standards the NRC is required to identify impacts, take a "hard look" at impacts and seriously consider alternatives and public comments. Public comments overwhelming call for the inclusion of the consideration of mitigation measure to cease nuclear waste production. (0611-22 [Shapiro, Susan])

Comment: The NRC's decision to eliminate consideration of the alternative to cease of production of more nuclear waste in the GEIS is arbitrary and capricious and without scientific support, and seems to be wholly based on the NRC's desire to continue to produce more nuclear waste. This failure to consider a realistic alternative makes it clear the NRC is not the proper agency to determine Waste Confidence since it's allegiance is solely with the nuclear industry to protect its continued profits without unbiased consideration of protecting public health, now and in the future. (0611-33 [Shapiro, Susan])

Comment: Require reliable, sustainable back up power for spent fuel pools including but not limited to solar or wind systems with battery back to insure against loss of power which would result in an uncontrollable spent fuel fire. (0611-54 [Shapiro, Susan])

Comment: Most importantly the NRC needs to deny any new licenses to prevent continue accumulation of unmanageable nuclear waste. The reality of a long term solution to nuclear waste does not exist, and may very likely never exist. Since the GEIS fails address the need to stop making more nuclear waste, as an alternative it cannot be relied upon to comply with NEPA. (0611-58 [Shapiro, Susan])

Comment: The GEIS does not calculate the level of risk from the ongoing production of nuclear waste vs. the cessation of waste production. The NRC attempts to dispense with its obligation to analyze this scenario by relegating it to the alternatives analysis as the "Cessation of Licensing or Cessation of Reactor Operation," classifying it as an alternative to the proposed action to address the environmental impacts of continued storage, and dismissing it on the basis of the argument that "Abandonment of reactor licensing and the closure of existing plants is not a reasonable alternative to the proposed action because these actions would not meet the NRC's stated objectives in proposing to revise 10 CFR 51.23." (0614-7 [Christie, Andrew])

Comment: This argument does not exempt the GEIS from analyzing all aspects of the environmental effects of continued waste storage, including the potential difference in impacts

from the ongoing re-racking of spent fuel pools and expansion of ISFSI sites and all activities attendant upon these actions, versus the lack of a requirement for same. (0614-8 [Christie, Andrew])

Comment: [I respectively urge the Commission to] Continue the moratorium on issuing new and renewal licenses for all reactors[.] (0620-12 [Rivera, Evelyn])

Comment: The Waste Confidence Decision cannot be interpreted as so limited in scope that the lunacy of producing more waste is not even considered. (0640-4 [Geary, B.])

Comment: One mitigation alternative not examined in the draft GEIS is the transfer of spent nuclear fuel from spent fuel pools to dry storage casks to reduce the density of spent nuclear fuel in the pools. The transfer of spent fuel from a pool to a cask would reduce the inventory of radionuclides and radiation source term in the pool. It would also reduce the environmental impacts from an off-site release of radiation following a severe accident at a spent fuel pool. The State of New York recommends that the NRC require nuclear licensees to remove spent fuel from on-site storage pools to dry cask storage as soon as possible. (0681-6 [Peterson, Alyse])

Comment: *On this basis, I wish to register my strong opposition to all the alternatives included in the draft GEIS. I believe the no-action alternative is the best of those included, but not sufficient, and I especially oppose the exclusion of an alternative that would continue the current moratorium on new reactor licensing and license extensions. I urge the USNRC to revise the draft GEIS to include the option for such an alternative, and in doing so to take full account of the issues that have been raised by citizens and public interest groups throughout the public involvement process.* (0684-10 [Kinsella, William])

Comment: I also disagree with the statement in section 1.6.3.1 that "the Commission has already established criteria that provide reasonable assurance of public health and safety and due consideration of environmental impacts in the construction and operation of nuclear power plants, including facilities for continuing storage of spent fuel." (0684-8 [Kinsella, William])

Comment: Furthermore, the ultimate purpose of the Waste Confidence Rule is to inform the NRC's licensing and relicensing decisions. Analyzing the alternative of producing no more waste will require the NRC to consider whether to cease issuing licenses for new reactors, to deny relicensing applications, and to revoke existing licenses. (0688-12 [Taylor, Wallace])

Comment: The NRC's next argument in its attempt to avoid considering the alternative of terminating licensing and reactor operation is that the Atomic Energy Act requires the NRC to license nuclear reactors unless there is a threat to public health and safety. But as presented by the NRC, this becomes a circular argument. The NRC states that it already has regulations in place to provide reasonable assurance of public health and safety and consideration of the environmental impacts of storing spent fuel. But the regulation allegedly providing such assurance is the Waste Confidence Rule, which is the rule that is being amended and evaluated with the DGEIS. Therefore, the NRC's argument is circular and self-serving. It is also important to note that the NRC has the authority to revoke a nuclear reactor license. 10 C.F.R. § 100 authorizes the NRC to revoke a license for "conditions . . . which would warrant the Commission to refuse to grant a license on an original application." Based on the August 7, 2012, Order of the NRC refusing to grant pending licenses and license renewals because of the court decision vacating the Waste Confidence Decision, the Waste Confidence Decision would be a "condition[] . . . which would warrant the Commission to refuse to grant a license on an original application," requiring the NRC to revoke the relicensing decisions described above. The Atomic

Energy Act, 42 U.S.C. § 2133(d), states that the NRC cannot issue a reactor license if it would be "inimical" to public health. The NRC, by its own regulations, cannot issue a license unless "[t]here is reasonable assurance . . . that the activities authorized by the operating license can be conducted without endangering the health and safety of the public" 10

C.F.R. § 50.57(a)(3). The essence of the decision in New York v. NRC was that spent nuclear fuel is a danger to public health and safety and that there is no reasonable assurance that a permanent repository will ever be established. And as the court in New York v. NRC found, spent nuclear fuel "poses a dangerous, long-term health and environmental risk. It will remain dangerous 'for time spans seemingly beyond human comprehension.'" (0688-13 [Taylor, Wallace])

Comment: Based on the foregoing, the NRC has the authority to refuse to issue new reactor licenses and renewals and to revoke existing licenses when public health and safety and the environment are impacted. (0688-15 [Taylor, Wallace])

Comment: Furthermore, in response to the NRC's argument that there will still be existing waste on site even if production of waste is halted, a discussion of the alternative of discontinuing production of radioactive waste should include the feasibility of hardened on site storage (HOSS). Although HOSS is not the perfect solution to the radioactive waste problem, it is the best solution to a bad situation. There actually is no permanent solution to the existence of approximately 70,000 tons of radioactive waste currently stored at reactor sites. But HOSS is a much better alternative than the groundless hope expressed in the DGEIS that this waste can be stored in pools and dry casks essentially forever. Therefore, a discussion of HOSS in the DGEIS is required. (0688-18 [Taylor, Wallace])

Comment: In discussing the alternative of discontinuing production of spent fuel, the EIS should consider how renewable energy can replace whatever current or future energy needs would have been supplied by nuclear power if nuclear power is discontinued as an energy source. Numerous studies have shown that we can generate all the energy we need from renewable sources with a comprehensive transmission and distribution grid if we will adopt policies supporting that vision. See, e.g., Archer and Jacobson, Supplying Baseload Power and Reducing Transmission Requirements by Interconnecting Wind Farms, *Journal of Applied Meteorology and Climatology* (v. 46, Nov. 2007); Jacobson and Delucchi, Providing All Global Energy with Wind, Water, and Solar Power, Part I: Technologies, Energy Resources, Quantities and Areas of Infrastructure, and Materials, *Energy Policy* (v. 39, p. 1154-1169); Jacobson and Delucchi, Providing All Global Energy with Wind, Water, and Solar Power, Part II: Reliability, System and Transmission Costs, and Policies, *Energy Policy* (v. 39, p. 1170-1190); Jacobson and Archer, Saturation Wind Power Potential and Its Implications for Wind Energy, found at www.pnas.org/cgi/doi/10.1073/pnas.1208993109. See also, The Energy Report: 100% Renewable Energy by 2050, prepared for the World Wildlife Fund by Ecofys and found at www.worldwildlife.org/climate/energy-Report.html; Big Risks, Better Alternatives, prepared for Union of Concerned Scientists by Synapse Energy Economics, Inc. and found at www.ucsusa.org/assets/documents/nuclear_power/Big-Risks-Better-Alternatives.pdf. Another important source is Arjun Makhijani, Carbon-Free and Nuclear-Free: A Roadmap For U.S. Energy Policy (2007), available for download at www.ieer/carbon-free/. (0688-19 [Taylor, Wallace])

Comment: We believe that the DGEIS fails to evaluate an important alternative that must be considered in the analysis of environmental impacts of radioactive spent nuclear fuel. That alternative is to stop licensing any new nuclear reactors and decommissioning all existing reactors so we are not creating any more radioactive waste. (0688-2 [Taylor, Wallace])

Comment: The electric utilities and energy companies assert that in order to provide baseload power they have to use coal, natural gas or nuclear energy. But baseload as viewed by the utilities and power companies is an outdated concept. They are stuck with the narrow view of electric power coming from power plants. But rather than referring to the term baseload we are really talking about energy and capacity. Energy is the total amount of electricity that is being supplied to consumers. Capacity is the highest level of electricity that can be supplied at any one time to meet peak demand. Renewable energy can meet the energy and capacity demands of the country, combined with a program of energy efficiency and conservation and expansion of the transmission grid. Most states have energy efficiency programs subject to public utility regulation. Likewise, many states have renewable electricity standards requiring that a certain amount of the energy consumed in the state be from renewable sources. There are other policies, including feed-in tariffs, tax credits, loan programs, etc., that should be adopted to encourage the expansion of renewable energy. The DGEIS should analyze all of these issues in examining the alternative of stopping the production of spent fuel by not permitting new nuclear reactors and closing existing reactors. This would lead us to a renewable energy future and away from the production of more radioactive nuclear waste. (0688-20 [Taylor, Wallace])

Comment: The storage and disposal of radioactive nuclear waste from spent fuel is a long-term problem posing grave risks to public health and the environment for which there is no solution. One alternative to this conundrum-- the Sierra Club believes it is the most important alternative --is to stop producing any more radioactive waste. For the reasons stated above, NEPA and common sense require that the DGEIS analyze this alternative. (0688-23 [Taylor, Wallace])

Comment: The only sensible course of action is to stop making more spent fuel. Therefore, the DGEIS must include an analysis of the alternative of discontinuing production of spent nuclear fuel by not licensing any new reactors and decommissioning all existing reactors. (0688-8 [Taylor, Wallace])

Comment: The Sierra Club and others commented during the scoping process for this DGEIS that the DGEIS must consider the alternative of stopping the production of any more radioactive waste. But the DGEIS has eliminated this proposed alternative from consideration. See, DGEIS § 1.6.3.1. (0688-9 [Taylor, Wallace])

Comment: •Very real also, although perhaps hard to quantify, is the public health toll attributable to NRC's failure to abide by the NWPA. Any delay in deploying additional nuclear power stations necessarily means prolonged use of fossil fuel combustion for large-scale electricity generation. The resulting effluents translate directly to some number of additional cases of heart and lung diseases, cancers,¹⁸ [footnote 18 text: See, e.g., "IARC: Outdoor air pollution a leading environmental cause of cancer deaths," International Agency for Research on Cancer, Press Release No. 221, dated October 17, 2013 ("the risk of developing lung cancer is significantly increased in people exposed to air pollution. . . . The predominant sources of outdoor air pollution are transportation, stationary power generation, industrial and agricultural emissions, and residential heating and cooking." (emphasis added)); "Smoggy Beijing sees lung cancer cases soar," BBC News, November 9, 2013 ("The number of lung cancer cases in the Chinese capital Beijing has soared over the last decade. . . . According to figures published by the state-run Xinhua news agency, they have increased by more than 50%. . . . Correspondents say Chinese people are becoming increasingly worried about the health problems caused by the thick air pollution that often blankets much of their country.".)] prenatal neurological development problems owing to exposure to mercury in the womb, early-onset asthma attributable to ozone, etc. Some fraction of these additional cases will result in premature

deaths. Senator Jim Jeffords' comments on the Senate floor on June 26, 2002 (see in the Congressional Record for that date, pp. S6052-S6053), provide a good summary of these untoward, power-plant-related health effects.¹⁹ [footnote 19 text: 148 Cong. Rec. S6052 ("Studies show that 30,000 Americans die every year due to powerplant pollution—30,000 deaths from powerplant pollution alone. Incredible. . . . Powerplant pollution results in 20,000 hospitalizations each year, 600,000 asthma attacks, 5 million days of lost work due to pollution-related illness, and 18,000 cases of bronchitis. . . . Powerplant pollution has resulted in mercury advisories in 44 of the 50 States. In these 44 States, our citizens are asked not to eat the fish caught in the lakes and streams. . . . Because of powerplant pollution, 6 million American women and children are exposed to mercury levels well above those considered safe by Federal health authorities. . . . According to the CDC, the Centers for Disease Control and Prevention, 10 percent of women in the United States have mercury levels above those considered protective of newborns. As a result, as many as 390,000 children are born each year at risk for neurological development problems due to exposure to mercury in the womb. The March issue of the Journal of the American Medical Association found that millions of people who live in areas polluted by fine particles have about the same increased risk of dying from heart or lung disease or lung cancer as people who live with a cigarette smoker. . . . This is simply the beginning of my list regarding the impacts of powerplant pollution. . . . There is acid rain, smog, lung disease, heart disease, asthma, on and on. . . . Just this year, a respected public health journal published the first study showing a direct connection between the onset of asthma in young, healthy children and their exposure to ozone. The journal found that children exercising outdoors are more likely to contract asthma if they live in areas polluted with high ozone concentrations. This dangerous ozone is created by pollution from old power plants.".)] (0692-9 [Skov, Jeff])

Comment: The most obvious problem with the approach NRC adopted by the rigged analysis is that the nuclear industry continues to produce enormous quantities of nuclear waste. NRC refused to consider reducing or stopping the production of nuclear waste by limiting new permits. In fact, the federal government continues to subsidize the nuclear industry with millions of dollars. The primary purpose of an EIS is to examine environmental impacts, yet the Agency substituted another purpose for the EIS: to improve the efficiency of the licensing process. This will result in more applications, more reactors and more waste. (0693-1-10 [Warren, Barbara])

Comment: Page 1-9. "Cessation of licensing activities and cessation of reactor operations do not satisfy the stated purpose and need for this draft GEIS, which is to improve the efficiency of NRC's licensing process, to prepare a single source that reflects the NRC's current understanding of the environmental impacts of continued storage, and to comply with the remand in the New York v. NRC decision. Abandonment of reactor licensing and the closure of existing plants is not a reasonable alternative to the proposed action because these actions would not meet the NRC's stated objectives in proposing to revise 10 CFR 51.23." NRDC Comment[:] This is an inaccurate restatement of the import of NRDC's comments offered during scoping. We address this issue above in our discussion of Scoping. Moreover, since licensing activities may not be resumed absent a Waste Confidence rule, the cessation of licensing activities and reactor operations must necessarily be analyzed under the No Action alternative. Suggesting that this is what NRDC demanded misconstrues the point of NEPA compliance we sought to make the agency understand. Thus, with the above text, NRC inappropriately restricts the alternatives that must be analyzed to comply with NEPA. By any measure, NRC will need to conduct an analysis of spent nuclear fuel either stored permanently at reactor sites or at other above ground (non-repository) site(s), or in various combinations of distributed and consolidated surface storage, as existing stores of spent nuclear fuel and spent fuel yet to be produced from lawfully licensed reactors will continue to pile up. But an analysis that omits an obvious

alternative and subset of alternatives directly related to the environmental harms under review is arbitrary and capricious. (0706-2-18 [Fettus, Geoffrey])

Comment: Page 1-9. "Imposing new regulatory requirements, such as requiring licensees to implement hardened at-reactor storage systems, reduce the density of spent fuel in pools, or expedite transfer of spent fuel from pools to ISFSIs, is outside the scope of this proposed action, which includes alternatives that improve the efficiency of the NRC's licensing process by generically addressing the environmental impacts of continued storage." NRDC Comment[:]
Consistent with comment #5 above, NRC fails to provide any reasonable basis for not analyzing alternatives that might increase public safety and reduce potential environmental harms by speeding removal of spent nuclear fuel from the pools when appropriately cooled. Moreover, the scope of NEPA does not extend to "imposing new regulatory requirements," and no one is suggesting that it does. But a proper NEPA analysis may uncover *the agency's need to consider* such requirements. (0706-2-19 [Fettus, Geoffrey])

Comment: *Alternative Storage Modes & Configurations* (Spent Fuel Pools with At-Reactor Dry Storage (ARDS); Upgraded Spent Fuel Pools and License-Extended/Expanded ARDS; Regional Consolidated Dry Storage (RCDS); and a Single National Consolidated Dry Storage Facility (NCDS). Various sequences and combinations of these storage modes need to be evaluated and compared in the alternatives analysis. (0706-2-21 [Fettus, Geoffrey])

Comment: Stop licensing new nuclear reactors, and stop relicensing aging reactors as the first alternative: This will at least provide some assurance to citizens that the problem of storing vast amounts of dangerous nuclear waste, often on the shores of fragile water bodies, including our Great Lakes, won't continue to grow. Creating additional waste without an identifiable solution for its permanent, safe storage is not rational or responsible to future generations. (0707-3 [Werner, Shahla M.]

Comment: Laws that created NRC and enable licensing of atomic fission to energy corporations were passed in error by a body that was either sorely misled, delusional, or had no care for the future. Production of massive quantities of radioactivity was legalized while there is no possible way to ensure that this radioactivity could, or would be isolated from the living systems of our planet. Even though it is clear that there is no safe dose of radiation, the production of massive amounts from radioactivity from 24 / 7 fission has not stopped, and today more than 95% of the radioactivity in radioactive waste in the USA is from the licenses that NRC issues. The court ordered moratorium on licensing of nuclear fission is the first rational step in curing this situation. The NRC has the option to join in correcting this situation: the nuclear licensing moratorium should be maintained and further expanded to a phase-out of operating reactors. We should, as a society, stop making more radioactive waste. NUREG 2157 declares the "need for nuclear energy" outside its scope; the "need" for this waste is not outside scope: we don't need any more radioactive waste. (0711-4 [Olson, Mary])

Comment: *CCNR recommends that the current suspension of licensing decisions by the NRC should be continued indefinitely until the NRC has established detailed plans for the long term management of irradiated nuclear fuel that is not based on the unwarranted assumption that a safe permanent walk-away disposal method will become available within a few decades.* (0714-1-6 [Edwards, Gordon])

Comment: CCNR [Canadian Coalition for Nuclear Responsibility] recommends that the current suspension of licensing decisions by the NRC should be continued indefinitely until the NRC has established detailed plans for the long term management of irradiated nuclear fuel that is

not based on the unwarranted assumption that a safe permanent walk-away disposal method will become available within a few decades. (0714-2-4 [Edwards, Gordon])

Comment: NEIS believes that the moratorium on licensing of new and relicensing of currently operating reactors should remain in place until such time as a permanent, deep-geological high-level radioactive disposal facility is designed, licensed, built and in operation. We ask NRC to maintain this moratorium until this condition is reached; and ask that the moratorium be extended to include the siting and licensing of any temporary, away from-reactor high-level radioactive waste "storage" facilities, such as those referred to as "centralized interim storage" facilities. It is irresponsible to continue the production of such wastes without a demonstrated and operational means of disposal. (0716-2 [Kraft, Dave])

Comment: *The NRC moratorium on licensing of new and relicensing of currently operating reactors should remain in place until such time as a permanent, deep-geological high-level radioactive disposal facility is designed, licensed, built and in operation. We ask NRC to maintain this moratorium until this condition is reached; and ask that the moratorium be extended to include the siting and licensing of any temporary, away-from-reactor high-level radioactive waste "storage" facilities, such as those referred to as "centralized interim storage" (CIS) facilities.* (0716-6 [Kraft, Dave])

Comment: The Blue Ribbon Commission recommended that the National Academy of Sciences ("NAS") conduct its own separate assessment of the lessons learned from Fukushima and the implications of these lessons for the conclusions reached in earlier NAS studies on the safety and security of spent nuclear fuel.¹¹³ [footnote 113 text: *Blue Ribbon Commission Report* at 44.] As part of this assessment, the Commission suggested that NAS conduct "an analysis of the advantages and disadvantages of moving spent fuel from densely packed pools to on-site dry cask storage to facilitate low-density packing in the pools."¹¹⁴ [footnote 114 text: *Id.*] However, the Near-Term Task Force report did not address this issue. When asked by Commissioner Ostendorff why this issue was not included, Task Force members replied that it was not clear what exactly happened to the spent fuel pools at Fukushima, that there was no "overwhelming evidence that the fuel would be safer outside of the pool than in it," and that their recommendations enhance pool safety more than removing fuel would.¹¹⁵ [footnote 115 text: Nuclear Regulatory Commission, Briefing on the Task Force Review of NRC Processes and Regulations Following the Events in Japan, Transcript of Proceedings, at 36-37, ML112020051 (July 19, 2011).] However, Task Force members failed to acknowledge that dry cask storage has numerous safety advantages over pool storage¹¹⁶ [footnote 116 text: *NAS Report* at 70.] and that some of the safety measures they recommended are necessary because of the dense-storage of fuel in U.S. spent fuel pools. In short, the recommendations deal with symptoms of the problem (e.g., the rapid heat up of densely packed spent fuel once water is removed from the pool) but do not offer alternatives or solutions to the problem itself. Even NRC Staff recognized that the transfer of spent fuel to dry cask storage has "a clear nexus to the Fukushima Daiichi event [and] may warrant regulatory action but [was] not included with the NTTF recommendations."¹¹⁷ [footnote 117 text: Nuclear Regulatory Commission, SECY-11-0317: Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned, at 5, ML11269A204 (Oct. 3, 2011).] It also appears that the Commissioners were not informed that Sandia National Laboratories has recently acknowledged that reducing the volume of spent fuel in spent fuel pools would mitigate the risks posed by dense storage. On February 7 and 8, 2012, NRC Staff made publically available three documents discussing the safety of spent fuel pools. The first is a slideshow explaining the findings of a study conducted by Sandia National Laboratories, which investigated zirconium fires during spent fuel pool loss of coolant accidents ("LOCAs").¹¹⁸ [footnote 118 text: Samuel G. Durbin and Eric R. Lindgren of

Sandia National Laboratories, investigations of Zirconium Fires During Spent Fuel Pool LOCAs (Slideshow), ML120380359 (Feb. 7, 2012).] The study found that low density racking is the spent fuel configuration that is least vulnerable to zirconium fires.¹¹⁹ [footnote 119 text: *Id.* at slide 15.] [Figure inserted] The disclosure of this study and its conclusion constitute significant new information because it is now clear that federal laboratories recognize that safer options are available for the storage of spent nuclear fuel. This recognition and the alternative of reducing the volume of waste stored in pools must be considered when NRC Staff examines the alternatives to the proposed federal action authorizing a 20-year extension of a facility's operating license. NRC should revise the Waste Confidence DGEIS and proposed rule and require the review of such alternatives[.] (0718-2-10 [Sipos, John])

Comment: Thinning of Spent Fuel Pools and Use of Dry Cask Storage[.] One alternative that should be considered is the thinning of spent fuel pools. Densely packed spent fuel heats up faster in the event of the loss of cooling water than more loosely packed fuel,¹⁴¹ [footnote 141 text: Allan S. Benjamin et al., *Spent Fuel Heatup Following Loss of Water During Storage* (Sandia National Laboratory, NUREG/CR-0649, SAND77-1371) at 50 ("1979 Sandia Report") (Mar. 1979) ("The high density holders . . . are the least well-suited to heat removal, as expected, particularly if the spent fuel is packed wall-to-wall so as to preclude a down-comer space at the edge of the pool.".)] giving workers and emergency crews less time to respond to prevent fire or other damage to the fuel assemblies.¹⁴² [footnote 142 text: *See 2006 Sandia Report* at viii ([D])dispersed configurations [of spent fuel assemblies] provided additional time for mitigative actions before the release of fission products versus a nondispersed configuration.); *See also NAS Report* at 103 ("[M]odifying the storage racks to provide for closer spacing of the fuel assemblies. . . . can make it more difficult to cool the freshly discharged fuel if there is catastrophic loss of the fuel pool water.".)] [Figure inserted] Alvarez et al. recommend moving away from the current "dense-pack" configurations and returning to open-rack configurations, for which the spent fuel pools were originally designed.¹⁴³ [footnote 143 text: *Reducing the Hazards* at 23.] The figures below illustrate the different designs.¹⁴⁴ [footnote 144 text: First figure: *Reducing the Hazards* at 17. Second figure: *1979 Sandia Report* at 20.] [Figure inserted] In the original design for pressurized-water reactor spent fuel pools, fuel assemblies were packed 53 cm apart, allowing the cooling water to channel between them.¹⁴⁵ [footnote 145 text: *Reducing the Hazards* at 17.] In the densely packed design, fuel assemblies are only 23 cm apart (close to the 21.4 cm spacing in reactor cores),¹⁴⁶ [footnote 146 text: *Id.* at 16.] allowing about five times as many assemblies to be stored in the pool.¹⁴⁷ [footnote 147 text: *NAS Report* at 43.] To keep these closely packed fuel rods sub-critical, they are placed in metal boxes containing neutron-absorbing boron.¹⁴⁸ [footnote 148 text: *Id.*] In a loss of coolant accident, where pool water is lost, these boxes would prevent the horizontal circulation of cooling air.¹⁴⁹ [footnote 149 text: *Id.* at 17.] A 1979 Sandia report¹⁵⁰ [footnote 150 text: *1979 Sandia Report.*] prepared for NRC found that with an open frame storage configuration in a well-ventilated facility, spent fuel in a drained storage pool would not overheat if it was cooled for five days before being transferred to the pool.¹⁵¹ [footnote 151 text: *Reducing the Hazards* at 23.] Also, as mentioned above on pages 54-55, Sandia recently released the results of a study finding that low density racking is the spent fuel configuration that is least vulnerable to zirconium fires.¹⁵² [footnote 152 text: Samuel G. Durbin and Eric R. Lindgren of Sandia National Laboratories, *Investigations of Zirconium Fires During Spent Fuel Pool LOCAs* (Slideshow), ML120380359 (Feb. 7, 2012).] If there is not enough room in the pool to permit open frame storage—because too much fuel is unloaded from a reactor during a given five year period—Alvarez et al. recommend considering: "(1) an arrangement where one fifth of the fuel assemblies are removed in a pattern in which each of the remaining fuel assemblies has one side next to an empty space; (2) an arrangement where alternate rows of fuel assemblies are removed from the rack."¹⁵³ [footnote 153 text: *Id.*] The first suggestion is illustrated in the figure

below.¹⁵⁴ [footnote 154 text: Figure is taken from: *Damages From a Major Release* at 133.] [Figure inserted] If this suggestion is found to be effective at allowing spent fuel in a drained pool to be convectively air cooled, it would reduce the amount of spent fuel that would need to be removed from pools in the U.S. in 2010 from 35,000 tons (under an open frame storage plan) to 9,000 tons.¹⁵⁵ [footnote 155 text: *Id.*] However, Alvarez et al. recommend that all spent fuel be removed from pools and placed in dry cask storage after it has cooled for five years. Similarly, the NAS report recommended that, space permitting, empty slots be arranged throughout the pool to promote natural air convection in the event that the pool is completely drained.¹⁵⁶ [footnote 156 text: *NAS Report* at 55.] That report also found that spent fuel is less at risk from accident or attack in dry cask storage than in a fuel pool.¹⁵⁷ [footnote 157 text: *NAS Report* at 68.] This is because the spent fuel stored in dry casks has been cooled for at least five years, and is therefore, not prone to zirconium cladding fires.¹⁵⁸ [footnote 158 text: *NAS Report* at 69.] Moreover, the dry cask system divides the spent fuel between many different casks—each cask stores only 10 to 15 tons of fuel, as opposed to a pool, which stores hundreds of tons—so if an individual cask is compromised, there is less potential radiation to be released. Additionally, since dry cask storage relies on natural air circulation for cooling, a breach would not release contaminated water into the environment and emergency crews would not need to find an alternative source of water with which to fill them. (0718-2-17 [Sipos, John])

Comment: In the wake of the Fukushima nuclear disaster, nuclear plant operators are beginning to consider thinning spent fuel pools as a safety precaution. For example, in April 2011, the Tennessee Valley Authority issued a nuclear program update that said it was considering moving spent fuel out of pools and into dry cask storage.¹⁵⁹ [footnote 159 text: Tennessee Valley Authority, “Fact Sheet: Nuclear Program Update” (Apr. 14, 2011). *Available at:* http://www.tva.gov/news/releases/aprjun11/pdf/nuclear_programupdate_fact_sheet.pdf. The Tennessee Valley Authority owns and operates various nuclear power reactors and is an agency of the United States.] Although TVA attended the January 11, 2012 public meeting, this initiative was not discussed. Others have called for the removal of spent fuel that is more than five years old from storage pools. In March 2011, David Lochbaum, of the Union of Concerned Scientists, stated before the U.S. Senate Energy and Natural Resources Committee, “A better strategy would be to reduce the inventory of irradiated fuel in the pools to the minimum amount, which would be only the fuel discharged from the reactor core within the past five years.”¹⁶⁰ [footnote 160 text: Statement by David Lochbaum, Director of Nuclear Safety Project, Before the U.S. Senate Energy and Natural Resources Committee, at 2 (March 29, 2011). *Available at:* http://www.ucsusa.org/assets/documents/nuclear_power/lochbaum-senate-energy-3-29-2011.pdf.] This, he said, would lower the risk of fire by decreasing the heat load of the pool, giving workers more time to respond in the event of the loss of cooling water. Also, if radiation was released, it would be significantly lower in a less densely packed pool. That same month at a meeting on Capital Hill, Energy Secretary Steven Chu recognized that the storage of spent nuclear fuel in dry casks is much safer than storage in pools.¹⁶¹ [footnote 161 text: Hearing on the Fiscal Year 2012: Department of Energy and Nuclear Regulatory Commission Budgets, House of Representatives, Subcommittee on Energy and Power joint with the Subcommittee on Environment and the Economy Committee on Energy and Commerce, at 77 (March 16, 2011). *Available at:* http://democrats.energycommerce.house.gov/sites/default/files/image_uploads/031611%20EPEE%20Fiscal%20Year%202012%20DOE%20and%20NRC%20Budgets.pdf (Chu stated: “After you take the fuel rods out of the reactor, immediately you put them in a pool of water for a period of time where they are actually still dissipating a considerable amount of heat. But then after that, the next stage is that you can put them in dry cask storage, which is much safer.”).] In May 2011, the Institute for Policy Studies released a report authored by Robert Alvarez, also recommending that all spent fuel that has been in pools for five years be removed and placed in dry storage.¹⁶²

[footnote 162 text: Robert Alvarez, *Spent Nuclear Fuel Pools in the U.S.: Reducing the Deadly Risks of Storage*, at 21 (May 2011).] Additionally, in April 2011, U.S. Senator Diane Feinstein called upon the NRC Commissioners to enact regulatory policies that reduce the amount of spent fuel stored in pools.¹⁶³ [footnote 163 text: Letter from Senator Feinstein to NRC Chairman Jaczko, ML11108A038 (April 8, 2011).] In August 2011, Chairman Jaczko acknowledged the benefits of transferring spent fuel to dry cask and said the Commission should consider this alternative: ["I also believe the Commission should consider in the long term if there should be new regulations to require licensees to move spent fuel to dry cask storage within a specific timeframe. This step, recognizing the inherent safety benefits of dry storage and combining that knowledge with the new ISFSI security regulations under development, may provide a safer and more secure disposition for spent fuel. I also believe that an NRC-developed pilot probabilistic risk assessment provides additional supporting evidence of the benefits of having more of the spent fuel held in dry storage."]¹⁶⁴ [footnote 164 text: Nuclear Regulatory Commission, Commission Voting Record: Near-Term Report and Recommendations for Agency Actions Following the Events in Japan, at PDF page 9, ML112310746 (Aug. 19, 2011).] (0718-2-18 [Sipos, John])

Comment: While removing spent fuel and placing it in dry cask storage remains the safer alternative, there are other steps that can also contribute to reducing the risk of zirconium cladding fires in spent nuclear fuel pools. For example, the fuel assemblies in pools can be arranged in a checkerboard pattern so that newly discharged fuel is surrounded by older, cooler fuel. The cooler fuel will act as heat sink, absorbing the heat from the newer fuel.¹⁶⁵ [footnote 165 text: *NAS Report* at 54.] Similarly, newly discharged fuel can be placed near the walls of the pool, which will also act as a heat sink. Water spray systems can be installed to cool fuel in the case of loss of pool coolant and pool walls can be reinforced to prevent their damage.¹⁶⁶ [footnote 166 text: *NAS Report* at 55.] Also, limiting the frequency of full core offloads into pools and delaying the transfer of fuel into a pool after a reactor shutdown would reduce the heat-load in the pool.¹⁶⁷ [footnote 167 text: *NAS Report* at 55.] What is possible at each facility will vary, and therefore, a site-specific evaluation must be conducted. Although the recent Near-Term Task Force report does not call for the transfer of fuel to dry storage, Recommendation 7 of the report addresses some concerns about enhancing the safety of spent fuel pools. The Task Force recommends that licensees be required to install or enhance equipment that will allow workers to better monitor spent fuel pools in emergencies, as well as improve the ability of workers to get water to the pools if necessary.¹⁶⁸ [footnote 168 text: *Near-Term Task Force Report* at 45-46.] The State urges NRC to include such requirements for relicensing, in addition to requiring the thinning of spent fuel pools.¹⁶⁹ [footnote 169 text: In the briefing on the proposed GEIS, held on January 11, 2012, Chairman Jaczko indicated that license renewal is an opportunity to get requirements implemented at nuclear facilities. *January 2012 GEIS Briefing Transcript* at 86. The State recommends that license renewal be made conditional upon the implementation of the requirements recommended by the Near-Term Task Force. This will ensure that the changes are implemented by licensees prior to license renewal.] (0718-3-1 [Sipos, John])

Comment: NRC should stop issuing reactor licenses until a real repository is determined. That would be a repository situated on bedrock that would be stable for thousands of years. (0739-3 [Quartermann, John S.]

Comment: AREVA agrees with the NRC conclusion that a moratorium on reactor and Independent Spent Fuel Storage Installation (ISFSI) licenses is not a reasonable or equitable alternative to the proposed rulemaking. A "no licensing" approach would not successfully achieve the intent of the proposed rulemaking, which is to catalogue the NRC's conclusion of the environmental impacts of continued safe storage of nuclear fuel. In addition, as NEI has

indicated, a licensing moratorium is not legally required by the National Environment Policy Act (NEPA) or the Atomic Energy Act (AEA). AREVA agrees that a licensing cessation is not a permanent solution. Such an act would be detrimental to the economic infrastructure of the industry, would not achieve the goals set forth by the proposed rulemaking, and is not legally bound by NEPA or the AEA. (0745-5 [Kelley, Devin])

Comment: NRC should not be allowed to issue new reactor licenses, nor grant license extensions to old operating reactors until a permanent, deep-geological high-level radioactive waste disposal facility is built and operating. (0757-7 [Lynch, Laura])

Comment: It should be clear by now that, unless we can deal with the waste products, nuclear energy is probably doomed. Shouldn't we just grow up and accept that and move on to more viable solutions to our energy need. (0758-2 [Kuchnia, Margaret])

Comment: I believe NRC should not be allowed to issue new reactor licenses, nor grant license extensions to old operating reactors until a permanent, deep-geological high-level radioactive waste disposal facility is built and operating. (0763-3 [Freeman, Susan])

Comment: NRC should not be allowed to issue new reactor licenses, nor grant license extensions to old operating reactors until a permanent, deep-geological high-level radioactive waste disposal facility is built and operating. (0791-3 [Mierzwicki, Tony])

Comment: In conclusion, the moratorium on issuing new reactor licenses and renewing existing ones must remain in place. The DGEIS and Proposed Rule are completely unacceptable. Further, because there is absolutely no solution for the more than 80,000 tons of current waste which will grow to more than 150,000 tons by 2050, the NRC must finally act responsibly and phase out nuclear power as quickly as possible and attempt to manage this deplorable mess as diligently as possible. The mantra must be "mitigate don't exacerbate." (0819-23 [Kline, Connie])

Comment: We disagree that abandonment of reactor licensing and the closure of existing plants is not a reasonable alternative. This should be INCLUDED as an option. We believe this is the only prudent and reasonable option, which responsibly acknowledges the severe danger of nuclear substances, the fact that no permanent geologic repository exists, and the fact that the NWO DO NOT measure up to the deep geologic repository alternative. No new licensing should be allowed unless and until the permanent solution for the waste is determined, and no plant licenses should be extended. (0836-28 [Davis, Anonymous])

Comment: The NRC does have the authority to pull licenses if they decide the plant is not safe, period. It does not matter if the licensee has some vested interest. We see this as the key and disheartening reality... the NRC is now a toothless lapdog instead of being a watchdog, and it has been co-opted by the industry to the point that it truly believes that the right thing to do is to continue to grant and extend licenses WHEN NO SOLUTION EXISTS TO DEAL WITH THE WASTE! (0836-29 [Davis, Anonymous])

Comment: Page 1-9, lines 19-20, you are right that cessation of nuclear power plant licensing and operations would halt the future generation of nuclear fuel. That is as far as your analysis should go. You are not responsible for regulating every form of energy or option. You have no analysis of "other environmental impacts that may result." etc. We believe that if done responsibly, this is the best course of action. (0836-30 [Davis, Anonymous])

Comment: Regarding Page 1-9, Lines 25-29, you say that requiring hardened storage systems, etc. are outside the scope of the GDEIS. Of course it is, because this is not a licensing action. But the GDEIS CAN state that these would be necessary if any site were to become truly safe under certain accident scenarios. To eliminate these concerns out of hand by stating that they are "out of scope" is truly ridiculous. THESE CONCERNS MUST BE ADDRESSED AND YOU CAN'T SWEEP THEM UNDER THE RUG BY SAYING THEY ARE OUT OF SCOPE!! There are differences between a deep geologic repository and surface NWOs... YOU MUST DISCLOSE THESE DIFFERENCES! (0836-32 [Davis, Anonymous])

Comment: Page 1-10, Line 1: the expedited transfer of fuel from fuel pools to ISFSI did not consider plants that were not operating. So their conclusions cannot be directly adopted by your group. You did not mention that, and then the implications that the scope of that project explicitly did not consider the scope you are considering. The fact is that the expedited fuel transfer project ASSUMES that the fuel will not necessarily need to be placed in dry storage on site, and could potentially be shipped directly from the fuel pools. Thus, by not moving fuel from the pools as soon as practicable into dry casks, they envision avoiding this cost. However, in the scenario you are promoting here, all fuel from the fuel pools will be moved into the ISFSI prior to being transported off site, and therefore, there is NO SAVINGS, and the conclusion of that project should be REVERSED, i.e. expedited transfer is WISE, PRUDENT, and COST EFFECTIVE, and the safest thing to do, based on the fact that there is a safety difference between dry casks and fuel pools. If you have to transfer it to dry casks anyway, why not do it as quickly as practicable, to avoid the safety differences between the ISFSI and FUEL POOLS? Answer: there is no reason, and thus the conclusions of the expedited transfer are now moot. (0836-33 [Davis, Anonymous])

Comment: I find it difficult to comment on a safe alternative to spent nuclear fuel when the very premise that ANY nuclear fission, fuel or waste can be deemed safe is seriously, intrinsically flawed. Nevertheless, the grim reality is that we do, in fact, have thousands of tons of highly lethal of spent nuclear fuel on site in at virtually all United States nuclear power plants. These aging nuclear power plants should NOT be granted operating extensions beyond their "safe" and originally approved lifespans. I believe that ALL nuclear power plants should be shut down, decommissioned, with no new nuclear reactors developed as this is an unsafe, economically and ecologically unsustainable technology. (There are other, less deadly viable energy alternatives.) There needs to be an end to the production and/or reprocessing of spent nuclear fuel. This will in turn, make finite the total amount of spent nuclear fuel to be stored. (0843-1 [Davis, Cherie])

Comment: There are better, cheaper and safer ways to fight global warming and provide electricity. While it will be expensive and unpopular to take care of the existing spent nuclear fuel, we must stop adding to the problem of spent nuclear fuel. The NRC needs to make prudent decisions regarding safety: it must expedite the thinning of overcrowded spent fuel pools and expedite the transition to dry cask storage. And, the NRC must not be allowed to license new nuclear reactors or relicense existing reactors. (0851-13 [Thatcher, Tami])

Comment: And further, the NRC admitted that not licensing and re-licensing nuclear power would stop the production of waste. However, NRC shied away from consideration of a no-action alternative that would stop licensing, by stating: Although cessation of nuclear power plant licensing and operations would halt the future generation of spent fuel, other environmental impacts could result from the required development of replacement power sources or demand reductions. Even then, the environmental impacts of continued storage would not cease until sufficient repository capacity becomes available. DGEIS at 1-9. This

statement is simply irrational, and reflects a complete lack of analysis. The fact that other energy sources may have environmental impacts does not render them unworthy of consideration. NEPA requires that the entire array of reasonable alternatives must be analyzed. *Calvert Cliffs*, 449 F.2d at 1128. In addition, consideration of the no-action alternative of not licensing and re-licensing reactors that would generate spent fuel is explicitly required under NEPA and NRC implementing regulations. (0897-3-10 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The GEIS should have a no-action alternative of not issuing any further licenses or license extensions for reactors or for spent fuel storage at least until the basis to do a scientifically valid GEIS exists in the area of high burnup fuel. At present the NRC lacks the factual and analytical basis to do so in a number of areas. This should be the preferred alternative. (0898-5-25 [Curran, Diane] [Makhijani, Arjun])

Comment: (X-16) The potential for a pool fire became clear in 1979. From the beginning, the means of addressing this threat was also clear. The radiological risk of a pool fire could be dramatically reduced by abandoning the use of high-density racks in pools, and reverting to low-density, open-frame racks.⁹⁹ [footnote 99 text: In the case of BWR spent fuel, removal of channel boxes from the fuel could also be appropriate.] Figure X-1 shows the two types of rack. Since 1979, numerous parties have intervened in license proceedings and pursued other avenues, seeking to persuade NRC to order the elimination of high-density racks. A corollary of that action would be the transfer of a substantial portion of the US inventory of spent fuel from pools to dry casks. NRC has consistently and vigorously opposed the elimination of high-density racks. (0916-2-10 [Curran, Diane] [Thompson, Gordon R.]

Comment: The draft GEIS does not consider options for reducing the radiological risk arising from management of spent fuel. However, numerous options of this kind are available. For example, options are available for providing enhanced protection of ISFSIs. Use of such options at ISFSIs across the United States would support a national strategy of protective deterrence. (0916-3-24 [Curran, Diane] [Thompson, Gordon R.]

Comment: An ounce of prevention is worth a pound of cure. The U.S. must stop generating radioactive waste. NRC estimates that 52,000 metric tons of irradiated nuclear fuel will be stored at commercial reactors in the U.S. by 2005. If currently operating reactors continue generating waste until the end of their 40 year licenses, the mountain of waste will more than double in size. If NRC continues to allow old reactors to extend their operating lifetimes from 40 to 60 years, the amount of waste will increase still more. If new nuclear reactors are built, yet more waste would be produced. Nuclear power must be phased out and replaced with safer, cheaper, cleaner ways to meet our electricity needs; conservation, efficiency, and renewable sources such as wind, solar, and fuel cells. (0929-18 [Kamps, Kevin])

Comment: We disagree that abandonment of reactor licensing and the closure of existing plants is not a reasonable alternative. This should be INCLUDED as an option. We believe this is the only prudent and reasonable option, which responsibly acknowledges the severe danger of nuclear substances, the fact that no permanent geologic repository exists, and the fact that the NWO DO NOT measure up to the deep geologic repository alternative. No new licensing should be allowed unless and until the permanent solution for the waste is determined, and no plant licenses should be extended. (0930-2-2 [Lutz, Ray])

Comment: We see this as the key and disheartening reality... the NRC is now a toothless lapdog instead of being a watchdog, and it has been co-opted by the industry to the point that it

truly believes that the right thing to do is to continue to grant and extend licenses WHEN NO SOLUTION EXISTS TO DEAL WITH THE WASTE. (0930-2-3 [Lutz, Ray])

Comment: Page 1-9, lines 19-20, you are right that cessation of nuclear power plant licensing and operations would halt the future generation of nuclear fuel. That is as far as your analysis should go. You are not responsible for regulating every form of energy or option. You have no analysis of "other environmental impacts that may result." etc. We believe that if done responsibly, this is the best course of action. (0930-2-4 [Lutz, Ray])

Comment: Regarding Page 1-9, Lines 25-29, you say that requiring hardened storage systems, etc. are outside the scope of the GDEIS. Of course it is, because this is not a licensing action. But the GDEIS CAN state that these would be necessary if any site were to become truly safe under certain accident scenarios. To eliminate these concerns out of hand by stating that they are "out of scope" is truly ridiculous. THESE CONCERNS MUST BE ADDRESSED AND YOU CAN'T SWEEP THEM UNDER THE RUG BY SAYING THEY ARE OUT OF SCOPE.. There are differences between a deep geologic repository and surface NWOs... YOU MUST DISCLOSE THESE DIFFERENCES. (0930-2-6 [Lutz, Ray])

Comment: Page 1-10, Line 1: the expedited transfer of fuel from fuel pools to ISFSI did not consider plants that were not operating. So their conclusions cannot be directly adopted by your group. You did not mention that, and then the implications that the scope of that project explicitly did not consider the scope you are considering. The fact is that the expedited fuel transfer project ASSUMES that the fuel will not necessarily need to be placed in dry storage on site, and could potentially be shipped directly from the fuel pools. Thus, by not moving fuel from the pools as soon as practicable into dry casks, they envision avoiding this cost. However, in the scenario you are promoting here, all fuel from the fuel pools will be moved into the ISFSI prior to being transported off site, and therefore, there is NO SAVINGS, and the conclusion of that project should be REVERSED, i.e. expedited transfer is WISE, PRUDENT, and COST EFFECTIVE, and the safest thing to do, based on the fact that there is a safety difference between dry casks and fuel pools. If you have to transfer it to dry casks anyway, why not do it as quickly as practicable, to avoid the safety differences between the ISFSI and FUEL POOLS? Answer: there is no reason, and thus the conclusions of the expedited transfer are now moot. (0930-2-7 [Lutz, Ray])

Comment: Position: Stop making nuclear waste for any number of reasons including a Lack of Waste Confidence > --Unless and until permanent isolation of the existing radioactive waste from the biosphere has been demonstrated, there should be no confidence in licensing waste production, and the NRC should stop licensing new reactors and relicensing old ones. The NRC does not have the authority to license making more waste BECAUSE the waste canNOT be isolated from the biosphere. There is no current working process to isolate or remove radioactive waste of all levels from our biosphere. (0938-1 [Sondheim, Steven])

Comment: There should be no more licensing or re-licensing of nuclear reactors FOR MANY REASONS INCLUDING THE FACTS THAT METHODS FOR permanent disposal AND ISOLATION of radioactive waste have NOT been determined, proven and funded. Why should we condone continued licensing of new reactors and renewing licenses from old reactors while we are facing the dilemma of not being able to safely dispose of the 70,000 metric tons of commercial high level nuclear waste already generated and the ~ 2000 metric tons being produced each year by nuclear power reactors in the US? > --The EIS should consider and analyze the option of not generating any additional waste. It should consider and evaluate phasing out nuclear reactors in the near future. Creating additional waste when there is no

identifiable solution for its permanent disposition cannot be justified. > --Any EIS regarding nuclear waste storage must first and foremost consider alternatives to nuclear waste generation. There are other methods of generating electricity that do not generate radioactive waste. Prevention and precaution are the responsibility of the NRC. (0938-16 [Sondheim, Steven])

Comment: New potentially less dangerous methods such as Hardened ON- Site Storage (HOSS) should be fully evaluated in the EIS. (0938-5 [Sondheim, Steven])

Comment: NRC should not be allowed to issue new reactor licenses, nor grant license extensions to old operating reactors until a permanent, deep-geological high-level radioactive waste disposal facility is built and operating. (0939-3 [Marschak, Cheryl])

Comment: Please suspend licensing of nuclear Power plants until the radioactive waste can be stored safely. There is no confidence in your current policy. Also the current power plants are aging and need onsite inspections. Our nation and planet depend on you. (0940-1 [Doyle, Rosemary])

Comment: The EIS for "waste confidence" should consider and analyze the option of not generating any additional waste. It should consider and evaluate phasing out nuclear reactors in the near future. Renewables and energy efficiency are more climate responsible and do not come with a legacy of generations of radioactive waste. (0950-1 [Commenters, Multiple])

Comment: NUCLEAR POWER GENERATION SHOULD BE PUT TO REST BECAUSE THERE IS NO REASONABLE EXPECTATION OF STORING SPENT FUEL SAFELY. WE HAVE ENOUGH WASTE TO LAST MILLIONS OF YEARS, AS IT IS, AND WE ARE ALL CONTAMINATED. (1004-2 [Dimondstein, Carla])

Comment: Ending radioactive waste generation is important to minimize these societal risks. The NRC should revise its Waste "Confidence" document to ensure the speediest possible end to that generation. (1007-3 [Diamond, Jim])

15. Comments Concerning Alternatives – Costs

Comment: In addition, the limited attempt to distinguish Alternatives through comparing costs and benefits in Chapter 7 of the Draft GEIS is meaningless. Because the NRC determines in the Draft GEIS that the environmental consequences are not variable across Alternatives, the costs that do differ are limited to administrative costs (e.g., to develop site-specific NEPA reviews, rulemaking costs, policy statement costs, and costs to develop the GEIS). Such administrative costs are not typically the focus of NEPA analyses. Furthermore, the manner in which these costs were evaluated is inappropriate. While the Draft GEIS states that the costs of each Alternative are projected from fiscal year 2015 through fiscal year 2044 (Draft GEIS, pg. 7-2), the actual calculations of costs also include those incurred in years 2013 and 2014 to develop the GEIS for the three Action Alternatives (this cost is not relevant to the No Action Alternative). These past costs (referred to as "sunk" costs) can no longer be avoided and, therefore, should not be included in the document. (0473-1-12 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The Draft GEIS does not include discussion of the intergenerational impacts of high consequence events and associated discounting methods over the long-term and indefinite time frames. Because the Draft GEIS does not monetize environmental impacts of accidents or events, it does not include discussion of discounting impacts to estimate a present value over

time. In the context of economic analysis, discounting is the process of determining the relative worth today of costs incurred in the future (i.e., calculating "present values" of future costs of benefits). In other words, discounting reflects people's preference for receiving a dollar today over the promise of receiving a dollar ten years from now; the dollar received ten years from now is worth relatively less. In economic analysis, we apply a discount rate to future costs and benefits to reflect this preference. The cost benefit analysis in section 7 of the Draft GEIS, which evaluates only administrative costs of the Alternatives over 30 years, applies discount rates of three percent and seven percent to evaluate future costs. For these types of costs over this short period of time, this approach is consistent with best practices for Federal agencies as described by the U.S. Office of Management and Budget (OMB).³ [footnote 3 text: Office of Management and Budget, Circular A-4, September 17, 2003]. However, OMB's guidance suggests considering lower but positive discount rates (economists commonly assume values as low as one percent) to evaluate costs and benefits over intergenerational timeframes, such as presented in the Draft GEIS for consideration of environmental impacts.⁴ [footnote 4 text: Ibid] Lower discount rates over long analytic time frames better reflect the public's view of intergenerational tradeoffs (for example, in trading off current consumption for avoidance of future adverse events), and thus provide a more reliable measure of the present value benefit of such policies. (0473-2-2 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Specifically, in considering intergenerational costs or benefits, economists generally agree a lower or declining discount rate is appropriate. The lower or declining rate reflects the current population's consideration of the well-being of future generations, as well as increased uncertainty regarding the appropriate discount rate over longer time frames. A recent article by prominent economists highlights the importance of the selection of a discount rate for policies that have implications for centuries. This study specifically cites the relevance of policies related to the disposal of nuclear waste, and establishes the importance of relying on low or declining discount rates.⁵ [footnote 5 text: Arrow, K., M. Cropper, C. Gollier, B. Groom, G. Heal, R. Newell, W. Nordhaus, R. Pindyck, W. Pizer, P. Portney, T. Sterner, R.S.J. Tol, and M. Weitzman. July 26, 2013. "Determining Benefits and Costs for Future Generations." *Science*: 341. Pg 349-350.] For example, in the context of severe events, a lower discount rate applied over a long time frame reflects both ethical considerations of the current population with respect to the welfare of future generations, and increasing uncertainty over time about the level of risk for such events. (0473-2-3 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Exhibit 1 illustrates the significant difference in the cumulative present value costs of high- consequence events over long time frames depending on the discount rate assumption.⁶ [footnote 6 text: Absent an estimated magnitude for the risk (probability multiplied by consequence) in each year, as described above, this exhibit can only be illustrative; thus, the vertical axis is unitless. For the purposes of this demonstration, we model a declining discount rate assuming linear decline in the assumed rate between three percent and one percent between years one and 300.] That is, the points along the curve represent the present value costs of a future environmental impact each year into the future applying varying discount rate assumptions to reflect declining values of dollars over time. The vertical axis represents the present value impact and the horizontal axis is time. The area under each curve therefore reflects the total present value economic impact (summing across all years) between years 1 and 300. Consistent with the concept of discounting as explained, the present value cost of economic impacts declines in future years but is sensitive to the assumed rate of decline (i.e., discount rate). As suggested by the state-of-the-science, applying a declining discount rate, or a rate of one percent can result in present value impacts more than an order-of-magnitude greater

than a seven percent discount rate. The declining and one percent discount rates appropriately incorporate consideration of the potential for distant future severe events in today's decisions. Exhibit 1: Sensitivity of Impacts to Discount Rate Assumption graphic. Absent: 1) considering the probability and potential adverse consequences of high- consequence events; 2) a discussion of the cumulative costs of such events across future years in the Draft GEIS; and 3) using an appropriate discounting assumption, it is unclear how NRC concludes that environmental impacts are "small" across all of the Alternatives (No Action and the three Action Alternatives), scenarios (varying time frames for continued storage), and sites. (0473-2-4 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: In 2013 President Obama commissioned a study on the costs of "doing nothing" and found that Utilities have already sued the US Gov with 80 victories to recover their storage costs because USA did not come through with a Yucca mountain or similar. Direct payouts around \$2B, and further they estimated that as more plants age and close that the USA taxpayers could be on the hook for \$20B in judgments by the year 2020. And up to an additional 20% could be legal and consultants fees, bringing the tab to \$24B How much more simple can this be? \$14.375B to "pretty darn well" fix to the problem for 50 years and reduce our risk of disaster or terrorist attack, create good jobs, or squander \$24B in judgment fees and lawyer costs and NO PROGRESS? (0484-6 [Olsen, Steven])

Comment: In 2013 President Obama commissioned a study on the costs of "doing nothing" and found that Utilities have already sued the US Gov with 80 victories to recover their storage costs because USA did not come through with a Yucca mountain or similar. Direct payouts around \$2B, and further they estimated that as more plants age and close that the USA taxpayers could be on the hook for \$20B in judgments by the year 2020. And up to an additional 20% could be legal and consultants fees, bringing the tab to \$24B. (0529-3 [Claybourne, Ana])

Comment: GEIS Section 7.6, p.7-15, Table 7-6. "Public perception" costs and benefits should not be included in NRC's cost benefit analysis (Table 7-6, GEIS 7-15). First of all these are entirely speculative and fail to consider that different members of the public have different perceptions. For example, NRC has concluded that there would be a public perception benefit to site specific review and a public perception cost to precluding such review. This could be true for part of the public opposing specific facilities, because it would provide a facility specific opportunity for opposition to the facility. However, among portions of the public who desire efficient use of Federal resources, the opposite would be true. This part of the public would not want the facility specific licensing of facilities to undergo unnecessary and duplicative environmental reviews. So, whose perception does NRC ascribe a given cost or benefit and what is the basis for NRC's determination? The Table 7-6 perceived benefits and costs are merely a declaration without basis. Such speculation should not be included in the GEIS. Avoiding speculation about perceived benefits and costs is consistent with the approach DOE took in the Yucca Mountain FEIS that cited a consensus among social scientists that a quantitative assessment of the potential impacts from risk perceptions was "impossible at this time and probably unlikely even after extensive additional research" (DOE/EIS-250, Appendix N, page 21). The speculative nature of perceived benefits and costs is recognized in GEIS Section 8.6, p. 8-12, lines 5-10 that first recognizes that perceptions vary among stakeholders, and then cites the same speculative benefits contained in Table 7-6. The tabular information in Table 7-6 and the wording in Section 8.6 regarding perceived benefits and costs should be deleted from the GEIS. (0544-30 [Enriquez, Elizabeth])

Comment: Instead of being cost effective as postulated in Appendix H the reliance on a GEIS will be much more expensive and time consuming. Appendix H does not take into consideration

the costs of endless litigation and the need to conduct supplemental EIS for each reactor site. (0611-21 [Shapiro, Susan])

Comment: Section 1.6 discusses alternatives to the proposed action, including the "No Action" alternative, which if implemented, would require the NRC to perform site-specific reviews of the environmental impacts of continued storage during licensing actions. In dismissing this alternative, the draft GEIS states that the alternative is not viable because of the costs associated with these site-specific reviews (to the public, the agency, and licensee) and that licensing boards would be required to hear nearly identical contentions in each proceeding. The NRC is already required to meet NEPA for licensing actions, either through an EIS or EA; the environmental effects of continued storage would simply be another aspect of those documents. As an organization that has spent considerable sums in participating in the NEPA process (EIS for the PINGP 1 and 2 license renewal and EA for the ISFSI renewal) and litigating environmental and safety issues, the Tribe does not believe that "costs" justify the dismissal of this Alternative. The licensee will simply pass the costs of the review on to the ratepayers and the NRC currently recovers most of its costs from the licensee/applicant (current estimate is that 90 percent of the NRC's budget is from licensee fees). As far as the costs to the public, that decision is best left to the tribes, states, cities, or communities impacted by continued spent fuel storage. Not everyone impacted by continued storage is aware of the draft GEIS and how the Waste Confidence Rule affects their communities and prevent them from raising issues related to continued storage during subsequent licensing actions. According to the January 2012 report, issued by the Blue Ribbon Commission on America's Nuclear Future (BRC or Commission), the Nation's taxpayers are currently financially responsible for the numerous partial breach of contract lawsuits filed by the utilities on behalf of its ratepayers. If the Government begins accepting waste in 2020 (close to 6 years from now), the government liability is estimated to be \$16.2 Billion (in 2012). The Government's partial breach of contract liability increases by \$500 Million for each year of delay. Of course, this is in addition to the estimated \$15 Billion already spent to develop the now-abandoned Yucca Mountain site. The additional costs of site-specific reviews are nothing compared to the money already wasted developing and abandoning the Yucca Mountain site. The Nation's ratepayers have willingly paid licensing fees, Nuclear Waste Fund fees, and their taxes, with the expectation that they would get something for their money-a national repository for the spent fuel generated in their communities and states and assurances that the environmental impacts of these spent fuel storage facilities will be evaluated with respect to their unique site and not some generic "reference site." The additional costs of site specific environmental reviews are nothing more than a legal device to shield the NRC and licensees from litigation related to long-term storage. (0619-1-10 [Mahowald, Philip R.]

Comment: "Public perception" costs and benefits should not be included in NRC's cost benefit analysis (Table 7-6, GEIS 7-15). As a legal matter, public perception is, we believe, too far removed from the physical environment to be an appropriate consideration in NEPA reviews. As the Supreme Court stated in *Metropolitan Edison Co. v. People Against Nuclear Energy*,⁹⁹ [footnote 99 text: 460 U.S. 766, 7777 (1983).] the operation of the facility is an event in the physical environment, but the alleged psychological health damage in that case was "too far removed from the event to be covered by NEPA." So too is "public perception." Further, these costs are entirely speculative and fail to consider that different segments of the public have different perceptions. For example, NRC has concluded that there would be a public perception benefit to site-specific review and a public perception cost to precluding such review. This assumption is likely to be correct for segments of the public opposing specific facilities, as a site-specific review provides an additional opportunity to voice this opposition. But among segments of the public concerned about the cost and availability of clean reliable electricity, the exact opposite would be true - *i.e.*, this segment of the public would not want the licensing of

generating facilities they support to become protracted by unnecessary and duplicative environmental reviews. The dilemma then becomes: Which group's perception should be credited or assigned a given cost or benefit? If the answer to this question is to be that the perception held by the majority of the public should prevail, then NRC's decision to associate costs and benefits with the views of those who oppose nuclear power plants is most certainly incorrect. According to recent public opinion surveys a majority of the public favor nuclear power. For example, a survey conducted in September 2013 by Bisconti Research Inc. and Quest Global Research found 69 percent of the respondents now favor the use of nuclear energy as one of the ways to produce electricity. Such poll results have been consistent for a number of years. Nonetheless, it is inappropriate for the NRC, an independent safety regulator, to base its cost-benefit analyses on the results of public opinion surveys or its perception of public opinion. Rather, it would be more appropriate for NRC to avoid attempting to quantify perception costs and benefits altogether. This would also be consistent with the conclusion reached by DOE in the Yucca Mountain FEIS that there was a consensus among social scientists that a quantitative assessment of the potential impacts from risk perceptions was "impossible at this time and probably unlikely even after extensive additional research."¹⁰⁰ [footnote 100 text: DOE/EIS-250, Appendix N, page 21.] (0827-5-1 [Ginsberg, Ellen])

Comment: Exelon suggests that the NRC reconsider including "public perception" costs and benefits in the NRC's cost benefit analysis. Exelon believes that these costs might be speculative and fail to consider that different segments of the public have different perceptions. For example, the NRC has concluded that there would be a public perception benefit to site-specific review and a public perception cost to precluding such review. Indeed, among segments of the public opposing specific facilities, this is most likely a correct assumption, as a site-specific tool provides another opportunity for this opposition to be considered. However, among segments of the public concerned about the cost and availability of clean reliable electricity, the exact opposite would be true; this segment of the public would not want the licensing of generating facilities they support to become protracted by unnecessary and duplicative environmental reviews. The dilemma then becomes to which group's perception does the NRC ascribe a given cost or benefit. If the answer to this question is to be that the perception held by the majority of the public should prevail, then the NRC's decision to associate costs and benefits with the views of those who oppose nuclear power plants is considered to be incorrect, according to recent public opinion surveys. Exelon reviewed a recent survey noting that 69 percent now favor the use of nuclear energy as one of the ways to produce electricity. But even though such poll results have been consistently typical for a number of years, it is probably not appropriate for the NRC, an independent safety regulator, to base its cost benefit analyses on the results of public opinion surveys. Rather, it would seem more appropriate for the NRC to avoid attempting to quantify perception costs and benefits altogether. (0942-6 [Helker, David P.]

16. Comments Concerning GEIS Assumptions and Analysis

Comment: Proposals by the NRC -- including a 2050 repository, institutional control forever, replacing storage containers -- are impossible and fanciful, or just plain lies. (0023-5 [Bridges, Martha])

Comment: I appreciate the fact that you have your data and references in the report, but the actual engineering calculations, the actual computer source codes are not available. Lawyers I hear call it work product. But what I'm trying to say is, yes, we do have very good results

reported in this 2157, however, the source code that generated those results, the engineering calculations by hand are not available. It brings a question to my mind. (0030-14-5 [Lewis, Marvin])

Comment: I went through the documents and every time there was a risk -- you know, summary of environmental impacts on continued storage at reactor storage, reactor storage, small, small, small, small. You know, away from storage. You know, away from reactors, small, small, small. You know, no water. You know, everything's small. But you know, I've been attending these meetings for two years between the North Anna issues and when we restarted there without actually doing a lot of checking. Everything's always downplayed. I mean we're talking about some serious issues here. I mean lessons learned from Fukushima. I went to one of the Blue Ribbon Commission meetings and these are serious issues. It seems like this document is so generic, it was put together in a rush. (0030-15-6 [Gray, Erica])

Comment: And we're talking about a 100-year changeout; that is mentioned several times in the document. And a 100-year changeout is going to cost -- well, let's see, we've got 1,500, roughly, dry casks nationally right now. And that means in 100 years, if they last that long, we're going to have to start changing them out at the same rate that we're making them. And if we had all of the fuel that we -- we would like to accelerate the rates that we're making them, and we'll have nearly 10,000 dry casks, just by the time we get all of the fuel that has already been made put into dry casks. That's an awful lot of dry casks, but that's only the beginning. That's only what they're going to have to do in 100 or 110 years, or whatever it takes us to get it all in. And then the other, oh, 100,000 dry casks that have been built in the meantime are all going to also need to be replaced over and over and over again. (0030-4-2 [Hoffman, Ace])

Comment: So we're talking about licensing and relicensing. That was Andy's opening statement. And 10 years ago, 15 years ago, when they were given this dry cask -- I have the documents, I was looking at them just a day or two ago, and the word "temporary" was always in the dry cask phraseology, that this was a temporary solution. But he didn't say "and relicensing and relicensing and relicensing" for 300 years, 500 years, and that's with changing them out. Just calling it licensing/relicensing is not going to be good enough. It could be quite a bit longer than that. (0030-4-4 [Hoffman, Ace])

Comment: There is a lot here to have confidence in. There is a lot more that will be said. But -- and I do think that, you know, these 100-year scenarios and repackaging, NEI may have some things to say about that. We don't think we are going to be repackaging every 100 years. (0030-6-9 [McCullum, Rod])

Comment: Though not required by NEPA, the GEIS makes very conservative assumptions. In other words, the GEIS makes assumptions that tend to overstate the environmental impacts of used fuel storage. For example, the GEIS assumes that used fuel will be moved to new casks every 100 years under the long-term storage scenario, even though current science and experience shows that cask replacement need not necessarily occur that frequently. (0030-7-6 [Matthews, Tim])

Comment: In the GEIS, To guide its analysis, the NRC relied upon certain assumptions regarding the storage of spent fuel. These included two assumptions that have no basis in experience or reality, never having been accomplished in the US. These are: Spent fuel canisters and casks would be replaced approximately once every 100 years. Independent spent fuel storage installation (ISFSI) and dry transfer system (DTS) facilities would also be replaced approximately once every 100 years. Given that NRC has ignored both past experience and staff recommendations to implement the lessons learned from experience (such as when they

went against the recommendation of their staff scientists to require hardened filtered vents in Mark 1 BWRs to prevent the explosions and massive release of radiation that occurred at Fukushima); to make assumptions based on NO evidence at all, no experience or confidence that such transfers of fuel from dry casks to new storage casks will occur without damaging embrittled fuel cladding, or that the technology will exist to safely transfer damaged fuel assemblies over unimaginable time frames is yet another example of NRC hubris and pattern of substituting wishful thinking for scientific integrity. (0089-10 [Shaw, Sally])

Comment: However, casks such as the Holtec High Storm 100 have leaked, even before their 20 year license expired. How then can NRC assume with confidence that they will not leak in the future, over 100 years to 1,000,000 years, and that these leaks will not have environmental impacts. Such assumptions are wishful thinking, not science. (0089-9 [Shaw, Sally])

Comment: Page 8-8 lines 19-22: For both at-reactor and away-from-reactor ISFSIs, there would be no irreversible and irretrievable commitments of resources during continued storage for most resources. However, impacts on land use, aesthetics, historic and cultural resources, waste management, and transportation would result in irreversible and irretrievable commitments. You say there is no irreversible and irretrievable commitments of resources for most resources. But the resources that are affected are significant. Also you fail to mention that the resources utilized to maintain the waste facilities will then not be available for alternative non-polluting, renewable, energy development. Maintenance of these waste facilities represents an irreversible and irretrievable commitment of resources that could otherwise be available for development of renewable energy sources. THIS IS SO IMPORTANT AS A VERY SIGNIFICANT IMPACT OF NUCLEAR ENERGY DEVELOPMENT AND MUST BE STATED SOMEWHERE IN THIS DOCUMENT. (0093-8 [Dennis, Harold E.B.])

Comment: So while our legislative and executive branches take their time trying to stay up with France on geologic disposal, our judicial branch has directed the Nuclear Regulatory Commission here to look at the what ifs. What if we don't dispose for these incredibly long periods of time? And they have done a credible job at looking at those ifs. We all need to understand these are what ifs. These are bounding scenarios. They've talked about things like 60 years in pools. Since dry cask storage was invented the average plant goes to dry cask storage 11 years after it shuts down. They've talked about putting dry-transfer facilities at every site. That won't happen. We'll use portable systems and every 100 years we will continue to license them well beyond 100 years. (0112-25-4 [McCullum, Rod])

Comment: Plutonium-239, just one of the poisons that radiate from spent fuel pellets, will remain hazardous for at least 240,000 years. Therefore your NRC assumption that "indefinite storage" at reactor sites can go on literally forever must end now. It has also been shown by the catastrophic release of nuclear fuel at Fukushima, that irradiated nuclear fuel will degrade with age, and will also degrade the materials with which the containers are built. Therefore NRC's assumption that dry cask storage - cask pads, inner canisters, and the dry casks themselves - will be replaced once every 100 years is seriously deficient. The fuel transfer operations must be undertaken whenever monitoring shows any danger of cask decomposition, no matter what the cost. (0127-2 [Lee, Catherine])

Comment: The proposed changes to the Waste Confidence Rule appear to assume that long-term storage of SNF will be in casks, and that the effects of long-term storage should be based upon this assumption. However, the NRC has no rule or policy that requires movement of SNF from wet storage to dry storage, and thus any analysis of long-term storage pool should analyze the possibility of SNF remaining in a densely configured elevated spent fuel pool (such as the pool

at the Vermont Yankee Station) for at least fifty years after cessation of operations, and perhaps longer because the NRC allows a licensee to request an extension of the period of SAFSTOR beyond 60 years. Absent a clear regulatory mandate from the NRC for movement of SNF from wet to dry storage, there is no basis for limiting analysis of the effects of the rule change to dry storage options. (0146-2 [Buchanan, Tom])

Comment: The assumptions the NRC used in the EIS are reasonable and conservative, and I believe the conclusions reached are correct. I know from personal experience that nuclear power plant owners have safely managed spent nuclear fuel for decades, and the continue to do so today. (0163-11-2 [Gutherman, Brian])

Comment: I looked at the Generic Draft -- the Generic Environmental Impact Study. I looked at that draft and in print it seems very solid. The pages are there. It's all lined out. And you know, it doesn't exactly seem as ambiguous as I found out it was when I talked to the people from the NRC out in the hall. Not only are there exceptions and exemptions, but it's for the purpose of an analysis. It's for the purpose of creating a model, which means that it's not really for us. It's not real. It's for a plant that doesn't exist. A perfect plant and a perfect world if there could be such a thing. (0163-21-1 [Elie, Marilyn])

Comment: I was here about two years ago, and at the time, my mind was blown by the presentation from the NRC that they had issued, that year, 1100 exemptions from safety procedures. So today while I was waiting before this began, I was encouraged to speak with the staff outside and there was graph. And it was a generic graph, which I didn't understand, so I asked for clarification, and I was curious about how much of the waste at Indian Point was in dry cask storage. The person told me they didn't know. They had no clue. There was a graph showing 60 years, 160 years, for dry cask storage, for open fuel ponds, whatever it was. It didn't make any sense. So I began to ask some questions and again, no clues. (0163-33-2 [Geist, Sheila])

Comment: There are three basic assumptions which this document is based upon which are false and misleading and inaccurate, and therefore, the GEIS is fatally flawed. (0163-7-5 [Shapiro, Susan])

Comment: It is my understanding that the NRC did not do the 'full analysis' required by the Court of Appeals. Instead of examining what would happen if spent fuel remained unprotected on the earth's surface indefinitely, the NRC assumed that spent fuel would be safely managed in surface storage for an indefinite period. The Court required NRC to examine the risks of spent fuel storage and did not allow NRC to merely assume that storage would be safe. (0177-5 [Craig, Anne])

Comment: Full knowledge of each of the Final EIS documents for each nuclear power facility would certainly have been beneficial, and I contend that a summary of this information should be within the DGEIS to quantify and to provide a summation of cause and effect specifics. (0219-1 [Olmstead, Stan])

Comment: The draft document draws the reader away from nuclear plant licensing and plant specific locations. The document for analysis is extremely general without any specifics and fails to be analytical. It is a "Trust Me Document." I can accept the concept of generic analyses. I cannot accept general analyses without specifics. The document is fraught with constant assumptions, short-term experience and has an industry-based analysis. Not one specific species is mentioned in the document for federally listed species, special status species or other

terrestrial species. No specific water bodies are analyzed that may become contaminated by the stored material whether on Eastern state waterways, Midwestern farming areas or the Pacific coast. Each existing facility has a unique environmental and geological situation and the assumption is made if it was adequately analyzed for a 40 year license with two 20 year renewals at the power plant then it is adequate for short term, long term and indefinite storage. Not true! I accept the attributes within the document's analyses, but do not accept the analyses. The DGEIS is a waste storage document. It has two essential and almost insurmountable problems: The serious nature of the waste to be stored and the vast length of time (millenniums beyond millennia) the waste must be safely stored. (0219-7 [Olmstead, Stan])

Comment: Despite each NRC commissioner's seemingly impressive academic credentials, the assumptions it makes regarding safe storage of nuclear waste are so flawed, any D grade high school student can see the dangers involved. (0239-1 [Rasmussen, Kenneth])

Comment: It's also heartening to see the four students get up here and talk about what they're doing, because one of the big flaws in the EIS is it assumes that every 100 years is going to be the same 100 years over and over again. I know better, I know these young people are going to do a way better job than my generation did. So, you know, again, that's where -- an example of where its bounding. (0244-11-8 [McCullum, Rod])

Comment: Why does the NRC rely on assumptions rather than directly implement specific and measurable expectations? How can the nuclear industry and U.S. society have confidence in such a system for managing waste, waste associated with detrimental biological effects when inappropriately handled? (0244-14-5 [Prescott, Lisa Marie])

Comment: Regarding the environment. According to the NRC, changes in the environment around spent nuclear fuel storage facilities are sufficiently gradual and predictable to be addressed generically. I beg to differ. (0244-14-6 [Prescott, Lisa Marie])

Comment: You say that this is the Waste Confidence Generic Environmental Impact Statement, so the key word would be confidence. And, to me, confidence comes from knowledge, so just a couple of suggestions. In this report the word "small" in capitalized font appears more than 119 times. However, there's no actual outline of what small really means. There's no numbers, there's no science, no actual graphs to really assess what the word small really means in this study. Also, it would just be nice to have, like, a copy of the data in which that was based upon. (0244-15-1 [Zuccarini, Ana])

Comment: So it's just -- for a nuclear, you know, very science-based, you know, PhD's, there's not a lot of science to these, it's just a lot of capital letters, small, moderate, large. So, you know, I'd appreciate, since this is up for the community and you are providing us a chance to really be acquainted with what you are doing, if you would just provide that kind of science for us to assess, even if somebody may not grasp completely what is written on there, it would just be like a good -- indicative of, you know, how much the study -- like how in depth it went, you know, many might be able to recognize some, you know, maybe some pollutants that are already in the environment that could maybe interact with some that might leak or whatnot. So, you know, even if I -- I'm not going to use this for anything, it would just be appreciated if you would provide that. (0244-15-6 [Zuccarini, Ana])

Comment: And then, also it says here that these -- the overall contributor, human health and environmental effects from continued short-term spent fuel storage would be limited in scope

and small for all populations. However, what are the limiting factors of the scope? (0244-15-8 [Zuccarini, Ana])

Comment: Just as we cannot assume that long-term geologic storage will be secured, we cannot assume that indefinite storage onsite will be safe. To act under these assumptions is inconsistent with the Nuclear Waste Policy Act and violates NRC's own regulations. Instead of these some assumptions the NRC should draft a new GIS to examine the probability that a geologic repository will be successfully sited, the probability that a successfully sited repository will actually contain radiation, the degree to which a repository may leak radiation, and the public health and environmental consequences that may occur if a repository is not sited or if it ineffectively contains radioactivity. (0244-3-3 [Hancock, Mandy])

Comment: From the onset I think the fundamental flaw here is just what Mandy said that, you know, instead of really following what the Court had ordered, which was an examination of the environmental effects, instead it works off this assumption that things will be okay, it's safe indefinitely.

And I think NEPA demands more, and I think, you know, the law over the last 40 years is -- you know, you see that in court decisions after court decisions. It's not a tool to justify a predetermined outcome.

And these effects that we speak of, I mean it's not speculative. I mean there's at least two events that, strangely enough, were not identified in this Generic Impact EIS, there being Yankee Rowe then the high flux beam reactor, issues from years ago. (0244-8-6 [Totoiu, Jason])

Comment: The NRC was -- I'm sorry, I didn't mean to -- okay. The spent fuel pools are more crowded than Japan's. The NRC was to find a permanent site for spent fuel. With Yucca off the map and our nuclear waste growing to 70,000 tons, a Federal court ruled in 2012 that the NRC could not proceed with new licenses or extensions until they completed an environmental study to show the environmental and health effects over time if spent fuel is not stored in a repository. (0245-14-3 [Kurz, Carol])

Comment: As a generic report, we understand the use of bounding assumptions. These types of assumptions result in a conservative approach being used on a generic basis. But it also may not be fully representative of what will occur at a site with fuel storage in the future. For instance, the report assumes that a dry transfer facility will be built at all dry cask storage facilities, and that all dry casks will be replaced every one hundred years. While the conditions of the casks will of course be closely monitored over their lifetime and a rigorous aging management program is already in place, it is unlikely that wholesale replacement of all casks would be required and the transfer facility may not be needed at all sites. (0245-20-3 [Dunlap, Jeff])

Comment: So, pool breakdown -- comprised of natural end state for which nuclear -- are naturally drawn by the great fact of the natural course of things. Only through the ongoing interventions of dutiful employees has it been forestalled like jugglers -- for reasons of their own. Where are the NRC's thorough, comprehensive, and informed analyses of the future? Should we expect to find such dutiful employees six decades after the nuclear supply business has gone bust? I'll just make a casual reference to Michael Burn, the convicted masked gunman, car-jacking senior operator with the six years unescorted access to Dresden, it's a big waste policy, licensing and relicensing -- (0245-24-6 [Conn, Corey])

Comment: This GEIS has one scenario where there is no repository at all becoming available. Again, why do we generate more waste when we're not going to have storage facility as one possibility? And changing out these casks every hundred years, I mean a thousand years from now, what kind of shape are these casks going to be in if we have to change them all, you know, every hundred years? (0245-27-2 [Ower, Douglas])

Comment: I opened up the big document and started to page through it. And I expected to see tables and charts that might tell me here is where we're at as far as filling up these spent fuel pools, here is where we are using dry casks, and here are some guidelines for best practices. And I didn't find any of that. I found that kind of quirky. And then I thought, well, we're going to have certainly some best practices and some guidelines that are going to underlie these assumptions. But I didn't find any of that. (0245-31-2 [Fox, Tracy])

Comment: The third point I have is actually in the EIS, which I partake a lot in my career when I worked at Argonne, uncertainty of the generic EIS, there's a lot of assumptions coming into that. But every assumption has a lot of uncertainty involved. So, I'm not too sure of how exactly uncertainty has been analyzed much more specifically. And maybe the last one would be the site-specific management part of that, how that ties into the uncertainties I mean here would be very important. (0245-5-3 [Chen, S.Y.])

Comment: As I said, the intent of the Court order was for the NRC to conduct a comprehensive analysis of the impacts of storing spent fuel onsite at nuclear plants indefinitely. The NRC has not done this. They have not provided a complete analysis but rather are assuming that spent fuel would be safely managed for an indefinite period of time. For example, the study assumes waste will not leak radioactivity because the fuel will be safely managed essentially forever, including the assumption that waste will be transferred into new storage casks every 100 years. This is a tough assumption to justify[.] (0246-22-2 [Fisher, Allison])

Comment: I would encourage the NRC to provide more details in the GEIS that are similar to these that I have just laid out regarding package robustness so that the public, in fact, can understand exactly what the NRC truly knows. (0250-27-4 [Pennington, Charlie])

Comment: In the GEIS, this draft, it says it's a potential environmental -- it analyzes potential environmental impacts that could occur as a result of the continued storage of spent nuclear fuel. I don't see that in here. I see a whitewash. I see the murdering of logic in the assumptions, that the storage of this fuel, the institutional control, the canisters being replaced every hundred years, the independent spent fuel storage installations, the dry transfer system. All of that stuff going on forever? Really? (0250-5-6 [Safer, Don])

Comment: Today at this hearing, we are considering the promise of safety by a) a repository available by 2050; b) institutional control forevermore; c) replacing storage containers every 100 years forevermore. Have we learned nothing from the hubris of humans in history? Are we promising the impossible? Do we dare? (0250-52-4 [Amos, T.J.])

Comment: One of the unintended consequences of the Nuclear Waste Policy Act is that it fomented the perception that nuclear waste, which by law must be permanently disposed underground, is so dangerous and unmanageable that it must be buried underground or otherwise permanently removed from the human environment. Unfortunately a comprehensive, accessible public education/information campaign to effectively address these fears, does not exist. Unchallenged and uncorrected, the public's misunderstanding of the risks and benefits of spent fuel will impede the country's ability to develop nuclear energy, and as a result, prolong

our reliance on carbon-based fuels. The fact that some members of the public fear a technology that has time and again been proven safe is no reason to banish the technology. We suggest to the NRC that the technical basis for the conclusions in the GEIS, and the numerous studies supporting the safety of spent fuel storage systems, drive the rulemaking and that the NRC expansively address in lay terms the evaluated risks associated with spent fuel storage. (0262-12 [Patterson, Karen])

Comment: We find that NRC's "finding of no significant impact" regarding: 1.) spent fuel pool fires; 2.) spent fuel pool leaks; 3.) vulnerability of spent fuel pools and dry cask sites to natural disasters and terrorist assaults; and 4.) NRC's belief in the adequacy of generic findings at reactors--to be unfounded, inadequate to the protection of the public health and safety (0274-5 [Kraft, David])

Comment: The NRC's draft Waste Confidence GEIS skirts the issue of long time storage safety by assuming fuel in dry casks can be managed indefinitely for 100's of years. It does not consider the possibility of terror attacks, nor mention the impacts of pool leaks, especially tritium, where there's a significant history of such accidents, nor show concern for earthquakes, tornadoes, floods which grow stronger with climate change. (0276-5 [Kurz, Carol])

Comment: I am extremely disturbed by NRC's methodology used to define how although consequences would be high, probability is extremely low. It is interesting to observe that in the Executive Summary, Tables ES-3 and 4, with few exceptions typically concludes probability of high consequence impacts are low. (But are significantly underestimated). (0284-14 [Borchmann, Patricia])

Comment: The Rule did not have the benefit of a full, comprehensive study of the potential public-health and environmental effects of long-term SNF storage at reactor sites, as mandated by the Court. Indeed, it implicitly acknowledges this (p. 56788): The DGEIS analyses are based only, it stated, "on current technology and regulations," instead of on detailed and rigorous scientific study, as the seriousness of the issue demands and as the Court has mandated. (0303-7 [Lamberts, Frances])

Comment: The Federal Circuit Court agreed with the New York Attorney General, required NRC to provide a thorough analysis of public health, safety, and environmental impacts about storage-- the impacts that storage would pose before allowing long-term storage to occur. (0325-11-2 [Borchmann, Patricia])

Comment: I'd like to bring to your attention now one section here, Section 8.4, Survey of Environmental Impacts and the section heading is "Relationship Between Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity." And it goes on to say, "In addition, the long-term productivity period evaluated in this chapter is the time period beyond continued storage (i.e., based on the NRC guidance in NUREG-1748, the period beyond the action under review.) As discussed in Chapter 1 in this draft GEIS, the NRC believes that the most likely outcome is that a repository will become available to accept the spent fuel generated by a reactor by the end of the short-term time frame, or 60 years after the end of the reactor's licensed life for operation." And I won't continue, but I read this page several times trying to understand what, if anything, it actually meant, and I still don't know what it means. And if this was a sort of hearing where one was allowed to summon a witness and question that witness, I would like to ask somebody from the Commission staff just what this does mean, because with all due respect, I don't think it means anything. (0328-11-2 [Muller, Alan])

Comment: The Draft Generic Environmental Impact Statement sidesteps the Circuit Court directed analysis with several assumptions, including an assumption that the spent fuel storage installation will be rebuilt, and that every cask will be reloaded every 100 years. In other words, the NRC purports to analyze the potential impacts of long-term onsite storage of spent nuclear fuel by assuming that there will be no long-term onsite storage of spent nuclear fuel. (0328-3-1 [Mahowald, Philip])

Comment: Now, to say that none of these impacts are anything but small in all of the work in this Generic Environmental Impact Draft, it's not credible, it's not credible. On the one hand you say it needs to be put into a deep geologic repository for 10,000 years or more, and then you say the impact is small. Somebody's lying. Somebody's lying, and it's not the children, and it's not the water, and it's not all the living things. I think it's the Nuclear Regulatory Commission, and I think it's the nuclear industry. (0328-6-3 [Foushee, Lea])

Comment: I think nobody is contending here that whatever pools or casks we design will last forever, we do think that the assumption that casks need to be repackaged every hundred years is conservative. (0329-10-4 [McCullum, Rod])

Comment: But one area I did want to focus on today, and it kind of picks up right where Rod McCullum from NEI just left off, was this notion of contents, I guess. Rod spoke about replacing the dry cask storage infrastructure once every hundred years, and he called that a conservative thing to do because I guess he thinks that the dry casks and supporting infrastructure are going to last longer than that in most likelihood. But I'd have to challenge that at its face. I mean, there have been problems with the dry cask storage at Surry, for example. There have been leaks of the inert gas through seals. Supposedly, it has not completely leaked out, which would introduce air and oxygen into the dry casks and, combined with the heat, could corrode the dry casks prematurely. So I think something that a commenter or a concerned citizen in Chicago at the Oak Park, Illinois hearing said was right on, which is a false confidence when it comes to technology is a technological arrogance. (0329-11-1 [Kamps, Kevin])

Comment: It's about the absurdity of assuming dry cask storage be maintained forever into the future with once-per-century replacement of the entire kit and caboodle. (0329-20-1 [Kamps, Kevin])

Comment: The Draft Generic Impact Statement has been challenged several times here. I don't see -- as an attorney who has read many EISs and litigated with others in the area of NEPA -- can't understand how you could possibly have a finding of no significant impact on the human environment. If nothing else, the pattern and history of leaks from existing aboveground storage, which supposedly had leak monitoring in compliance with NRC regulations, shows that one cannot say that there will not be significant releases of radioactivity to the human environment from aboveground storage. (0329-25-2 [Paddock, Brian])

Comment: And yet, the NRC in this GEIS has determined that the above and all other major risks attendant to high level nuclear waste should be entirely discounted, written out of the equation, because each is unlikely and the foresight and powers of the NRC are so remarkable, that it will be able to prevent the occurrence of any and all major problems. With knowledge of the future that is vast and precise, the NRC has determined that continued storage of nuclear waste in aging spent fuel pools for the next 100 years is nothing to worry about. And holding large amounts of nuclear waste at dozens, perhaps even hundreds of sites throughout the nation for 200 years is no problem either. Indeed, the NRC's omniscience is such that, rest

assured, having large amounts of high level nuclear waste on these sites is safe for millennia. (0341-1-18 [Mermelstein, Richard])

Comment: For 100 years, 200 years, tens of thousands of years: All environmental and human health impacts the NRC proclaims in the GEIS will be "SMALL." Impacts from major natural disasters, major earthquakes, raging wildfires, floods and massive storm surges, with all the possible consequences that could ensue, are also "SMALL." Impacts relating to accidents, the GEIS attests, will be "SMALL." Even impacts from terrorist attack directed at nuclear sites or materials in transport, the GEIS assures, will be "SMALL"! How, we wonder, did the NRC arrive at these patently preposterous conclusions? (0341-1-19 [Mermelstein, Richard])

Comment: The GEIS suffers at its very foundation from a flawed risk model. The GEIS states: "NRC's concept of risk combines the probability of an accident with the consequences of that accident. In other words, the NRC examines the following questions: * What can go wrong? * How likely is it? * What would be the consequences?" (GEIS, at xxx). "What can go wrong?" begs the answer: Fukushima and Chernobyl. And this illuminates the reality that embodied in any evaluation is a value system. The value system expressed in the GEIS clearly does not elevate human health, the protection of the environment, or the security of the nation above the goal of enabling the additional accumulation of high level nuclear waste.⁵[Footnote 5 text: A value system that focuses on public health, preserving the integrity of essential natural systems, averting climate change, making energy generation more democratic, and reducing homeland security risks and geopolitical conflict would, in contrast, promote expansion of efficiency technologies, advance transmission system modernization, and strive towards transition to energy systems which are renewable and sustainable. Energy policy encompasses a host of policy objectives.] It is exceptionally disingenuous for the risk formulation in the GEIS to be proffered as if some sort of objective mathematical equation drives the analysis. Each of the three bullet point questions posited involves human beings making judgment evaluations based on what they subjectively deem worthy of attention and consideration.⁶ [Footnote 6 text: The very quirky exception made in the GEIS findings of no impact being "LARGE" is the area of "Historic and Cultural Resources." Apparently the GEIS authors view the potential destruction of things like a historic graveyard to be more problematic than the despoliation of the lands of a Native American reservation or the pollution of a National Heritage river. In the GEIS, the impact of loss of historic buildings and cultural assets is admitted may be "LARGE" with the explanation that such loss is permanent. Yet the impacts of "Public and Occupational Health" (i.e., illness and loss of human life due to radiation exposure) is deemed "SMALL." One would think death to also be a rather permanent condition. The sole additional finding of other than small is the concession that nonradioactive waste might have impacts that are "MODERATE." This is rather bizarre, given the determination that all impacts relating to highly radiotoxic material are "SMALL."] Each involves a subjective decision as to what specific selection of sets of data to use and how to weight each component of available evidence. And, with respect to very long term holding of nuclear waste, each step involves - at best - an educated guess based on limited data. (0341-2-1 [Mermelstein, Richard])

Comment: Radiation is Not a Major Health Risk. This assumption is implicit. Reading the GEIS, if one did not know what spent fuel was, the reader would conclude the material was a minor pollutant presenting minimal health risk.¹² [footnote 12 text: It is worthy of note that none of the individuals in the GEIS Table 9-1 List of Preparers put forth as having public and occupational health expertise are medical doctors. It is also perplexing that the GEIS determines nonradiological waste to be more of a health concern than radiological waste. Moreover, as earlier noted, the GEIS concedes that the impacts of nuclear waste might be "LARGE" with respect to historic and cultural resources, because the effects could be

permanent, yet deems the impacts upon public and occupational health to be "SMALL." This is a rather bizarre given the fact that chronic illnesses and certainly loss of human life caused by radiation exposure would normally be seen as pretty permanent conditions.] (0341-2-12 [Mermelstein, Richard])

Comment: The following point mandates emphasis: Models are models, not reality. A model's equations are a limited and partial representation of a limitlessly complex series of systems. And when dealing with extraordinarily complex systems that interact with multiple other highly complex systems - as is the case here, where nuclear installations with massive numbers of constituent parts interact with complex, constantly changing, ambient environmental conditions, weather behaviors, geologic events, human actions (both benign and malevolent), and the behaviors and capabilities of other infrastructure - modeling is a particularly inadequate mechanism of prediction. The very best a model can do is pick out some relevant variables relating to the machine and its structures and tie them through different algorithms to dynamic equations relating to selected sets of models for other systems. Probabilistic risk modeling may be useful and acceptable for NRC institutional use in assessing the odds of certain specified outcomes for certain specific systems, components, or dangers. But it is an invalid and unacceptable model to use when, as here, a vast number of factors are unknown, and the potential outcomes are catastrophic. (0341-2-2 [Mermelstein, Richard])

Comment: The NRC cannot seriously contend, for example, that climate change would not exert a multiplier effect on the aging mechanisms applicable to spent fuel assemblies, spent fuel pools, or ISFSIs. Yet such analysis is absent. For a wide assortment of risks - flooding risk, dam failure risk, earthquake risk, site structure hazard risk, construction accident risk, landslide risk, hurricane risk, tornado risk, site fire risk, wildfire risk, malevolent insider risk, terrorism risk, human error, acts of nature, you name it - small risks can grow pretty exponentially when combined and when the time periods are long. Take just seismic risk. Accepting that the seismic risk is numerically (albeit not qualitatively) small for any given year to the current existing nuclear plant infrastructure, that does not mean risk will remain small as more spent fuel is created, more nuclear sites are built, and the decades and centuries pass. Not only does the GEIS not consider this, but IPSEC is aware of no existing seismic study which has conducted such analysis. Most astonishingly, given the nuclear events of recent years,⁷ [footnote 7 text: Fukushima at least had emergency generators designed to operate for 8 hours. The NRC has allowed Indian Point and many other plants in the U.S. to operate with generators designed for only 4 hours. Notably, just this year, a supervisor, the Chemical Manager, at Indian Point was indicted and pled guilty on charges of falsifying tests relating to emergency diesel operation.] there is no analysis which connects the potential consequences of a protracted station blackout (or SBO) to the risks presented by extreme weather, other infrastructure vulnerabilities, earthquakes, terrorism, sabotage, the aging transmission grid and just plain inept operation.⁸ [footnote 8 text: The large-scale, broad geographic region power outages in the U.S. include those from Superstorm Sandy and the nor'easter which struck 3 days later in 2012 and the East Coast-Canada blackout of 2003 (during which, incidentally, Indian Point's emergency communications systems and emergency diesel generators failed. See NRC, Special Inspection Report, 2003).] The entirety of problems which may impact spent fuel both during and after reactor license periods is particularly relevant to sites with multiple reactors where continuing reactor operation overlaps with the "short-term" storage period. Sites with more than one spent fuel pool also mandate scrutiny because of the multiplier effects which inevitably result should several pools be affected by one event. The methodology employed in the GEIS thus disregards the entire discipline of disaster science. More astoundingly, the GEIS also appears to have no institutional memory of nuclear accident and incident history. (0341-2-5 [Mermelstein, Richard])

Comment: Obviously the NRC is eager to justify an end to the Court-imposed moratorium on reactor licensing and renewal procedures. Yet it attempts to do so without addressing the actual issues or providing proposals to deal with potential scenarios that could result in a release of materials. The draft seeks to rely on claims of low potential for problems, a claim that is without scientific validity given recent events, and which avoids rather than addresses the potential impacts should a problem arise. (0402-1 [Gross, Cheryl])

Comment: As for dry cask storage, the NRC has proposed basically two scenarios to deal with the political impasse over the Yucca Mountain repository; and to inspire "confidence" that nuclear power plants will be able to continue to produce and dispose of their nuclear waste into the foreseeable future. These scenarios are: (1) continued on-site storage of spent fuel in cooling pools for the first 60 years after reactor shutdown, after which the fuel will be transferred to dry cask storage on-site, placed on concrete pads in the open air where they are effectively parked for the next 100 years or indefinitely with pad and cask replacement each additional 100 years; and (2) away-from-reactor dry cask storage at independent spent fuel storage facilities yet to be determined, on concrete pads in the open air, with the possibility of indefinite storage by replacing the pad and containers every 100 years. Facilities for dry transfer of fuel assemblies between casks would need to be constructed in both of the above scenarios. The away-from-reactor analysis in the case of scenario (2) smacks a bit of desperation as the NRC repeatedly uses another politically failed depository as an example of and "proof of concept" that an away-from-reactor consolidated independent fuel storage facility is both feasible and practical. The example used is that of a withdrawn license application by Private Fuel Storage, Ltd., to build a depository on the Goshute Indian reservation in Skull Valley, Utah. Basically, the proposal amounted to relocation of the politically failed national underground repository at Yucca Mountain to an above-ground, open-air, indefinite, storage facility, built to accommodate 40,000 metric tons of the nation's accumulated high level nuclear waste, just 35 miles from Salt Lake City. Not surprisingly this proposal met with considerable resistance. PFS, Ltd. wanted the Goshute land because it was not subject to state environmental regulations. They approached the tribal leaders and made them an "offer they couldn't refuse," namely, give every member of the tribe a million dollars and let them all move away from their reservation, en masse. Some members of the tribe declined the recommendation of their elders and because they refused to leave the reservation, the deal fell through. The Governor of Utah also weighed in on this controversy and threatened to block road and rail transport of high level waste across State transportation corridors into the depository. The proposal became a poster-child for environmental injustice, until it was eventually abandoned. (0410-20 [Nelson, Dennis])

Comment: You have assumed that cask pads, inner canisters, and the dry casks will be replaced once every 100 years, for hundreds of millennia. Since Spent Fuel Pools (SFP) will have been dismantled by, at most, 60 years after permanent reactor shutdown, you further assume that dry transfer systems will be built and replaced every 100 years. Will degradation of irradiated nuclear fuel prevent the proper execution of such transfer operations? No one knows and you don't care. (0419-10 [Agnew, David])

Comment: A continuing issue is the spent fuel will need new containers every century or two. Will the NRC determine the likelihood that time will treat these containers gently or what will be the likelihood and effects of failure of these containers? (0430-2 [Lewis, Marvin])

Comment: The key risk analysis makes almost no distinction between levels of risk involved in on-site and remote storage. Table E-4 applies the methodology used in E-3 to remote storage, using the same three timeframes and 24 environmental factors. The levels of environmental impact for spent fuel storage at remote (away-from-reactor) sites are shown as identical to on

site-storage, with one exception: Aesthetic impacts rate as "Small" for on-site storage and "Small to Moderate" for remote storage. In summary, the draft Generic EIS finds essentially no difference between on-site and remote storage from an environmental impact perspective, and rates impacts as "Small" in over 80 percent of the data points. (0431-12 [Pascall, Glenn] [Watland, George])

Comment: The findings of the GEIS appear to seriously understate (a) generic levels of risk in storing spent nuclear fuel on-site at decommissioned reactors; (b) specific risk factors arising from characteristics of specific sites; (c) risk differentials of long term or indefinite storage on-site rather than at a remote geologic repository; (d) added risks of on-site storage created by the use of high burn-up fuel. (0431-2 [Pascall, Glenn] [Watland, George])

Comment: The GEIS risk analysis of on-site storage is not credible regarding either the generic level of risk or site-specific factors affecting risk. Table ES-3 in NUREG 2157 summarizes the likely at-reactor impacts on 24 environmental factors during short-term, long-term, and indefinite storage of spent nuclear fuel. Applying the time scenarios (3) to the environmental factors (24) results in 72 assessment points. Five of every six impacts - 60 out of 72 - are rated as Small, including all impacts on land use, climate change, geology and soils, surface-water quality and use, groundwater quality and use, aquatic ecology, noise, waste management of low-level, mixed and non-radioactive waste, public health, accidents, and sabotage or terrorism. "Small to Moderate" impacts are projected for short-term air quality, short-term terrestrial resources, and traffic during short, long, and indefinite storage. "Small to Large" impacts are projected on historical and cultural resources; i.e. disruption at sites that have these values. "Large" impacts are projected in only one case - beneficial socioeconomic impacts. Such low levels of estimated impact do not square with widely held concerns of both the public and experts regarding indefinite on-site storage of waste. These concerns arise from the inherently higher risk levels related to accidents, terrorism or sabotage at sites that are neither isolated nor remote from urban areas or water. (0431-8 [Pascall, Glenn] [Watland, George])

Comment: The Waste Confidence Draft GEIS itself is overall a dishonest and inappropriate assessment of the environmental impacts of spent nuclear fuel. A broad brush generic assessment, even if done well, cannot deal with individual plant site specific issues. The time frames defined in alternatives of the DGEIS are totally unresponsive to the needs to protect the environment and human health. It is flawed in structuring the alternatives which avoid real solutions to the issues of the extreme hazards and consequences of spent nuclear fuel. Its purpose really seems to be (and was so stated by NRC in its public hearings) to grease and accelerate licensing and relicensing, and avoidance of site specific environmental analysis of SNF. This is subverting the purpose and utility of the NEPA process. Each of the more than 100 nuclear power facilities and ISFSIs is unique and this document cannot possible provide legitimate or accurate assessment of the site specific environments and impacts where these facilities occur. (0447-2-1 [Andrews, Richard])

Comment: However, Dry Cask Storage is not a long term or permanent solution by any means. The original licenses for the nation's reactors did not envision long term storage of nuclear waste on site as a responsible or necessary option. That said, the NRC is now asserting that storage indefinitely in dry casks will be safe & reliable for generations so long as the casks are replaced every 100 years by those who follow. This is another unreasonable assumption since human beings are notoriously fickle & irrational. (0454-6 [Waldstein, Joe])

Comment: Storing nuclear fuel waste on-site at closed nuclear power plants for decades or even longer, with no requirement to move the waste at any point to a less hazardous location is irresponsible and an accident waiting to happen. (0464-3 [Nelson, Pam])

Comment: The NRC's flawed environmental study is based on a number of unrealistic assumptions that must be reconsidered. The NRC assumes all the waste will be moved from the spent fuel pools into dry casks within 60 years of the reactors' permanent shutdown, despite the fact that NRC regulations allow plant owners to ask for an exemption from the 60 year cleanup requirement. Due to this unfounded assumption, NRC has inappropriately ignored the potential impacts of storing nuclear waste in unsafe pools, which are highly vulnerable to accidents and terrorist attacks, long-term. (0465-3 [Commenters, Multiple])

Comment: It is imperative for NRC to conduct a legally sound and complete environmental review as mandated by the U.S. Court of Appeals. This review must not generically waive off critical risks and impacts associated with the prospect of centuries of nuclear waste storage and individual reactor sites, and must fully consider site-specific concerns, as well as all feasible alternatives and mitigation measures, including not licensing/relicensing plants in order to avoid the production of any additional waste, and requiring the expedited removal of spent fuel from pools and into dry casks to reduce safety risks of pool storage. (0465-9 [Commenters, Multiple])

Comment: We conclude that the Draft GEIS fails to take a "hard look at environmental consequences" as would be expected of such a decision document. In particular, the document assumes away any site-specific differences in risks associated with continued storage of spent fuel and fails to provide sufficient basis for the conclusion that the environmental impacts are likely to be "small." (0473-1-1 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: It is our professional opinion that the Draft GEIS fails to adequately support its findings that the environmental impacts of continued storage of spent nuclear fuel at at-reactor and away-from-reactor sites until a repository is available are "small" across all timeframes, and that the environmental consequences do not differ across Alternatives. (0473-1-2 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: NRC Staff attempts to justify its decision not to perform this analysis by indicating that if a licensee made a request under § 50.82(d) to extend decommissioning, NRC Staff would conduct "any appropriate site-specific NEPA analysis" at that time. Presumably most, if not all, licensees will seek to employ § 50.82's decommissioning extension since there is currently no estimate of repository availability within the 60-year timeframe contemplated by these regulations, which would mean many site-specific spent fuel pool fire analyses would be done many decades from now.²⁰ [footnote 20 text: As the GEIS notes in footnote 3, "the Commission's regulations provide that renewed operating licenses may be subsequently renewed, although no licensee has yet submitted an application for such a subsequent renewal." This would mean that no spent fuel pool fire analysis would be done for another potentially 80 years for plants nearing the end of their license now but that obtain a second license renewal. The Court clearly did not authorize this approach.] Simply put: the Court did not permit the NRC to opt out of doing a long-term analysis of spent fuel pool risk because the probability of such an occurrence is not zero. That analysis needs to be done before plants are licensed or relicensed, thus generating spent fuel which may remain on- site beyond 60 years post-operating life if neither dry cask storage or a permanent repository is available. (0473-12-12 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The DGEIS does not establish that independent spent fuel storage installations are a viable possibility at every reactor site such that generic review is appropriate. Additionally, the DGEIS explicitly assumes that each reactor will have an at-reactor ISFSI or DTS by the end of a reactor's life, in doing so assuming that every nuclear power plant has the capability of accommodating an ISFSI or DTS if they don't already have one. DGEIS at 4-5. The DGEIS does not establish that this is true at each plant site, to support a generic finding. The States submit that in order to rest a generic finding on the assumption that ISFSIs and DTS facilities will be constructed at every facility, the NRC must examine every facility and make an affirmative finding that indeed each and every power plant site can accommodate these new facilities. The DGEIS offers only a sample of the total site area vs. land area developed for ISFSIs for seven locations around the country (Table 3-1, DGEIS at 3-4), and does not include a site-by-site list of facilities that were assessed for ISFSI viability. This does not support a generic finding for all locations around the country. (0473-12-20 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The D.C. Circuit in its decision concluded that the NRC was required to examine the consequences of pool fires unless their probability was zero. 681 F.3d at 482. Yet in response to this directive, in the DGEIS the NRC again opted not to offer any analysis of the consequences of spent fuel pool fires and leaks after the short-term time frame, citing without basis the NRC's belief that all waste will be moved from pools to dry cask by the end of 60 years after licensed life. This position is clearly inconsistent with the Court's order. The Court gave the NRC one option only for concluding that no analysis of consequences was necessary: "Only if the harm in question is so 'remote and speculative' as to reduce the effective probability of its occurrence to zero may the agency dispense with the consequences portion of the analysis." 681 F.3d at 482 (emphasis added). (0473-12-7 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: An agency's use of a model is arbitrary if that model "bears no rational relationship to the reality it purports to represent." *American Iron & Steel Inst. v. EPA*, 115 F.3d 979, 1005 (D.C. Cir. 1997) (quotation marks and citations omitted). Models need not fit every application perfectly, nor need an agency "justify the model on an ad hoc basis for every chemical to which the model is applied." *Chemical Mfrs. Ass'n v. EPA*, 28 F.3d 1259, 1265 (D.C. Cir. 1994). If, however, "the model is challenged, the agency must provide a full analytical defense." *Eagle-Picher Indus., Inc. v. EPA*, 759 F.2d 905, 921 (D.C. Cir. 1985); see also *Natural Resources Defense Council, Inc. v. Herrington*, 768 F.2d 1355, 1385 (D.C. Cir. 1985). Furthermore, an agency "retains a duty to examine key assumptions as part of its affirmative burden of promulgating and explaining a non-arbitrary, non-capricious rule." *Small Refiner Lead Phase-Down Task Force v. EPA*, 705 F.2d 506, 534 (D.C. Cir. 1983). Here, the NRC knows that "key assumptions" underlying Sample Problem A/NUREG-1150 MACCS2 code inputs are wrong and yet has offered no defense of its continued reliance on those inputs. C.f., *Columbia Falls Aluminum Co. v. EPA*, 139 F.3d 914, 923 (D.C. Cir. 1998). By failing to account for the differences between spent fuel pool sites and the effects of those differences on the impacts of an accident, the DGEIS fails to perform a conservative bounding analysis. NRC Staff has failed to ensure that the DGEIS contains accurate information. See *Native Ecosystems Council v. U.S. Forest Serv.*, 418 F.3d 953, 964-65 (9th Cir. 2005) (NEPA requires that agencies rely on high quality data and accurate scientific analysis); 40 C.F.R. § 1500.1(b) (same), § 502.24 ("Agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements"); Entergy Nuclear Operations, Inc. (Indian Point, Units 2 and 3), LBP-11-17, at 11-12 (citing *ShieldAlloy Metallurgical Corp. v. NRC*, 624 F.3d 489, 492-93 (D.C. Cir. 2010)) ("NRC would be acting arbitrarily and capriciously if it did not look at relevant data and sufficiently explain a rational nexus between the facts found in its

review and the choice it makes as a result of that review."); see *Nw. Ecosystem Alliance v. Rey*, 380 F. Supp. 2d 1175, 1196 (W.D. Wash. 2005) (the fact that older data had been used for a previous NEPA analysis is not a justification for its continued use where more recent data dictated a different result) (citing *Friends of the Clearwater v. Dombek*, 222 F.3d 552, 557 (9th Cir. 2000) ("The agency must be alert to new information that may alter the results of its original environmental analysis")). Administrative convenience or tradition do not justify use of obsolete or inapplicable information. The ISR Report also addressed site-specific characteristics for the configuration of spent fuel pool and seismicity. These are also crucial to a conservative bounding analysis and should also be corrected. (0473-13-10 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: In leaving the decision of whether to perform a site-specific or generic analysis to NRC, the D.C. Circuit conditioned the Commission's discretion to utilize generic analysis on the "Commission's use of conservative bounding assumptions and the opportunity for concerned parties to raise site-specific differences at the time of a specific site's licensing." *New York v. NRC*, 681 F.3d 471, 480 (D.C. Cir. 2012). The NRC has not employed a conservative bounding analysis for spent fuel pool fires, and the NRC has not provided a meaningful opportunity for concerned parties to raise site-specific differences at the time of a specific site's licensing (see discussion of waiver below). (0473-13-5 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Although the DGEIS acknowledges in passing that "the economic impacts would vary for different facilities," and notes that "[f]or example, higher total population or population density could result in higher relocation costs, and land use (e.g., whether land is used as farmland or not) could also impact decontamination and condemnation costs" (DGEIS at F-7), there is absolutely no acknowledgement of the disparity in impacts at Indian Point and other plants as compared to the sites used by NRC in the documents it relies upon--chiefly Surry, which is surrounded by farmland in rural Virginia, and Peach Bottom, via the Spent Fuel Consequence Study, which is surrounded by a much lower population density. (0473-13-6 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The D.C. Circuit found that a comprehensive general analysis of risks is sufficient, particularly "given the Commission's use of conservative bounding assumptions." *New York*, 681 F.3d at 480. However, NRC fails to employ conservative bounding assumptions in examining the impacts of spent fuel pool leaks. For example, its conclusion that groundwater impacts will be small rests on its finding that "the hydrologic characteristics associated with typical nuclear power plant settings . . . will act to impede the offsite migration of future spent fuel pool leakage." DGEIS at 4-26. Relying on the characteristics of typical nuclear plants does not result in a conservative estimation of the impacts of leaks. Such an analysis gives no sense of the groundwater impacts at a plant lacking typical hydrologic characteristics such as proximity to a large water body, shallow water table flow toward that water body, flat hydraulic gradients in the shallow water tables, large distance to local groundwater users, and the likelihood that local groundwater usage is in deeper confined aquifers. *Id.* While NRC states that leaks at sites with different hydrological conditions could have the potential to affect nearby groundwater users (DGEIS at E-14), it simply concludes that in the unlikely event that contamination exceeded Maximum Contaminant Level for a groundwater source, "the EPA could take emergency action under the Safe Drinking Water Act (EPA 1991)." DGEIS at E-16. The DGEIS does not state which plants lack the "typical hydrologic characteristics," what combination of hydrologic characteristics could lead to groundwater contamination, or what the expected groundwater impacts could be (aside from exceeding drinking water standards). NRC does not even explain what emergency actions might be taken by EPA. Such actions might include preventing the

affected population from using their only source of potable water or preventing farmers from using their only source of irrigation. NRC must conduct a conservative bounding analysis that takes a detailed look at the impacts at plants lacking "typical hydrologic characteristics," such as plants where there are nearby groundwater users of shallow groundwater aquifers. (0473-15-4 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Similarly, NRC's examination of surface water impacts lacks conservative bounding assumptions. While NRC acknowledges that a leak could result in "indirect effects on surface-water quality" due to groundwater contamination, it concludes that the effects would be small because the contaminated groundwater would be diluted by the large volume of surface water. DGEIS at E-17. Contrary to NRC's approach, impacts to surface waters should be bounded by sites that are different in character. For example, the impact on a river that is designated for the best uses of surface water will be different than the impact on an ocean that does not have that designation. In addition, plants like Vermont Yankee, which is near a downstream dam where contaminated sediment can accumulate, are different than plants that are discharging to free-flowing rivers. NRC also states that even if a pool leaked into surface waters continuously, the quantities of radioactive material would be comparable to values associated with permitted, treated effluent discharges from plants. However, NRC fails to examine the combined impact of a leak and effluent discharges on sensitive surface waters, including whether state or federal water quality standards could be violated. (0473-15-5 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Nor did NRC employ conservative bounding assumptions to determine the impacts of leaks on soils. Such an analysis would look at the impacts at sites that are in agricultural areas such as Fort Calhoun in Nebraska or Duane Arnold in Iowa. At a minimum, NRC must include such conservative bounding assumptions if it is to conduct a generic analysis of the risks of spent fuel pool leaks. That being said, the findings of the DGEIS indicate that generic analysis is not appropriate for spent fuel pool leaks. (0473-15-6 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The DGEIS often uses vague language that does not adequately describe impacts; for example, it says various occupational activities "may have effects on upland vegetative communities and habitats" (DGEIS at 3-21, emphasis added). The DGEIS claims, with no basis, that the effects of indefinite storage would be the same as the effects of long term storage. The DGEIS frequently refers to the "License Renewal GEIS" determinations, without adequately explaining how the License Renewal GEIS reached that determination or incorporating the License Renewal GEIS's conclusions into this document. The State submits that a reader residing in one of the dozens of nuclear waste storage communities around the country trying to understand the impacts of nuclear waste storage near their home deserves to have all of the relevant information in one place. (0473-16-2 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Failure to address current and future safety conditions: The WCGEIS fails to address current and future safety conditions. The Affected Environment section does not adequately address worker or public dosages, emissions, scrams, or safety violations in terms of either nuclear power plants or the spent-fuel basins. Moreover, no consideration has been given to safety issues such as number or trends in SCRAMS or safety violations and how this may affect future safety operations. The WCGEIS needs to be revised to address the risks and impacts posed by such events in terms of a national fleet of operating reactors and spent-fuel basins. (0496-11 [Batobato, Alicia])

Comment: The "Current Technology" Assumption (1): Storage and Subsequent Transportation: The GEIS states that its analyses are based on "current technology and regulations". Our understanding is that current technology has (in combination with substantial strengths) substantial limitations: e.g. How well are we able to monitor the condition of SNF in pool storage? How well are we able (based on such monitoring) to anticipate hazards such as spent fuel fires or pool leaks? How well does the inspection of spent fuel assemblies when removed from pools provide the basis for long-term storage in sealed canisters? How well can we monitor the condition of spent fuel stored long-term in sealed canisters? Is it realistic to expect utilities to repackage spent fuel if there is a probability (but no assurance) that the current packaging may be safe for extended storage and subsequent transportation? What is the assurance that spent fuel that is safely stored in canisters will also be safe in transport, with its increased temperature (due to the sealed transportation cask) and substantially increased physical stress? We are doubtful that current technology and knowledge regarding the above questions support a conclusion that SNF is assuredly safe in continued storage and (except in the indefinite storage case) subsequent transportation. (0505-6 [Williams, Jim])

Comment: The "Current Technology" Assumption (2): Replacement of Canisters and Casks: The GEIS assumes that, as long as SNF remains on site, all canisters and casks would be replaced every 100 years. The GEIS further assumes that, after all SNF is removed from a pool and the pool is shut down, a dry transfer system would be built at the site, and maintained, and replaced every 100 years, until all SNF is removed. We question this assumption on both institutional and technological grounds. On institutional grounds, utilities may be reluctant to replace all canisters and casks, given the cost and hazard of replacement, as well as the perhaps ambiguous information regarding the need. Continued storage requires assurance that utilities at up to 75 sites can be persuaded to build such facilities. On technical grounds, we question whether site-built hot cells can reliably be used to cut open and repackage large sealed canisters (something that utilities are very reluctant to do in currently operating spent fuel pools), and then do it again 100 years hence, when the facility may be degraded. We also question whether mobile hot cells (current technology) could do the job that the GEIS continued storage assumption presumes. (0505-7 [Williams, Jim])

Comment: The draft GEIS does not do a full analysis of the potential environmental effects of storing spent fuel onsite at nuclear plants, as ordered by the court. (0531-1-3 [Morgan, Sally])

Comment: Adequate proof of no significant environmental impact for long term or indefinite storage of nuclear waste at facilities without a national repository is impossible. The nuclear industry is subject to the same human errors and unpredictable disasters as any other industry, but with hazardous waste that will continue to be a problem for hundreds of thousands of years, there is simply no way to assure a "low" environmental impact. (0531-1-5 [Morgan, Sally])

Comment: The draft GEIS does not do a full analysis of the potential environmental effects of storing spent fuel onsite at nuclear plants, as ordered by the court. (0531-2-3 [Morgan, Sally])

Comment: Adequate proof of no significant environmental impact for long term or indefinite storage of nuclear waste at facilities without a national repository is impossible. The nuclear industry is subject to the same human errors and unpredictable disasters as any other industry, but with hazardous waste that will continue to be a problem for hundreds of thousands of years, there is simply no way to assure a "low" environmental impact. (0531-2-5 [Morgan, Sally])

Comment: The statement by the GEIS Draft that long term - or indefinite - storage has little environmental impact completely disregards the extreme hazards of radioactive wastes and the complete lack of experience of storing these toxins. (0541-2 [Justesen, Evelyn])

Comment: Section 1.8, Analytical Approach, should discuss a scenario of completing the Yucca Mountain repository, as required by Federal law. That scenario would have the least cumulative environmental impacts when compared to the scenarios analyzed in the Draft GEIS. It may be unnecessary to repeat the analysis in the Yucca Mountain EIS, but reference should be made to the Yucca Mountain EIS results. Otherwise, this GEIS would evaluate one scenario that is not allowed by Federal law while ignoring the only scenario that is required by Federal law. Furthermore, in the scenarios analyzed in the Draft GEIS, comparison should be made in the impact assessment sections to show the difference in cumulative impacts between a Yucca Mountain scenario and the other scenarios analyzed. In particular, the comparative analysis should recognize that without Yucca Mountain, or some other repository in the near term, multiple transportation campaigns will be required. It should also be recognized that without Yucca Mountain, all spent fuel will have to be repackaged after it is in dry storage for ultimate repository disposal. In the Yucca Mountain scenario, a significant portion of the spent fuel will be loaded by the utilities in transportation, aging, and disposal canisters and disposed directly without repackaging. It is unlikely (and absolutely unknown) what type of packaging would be required for any alternative repository option, should one ever be developed. The ability to dispose large waste packages may be unique to Yucca Mountain. With the recent writ of mandamus ordering NRC to restart the Yucca Mountain licensing process, it is unclear how NRC can continue to flout Federal law and ignore the Yucca Mountain alternative in any proper NEPA analysis. (0544-12 [Enriquez, Elizabeth])

Comment: The NRC addresses the issue of spent fuel for only 160 years---not its full range of the radioactive time period. The NRC considers 3 alternatives: Indefinite storage at reactor sites, regional consolidated storage sites, central repository. In doing so, the NRC expresses confidence that spent fuel will be managed adequately and safely, with no basis for such assertions or conclusions. (0552-1-6 [Macks, Vic])

Comment: So, how many elements of comparability satisfy a generic assessment? In conclusion, it is my opinion that this DGEIS is premature and establishes an impact rating system solely related to magnitude of very poorly described potential environmental impacts. It is, in the general absence or severe shortage of relevant evidence, model-driven by use of "Reference guides." None of the critical storage items-cask performance in many different environments and tested over a very short time period (14 years, one casket), the potential for catastrophic impacts on storage facilities, which can have far greater environmental consequences than any considered in the GEIS, and the human impact factor that has great potential for environmental harm, but which doesn't fit the format for this GEIS. (0553-16 [Wilshire, Howard])

Comment: The evidence base is so deficient that the indefinite time frame considerations are not credible. I would give pigs a better chance of flying than protocols followed indefinitely would protect the environment. (0553-17 [Wilshire, Howard])

Comment: Since this statement indicates unspecified assessments of unspecified environmental impacts on unspecified resource areas, it is both uninformative and says nothing about how it fits into a generic impact statement. (0553-6 [Wilshire, Howard])

Comment: The draft rests on unsupported assumptions that support its "small impact" finding but it has no basis in reality. (0556-1-11 [Lampert, Mary])

Comment: NRC's DGEIS claims, absent support, that no serious impacts will occur from leaving the spent fuel onsite indefinitely. What NRC simply substituted is its offsite repository fantasy for another fantasy - waste could remain safely onsite in above ground storage indefinitely. This assumption defies commonsense and conflicts with the Nuclear Waste Policy Act (NWPA). (0556-1-3 [Lampert, Mary])

Comment: DOE's *Inventory and Description of Commercial Fuels in the US*, March 31, 2011 ¹² [footnote 12 text: <http://sti.srs.gov/fulltext/SRNL-STI-2011-00228.pdf>] shows how reactors vary. DOE looks at: fuel types; fuel cladding: some better than others (primarily there are 4 cladding alloy types: Zirconium 2, improved Zirc 4, M5, Zirlo, optimized Zirlo [DOE, p. 6, Table 5]). Wet storage, varies by density and geometry; dry storage, varies by location and vendor; license termination dates vary; ranges of burnup vary (DOE, pg., 25, Table 7). Therefore the potential environmental impacts will vary from reactor to reactor. For example: Individual reactors are making increasing use of high burnup fuel. Each reactor varies. High burnup fuel has more tritium, which is notoriously hard to clean up if it contaminates groundwater. The time spent fuel is stored in pools and dry casks varies from one reactor to the next. Therefore NRC's generic assumption about the time the fuel can be stored in the pool and dry casks before it must be moved makes no sense. (0556-1-36 [Lampert, Mary])

Comment: In addition to failing to treat environmental impacts on a site specific basis, the DGIS relied upon false and unsupported assumptions. If you take away the unsupported assumptions, NRC's findings fall apart. (0556-2-1 [Lampert, Mary])

Comment: The unsupported assumptions include: The analyses in the draft GEIS are based on current technology and regulations. (0556-2-3 [Lampert, Mary])

Comment: Analyses in the draft GEIS are based on current technology and management practices. The assumption is wrong on its face. Much of the technology on which it relies does not currently exist; and no one should be foolish enough to assume that management practices principally focused on generating electricity will remain unchanged when current management no longer exists and all that remains is long-term storage of spent nuclear fuel. Whatever minor experience industry might now have is too short to project over the hundreds of years that the DGEIS is projecting. (0556-2-6 [Lampert, Mary])

Comment: Cask storage is far safer than pool storage but not without its pitfalls. PW disagrees with NRC's unqualified finding that spent fuel can be stored safely in dry casks placed on pads both over the short term, 60 years after the license to operate ends and for the interim period (100-300 years) and for the extended period (300 yrs and beyond) by simply changing the casks and pad every 100 years. Instead, PW supports the alternative of requiring specific safety requirements for dry cask storage. For example: • Casks must be required to be located over the short, long, and indefinite periods at higher elevations to avoid flooding, especially along coasts, because of climate change and sea level rise. Placing casks at higher elevations is especially important in marine locations where chloride has the potential of inducing stress corrosion cracking of austenitic stainless steel³⁸ [footnote 38 text: IN 2012-20 Potential Chloride Induced Stress Corrosion Cracking of Austenitic Stainless Steel and Maintenance of Dry Cask storage System Canisters. (ML 1231a440)] and corrosion of concrete, impacting both cask over-packs and pads. • Casks need to be outfitted with monitors for both temperature and radiation, although not required now. • Casks need to be protected from the elements by

placement in buildings, especially in areas with snow and ice storms and a building would limit line of sight attacks, • Offsite emergency planning must be required with compensation for offsite radiological emergency planning expenses while waste is onsite. • There simply is no way to project on a generic basis that casks and pads will last 100 years. There is no history to base it upon. (0556-5-7 [Lampert, Mary])

Comment: NRC assumes that casks (both the inner canister and outer over-pack) and cask pads only need to be replaced every 100 years. This is contradicted by NRC's own statement that, "Dry casks are licensed or certified for 20 years, with possible renewals of up to 40 years. This shorter licensing term means the casks are reviewed and inspected, and the NRC ensures the licensee has an adequate aging management program to maintain the facility³⁹." [footnote 39 text: <http://www.nrc.gov/waste/spent-fuel-storage/faqs.html>] NRC provides no proof that casks can go an additional 60 years before replacement. NRC assumes that there will be Dry Transfer Systems to perform the "change of clothes" since pools will be dismantled during decommissioning 60 years after reactor shutdown. But there is no showing that assemblies will not degrade making transfer unsafe. This is especially true with high-burnup fuel that has spent more time in the reactor core and is more radioactive and thermally hotter. NRC has not provided the cost for the transfer operation nor indicated who will pay. (0556-5-8 [Lampert, Mary])

Comment: Next, if future stakeholders may be precluded from raising site specific issues, it is essential that the Draft GEIS relies on sufficient data and analysis to support its conclusions. However, NRC staff indiscriminately adopts many of the findings from the Final Environmental Impact Statement for the Construction and Operation of an Independent Spent Fuel Storage Installation on the Reservation of the Skull Valley Band of Goshute Indians and the Related Transportation Facility in Tooele County, Utah, NUREG-1714, December 2001 ("PFS FEIS").¹⁰ [footnote 10 text: Utah participated in the NRC licensing proceedings for the PFS facility and is intimately familiar with the PFS proposal] In general, notwithstanding whether Utah agrees with the analysis and conclusion included in the PFS FEIS, barring an adequate explanation of its basis, it is wholly inappropriate to incorporate the site specific details of the PFS FEIS into a generic EIS. Moreover, an earlier version of the waste confidence rule prevented the consideration of any environmental impacts for continued storage beyond the storage licensing period in the PFS FEIS. Now, after the U.S. Court of Appeals, District of Columbia, vacated the waste confidence rule, staff rely, in part, on findings in the PFS FEIS when it did not consider the impacts of continued storage. Without an adequate explanation for the basis of incorporating portions of the PFS FEIS findings into the final GEIS, it is circular logic to rely on an analysis that did not consider the impacts of continued storage when the stated purpose of the Draft GEIS is to "address[] the environmental impacts of continuing to store spent fuel ... at an away-from-reactor storage facility, after the end of a reactor's licensed life for operation until final disposition in a geologic repository ("continued storage").¹¹ [footnote 11 text: Draft GEIS at 1-1] (0579-5 [Smith, Amanda])

Comment: Staff recognize that environmental impacts of constructing and operating an away-from-reactor ISFSI would be evaluated in more detail during a site-specific licensing proceeding. The final GEIS should clarify what potential impacts will not be considered in a site-specific evaluation. (0579-8 [Smith, Amanda])

Comment: Further, the NRC has failed to sufficiently demonstrate (a) that a generic environmental assessment "provides for the same level of environmental protection as the other [Rulemaking] alternatives" (DGEIS, Executive Summary, p. xxvi, lines 10 - 11) and (b) that the quality of a generic environmental assessment inherently meets or exceeds the quality, detail and comprehensiveness of a gold-standard professional site-specific investigation and report. In

fact, the NRC implicitly acknowledges that the primary benefits of a generic regulatory framework accrue predominantly to the private and corporate stakeholders. "The NRC's preliminary conclusion is to revise 10 CFR 51.23 because of the efficiencies that would be gained in reactor and spent fuel storage facility licensing reviews. Revising the Waste Confidence rule minimizes expenditures on site-specific reviews, [and it] limits the potential for lengthy project delays . . ." (DGEIS, Executive Summary, p. xxvi, lines 7 - 10). Indeed, according to the NRC's statements published in the Federal Register (78 FR 56803 - 56804, SUPPLEMENTARY INFORMATION: Section XII -- Regulatory Analysis), the "DGEIS [Chapter 7] contains an estimate that it could cost over \$24 million to address continued storage in site-specific proceedings[.]" and "[l]icensees and license applicants ultimately shoulder the majority of costs incurred { . . . }." The same paragraph in Section XII also notes that a "draft regulatory analysis has not been prepared for this proposed regulation because this regulation does not establish any requirements that would place a burden on licensees." Well, \$24 million is certainly not "small money;" but, it is merely a "rounding error" in relative terms compared to the \$15+ BILLION price-tag on a new reactor facility such as the currently proposed Fermi 3 reactor in Michigan. In other words, the NRC's position is "penny wise and pound foolish," as the saying goes. (0603-10 [Schonberger, David])

Comment: Perhaps the most insidious, alarming and disturbing aspect of the NRC's proposed Waste Confidence Rule is the inherent GENERIC design and application of the Rule, which is based on a fundamentally misguided GENERIC approach to the supporting Environmental Impact Statement. While it is indeed true that the labels "spent nuclear fuel" and "high-level radioactive waste" are relatively generic and simplistic terms, the practical, technical and logistically-unprecedented challenge of properly and responsibly managing such material, which remains distributed across numerous facilities throughout the continent, necessitates a structural and regulatory approach that is SITE-SPECIFIC and not generic in nature. The NRC is evaluating Waste Confidence on a generic basis because the "NRC considers the continued storage of spent fuel a generic activity that is similar for all commercial nuclear power plants and storage facilities. Therefore, a generic analysis is an appropriate, effective, and efficient method of evaluating the environmental impacts of continued storage." (DGEIS, Executive Summary, p. xxiv). I certainly agree that the generic approach is an efficient regulatory concept; however, I disagree that the generic approach is appropriate and effective. As a matter of fact, the State of Michigan has recently proposed revising criteria and requirements for remediation and redevelopment of contaminated facilities (so-called "brownfields") in order to accommodate a GENERIC paradigm. The new regulations are expected and actually intended to be a game-changer for the corporate stakeholders, as new efficiencies and "less burdensome" rules are introduced into the system. (Regulatory Impact Statement and Cost-Benefit Analysis, "Cleanup Criteria Administrative Rules for Part 2 of NREPA," ORR Rule 2013-056 EQ, State of Michigan Department of Environmental Quality, Remediation and Redevelopment Division, 10/10/13). Fundamentally, the NRC has failed to sufficiently demonstrate that the technical process of continued storage of spent nuclear fuel is a generic task rather than a case-by-case challenge which presents unique circumstances requiring site-specific evaluations and analyses in order to properly, appropriately and effectively mitigate risk. (0603-9 [Schonberger, David])

Comment: [The NRC must] re-examine the unrealistic assumptions it makes in the GEIS[.] (0604-12 [Pisha, Gayla])

Comment: The NRC assumes all the waste will be moved from the spent fuel pools into dry casks within 60 years of the reactors' permanent shutdown, despite the fact that NRC regulations allow plant owners to ask for an exemption from the 60 year cleanup requirement. As a result, the NRC has not adequately considered the potential impacts of storing nuclear

waste in unsafe pools for the long-term, a concern because these are more vulnerable to accidents and terrorist attacks. (0604-7 [Pisha, Gayla])

Comment: Furthermore, the NRC should consider the possibility that spent fuel will still be stored on-site more than 60 years after the licensed life of a power plant. There are potentially serious environmental consequences if fuel remains on-site indefinitely. By not addressing this contingency, the DEGIS fails to provide adequate assurances to us or our communities. Currently, no alternative plan exists to storing spent fuel on-site at Pilgrim, and there will not be one for the foreseeable future. People who live in the shadow of Pilgrim deserve information about the environmental impacts of indefinite on-site storage. Moreover, this information will be invaluable during ongoing NRC relicensing decisions. Finally, information about the potential impacts of indefinite on-site storage may spur policymakers to finally develop a suitable off-site storage facility. Every day that passes without a long term strategy to more safely store nuclear waste heightens the exposure for our communities to the destructive forces of a nuclear disaster. (0607-6 [Messinger, Michael])

Comment: Before it can be assumed that spent fuel canisters and casks, ISFSI and DTS facilities will be replaced every 100 years, the ability to actually perform replacement functions must be demonstrated. This means, first, at a minimum, that the Draft GEIS must contain or rely upon a probability assessment regarding the number of waste fuel assemblies that experience each identifiable degradation mode, and the confidence boundaries surrounding that assessment. Second, this means that the protocol for safely managing the identified volume of degraded fuel assemblies must be specified for each identifiable degradation mode. This includes the protocol for safely managing criticality events inside casks during storage periods. The protocols must be detailed and specific enough to give reasonable confidence that if followed, degraded fuel assemblies will not result in unacceptable levels of adverse environmental impact. Third, this means that the additional costs of managing the degraded fractions identified in the probability assessment be quantified, included in the cost of maintaining institutional control as specified earlier in this comment, and accounted for in terms of where the required money will come from. (0608-15 [Crocker, George])

Comment: The Draft GEIS states, in category after environmental impact category, in virtually every instance in each of the timeline scenarios, that the impact will be "small." Such a repeated finding of "small" regardless of the length of storage does not pass the smell test. (0608-16 [Crocker, George])

Comment: NAWO is concerned that there apparently has been no analysis that demonstrates that an available land-base exists, at every reactor site, that is capable of hosting an ISFSI large enough to hold the number of dry storage casks needed to contain the posited 80-years worth of irradiated fuel produced by each reactor. (0608-19 [Crocker, George])

Comment: The Summary of Environmental Impacts provided by Chapter 8 of the Draft Waste Confidence Generic Environmental Impact Statement, which in turn provides the regulatory basis for the NRC's proposed amendment to 10 CFR 51.23, would, NRC Staff asserts, re-establish Waste Confidence regarding the safety and environmental impacts of storing spent nuclear fuel beyond the licensed life for operations of nuclear power plants. Because of numerous untenable assumptions that guide and are essential to the NRC's analysis, and that are specified below, nothing could be further from the truth. (0608-5 [Crocker, George])

Comment: --[The NRC has failed to fully examine] the environmental consequences and costs that may occur if a repository cannot be sited or cannot effectively contain radioactivity; (0611-12 [Shapiro, Susan])

Comment: The findings in the GEIS that basically all environmental impacts with every few exceptions are small is wholly unfounded, not scientifically supported and are self serving, arbitrary, and conclusory. (0611-30 [Shapiro, Susan])

Comment: NRC has failed to do the "full analysis" required by the Court. Instead of examining what would happen if spent fuel remained unprotected on the earth's surface indefinitely, the NRC assumed that spent fuel would be safely managed in surface storage for an indefinite period. But the Court required NRC to examine the risks of spent fuel storage, and did not allow NRC to merely assume that storage would be safe. The GEIS fails provide a scientific and "full analysis" of the potential environmental effects of permanently storing spent fuel on-site, and therefore does not satisfy the Court's order. Instead the NRC has based the EIS on the unproven and unscientific assumption that spent fuel can be stored safely forever without evidence or proof. (0611-9 [Shapiro, Susan])

Comment: No wonder NEI is attempting to convince the NRC to interpret the WCD as being so restricted in scope such that the sheer lunacy of producing more nuclear waste in the first place is ignored! NEI claims that "site-specific and generic" Environmental Impact Statements (EISs) cover all permutations of this basic question: Is what we're doing logical? However, they do not: Invariably, ALL other NRC and DOE EISs assume that the waste problem can be solved, thus relegating the dangers of continued operation, continued production of nuclear waste, and continued mining of uranium to matters which can be assessed through Probabilistic Risk Assessments (PRAs). (0616-6 [Hoffman, Ace])

Comment: The Tribe remains concerned that the environmental impacts long-term and indefinite storage have not been adequately evaluated in this draft GEIS. (0619-2-9 [Mahowald, Philip R.])

Comment: The wealth of truly independent scientific literature indisputably sets forth the harm from radiation and the mass contamination that it has inflicted, and will continue to inflict, on mankind and on our environment. Such evidence is ignored by this and other environmental impact statements and analyses issued by the NRC which I have read. The labeling of "low" and "small" impacts are seen time after time when various assumptions of risk are muddled through proposed mitigation measures and "cost-benefit" analyses used to "balance" the real impacts with industry goals. That a license is granted for the construction and operation of a nuclear reactor to generate electrical power without examining the full environmental impacts and all costs which will be needed beyond the reactor's "end of life" and the "life" of its waste which will last for hundreds of thousands of years is a mockery of this and the entire EIS process. (0620-9 [Rivera, Evelyn])

Comment: Instead of assuming that spent fuel can be stored safely forever at or away from reactor sites, the NRC should examine the likelihood that a federal repository will be successfully sited, and then assess the health and environmental consequences that may occur if a repository is not sited or if accidents occur related to the repository. (0622-1-12 [Vale, Karen])

Comment: In addition, the DGEIS should discuss under what conditions on-site storage is not appropriate, and therefore when off-site storage is preferable to insure safer, long term/indefinite storage of this hazardous waste. (0622-1-13 [Vale, Karen])

Comment: APV opposes the NRC plan, as outlined in this GEIS, to use the Private Fuel Storage (PFS), LLC "centralized interim storage" proposal, targeted at the Skull Valley Goshutes Band of Indians in Utah, as a model for away-from-reactor storage. (0648-8 [Price, Scott])

Comment: The NRC assumes a 100-year replacement cycle for the ISFSI facility, spent fuel canisters and casks, and dry transfer system⁴. [footnote 4 text: Dry Transfer System (DTS): would allow for the retrieval of spent fuel for inspection or repackaging without the need to return the spent fuel to the spent fuel pool. A DTS would be built on site in the long-term storage timeframe.] The NRC provides no background data or material analysis in support of a 100 year replacement cycle. In fact, the NRC refutes its own assumption: "this assumption does not mean that dry cask storage systems and facilities need to be replaced every 100 years to maintain safe storage."⁵ [footnote 5 text: Waste Confidence Generic Environmental Impact Statement Draft Report for Comment. (as n.3 above).] It is clear that the exact lifetime of the spent fuel storage systems is unknown. Furthermore, it should be noted that a Dry Transfer System as envisioned in the draft GEIS has not yet been constructed in this country. (0681-1 [Peterson, Alyse])

Comment: The NRC also assumes that all spent fuel will be removed from fuel pools on site and placed in dry cask storage no later than 60 years after the end of the reactor's licensed life for operation. The assumption that plant owners will do this voluntarily is unrealistic. To begin with, NRC's regulations do not require spent nuclear fuel to be removed from the pools or the site. 10 C.F.R. § 50.82(a)(3) (decommissioning and removal of fuel may be delayed beyond 60 years given "unavailability of waste disposal capacity"). (0681-3 [Peterson, Alyse])

Comment: It is highly improbable that the owner of record will voluntarily spend the money and manpower necessary to move all spent fuel from an on-site spent fuel pool to dry cask storage or increase the current rate of transfer of spent fuel between pool and cask. First, nuclear plants do not generate profits during decommissioning and, similarly, the storage of spent nuclear waste at a nuclear plant is not ordinarily thought of as a profit making activity. Secondly, the current NRC stance is that spent fuel pool and dry cask storage are equally safe and secure: "The NRC believes spent fuel pools and dry casks both provide adequate protection of the public health and safety and the environment. Therefore [according to NRC] there is no pressing safety or security reason to mandate earlier transfer of fuel from pool to cask."⁶ [footnote 6 text: "Spent Fuel Storage is Pools and Dry Casks Key Points and Questions & Answers," Nuclear Regulatory Commission (March 2013) (available at <http://www.nrc.gov/waste/spent-fuel-storage/faqs>. (last viewed 21 Nov. 2013).] New York State staff understand that nuclear licensees in New York currently plan to keep fuel storage pools at maximum capacity (i.e., dense storage) until a means for federal transport and final disposal is available.⁷ [footnote 7 text: See, e.g., State of New York, Riverkeeper, Inc., and Hudson River Sloop Clearwater's Joint Contention NYS-39/RK-EC-9/CW-EC-10 Concerning the On-Site Storage of Nuclear Waste at Indian Point, 32 (Jul. 8, 2012) ML12190A002 (discussing Entergy statement during May 2012 site visit).] (0681-5 [Peterson, Alyse])

Comment: The Draft GEIS claims that the environmental impact of long-term or indefinite storage is small. This is an absurd statement on its face, given the known extreme hazards of radioactive wastes and the lack of any experience of storing these toxins for even a hundred years, let alone hundreds of thousands of years. (0686-2 [Malboeuf, Simone])

Comment: The end result of the faulty analysis in the GEIS is a determination that storage of nuclear spent fuel is incidental and has fewer impacts than reactor operations. Therefore, the agency concludes, long-term or indefinite storage poses no significant environmental impacts. (0693-1-12 [Warren, Barbara])

Comment: V. The Court Decision called for an analysis of the environmental impacts of failing to obtain a permanent repository. (State of NY, et. al., Petitioners v. NRC and the USA, Respondents, US Court of Appeals for the District of Columbia Circuit, June 8, 2012, No. 11-1045.) The GEIS rather than conducting the analysis called for by the court, instead merely adopted the position that few impacts would occur in the short term, long term and even indefinitely, because all this high level nuclear waste fuel would be adequately managed. This is not the analysis the court decision required. (0693-3-1 [Warren, Barbara])

Comment: Tanks at the end of their 50-yr. maximum useful life have not been replaced, calling into serious question the likelihood of cask replacement every 100 years for spent fuel. (0693-4-10 [Warren, Barbara])

Comment: Throughout the GEIS, NRC has told us how unlikely many adverse events are, but nowhere has NRC provided details about how it derived these probabilities. NRC used probabilities to assign small impacts to the majority of environmental impacts, although this was secondary to not properly evaluating the impacts in the first place. (0693-4-6 [Warren, Barbara])

Comment: Here, the NRC has considered a broad spectrum of potential scenarios and made informed scientific judgments based on substantial available data, experience, and analyses about the possible impacts stemming from each storage scenario. Indeed, some assumptions, such as the 100 year replacement assumptions and the need to construct a DTS at every site, are likely very conservative, and add further support for the robust nature of the NRC's response to the D.C. Circuit decision. (0694-2-13 [Shea, Joseph])

Comment: TVA also concurs with the NRC's assumption that "an ISFSI of sufficient size to hold all spent fuel generated during licensed life for operation [will be] constructed during the reactor's licensed life for operation."⁸³ [footnote 83 text: *Id.* at 2-17.] (0694-2-25 [Shea, Joseph])

Comment: TVA's own experience with dry cask storage fully supports the NRC's conclusions that dry cask storage is technically feasible for the timeframes considered in the DGEIS.¹¹⁴ [footnote 114 text: *Id.* at B-11 to B-15.] In fact, TVA believes that the NRC's assumption of replacing dry casks every 100 years of service life is very conservative, and that due to their robust design the casks could last much longer without substantial maintenance. (0694-3-12 [Shea, Joseph])

Comment: The DGEIS states that WBN-1 is not yet eligible to request renewal, but that "[t]he NRC assumes that this facility will undergo a license renewal review for purposes of this analysis."¹⁴⁶ [footnote 146 text: See DGEIS at 7-5 to 7-6 (notes 4 & 5).] This assumption is reasonable; TVA is not aware of any reason that it will not seek license renewal of WBN-1. Additionally, this assumption is intended to lend conservatism to the Staff's environmental impacts analysis for continued spent fuel storage. (0694-3-19 [Shea, Joseph])

Comment: [T]he NRC has considered a broad spectrum of potential scenarios and made informed scientific judgments based on substantial available data, experience, and analyses about the possible impacts stemming from each storage scenario. Indeed, some assumptions, such as the 100 year replacement assumption and the need to construct a DTS at every site,

are very conservative, and add further support for the robust nature of the NRC's response to the D.C. Circuit decision. (0697-1-30 [Bessette, Paul] [Kuyler, Raphael])

Comment: Entergy's own experience with dry cask storage fully supports the NRC's conclusions that dry cask storage is technically feasible for the timeframes considered in the DGEIS.⁹² [footnote 92 text: *Id.* at B-11 to B-15.] In fact, Entergy believes that the NRC's assumption of replacing dry casks every 100 years of service life is very conservative, and that due to their robust design the casks could last much longer without substantial maintenance. (0697-2-21 [Bessette, Paul] [Kuyler, Raphael])

Comment: Entergy also concurs with the NRC's assumption that an ISFSI of sufficient size to hold all spent fuel generated during licensed life for operation will be constructed.⁶⁶ [footnote 66 text: See DGEIS at 2-17.] (0697-2-6 [Bessette, Paul] [Kuyler, Raphael])

Comment: *The Safety-Relevant Classes of Spent Fuel Requiring Continued Storage*, (commercial low-enriched uranium (LEU) oxide "Low Burn-up" SNF, commercial LEU oxide "High Burn-up" SNF, and "Other Fuels" requiring special consideration in a prolonged surface storage scenario, e.g. High Temperature Gas Reactor (HTGR), Plutonium MOX, and Damaged fuels). (0706-2-22 [Fettus, Geoffrey])

Comment: *Storage Cask Technology Options*, including repackaging options for deteriorating fuel and fuel stored in non-qualifying casks for transport or extended surface storage, (e.g., "Storage Only"; "Transport Only"; "Dual-Purpose" storage and transport). The Draft GEIS must discuss new proposed and reasonably foreseeable cask and storage technologies and their implications for prolonged surface storage safety and environmental impacts. (0706-2-23 [Fettus, Geoffrey])

Comment: Page 3-1 to 3-37. Discussion of ISFSIs and need for site specific reviews. NRDC Comment[:] While NRDC has no quarrel with a broad treatment of the affected environment in the an initial generic or programmatic environmental analysis, the description of the affected environment from 3-1 to 3-37 is so cursory so as to be meaningless in terms of the hard look necessary under NEPA. This is especially true for an action of the magnitude of examining the impact of storing spent nuclear fuel in place for potentially long periods of time, past that which one might reasonably rely on the viability of institutional controls. As we explained *supra* at comment #5 in our proposed matrix of reasonable alternatives that could lead to a compliant NEPA analysis, there could be a meaningful examination of environmental impacts at a site specific level or at least a regional level. Once the agency has presented and commenced an evaluation of the diverse range of actual alternatives in terms of snf amounts, storage configurations, spent fuel classes, cask options and institutional control scenarios, the agency can then commence examination of quantitative impacts on realistically portrayed affected environments. It should suffice to say regional and local environments differ – differing climates, peak and average temperatures, moisture content, salinity, natural environment. The cursory descriptions in the Draft GEIS don't reach this important differences and the way the proposed rule is structured, those important differences would never be examined. Thus, the cursory nature of this section illustrates the need for a tiered process, at least on a regional or site-specific level. Only then could then could decision-makers have the proper information before them. (0706-4-2 [Fettus, Geoffrey])

Comment: Page 4-21 - 91. NRDC Comment[:] Consistent with comments #5, #9, and #19 above, the conclusory treatment of the environmental impacts to the affected environment are so NRC's presentation of generic treatment of the affected environment and the reliance on the

arbitrary assumption that institutional controls will last forever ensures the conclusions regarding environmental impact from 4-20 (Geology) to 4-91 fail NEPA's hard look requirement. There are repeated problems and assumptions of no environmental impact where the NRC has provided no basis that challenges DOE's analysis of the environmental effects of failing to develop a repository or even a basis that supplies common sense. Examples include 4-77, DTS, 4-54 (land use), 4-24 surface water quality, 4-28, groundwater quality, etc. (0706-4-3 [Fettus, Geoffrey])

Comment: No wonder NEI is attempting to convince the NRC to interpret the WCD as being so restricted in scope such that the sheer lunacy of producing more nuclear waste in the first place is ignored! NEI claims that "site-specific and generic" Environmental Impact Statements (EISs) cover all permutations of this basic question: Is what we're doing logical? However, they do not: Invariably, ALL other NRC and DOE EISs assume that the waste problem can be solved, thus relegating the dangers of continued operation, continued production of nuclear waste, and continued mining of uranium to matters which can be assessed through Probabilistic Risk Assessments (PRAs). (0709-6 [Wythe Elnagar, Romi])

Comment: The NRC's DGEIS contains a deficiently generic analysis of the impacts of long-term and indefinite onsite nuclear waste storage to purportedly support the proposed rule, which, if adopted, would preclude site-specific NEPA analyses for future nuclear power reactor, reactor license renewal, and spent fuel storage facility licensing actions.⁵ [footnote 5 text: See, e.g., DGEIS at xxiv ("The proposed action is to issue a rule, 10 CFR 51.23, that generically addresses the environmental impacts of continued spent fuel storage by incorporating into rule the conclusions of the final version of this draft GEIS. If the proposed Rule is adopted, the site-specific NEPA analyses for future commercial power reactor and spent fuel storage facility licensing actions would not need to consider the environmental impacts of continued storage.")].] The DGEIS fails to recognize and assess critical site-specific concerns related to the impacts of onsite nuclear waste storage, and as a result does not take the "hard look" required by NEPA. That is, NRC has presented an allegedly conservative bounding assessment, however the bounding parameters used were not broad enough to cover various site-specific concerns. As a result, the DGEIS is fundamentally flawed, and NRC has demonstrably failed to justify the generic proposed rule and future preclusion of the consideration of site-specific issues relating to nuclear waste storage.⁶ [footnote 6 text: See *New York v. NRC*, 681 F.3d at 480-81 (explaining that a generic analysis must be "thorough and comprehensive" and that a generic rulemaking is considered appropriate where "conservative bounding assumptions" are used and there is "the opportunity for concerned parties to raise site-specific differences at the time of a specific site's licensing").] In order to comply with NEPA, the NRC should specifically require site specific review of the impacts of future spent fuel pool leaks, and the risk and consequences of pool fires in all licensing proceedings.⁷ [footnote 7 text: It is critical to note that in the Court Ruling, while not agreeing with Petitioners that site specific review was required, the Court did not specifically prohibit the NRC from conducting site specific analyses in the DGEIS. *Id.* at 480-81. On the contrary, while the Court Ruling states that "a comprehensive general analysis" might be sufficient to "examine onsite risks that are essentially common to all plants," it also states the following; "Nonetheless, whether the analysis is generic or site by site, it must be thorough and comprehensive." *Id.* at 481-82. Moreover, the justification for the Court permitting a generic analysis included the notion that that site specific issues could be raised by intervenors at the time of a specific site's licensing action. *Id.* at 480-81. However, the proposed rule at issue here, supported by the facially deficient DGEIS, would expressly *prohibit* such site specific analysis of the environmental impacts of spent fuel storage in all future licensing proceedings, which clearly undermines the basis for a generic analysis.] (0710-1 [Brancato, Deborah] [Musegaas, Philip])

Comment: If dry storage and recontainerization is used, what is the likelihood that it will exceed the viability of our species? (0711-38 [Olson, Mary])

Comment: NRC mistakenly projects uniformity in parameters such as heat and rate of heat generation, aging and rate of aging, fissile material content and overall "biological effectiveness" (one of the most offensive technical terms for "likeliness to cause disease and death") for different types of fuel with different levels of burn-up, decay and damage. This mistake is unacceptable. If it is not a mistake, the wholesale incompetence it reflects is stunning and if it persists will undermine any remaining ability to ensure that this highly varied material is not released to our biosphere. In addition, NRC fails to factor the changing characteristics of this waste over time. The dominance (heat and high-surface radiation dose) of the intense fission products in the several centuries give way; later the access to the plutonium and other fissile materials will become easier. NRC fails to factor this shift. (0711-9 [Olson, Mary])

Comment: The NRC has not conducted a thorough environmental analysis of spent fuel storage and disposal issues, the costs and risks of storing spent fuel at reactor sites for decades, or even hundreds of years. (0712-1 [Schimmelpfennig, Pamela Y.])

Comment: In particular, it is imprudent for NRC to presume that a geologic repository will become available within a few decades. (0714-1-7 [Edwards, Gordon])

Comment: REQUEST TO NRC: We request that NRC provide these calculations, the model used, the base assumptions, and all pertinent data regarding the projected future water conditions of the Illinois river network in a climate disrupted world, and the effects this will have on Illinois reactor functioning; as well as their effects on the assumptions NRC has made in this DGEIS. Since NRC allowed us 75 days to comment on the DGEIS, we request that the requested information be provided within 75 days of the submittal of these comments. (0716-14 [Kraft, Dave])

Comment: NRC has relied on inadequate, outdated, superceded and at times simply wrong information as the basis for its many opinions. Using the GIGO rule, the DGEIS is totally inadequate to the task of protecting the public health and safety, since NRC has made "predictions" about a world that simply does not exist. (0716-24 [Kraft, Dave])

Comment: As some of the material below will demonstrate, NRC has totally ignored the Court mandate to actually envision future problems – even those NRC feels are not likely – and do real calculations to reach predictions and conclusions about consequences. Instead NRC has merely proclaimed the world flat, and has proceeded to give assurances based on its ill-informed opinion. This is not what the Court required of NRC. (0716-5 [Kraft, Dave])

Comment: The State of New York submits that the Waste Confidence DGEIS and proposed rule are inconsistent with NEPA's objective of forcing federal agencies to examine previously-held assumptions, confront the environmental consequences of their present decisions, and meaningfully weigh reasonable alternatives or conditions to the requested federal action before the federal agency takes action. Staff's approach fails to take the NEPA-required "hard look" at the environmental consequences of from continued dense storage of spent nuclear fuel in spent fuel pools. (0718-2-14 [Sipos, John])

Comment: Event reports and accident precursors[.] In the DGEIS, US-NRC has relied upon a compilation of event reports such as NUREG-1275 Vol. 12 (US-NRC 1997a) to identify relevant spent fuel events. The DGEIS mentions that US-NRC staff also performs annual reviews of U.S.

and international operating experience with spent fuel storage and handling (US-NRC 2013a), although this does not appear to be documented in an official document. (0718-3-17 [Sipos, John])

Comment: As we cannot assess the stability of future society or its similarity to our own, any storage design that requires the active input of either educated human labor or electrical or fossil energy is making too many assumptions. Any study of the recorded history of human society will tell you that the highest probability outcome for the next 10,000 year period is that the world as we know it will change to something unrecognizable to our present day. the people of any future era will likely not have the financial and technical means, the interest, or the knowledge necessary to satisfy the proposed 100 year cycle of indefinite reconstruction of these storage facilities. Thus, the environmental, economic and human safety effects of such storage are incalculable. (0724-5 [Gamble, Dan])

Comment: The National Environmental Policy Act is based on a critical principle: that one should honestly and thoroughly evaluate potential environmental impacts of major federal actions *before* deciding to undertake them. Here, NRC proposes to make licensing decisions that would result in creation of large amounts of additional high level radioactive waste for which no disposal solution exists. Yet NRC has declined to evaluate the environmental consequences of such production, solely on the assumption that institutions will exercise "eternal vigilance" of the waste. (0738-19 [Hirsch, Daniel])

Comment: The Draft GEIS claims that the environmental impact of long-term or indefinite storage is small. This is hypothetical ... given the known extreme hazards of radioactive wastes and the lack of any experience of storing these toxins for even a hundred years, let alone hundreds of thousands of years. The Draft GEIS claims that impact of a severe accident would be small. Such a conclusion cannot be supported by logic or experience. A severe accident would release deadly radioactivity into the environment. Every release of manmade radioactive matter into the environment to date has had serious and long-lasting impacts on humans and other living things within the area affected. (0757-4 [Lynch, Laura])

Comment: The NRC, by court order, has been required to gather public input regarding a Generic Environmental Impact Statement (GEIS) regarding the storage of nuclear waste that is grossly inadequate and leaves over 150 million Americans who live within 50 miles of a nuclear power plant at risk. The NRC has declared that it would only be a SMALL risk to the environment and communities near nuclear power plants to store nuclear waste on-site for 60 years, 160 years or even INDEFINITELY if no permanent repository is established. (0774-1 [Revilla, Oscar])

Comment: The Draft GEIS Lacks any Reference to Manufacturers' Requirements for the Storage Systems. The Draft GEIS assumes that there will be dry cask storage after (or during) the one hundred (100) year period following cessation of plant operations. The Draft GEIS further assumes that these robust systems of storage will be adequate for that time though, after 100 years, they will need to be transferred into a second storage cask or a cask that may be used for transfer.⁴ [footnote 4 text: As noted previously, the confidence expressed in the 100 year timeframe for storage is inconsistent with the base line assumption that storage will start on the day that a plant ceases operation. Storage starts the day the spent fuel assemblies are transferred to the dry cask storage.] Despite these assumptions, there is no reference to any manufacturers' analysis on the useful life of the casks. Nowhere is there any reference to any warranty that is provided or other information that would tend to support the conclusions that are reached within the Draft GEIS on storage. There is no reference to any experiences to date on attempted transfer. There is not a sufficient period of empirical evidence that would otherwise

support the conclusions reached by the Draft GEIS. Simply put, there has not been storage over the stated period times that would support the same conclusions. Rather, the Draft GEIS makes and relies on these assumptions being made without any substantive analysis or support. In order to support the conclusions set forth within the Draft GEIS, manufacturers' information must be included. The Draft GEIS must also set out what historically has been said about storage and the use and limitation of the current storage systems. (0783-1-11 [Harlan, Thomas])

Comment: Under section ES.9, page xxvii, lines 10-21, the Draft GEIS sets forth some of the assumptions that were made in preparing the same. As described below, these assumptions have no empirical or other evidence to support the validity of the same. Rather, the conclusions/assumptions are based upon the experience of the NRC and its continued management of the nuclear industry. However, as the NRC has noted, the Draft GEIS, is in response to the unique set of facts that the NRC is facing relative to spent nuclear fuel. The experience that purportedly is being relied upon is not experience realized through completion of a similar exercise and then repeating that same task but rather is garnered in real time. That is not the definition of experience. Accordingly, any assumption, in keeping with basic NEPA principles, should be supported in an articulable way. (0783-1-14 [Harlan, Thomas])

Comment: An analysis that starts upon cessation of operations of a power plant that generates a spent fuel also provides a false mark for the storage periods being analyzed in the Draft GEIS. For example, at the PINGP storage in dry casks began in 1993. The plant, however, will not cease operations until 2033 and 2034, respectively. Accordingly, storage in dry casks will be ongoing for over forty (40) years prior to the PINGP's cessation of operations. Applying the logic of the Draft GEIS, replacement would not occur until one hundred (100) years after the PINGP's cessation. This would mean that the casks, first filled in 1991, would be over one hundred-forty (140) years old before replacement of the same would occur. This is inconsistent, the presumption that dry casks need to be changed every one hundred (100) years. Accordingly, the best mark to start or use is the timeframe that spent fuel goes into dry cask storage. This timeframe would not include mandatory time it has spent in the spent fuel pool to ensure that the fuel assemblies have sufficiently cooled for handling and radio activity.² [footnote 2 text: This argument assumes, and the NRC should require, that spent fuel is moved to dry storage in a commercially reasonable timeframe after the same has sufficiently cooled in a spent fuel pool. The NRC should limit spent fuel pool storage.] (0783-1-6 [Harlan, Thomas])

Comment: Under section 1.2, page 1-4, lines 17-21, the language regarding the timeframe in which the continued storage should be analyzed must exclude any language relative to the end of a reactors license life for operation. The appropriate timeframe for beginning the analysis on storage is the date in which the spent fuel is actually stored. This analysis shall be separate and distinct from any licensing and further separate and distinct from any operations or decommissioning. (0783-2-1 [Harlan, Thomas])

Comment: On page 1-16, lines 1-4, the Draft GEIS contradicts itself by indicating that storage in a single cask can go beyond the one hundred (100) year cycle. There is no experience or evidence to support this assumption. There is no evidence to support that casks can even last 100 years. This assumption must be removed. (0783-2-10 [Harlan, Thomas])

Comment: On page 1-16, lines 10-12, there is an assumption on aging management. This assumption should be blended into institutional control and measured from the stand point of a generator's ability to provide systems and appropriate funding for age management of the storage systems. Again, this assumption is made without any empirical evidence or support that

generators would have the necessary funds and capabilities to ensure maintenance and safety. (0783-2-11 [Harlan, Thomas])

Comment: On page 1-16, lines 32-36, there is an assumption that a DTS is going to be replaced once during the life cycle of storage. This assumption is premised upon the robustness of the storage casks themselves and the ability of the generator to properly maintain the same. This assumption therefore is faulty because it is built on two other assumptions for which there is no experience or information to support the same. (0783-2-12 [Harlan, Thomas])

Comment: Under section 2.1.1.2, page 2-5, lines 10-13, the assumption regarding decommissioning and removal of spent fuel within sixty (60) years should be modified. Rather, the assumption should be that spent fuel should be moved to dry cask storage as soon as commercially reasonable. In no event, this should exceed five (5) years after the same has sufficiently cooled. (0783-2-14 [Harlan, Thomas])

Comment: This also applies to the various reports the Draft EIS cites to and relies upon. Those reports may be based upon assumptions of experience or that the Commission, as contemplated by the old Waste Confidence Rule, will simply remove the fuel in a stated period of time. Thus, while there is an analysis of some aspect of storage, the equipment or components used and various threats to the same, there is not an inclusion of a specific time element and the natural decay or degradation of the examined equipment or components. The Commission must be careful in its reliance on these types of reports – as well as the assumptions in the Executive Summary or its risks concluding, without analysis, that continued storage need not be analyzed. (0783-2-4 [Harlan, Thomas])

Comment: Under section 1.8.3, starting on page 1-13 and carrying over to 1-17, the Draft GEIS makes a number of assumptions that are then carried forward throughout the document. These assumptions are, in many ways, not supported by any substantive evaluation, analysis or any other empirical evidence. There is no reference to any report, study, or other governmental or non-governmental review. As such, these assumptions, rather than support and provide depth to the Draft GEIS, pull away from it and create opportunities to challenge the same for failure to meet NEPA requirements. (0783-2-6 [Harlan, Thomas])

Comment: The opening section of Chapter 4 should be modified to reflect the prior comments set forth in this letter. This should include, but not be limited to, modification of the timeframe in which the analysis should take place, modification of the assumptions set forth in section 1.8.3 and further expansion of the analysis to include both direct and indirect impacts of the proposed action. Finally, chapter 4 should be amended to include a discussion on mitigation, emergency preparedness, and other impacts that a host community would be facing. (0783-3-1 [Harlan, Thomas])

Comment: Appendix B addresses the technical feasibility of continued storage and repository availability. The technical feasibility of continued storage is based upon a series of underlying assumptions and conclusion about the robustness of the storage facilities. These assumptions, among other things, fail to include any sort of analysis from the manufacturer in the form of warranties or recommended useful life. (0783-3-20 [Harlan, Thomas])

Comment: Under section 4.12, page 4-47, lines 33-37 and carrying over to page 4-48, lines 1 and 2, there is reference to the rule making for certification of the cask design. It describes the various environmental requirements that are met for the same. The reader is left with a distinct impression that there was not, for the cask design, an EIS or EA completed. Despite this, the

Draft GEIS indicates that it is simply relying on the same. This reliance is inappropriate. The cask itself will be the storage vehicle for spent fuel, and as such, the analysis of the cask itself must be included within the Draft GEIS.⁶ [footnote 6 text: This is a bit ironic since there is an underlying assumption that the storage system (i.e. cask) is so sturdy and robust there will not be a release from the same.] As stated before, this analysis should include but not be limited to information from the manufacturers as to warranty and anticipated life, the original estimates for the casks and other information. (0783-3-4 [Harlan, Thomas])

Comment: In conclusion, it is my opinion that this DGEIS is premature and establishes an impact rating system solely related to magnitude of very poorly described potential environmental impacts. It is, in the general absence or severe shortage of relevant evidence, model-driven by use of "Reference guides." None of the critical storage items--casket performance in many different environments and tested over a very short time period (14 years, one casket), the potential for catastrophic impacts on storage facilities, which can have far greater environmental consequences than any considered in the GEIS, and the human impact factor that has great potential for environmental harm, but which doesn't fit the format for this GEIS. (0805-15 [Wilshire, Howard])

Comment: Environmental Impacts At-Reactor Continued Storage of Spent Fuel[:p. 4-3. "In this chapter, the NRC uses the License Renewal GEIS (NRC 2013) to inform some of the impact determinations regarding continued storage. In many of these cases, the analysis in this draft GEIS considers how the environmental impacts of continued storage compare to the impacts considered in the License Renewal GEIS. In the License Renewal GEIS, the NRC evaluated the potential impacts in each resource area by reviewing previous environmental analyses for past license renewal reviews, scientific literature, and other available information. Where appropriate, this draft GEIS also considers analyses and impact determinations made in previous ISFSI licensing and renewal environmental assessments (EA) and environmental impact statements (EISs) and in reactor license renewal and new reactor licensing EISs to inform the impact determinations in this analysis." Comment: Since this statement indicates unspecified assessments of unspecified environmental impacts on unspecified resource areas, it is both uninformative and says nothing about how it fits into a generic impact statement. (0805-6 [Wilshire, Howard])

Comment: The DGEIS defies credulity. Unless the NRC is clairvoyant or omniscient, how can it possibly predict with any assurance that onsite storage will be safe for 100 years, let alone millions or billions that it remains hazardous? (0819-5 [Kline, Connie])

Comment: NRC's conclusions are no more believable or reliable than an online psychic or fortune teller. It is just incredible that the DGEIS dismisses as "Small" virtually every "Environmental Impact of At-Reactor Spent Fuel Storage" including, but not limited to, "Geology and Soils", "Surface and Groundwater Quality and Use", "Aquatic Ecology." Likewise, the environmental impacts of "Postulated Accidents" and "Terrorism or Sabotage" are deemed to be "Small" (i.e inconsequential). (0819-6 [Kline, Connie])

Comment: "Indefinite" at reactor site storage, is an irreversible and irretrievable commitment of resources, and should be analyzed as such. (0820-6 [Eide-Tollefson, Kristen])

Comment: The GEIS Analysis Assumptions at 1.8.3 undermine the purpose of the environmental review, as charged by the Court. NRC cannot simply assert its own purposes or assumptions to over ride and undermine the Court's charge. The need and purposes of 1 and 3 are incompatible. (0820-7 [Eide-Tollefson, Kristen])

Comment: The Court's charge is to examine and evaluate the environmental effects of "indeterminate", permanent at reactor site storage. NRC cannot evade this requirement by assuming or reasserting the premise that prompted the court's challenge: that permanent storage will be available "when needed". (0820-8 [Eide-Tollefson, Kristen])

Comment: Inadequate application of scientific principles, thinking, testing, methodology, and practices in DGEIS and entire oversight process[.] Scientific principles and practices require their thorough application with rigor to every potential point of vulnerability, to every potential point from which lack of safety is introduced: anything less is unacceptable. Safety, which logically assures the protection of the environment and humanity from harmful exposure, requires placement at the top of the scientific decision tree, upon which all else depends. If a point of vulnerability does not have a practical solution when we are dealing with the most lethal substances created on earth, then logically the entire ensuing operation becomes too dangerous. Vulnerabilities with this extreme dangerousness exist; therefore, safety requires that the operation be stopped in order to avoid unsafe situations. (0823-1 [Michetti, Susan])

Comment: We request actual EIS regarding any and all safety issues, including fuel storage pools and casks that pertain to the actual timeframe required for all ionizing radiation isotopes identified as present to expire. The impossibility of safe actual physical storage in an actual location exists at the top of the scientific decision tree of safety for humanity and environment throughout the full timeframe of impacts. (0823-23 [Michetti, Susan])

Comment: It is unacceptable for the NRC to fail to address the significant decrease in regulatory oversight and the possibilities of harm to the public and the environment from contamination, specifically pertaining to factors impacting the spent fuel storage, referred to as "Waste Confidence Pool Storage" after the shut down of reactors for the next 60 years and "Dry Cask Storage License Renewal(s)" up to the next 40 years and "Long Term Indefinite Storage." Placing safety assurances upon an irrational assumption that a repository will be available at the end of 60 years of "Waste Confidence Pool Storage" is unacceptable when the overwhelming evidence points to the impossibility of safe repository. (0823-52 [Michetti, Susan])

Comment: Predictable inadvertent environmental exposure to ionizing isotopes without a safe method of disposal requires pre-emption based on the highest value, safety. The failure of the NRC to use actual scientific thinking, methodology, and practices throughout its entire oversight program, decision-making, and approval of nuclear reactor licenses and license extensions, unacceptably, has negligently allowed impacts of ionizing radiation on the complete environment to be overlooked. (0823-6 [Michetti, Susan])

Comment: Specifically, this analysis requires examination of impacts upon the full surrounding environment, its ecosystems, and its interconnecting influences to the rest of this finite planet over the complete timeline of impacts. Plants, trees, insects, wildlife, humans, and all living organisms require full consideration of impacts for the full cumulative lifetime of the isotopes which, contrary to our deepest wishes, likely will not remain contained and isolated. Other features, including water bodies, landforms, atmospheric features, and climate, require full impact identification and consideration for the complete timeline of impacts. Other variables and criteria also require rigorous and thorough scientific assessments and analyses through the complete timeline of impacts for the longest living radionuclide's ionizing wavelengths to expire. (0823-65 [Michetti, Susan])

Comment: We call for explanations of the logic used for the significance determinations in context, based on reasoning for each individual site for predicted measureable change in terms

of scope, geographic event, timing, duration, frequency, degree of irreversibility criteria. These variables are not all inclusive. (0823-82 [Michetti, Susan])

Comment: The once a nuclear power plant is shut down the NRC does not dictate how the power plant owner/operator should go about decommissioning their facility. Details about how the plant will be dismantled and the schedule is left up to the plant owner/operator. With the lack of a national repository for high-level waste the plant owner/operator must, under NUREG 2157, store the spent nuclear fuel on site. I am concerned that once a nuclear power plant is shut down, the plant owner/operator may decide that it is too expensive to build dry casks and keep spent fuel in the shut down plant's spent fuel pool until a national repository for high level waste is built. This scenario is not addressed in the NUREG 2157 and would further expose the surrounding community to prolonged periods of time where large quantities of spent nuclear fuel is in one place, relying upon active cooling, and more vulnerable to a potential terrorist aircraft attack when compared to dry casks. Allowing the plant owner/operator to make the determination of whether or not to place the spent fuel in dry casks or leave it in the spent fuel pool based upon cost/profit considerations is not fair to the surrounding community. (0826-15 [Morgal, Rick])

Comment: NRC justifiably assumes that used fuel would be removed from reactor pools within 60 years of reactor operation.⁴⁴ [footnote 44 text: Draft GEIS 1-14.] This assumption is appropriately conservative and bounding. Experience indicates that the time to remove fuel from the pool would actually be considerably less than 60 years. At the 14 reactors shut down prior to 2003, movement of fuel to dry cask storage was accomplished in 2 to 34 years. Of the 4 plants which took the longest time, over 20 years, 3 of them shut down 8 or more years before dry cask storage technology was even developed. Since dry cask storage was first deployed in 1986, the average length of time for shutdown plants to move to dry storage has been 11 years. (0827-1-17 [Ginsberg, Ellen])

Comment: The NRC's short-term and long-term timeframes reflect reasonable assumptions, and are supported by ample regulatory and technical information in the record of the environmental review and the rulemaking. For example, Section 1.8.3 of the draft GEIS clearly explains the assumptions underlying the agency's analysis, and provides the basis for those assumptions. Those assumptions are then relied upon, in conjunction with other technical information and experience, to assess the environmental impacts of continued storage at reactor sites (Section 4) and at away-from-reactor facilities (Section 5). (0827-1-18 [Ginsberg, Ellen])

Comment: NRC has assumed, for the purposes of the long-term storage scenario, that spent fuel will be moved to new casks every 100 years, and that the dry transfer station and ISFSI pads can be replaced every 100 years.⁴⁵ [footnote 45 text: Id. at 1-14] While NEI agrees that this assumption is bounding and appropriate for use in this analysis, it is important to note that this is a very conservative assumption. Experience to date demonstrates that it will not be necessary to replace the ISFSI or DTS, or to repackage spent fuel, with this frequency. (0827-1-19 [Ginsberg, Ellen])

Comment: Similarly, the assumption in section 4.1 and 4.7 of the draft GEIS that ISFSI replacement would take place on new land with old land "reclaimed" appears to overstate the associated environmental impacts.⁴⁶ [footnote 46 text: Draft GEIS at 4-6 & 4-24.] It is more likely that ISFSI owners would either repair or reconstruct the concrete pad on which the casks sit in the same location, or replace sections of the pad as needed, thus eliminating or significantly reducing the need to disturb new land. If the NRC continues to assess impacts using this

assumption, its conservatism should be recognized and the resulting small impacts should also be characterized as bounding. (0827-2-2 [Ginsberg, Ellen])

Comment: GEIS Section 1.8.3: Page 1-17, states: "It is assumed that an ISFSI of sufficient size to hold all spent fuel generated will be constructed during the licensed life for operation." Industry disagrees with this assumption. There is no reason the full ISFSI needs to be constructed (or even designed) during the licensed life of the reactor. A few plants, like Harris, won't need an ISFSI built before the license ends if there is enough room in the pool for all of the fuel. And while the vast majority of plants will have an ISFSI constructed during their licensed life, they will still retain a significant quantity of fuel in the pools for at least the first few years after shutdown. An ISFSI can (and would likely) be expanded at an appropriate time after operations cease, which may be after the license life. (0827-7-19 [Ginsberg, Ellen])

Comment: Section 1.8.3, Analysis Assumptions, pp. 1-14 to 1-17, states various assumptions used in the GEIS analysis. In general the assumptions are made in an attempt not to underestimate environmental impacts. Industry does not disagree with this approach, but believes the GEIS should recognize this fact, either at the beginning of section 1.8.3 or explicitly in each stated assumption. Sometimes, but not in every case, the assumption already explicitly explains this conservatism. The GEIS should consistently recognize the reasonably conservative or bounding nature of many of the assumptions made for analysis purposes. (0827-7-2 [Ginsberg, Ellen])

Comment: You say there are no "there are no remaining issues that require resolution" (Lxii) and yet you also say "The environmental impacts of terrorism are an area of particular controversy." That also means that it requires resolution, and therefore your first statement is incorrect. But we will see also in other comments below that this statement is patently untrue. THERE ARE REMAINING ISSUES AND THEY MUST BE RESOLVED. (0836-22 [Davis, Anonymous])

Comment: Page 1-17, Lines 14-15 "It is assumed that an ISFSI of sufficient size to hold all spent fuel generated will be constructed during the licensed life for operation." Not necessarily true. At San Onofre, they have not constructed the ISFSI completely yet, and yet their "for operation" license is no longer valid. You may have to change this to "licensed life for operation and decommissioning time (60 years)," otherwise, your assumption is clearly incorrect. Plus, why do you need to assume this? Please note you can't have it both ways, between this comment and the prior one, something has to give. (0836-36 [Davis, Anonymous])

Comment: Page 2-12, Lines 17-20. You say that you are still working on trying to determine if the design basis and systems, structures, and components important to safety, including spent fuel pools, needs to be updated. But you haven't completed that yet. You say "NRC has not yet received responses to the request for information and has not decided whether any license needs to be modified, suspended, or revoked, for purposes of analysis in this draft GEIS, the NRC assumes that the existing regulatory framework remains unchanged." That sounds like a pretty big assumption, and clearly is in violation of your other assumption and statement that "there are no remaining issues that require resolution" (Page Lxii) Gee, this seems like yet another example of an issue that requires resolution, unless it is the normal practice of the NRC to depend on assumptions that everything is fine. This is quite distressing to say the least, that a regulatory agency that has its primary mission safety, and it would simply assume that everything is fine. NO MORE ASSUMPTIONS, PLEASE! (0836-38 [Davis, Anonymous])

Comment: Page 2-17, Lines 3-5, the same comment as #21 above ["It is assumed that an ISFSI of sufficient size to hold all spent fuel generated will be constructed during the licensed life for operation." Not necessarily true. At San Onofre, they have not constructed the ISFSI completely yet, and yet their "for operation" license is no longer valid. You may have to change this to "licensed life for operation and decommissioning time (60 years)," otherwise, your assumption is clearly incorrect. Plus, why do you need to assume this? Please note you can't have it both ways, between this comment and the prior one, something has to give.] (0836-40 [Davis, Anonymous])

Comment: Page 4-.34, Section 4.9.3, as an example, "Indefinite Storage" If the ISFSI must be completely rebuilt at the end of 100 years, then THE SPENT FUEL SHOULD BE MOVED TO ANOTHER LOCATION, typically out of high-population density areas, away from water resources and to seismically inactive areas, and hopefully in a way that will not allow terrorist or wartime attacks. Therefore, IN NO CASE SHOULD ANY CO-LOCATED ISFSI CONTINUE TO OPERATE FOR MORE THAN 100 YEARS! Indeed, the canisters should be transported to a more appropriate area at that time, and this line of reasoning SHOULD BE MORE PREVALENT in the DGEIS. NO PERMANENT ISFSIs! We soundly REJECT THE NOTION presented in this section. (0836-54 [Davis, Anonymous])

Comment: With an eye toward the four specific questions the NRC requested of the public, I completely understand the need for it, the Generic Rule, but the question I have is: Has the NRC really gotten to the root issues for implementing a Generic Rule that does not undermine the Common Defense? (0838-5 [Clermont, Elaine])

Comment: No wonder NEI is attempting to convince the NRC to interpret the WCD as being so restricted in scope such that the sheer lunacy of producing more nuclear waste in the first place is ignored! NEI claims that "site-specific and generic" Environmental Impact Statements (EISs) cover all permutations of this basic question: Is what we're doing logical? However, they do not: Invariably, ALL other NRC and DOE EISs assume that the waste problem can be solved, thus relegating the dangers of continued operation, continued production of nuclear waste, and continued mining of uranium to matters which can be assessed through Probabilistic Risk Assessments (PRAs). (0856-6 [Fritz, John])

Comment: The NRC, by court order, has been required to gather public input regarding a Generic Environmental Impact Statement (GEIS) regarding the storage of nuclear waste that is grossly inadequate and leaves over 150 million Americans who live within 50 miles of a nuclear power plant at risk. The NRC has declared that it would only be a SMALL risk to the environment and communities near nuclear power plants to store nuclear waste on-site for 60 years, 160 years or even INDEFINITELY if no permanent repository is established. The analysis makes no distinctions among all of the nuclear power plants covered by the GEIS with regard to levels of seismic risk (earthquakes and tsunamis), regional population levels, proximity to transportation corridors, etc. In the GEIS Executive Summary, the stated purpose of this ruling is for the efficiencies that would be gained, minimizing expenditures and avoiding delays in licensing reviews. This apparent bias towards the industry seems to contradict the sole purpose of the NRC in protecting the public and the environment. This report only reinforces the growing mistrust of nuclear regulators who would play down the risk of storing nuclear waste wherever it may be presently, apparently bending to the will of the industry they are supposed to regulate. (0860-2 [Headrick, Gary])

Comment: Implicit in the Court's charge to the NRC is the need to forecast future conditions. NEPA itself can be seen as a requirement to predict the future. There are a wide variety of

accepted, time-honored and reliable methods for anticipating future conditions. The NRC should have used these types of futures methods to better assess the possible environmental impact of its proposed action and/or in conjunction with a more recognized method used in the past like probabilistic risk assessment (PRA) and in conjunction with a more robust generic analysis as purported to be used in the DGEIS. In the DGEIS PRA was noted in relationship to a NRC study on dry casks, in particular the Hi-Storm system (see section 4.18.2.2). That study did not necessarily use generic analysis as this technique may not be compatible with such an abstracted analysis - it relies on real data and real institutions/installations to be effective. This would be true even if the actual NPP site is obscured in the final study write-up so as to not pose a security threat or act as a blueprint for terrorists, saboteurs or otherwise increase site specific threats (NRC 2007). A perfect prediction of the future is not possible. The methods presented herein are not perfect and they are not a crystal ball. When used as part of an array of analysis techniques, the results of a triangulated analysis are more likely to be valid and reliable over those from when an unrealistic and not representative generic methodology is used. They help in taking a hard look at the issues and allow the agency to truly understand the potential environmental, social, economic and political concerns that may arise in the future. When such a generic methodology is used, its internal and external validity/reliability flaws are revealed. The listing of possible methodologies below could have been used to effectively examine future possible conditions derived from current knowledge and conditions. A discussion of some of the background for these possible techniques is useful and may show how the NRC could have used such techniques to conduct a valid and reliable NEPA analysis. (0867-1-1 [Griffin, William])

Comment: A way in which the DGEIS could have examined future alternatives would be to extrapolate from an analogous case in a manner similar to the case study method. In this method, the NRC would use real data from a real operating reactor site and then apply that data in other localities. In fact, this is what the DGEIS tries to do in its generic application. The DGEIS relied on information about the reactors and ISFSI's at Diablo Canyon, Morris, Humboldt Bay, Robinson, Surry, Calvert Cliffs, and Fort Saint Vrain (DGEIS p. 4-97-4-102). The main difference between the DGEIS and a more vigorous analogous case method is that the DGEIS uses a complete abstraction as the basis for drawing DGEIS conclusions. In an alternative to such abstracted analysis, the DGEIS could have used the analogous case method to extrapolate from operating NPP and licensed ISFSI facilities as a means of examining cask degradation and facilities degradation. The analogous case study method would have had numerous advantages over a generic analysis based on abstract and unrealistic data. First, it would leverage existing data already being collected by the site licensee and the NRC. Such an analytical framework would relate to actual conditions and would admit other problems that may not have been anticipated in an abstract construct like the DGEIS. A viable case study method also can be useful when there is not sufficient data for statistical sampling or remodeling. In this case in particular, there is very little relevant available data. By creating a robust case study method and then adapting it to other locations, the NRC could have produced a generic EIS that is less abstract and more grounded in reality. Another advantage is that analogous studies enable the development of a wide range of detailed data and investigations. This additional detail would have made it possible to develop new insights and information about this complex and difficult problem. (0867-1-10 [Griffin, William])

Comment: In this case, the NRC has developed a case study of a fictional facility, thereby combining the worst aspects of case study methods with the worst aspects of simulation. Another criticism of the analogous case study method is that it relies on data collected by a single organization and therefore may suffer from internal bias. This is the issue in the case of the NRC and its DGEIS. The agency has the political aspect of its operations, the Commission,

and the actual day-to-day operational aspect, the agency. This bifurcated structure introduces bias as the Commission tries to meet its political demands/agenda and the agency works to meet a variety of internal and external pressures. A final criticism is that it is often difficult to draw specific cause-and-effect inferences from the analogous case. A hard look at the issues does not justify a casual analysis; rather it requires a meaningful and justifiable analysis to meet NEPA, something the generic analysis fails to accomplish. (0867-1-11 [Griffin, William])

Comment: Another potential method of predicting the future implications of SNF storage is general morphological analysis (GMA). This method was developed by Fritz Zwicky and the intent of GMA is to investigate relationships in complex problems that will require judgment. The method was applied to a wide variety of fields including astrophysics, jet engine propulsion systems and legal aspects of space development. Morphological analysis was developed because many complex policy problems include non-quantifiable components that require judgment to be analyzed. This kind of complex policy problem makes quantitative methods less useful. When these methods are applied to problems requiring judgment, the result fails to show a clear, analytical link between the conclusion and the initial problem. The DGEIS demonstrates this very problem. The report amasses a wealth of facts, but there is no clear connection between the facts in the report and the conclusion drawn by the DGEIS. This gap is due to the absence of clearly articulated and analytically understood judgments. The 'judgment' problem made traditional models methods erratic and unreliable and was the impetus for the development of GMA. (0867-1-12 [Griffin, William])

Comment: To accomplish the task of analysis, GMA uses morphological boxes that are constructed by setting the parameters against each other in a matrix. Each cell of the box contains one particular value or condition from each of the parameters and thus marks out a particular state or configuration of the problem complex. This technique divides an issue into ever smaller components to try to isolate the individual effects that changes could have in the future. In this case, the NRC could have assessed the impact and various time periods of various parts of institutional control. For example, one conditional would be the loss of heavily armed guards at the storage site in say a future time frame of 30 years. Likewise this technique would allow the NRC to address the loss of monitoring in 60 years and try to understand what environmental effects would result. The robustness of this technique would have allowed the NRC staff to examine a variety of conditionals and thus provided a vehicle for the mandated hard look at those issues. (0867-1-13 [Griffin, William])

Comment: Each of these forecasts is normative in that it contains some future expectation. The DGEIS is a normative forecast of the future. It relies on assumptions about the future that oversimplify important aspects of the problem (e.g. funding, institutional control, staff). These assumptions have the same effect as value judgments on the quality of the assessment. An explanatory, or positive forecast, is one that provides a prediction about the future that does not incorporate as explicit value judgments about future conditions. Explanatory forecasts strive to be free of the values of the forecasting research team. When judgment is necessary (as it would be in the case of the DGEIS) the explanatory forecast seeks to understand and isolate its effects from the other parts of the forecast. Examples of an explanatory forecast are: • By 2030, there will be 42% fewer retail outlets to purchase guns than there are today. • By 2040, the US national debt will have grown to \$88 billion. • By 2048 funds to pay for nuclear waste site management will have declined by 56%. NEPA calls for an examination of the impacts of federal actions on the environment. To accomplish a hard look at the issues, that explanation should be free from the values and preferences of the Federal agency preparing the forecast. (0867-1-3 [Griffin, William])

Comment: *The NRC assumes that aging management, including routine maintenance activities and programs occurs between replacements. These "routine" or planned maintenance activities are distinct from the "replacement" of facilities and equipment. The NRC here assumes that there will be money, equipment, and available expertise even though each of these sites will be the responsibility of a utility which is obtaining no income from the site and may not even be in existence in the distant future. NRC also does not discuss the basis for any unspoken assumption that funding for these efforts will be adequately provided by funds that are being created today for spent fuel management when the assumed time frame is far less than the timeframes that are to be addressed in the DGEIS. None of these assumptions fall within NRC's expertise. (0867-2-12 [Griffin, William])*

Comment: *The spent fuel is moved from the spent fuel pool to dry cask storage within the short-term storage timeframe. While there may be money, equipment and expertise available to make the transfer if it were done while the plants are still operating, there is no analysis in the DGEIS to demonstrate a basis for that assumption 50 years after the plant has been shut down. None of these assumptions fall within NRC's expertise. (0867-2-13 [Griffin, William])*

Comment: *The NRC assumes that nuclear power plant decommissioning occurs within 60 years after the licensed life for operations in accordance with 10 CFR 50.82 or 52.110. The NRC also assumes that, by the end of the short-term storage timeframe, a licensee will either terminate its Part 50 or 52 license and receive a specific Part 72 ISFSI license (see 10 CFR Part 72, Subpart C) or receive Commission approval under 10 CFR 50.82(a) (3) or 52.110(c) to continue decommissioning under its Part 50 or 52 license. In either case, the NRC assumes that the NRC will conduct an appropriate site-specific NEPA analysis for either issuance of a Part 72 ISFSI license or approval to continue decommissioning in accordance with 10 CFR 50.82(a)(3) or 52.110(c). The ISFSI and DTS would be decommissioned separately. This is an appropriate assumption if the NRC continues to exist with adequate funding. The funding for the NRC is substantially derived from fees paid by operating nuclear power plants and thus the agency itself is subject to the economic whims of energy production. It may or may not be functioning and/or could be replaced as happened to the AEC. Thus, it is possible that oversight operations of this type would be given to another agency or that Congressional budget constraints would limit the funds available to fully operate the NRC or its successor to the same extent as now available. (0867-2-14 [Griffin, William])*

Comment: *Replacement of the entire ISFSI would occur over the course of each 100-year interval, starting at the beginning of the long-term storage timeframe. Construction, operation, and replacement of the DTS are assumed to occur within the timeframe, it could be near the end of its useful life by the end of that storage timeframe. To be conservative, the NRC included the impacts of replacing the DTS one time during the long-term storage timeframe. The NRC here assumes that there will be money, equipment, and available expertise. None of these assumptions fall within NRC's expertise. (0867-2-15 [Griffin, William])*

Comment: *Because an away-from-reactor ISFSI could store fuel from several different reactors, the earliest an away-from-reactor ISFSI would enter the short-term timeframe is when the first of these reactors reaches the end of its licensed life for operation. This needs to be examined for the timing of shipments and the movement of the waste. There will be substantial movement of fuel required for this to be successful. Such analysis is not generically possible, it is site specific. (0867-2-16 [Griffin, William])*

Comment: *The amount of spent fuel generated is based on the assumption that the nuclear power plant operates for 80 years (40-year initial term plus two 20-year renewed terms). A*

typical spent fuel pool of 700 metric tons of uranium (MTU) storage capacity reaches its licensed capacity limit about 30 years into the licensed life for operation of a reactor. At that point, some of the spent fuel would need to be removed from the spent fuel pool and transferred to a dry cask storage system at either an at-reactor or away-from-reactor ISFSI. This may or may not be a reasonable assumption. Burn up times for reactor fuel have changed as the technological controls for reactors have been improved. It may be that in the future, to help in recovery of costs, it will be necessary to run reactors to achieve hotter burn up fuel. This could affect the rate at which waste is produced, how fast wet storage fills to capacity and when/how SNF is moved into dry-storage casks. The results of such operational choices may impact storage, transfer and even the physical integrity of the fuel assemblies (Alvarez). (0867-2-17 [Griffin, William])

Comment: *The environmental impacts of constructing a "spent fuel pool island," which allows the spent fuel pool to be isolated from other reactor plant systems to facilitate decommissioning, are considered within the analysis of cumulative effects in Chapter 6. Because a new spent fuel pool cooling system would be smaller in size and have fewer associated impacts than existing spent fuel pool cooling systems, the environmental impacts of operating the new spent fuel pool cooling system in support of continued storage in the spent fuel pool, would be bound by the impacts of operating the existing cooling system described in Chapter 4. It is assumed that an ISFSI of sufficient size to hold all spent fuel generated during licensed life for operation will be constructed. This assumption ignores the considerable environmental impacts that would be involved in the construction of such a spent fuel pool island, the economic costs of operating and maintaining such a facility, and its vulnerability to natural disasters and malevolent acts. (0867-2-18 [Griffin, William])*

Comment: The NRC response to the need to conduct an environmental analysis of the continued production of spent fuel when no permanent repository is available and to continue to allow storage of spent fuel at reactor sites in pools or dry casks is at best inadequate. After the Court rejected NRC's 2010 attempt to address these issues, the NRC began the current process which has produced the DGEIS for comment. The DGEIS is intended to evaluate the costs of policy options, but without performing any of the detailed analysis necessary to understand the environmental impacts. Further, it abstracts the impacts through the device of a generic analysis, and assesses only the impacts on a generic basis. (0867-2-2 [Griffin, William])

Comment: It is important to recognize that the DGEIS does not contain any specific information that pertains to any real NPP. It does not describe the conditions at any operating or decommissioned NPP and it does not provide credible forecasts of the impacts that could result from the indefinite storage of SNF at a specific geographic location near or at the NPP. The DGEIS does not assess any genuine condition of the environment and it does not provide information about the environmental effects in the absence of a physical repository. (0867-2-3 [Griffin, William])

Comment: The key to the DGEIS, and the primary reason it is able to reach the conclusion that the environmental impacts of long term and indefinite storage of spent fuel at reactor sites are small, is that it relies on a number of assumptions which have the effect of eliminating the most troublesome issues from consideration. By this approach, NRC is choosing to address the issues raised by the absence of a permanent waste repository for nuclear wastes by doing normative forecasting - i.e. projecting an ideal, not a reasonably likely, future and then examining the impacts that could occur if that ideal future were reality. As already noted, this approach is inappropriate for conducting an environmental impact analysis which is intended to

assist NRC in making choices among alternative ways to deal with the problem created by the absence of a permanent waste repository. (0867-2-5 [Griffin, William])

Comment: The analysis of environmental consequences in the DGEIS does not reflect reasonably foreseeable and different future conditions. (0867-3-20 [Griffin, William])

Comment: The DGEIS does not contain a thorough and in-depth analysis of the consequences of indefinite storage of spent fuel. The DGEIS does not properly assess the impacts of indefinite storage of SNF because its analysis depends upon invalid or questionable assumptions. (0867-3-21 [Griffin, William])

Comment: The NRC is not entitled to agency deference on many these assumptions because in whole or in part, the assumptions fall outside of the agency's area of expertise. (0867-3-22 [Griffin, William])

Comment: The assessment does not properly address the risks to the environment. (0867-3-24 [Griffin, William])

Comment: The DGEIS fails to justify the use of generic analysis of many of the environmental consequences that are substantially impacted by site-specific variations. (0867-3-25 [Griffin, William])

Comment: This report examined the DGEIS and the NRC's assumptions, staff choice of methodology and the validity/reliability of the conclusions that flow from these. The use of these assumptions in the construction of the DGEIS leads the NRC to fail to address the hard look questions NEPA requires be examined. Instead it offers a generic analysis that does not provide an adequate record for NRC to make a decision on this major federal action. (0867-3-26 [Griffin, William])

Comment: First, the assumptions underlying the DGEIS conceal the real issues behind the generation, storage and movement of SNF. The NRC's assumptions in the DGEIS were used to limit the alternatives being considered and diminish the scope of the environmental consequences that needed to be evaluated. These assumptions, in conjunction with the Commission's choice to accelerate the time needed to do the analysis from the staff suggested seven years to the Commission mandated two years, resulted in an insufficient, invalid and unreliable DGEIS. (0867-3-27 [Griffin, William])

Comment: Secondly, the overall methodology used in the DGEIS avoids a valid and scientifically sound analysis of the issues. Using a normative forecasting method and thus assuming a future, rather than analyzing the facts and considering reasonably different futures, avoids the type of analysis required by NEPA. (0867-3-29 [Griffin, William])

Comment: In addition, the choice of a generic analysis does not meet the needs of NEPA because it glosses over the important site-specific conditions and factors which will markedly alter the environmental consequences and mitigation alternatives for each site. The use of unsupported assumptions led to no consideration of many of these site-specific conditions and factors. NRC has common methodological approaches like probabilistic risk assessment (PRA) that do consider different futures and make predictions about the probability of different conditions arising in the future in making consequences analyses but it fails to use a similar methodology here and thus fails to address a variety of reasonably foreseeable conditions that must be addressed in such an analysis. (0867-3-30 [Griffin, William])

Comment: Third, the analysis above offered several realistic and reasonable alternatives to the methodological choice of a generic analysis and the normative forecasting. Good methodological practice recognizes that a singular method for such an important task is often either invalid or unreliable - or degrees of both. A single method has flaws, as do all methods. What is needed is to address the issues in the best possible manner - one which seeks scientifically sound, valid and reliable results. That can better be achieved with the triangulation of methodologies - two or more wherein each covers the shortcomings of the other. NRC has not used even one of the exploratory methodologies in the DGEIS. To summarize, the choice of the generic approach, using normative forecasting and unsupported assumptions, does not meet a minimum level of research inquiry. It fails to construct a valid and reliable research endeavor that should be necessary to meet NEPA requirements. (0867-3-31 [Griffin, William])

Comment: Fourth, the choices by the NRC to avoid issues like environmental contamination from leaks in the pools/or dry storage, the real possibility of future funding shortfalls for their own operations, the realistic and foreseeable loss of institutional controls and the other issues noted above, should have been part of the analytical process but the DGEIS fails to address these very real concerns. (0867-3-32 [Griffin, William])

Comment: The nuclear industry is critically concerned about the availability of trained staff (ANS). There are reasons to believe that the industry will not be able to provide enough trained and technically sound staff if current trends continue. The continuing aging of the workforce is expected to create a severe shortage of qualified workers. The workers who are available will be needed for other, more lucrative purposes. These purposes include: • maintain the safe and reliable operation of commercial and defense nuclear plants • continue necessary research and development in education, medicine, power, and manufacturing • continue development and construction of new nuclear facilities • staff nuclear medicine needs • continue nuclear education[.] Spent nuclear fuel management will have to compete with other, more urgent and possibly more lucrative, fields for talent. Another alternative to address the impending talent shortage is that the US will be forced to hire foreign workers or outsource the spent fuel management to a foreign company entirely. This will create a different set of problems related to the safety and security of the fuel. The DGEIS is silent on this imminent problem and the implications it has for the risks and the environmental consequences of spent fuel management. (0867-3-8 [Griffin, William])

Comment: The methodology informing the Waste Confidence Rule EIS is scientifically invalid! The artificial creation of composite, generic, and non-existent nuclear sites is inherently flawed to perform qualitative analysis. (0869-3 [Homick, Nick])

Comment: YOUR CONCLUSION THAT IN ALL AREAS THE SHORT TERM, LONG TERM, AND INDEFINITE STORAGE IMPACTS ARE ALL "SMALL" IS SIMPLY 100% WRONG. (0887-5 [Chappellet, Carissa])

Comment: In addition, the DGEIS must show that it has quantified the risks and costs associated with siting a repository or failing to do so, including the risks and costs of maintaining spent fuel at reactor sites or away-from-reactor storage facilities for an indefinite period. (0897-1-15 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In addition, the NRC conducts a generic analysis using bounding parameters that are not broad enough to cover a number of site-specific concerns. See *New York v. NRC*, 681 F.3d at 480-81 (NRC must conduct a "thorough and comprehensive" analysis using "conservative bounding parameters."). (0897-4-24 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: And, it fails to consider impacts of storage of spent fuel in pools for longer than 60 years, although such storage is reasonably foreseeable and indeed contemplated by certain NRC regulations, including the proposed rule 10 C.F.R. § 51.23 (which has no time limit on extended storage) and existing rule 10 C.F.R. § 50.82 (which allows for decommissioning beyond 60 years under certain circumstances). See *Robertson*, 490 U.S. at 350; see also *Potomac Alliance*, 682 F.2d at 1035-36 (J. Bazelon, concurring) (noting that NRC may not simply ignore reasonably foreseeable possibilities). (0897-4-25 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Second, the decommissioning regulation contemplates storage beyond 60 years in certain circumstances. 10 C.F.R. § 50.82(a)(3). In determining whether decommissioning beyond 60 years is appropriate, NRC considers several factors, including the “unavailability of waste disposal capacity.” 10 C.F.R. § 50.82(a)(3). In light of the current unavailability of a repository or disposal site, it is reasonably likely that some licensees could seek Commission approval to extend the decommissioning time period, including wet storage of spent fuel, beyond the 60 year timeframe. In order to comply with NEPA, the NRC must assess the potential impacts of wet storage beyond 60 years. (0897-6-10 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Third, the NRC’s Decommissioning GEIS contemplates pool storage for more than 60 years in the ENTOMB alternative. Decommissioning GEIS, Supplement 1, NUREG-0586 (2002). The Decommissioning GEIS presents three decommissioning alternatives: SAFSTORE, DECON, and ENTOMB. As the NRC explains: “During the short-term storage timeframe, the pools will be used to store fuel until a licensee decides to remove the spent fuel as part of implementing either the SAFSTOR or DECON decommissioning option.” DGEIS at 2-25. The ENTOMB scenario, however, contemplates storage of spent fuel in pools for up to 100 years. *Id.* at 3-25– 26. However, the NRC ignores the third option for decommissioning, the ENTOMB scenario. See Decommissioning GEIS, Supplement 1, NUREG-0586 at 3-21. (0897-6-11 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: NRC’s SFP leaks impact analysis violates NEPA because it does not consider impacts from SFP storage beyond 60 years, even though longer storage in SFPs is contemplated by the proposed regulation 10 C.F.R. § 51.23 and by 10 C.F.R. § 50.82[.] NRC assumes that spent fuel will be stored in pools for no more than 60 years after the licensed life of a reactor, and thus, only looks at SFP impacts in the 60-year short-term timeframe. DGEIS at 1-14. NRC bases its assumption on one of its decommissioning regulations which states that “[d]ecommissioning will be completed within 60 years of permanent cessation of operations.” 10 C.F.R. § 50.82(a)(3); see also DGEIS at xxix. This assumption is problematic in at least three ways. (0897-6-8 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: We are aware that an agency preparing an environmental impact statement (EIS) can proceed even when important information is missing. But it is obliged to at least specify the important information and data gaps in any EIS and provide a discussion of the available evidence of the importance of the missing data. This is not only legally required under 40 CFR 1502.22, it is a basic element of scientific integrity and a part of the meaningful assessment of uncertainties. In case the data gaps are in critical areas and are so large that meaningful uncertainty bounds cannot be put on the impacts, the NRC should make that finding in its assessment of the problem. In this case, the NRC and other agencies know the data gaps well. Moreover, the NRC itself was on a path to remedy them at least to some extent over the coming years. But the Draft GEIS fails to discuss the consequences of a failure to include that

information in its environmental impact analysis and on its conclusions. (0898-2-5 [Curran, Diane] [Makhijani, Arjun])

Comment: The Draft GEIS claims that the environmental impact of long-term or indefinite storage is small. This is an absurd statement on its face, given the known extreme hazards of radioactive wastes and the lack of any experience of storing these toxins for even a hundred years, let alone hundreds of thousands of years. (0908-2 [Mikkelsen, Sara])

Comment: On page 8-8, in the discussion of "Irreversible and Irretrievable Commitments of Resources" the Draft states "there would be no irreversible and irretrievable ... for most..... HOWEVER, IMPACTS ON LAND USE, AESTHETICS, HISTORIC AND CULTURAL RESOURCES, WASTE MANAGEMENT, AND TRANSPORTATION WOULD RESULT IN IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS THE LOSS...IN PERPETUITY....IRREVERSIBLE COMMITMENT OF CAPACITY FOR WASTE DISPOSAL" My Comment: DOES THIS MEAN ACCEPTANCE OF PERMANENTLY SACRIFICE LAND ON OUR PLANET???? (0910-12 [Carey, Corinne])

Comment: On page.iii etc., repeatedly the draft states "Impacts would be SMALL." ... in the various sections and considerations. COMPARED TO WHAT???? (0910-9 [Carey, Corinne])

Comment: The prediction of continued safe storage is probably acceptable for the ShortTerm storage (60 years). However, is it reasonable to rely on relatively short actual storage experience to predict Long-Term (100 years) or Indefinite safe storage (even with aging management programs), given the findings of indicators of potential concerns cited in the GEIS (i.e. , "chloride-induced stress corrosion cracking of austenitic stainless steel and maintenance of dry cask storage system canisters [NRC 2012b] and the "potential effects of hydride reorientation on cladding behavior [Billone et al. 2013]? (0913-6 [Bevill, Bernard])

Comment: Have indications of other potential radiation induced embrittlement issues been identified and/or studied? (0913-7 [Bevill, Bernard])

Comment: (VIII-2) The hazard posed by a nuclear fuel assembly begins at the moment when the assembly first undergoes nuclear fission, which occurs inside a reactor. That moment would be the logical starting point for any GEIS that addresses spent fuel. A less logical, but perhaps plausible, starting point would be the moment when the fuel assembly is discharged from a reactor and placed in a nearby pool. The draft GEIS uses a much later and entirely illogical starting point. The draft GEIS considers the environmental impacts of storing spent fuel during a period that begins when the reactor that discharged the fuel is no longer licensed for operation. (VIII-3) By adopting this later starting point, the draft GEIS excludes from consideration a set of significant environmental impacts that arise in earlier phases of the life of a fuel assembly. That exclusion is illogical. (0916-1-16 [Curran, Diane] [Thompson, Gordon R.]

Comment: (IX-7) In Sections VI and VII of the Thompson scoping declaration, I set forth a number of recommendations for the use of scenarios.⁸³ [footnote 83 text: Thompson, 2013b, Sections VI, VII, and X.] These recommendations could have helped the framers of the draft GEIS to avoid the self-crippling of the draft GEIS that I have described in the preceding paragraphs. The framers ignored my recommendations. Those recommendations would, in principle, have allowed the draft GEIS to bound the radiological risk of storing spent fuel. Moreover, those recommendations would have allowed the draft GEIS to compare the risk posed by different scenarios and different options for managing spent fuel. (0916-2-3 [Curran, Diane] [Thompson, Gordon R.]

Comment: Rather than analyze the risks of irradiated nuclear fuel generation, storage (on-site, in pools and dry casks; and away-from-reactor), and ultimate disposition, NRC has instead simply assumed away all the risks. Rather than analyze risks, NRC has simply assumed safety, at every turn. (0919-2-14 [Kamps, Kevin])

Comment: NRC also makes an overly optimistic assumption that technological progress will advance as time goes on, or at the very least, our society will stay at the same level of civilizational advancement as it currently is at. (0919-2-8 [Kamps, Kevin])

Comment: On Page 2-25 (lines 13-16), NRC states: "Beyond the decommissioning period, the NRC assumes that all of the spent fuel has been transferred to a dry cask storage system in an at-reactor or away-from-reactor ISFSI, as no other option currently exists." (emphasis added) This is a refreshingly frank admission, for a change, coming from NRC! But we would add, these on-site, or away-from-reactor (centralized "parking lot dumps") ISFSIs could very well themselves become de facto permanent surface storage facilities - or dumps. The on-site ISFSI at Surry, VA has been there since 1986, with no end in sight. The so-called "away-from-reactor" ISFSI (wet pool storage) at GE Morris in IL (so-called, as the Dresden nuclear power plant's three reactors are just a half-mile away!) has been there since the late 1960s, with no end in sight. The list of examples is a very long one. (0919-3-18 [Kamps, Kevin])

Comment: At Page 1-17, lines 22 to 24, NRC states: "These analyses are not intended to be, and should not be interpreted as, representative of any specific storage facility or site in the United States where spent fuel is currently stored or could be stored in the future." This passage rings oddly legalistic in sound. That's a very strange thing to say. So this entire DGEIS is essentially a fictitious, meaningless document? With no connection to reality? (0919-3-8 [Kamps, Kevin])

Comment: At Page 3-1, lines 2 and following, NRC states: "the affected environment is the environment that exists at and around the facilities that store spent nuclear fuel (spent fuel) after the end of a reactor's licensed life for operation." But of course, if the irradiated nuclear fuel spills into Lake Michigan, for example at the Big Rock Point and/or Palisades nuclear power plant sites on Michigan's Lake Michigan shoreline, then it will flow downstream; if it leaks into the air, it will blow downwind. Over vast distances. It would re-concentrate up the food chain, atop which humans sit. And the effects would persist for many generations into the future. So, NRC's definition of the potential "affected environment" needs to be expanded, significantly. (0919-4-16 [Kamps, Kevin])

Comment: Re: lines 5 and following, "Where appropriate, this chapter will discuss the environmental impacts during reactor operations to establish the baseline affected environment at the beginning of continued storage." But reactor operations is not an appropriate baseline. The pristine environment that existed before the reactor was built is the appropriate baseline, at least from a radiological perspective. To exploit the fact that the adjacent reactor has already radioactively contaminated the environment, to justify further radioactive contamination from forevermore radioactive waste storage, is not appropriate. (0919-4-17 [Kamps, Kevin])

Comment: At Page 2-27, lines 10-12, NRC states "it should be recognized that the environmental impacts of constructing and operating an away-from-reactor ISFSI would be evaluated in more details (sic) in an environmental review associated with a site-specific license application." But NRC really doesn't know what it's talking about, as it has never really done one. It's all assumptions. If PFS, LLC is the best they've got to point to, it doesn't instill much

confidence. Its licensing was highly controversial, for good reason; and in the end, it got cancelled! (0919-4-6 [Kamps, Kevin])

Comment: The enhancement of existing aging management programs for the spent fuel pool concrete structure and liner plate should not just be done under the license renewal process. This should be an ongoing process that is done prior to license renewal and continues into the short term storage timeframe whereby leaks would be detected early and repaired. (0920-2 [Foster, Ruth])

Comment: The conclusion [in the GEIS] box indicates that NRC did independent impact assessments of continued storage, considered public scoping comments and did a cost-benefit balance. How does an agency do an independent assessment of those they regulate? The NRC has a conflict of interest in this case. If the assessment was done by an outside agency such as GEO, or outside institute such as NSF, it would be an independent-impact assessment. (0920-22 [Foster, Ruth])

Comment: You say there are no "there are no remaining issues that require resolution" (Lxii) and yet you also say "The environmental impacts of terrorism are an area of particular controversy." That also means that it requires resolution, and therefore your first statement is incorrect. But we will see also in other comments below that this statement is patently untrue. THERE ARE REMAINING ISSUES AND THEY MUST BE RESOLVED. (0930-1-15 [Lutz, Ray])

Comment: Page 1-17, Lines 14-15 "It is assumed that an ISFSI of sufficient size to hold all spent fuel generated will be constructed during the licensed life for operation." Not necessarily true. At San Onofre, they have not constructed the ISFSI completely yet, and yet their "for operation" license is no longer valid. You may have to change this to "licensed life for operation and decommissioning time (60 years)," otherwise, your assumption is clearly incorrect. Plus, why do you need to assume this? Please note you can't have it both ways, between this comment and the prior one, something has to give. (0930-2-10 [Lutz, Ray])

Comment: Page 2-12, Lines 17-20. You say that you are still working on trying to determine if the design basis and systems, structures, and components important to safety, including spent fuel pools, needs to be updated. But you haven't completed that yet. You say "NRC has not yet received responses to the request for information and has not decided whether any license needs to be modified, suspended, or revoked, for purposes of analysis in this draft GEIS, the NRC assumes that the existing regulatory framework remains unchanged." That sounds like a pretty big assumption, and clearly is in violation of your other assumption and statement that "there are no remaining issues that require resolution" (Page Lxii) Gee, this seems like yet another example of an issue that requires resolution, unless it is the normal practice of the NRC to depend on assumptions that everything is fine. This is quite distressing to say the least, that a regulatory agency that has has its primary mission safety, and it would simply assume that everything is fine. NO MORE ASSUMPTIONS, PLEASE. (0930-2-12 [Lutz, Ray])

Comment: Page 2-17, Lines 3-5, the same comment as #21 above ["It is assumed that an ISFSI of sufficient size to hold all spent fuel generated will be constructed during the licensed life for operation." Not necessarily true. At San Onofre, they have not constructed the ISFSI completely yet, and yet their "for operation" license is no longer valid. You may have to change this to "licensed life for operation and decommissioning time (60 years)," otherwise, your assumption is clearly incorrect. Plus, why do you need to assume this? Please note you can't have it both ways, between this comment and the prior one, something has to give.] (0930-2-14 [Lutz, Ray])

Comment: 4-.34, Section 4.9.3, as an example, "Indefinite Storage" If the ISFSI must be completely rebuilt at the end of 100 years, then THE SPENT FUEL SHOULD BE MOVED TO ANOTHER LOCATION, typically out of high-population density areas, away from water resources and to seismically inactive areas, and hopefully in a way that will not allow terrorist or wartime attacks. Therefore, IN NO CASE SHOULD ANY CO-LOCATED ISFSI CONTINUE TO OPERATE FOR MORE THAN 100 YEARS. Indeed, the canisters should be transported to a more appropriate area at that time, and this line of reasoning SHOULD BE MORE PREVALENT in the DGEIS. NO PERMANENT ISFSIs! We soundly REJECT THE NOTION presented in this section. The affect on Aquatic resources, again, assumes NO ACCIDENTS occur. (0930-3-6 [Lutz, Ray])

Comment: It is very apparent that lawyers directed those people who were writing and compiling the document to claim that most any scenario involving radioactive waste will have a "Small" impact. When one is dealing with among the few most toxic substances known (such as some kinds of plutonium and other radionuclides) in high concentration (and sometimes near major population centers), these claims flunk the basic logic test. (0937-2 [Campbell, Bruce])

Comment: Make sure to include in the record all documents which involve analysis of potential for leaks and fires at spent fuel ponds. This should not be too much to ask seeing that these two factors needed to be included in the generic document to satisfy the D.C. Circuit concern with the earlier inadequate Waste Confidence Generic EA. Seeing that the court specifically called for it, I am appalled at what passes for a true analysis in regards to both leaks from spent fuel pools, as well as possibility of fire at spent fuel pools. The court and concerned citizens must reject this inadequate and vague document which leaves us no closer to a meaningful evaluation of the relative safety of different modes and locations of radioactive waste storage. (0937-31 [Campbell, Bruce])

Comment: Radioactive waste is radioactive waste whether or not a facility has an operating license. In fact, certain radioactive waste at facilities with an operating license and certain radwaste at facilities who no longer have an operating license can be exactly the same in terms of curies, heat, and radionuclide dispersions -- thus the distinction does not make sense except insofar as it is supposed to be vague and generic and justifying promoting future nuclear power facilities and reactors without a thorough environmental review. (0937-32 [Campbell, Bruce])

Comment: The NRC Statement rates the risks of on-site storage as almost insignificant. This is not credible at any site. (0944-5 [Pascall, Glenn] [Watland, George])

Comment: The Draft GEIS claims that the environmental impact of long-term or indefinite storage is small. This is an absurd statement on its face, given the known extreme hazards of radioactive wastes and the lack of any experience of storing these toxins for even a hundred years, let alone hundreds of thousands of years. (0951-2 [Commenters, Multiple])

Comment: Blue Ridge Environmental Defense League ("BREDL"), the Institute for Energy and Environmental Research ("IEER"), Natural Resources Defense Council ("NRDC"), Riverkeeper, and Southern Alliance for Clean Energy ("SACE") hereby submit comments on the NRC's draft report, Background and Preliminary Assumptions for an Environmental Impact Statement Long-Term Waste Confidence Update (December 2011) ("Draft Report"). The Draft Report should be withdrawn because the assumptions it proposes are inconsistent with the National Environmental Policy Act ("NEPA") and NRC regulations. In addition, by indicating that the NRC plans to prepare an EIS that discusses the environmental impacts of long-term SNF disposal without also discussing the impacts of SNF disposal in a repository and the impacts

that may occur if SNF disposal is never achieved, the NRC unlawfully segments the environmental analysis for SNF disposal. Finally, the NRC's decision to issue the Draft Report without publishing a notice in the Federal Register is inconsistent with the NRC's open government policy and long-established practice. (0954-1 [Curran, Diane] [Fettus, Geoffrey])

17. Comments Concerning GEIS Assumptions – Dry Transfer System

Comment: Under its "indefinite storage" scenario, NRC has assumed that dry cask storage -- cask pads, inner canisters, and the dry casks themselves -- will be replaced once every 100 years, forevermore into the future. NRC assumes that Dry Transfer Systems will be built (and also replaced every 100 years), since pools will have been dismantled during decommissioning, by at most 60 years after permanent reactor shutdown. But NRC has not dealt with the very real risk that the irradiated nuclear fuel will so degrade with age that such transfer operations cannot be carried out safely or smoothly. This is especially a risk with "high burn-up fuel," that has spent more time in an operating reactor core, and is thus significantly more radioactive and thermally hot. NRC has also not provided the price tag for such future transfer and replacement operations. (0002-4 [Commenters, Multiple])

Comment: I would like to know what procedures are in place to conduct dry transfer of degraded fuel assemblies from the Wholetech casks when they expire in 100 years or less. How about 200 years, 300 years? That's how long it takes cesium to become benign. What about 240,000 years? (0163-22-7 [Shaw, Gary])

Comment: [I can only imagine how the next generation and the generations after that are going to feel when the amount of nuclear waste has grown even larger and they are dealing with the inevitable problems of] the difficulties, costs, spills, and accidents that will come from moving waste from pools to dry casks and then from dry casks to other dry casks. (0163-34-5 [Azulay, Jessica])

Comment: Likewise, the Generic Environmental Impact Statement is full of predictions that we will have a yet to be invented or tested equipment like dry transfer systems and casks that can reliably last for 100 years. (0163-34-9 [Azulay, Jessica])

Comment: NRC assumes that cask pads, inner canisters, and the dry casks will be replaced once every 100 years, for hundreds of millennia. Since Spent Fuel Pools (SFP) will have been dismantled by, at most, 60 years after permanent reactor shutdown, NRC further assumes that dry transfer systems will be built and replaced every 100 years. Will degradation of irradiated nuclear fuel prevent the proper execution of such transfer operations? No one knows and the NRC appears to disregard this concern. Can anyone seriously believe that the safekeeping of radioactive waste will continue for 240 millennia or even longer? (0230-5 [Garb, James])

Comment: Dry transfer systems. I remember talking about dry transfer systems during the Prairie Island nuclear waste fight in '94, in '88, in '90, throughout that whole time, first in administrative proceedings, then in the courts, then in the legislature. We talked about it, because that was clear at the time that the waste could not remain in the casks -- that something would have to happen with the waste in the casks. It would have to be transferred. How do you do that? Well, at the time they called it a dry box, and it cost about \$100 million a copy, as I recall. (0328-7-4 [Crocker, George])

Comment: Under its "indefinite storage" scenario, the NRC has assumed that dry cask storage- cask pads, inner canisters, and the dry casks themselves-will be replaced once every

100 years, forevermore into the future. The NRC assumes that Dry Transfer Systems will be built (and also replaced every 100 years), since pools will have been dismantled during decommissioning, by at most 60 years after permanent reactor shutdown. But the NRC has not dealt with the very real risk that the irradiated nuclear fuel will so degrade with age that such transfer operations cannot be carried out safely or smoothly. This is especially a risk with "high burn-up fuel," that has spent more time in an operating reactor core, and is thus significantly more radioactive and thermally hot. The NRC has also not provided the price tag for such future transfer and replacement operations. (0336-8 [Lish, Christopher])

Comment: NRC assumes that Dry Transfer Systems will be built (and also replaced every 100 years), since pools will have been dismantled during decommissioning, by at most 60 years after permanent reactor shutdown. But NRC has not dealt with the very real risk that the irradiated nuclear fuel will so degrade with age that such transfer operations cannot be carried out safely or smoothly; This is especially a risk with "high burn-up fuel," that has spent more time in an operating reactor core, and is thus significantly more radioactive and thermally hot. NRC has also not provided the price tag for such future transfer and replacement operations (0377-5-18 [Cuthbert, Lewis])

Comment: The practical problems in storing or reprocessing waste are severe. If spent fuel stored on site cannot be transferred to a remote site, it will be necessary over time to transfer fuel from one cask to another. No one knows how to do this, especially if the casks are damaged. (0431-10 [Pascall, Glenn] [Watland, George])

Comment: An example of this problem is the way that the EIS addresses the need to replace Independent Spent Fuel Storage Installations (ISFSI), storage canisters, and casks. Without looking at specific sites where SNF is stored, the EIS fails to consider the real possibility that there may not be room on the existing sites to construct the necessary Dry Transfer Systems (DTS) and ISFSI. Without adequate space on site, it may be necessary to transport the SNF to a location where the SNF can be repackaged in the replacement canisters and casks. (0459-4 [Johnson, Abigail])

Comment: The EIS also assumes that the necessary DTS can be constructed and operated successfully, in spite of the fact that one has not been built and operated. The EIS uses a DTS design that was never licensed or constructed as a generic example of what would be constructed. NRC found that, The DTS concept has merit, but never considered a license application for such a facility. (0459-5 [Johnson, Abigail])

Comment: In fact, the Draft GEIS has not demonstrated that the effective probability of accidents and events is zero. The Draft GEIS makes the assertion regarding low probabilities of all initiating events despite describing significant uncertainties and information gaps: With respect to the safety of dry transfer systems (DTS) that would be required in the long-term and indefinite timeframes, the Draft GEIS describes that no such systems exist in the U.S. today. For the purposes of the Draft GEIS, however, the NRC references a design for a DTS developed in the 1990s. Based on this reference design, the NRC concludes that future DTSSs will be safe to support continued storage with small environmental impacts (Draft GEIS, pg. 2-19). Considering a complete lack of experience developing a DTS in the U.S., the NRC provides limited evidence to support its assumption that such a system will be safe at all sites over indefinite continued storage timeframes. This underscores our findings that codifying continued storage will be safe over the timeframes considered in the Draft GEIS is premature, and that the Draft GEIS does not provide sufficient analysis to support its conclusion. (0473-1-20 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: moreover, the DGEIS acknowledges that a dry transfer system would be required to do so, and that none currently exists in the United States (this issue is discussed in more detail below) (0473-12-10 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: No dry transfer system currently exists in the United States: The key to the NRC's long-term storage plan is the combination of ISFSIs and dry transfer system ("DTS") facilities. Currently, not every facility in the U.S. has an ISFSI. Indeed, as of November 2010, only 63 ISFSIs were licensed, at 57 sites. See NRC, Spent Fuel Storage in Pools and Dry Casks, Key Points and Questions & Answers, available at <http://www.nrc.gov/waste/spent-fuel-storage/faqs.html> (last accessed Nov. 18, 2013). More importantly, the DGEIS acknowledges that no DTS facility currently exists anywhere in the United States. DGEIS at 2-20. The Department of Energy has not asked the NRC to approve the license for a DTS facility (DGEIS at 2-21), and the NRC has thus not required licensees to construct DTS facilities.²² [footnote 22 text: See, e.g., *Northern States Power Company, Prairie Island Nuclear Generating Plant and Prairie Island Independent Spent Fuel Storage Installation, Issuance of Director's Decision under 10 C.F.R. 2.206*, 63 Fed.Reg. 8703, 8710 (Feb. 20, 1998) (rejecting petitioner's request to order licensee to build a DTS facility).] (0473-12-16 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: This is true despite NRC's acknowledgment in a 2010 Staff memorandum to the Commissioners that "[f]or most (if not all) reactor sites, the SFPs do not have sufficient capacity to hold all the spent fuel generated during 60 years of potential operation under 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities." Memorandum, Robert Borchardt to Commissioners, COMSECY-10-0007 (June 15, 2010), ML101390413, at 2. Clearly, an alternative to spent fuel pool storage during the 60-year timeframe will be needed, and yet none is contemplated by the DGEIS. (0473-12-17 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: For both the at-reactor and away-from-reactor storage sites, the NRC assumes in the DGEIS that the construction, operation, and replacement of a DTS facility is necessary at some point to handle the transfer of fuel, and further assumes that ISFSI and DTS facilities would be replaced approximately once every 100 years. DGEIS at xxviii. The DGEIS contemplates first the construction of the ISFSI, and then at a later date, the DTS facility because it would not be needed right away (that is, it would not be constructed during short-term storage). DGEIS at 5-2, 6-8. The DGEIS contemplates that "[a] dry transfer system would be built at ISFSI sites (at-reactor or away-from reactor) in the long-term storage timeframe. A DTS would enable retrieval of spent fuel for inspection or repackaging without the need to return the spent fuel to a spent fuel pool." DGEIS at xxviii. NRC cannot rely on the hypothetical DTS option unless and until it is a reality in this country: until the technology has been proven and adopted, and until regulations requiring facilities to construct DTS facilities by a date certain have been promulgated. Otherwise, the DTS option is another effort by NRC to assume how nuclear waste storage might one day be handled to limit environmental review of present reality. The D.C. Circuit has rejected the NRC's attempts to do just that. See *New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012). In the absence of this information, the NRC cannot assume that all fuel will be removed from spent fuel pools or transferred from one dry cask to another at a certain time. Thus, the NRC must at a minimum conduct a spent fuel pool analysis, including severe accident or fire impacts, resulting from the storage of waste in pools for the long-term and indefinite time periods. (0473-12-18 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The DGEIS recognizes that each ISFSI and DTS facility must be licensed through separate licensing proceedings. DGEIS at 1-16. Yet, the DGEIS assumes that every ISFSI and DTS license application would be granted (id.), when in fact the federal government has not approved the technology itself and DOE has not asked NRC to license it. The DGEIS fails to consider options if DTS facilities never become a reality, if licenses are not granted to ISFSIs or DTS facilities at specific sites, or if these facilities are not an option at certain sites around the Nation. (0473-12-21 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Potential impacts assessed by unverified assumptions of deterioration of spent fuel pools, canisters, and casks, are as site-dependent as risks related to site-specific geology, geohydrology, and climate change with its attendant increase in severe weather events. (0553-14 [Wilshire, Howard])

Comment: Obvious problems of guesswork appear in use of existing environmental impact determinations of particular sites as "reference models for impact assessment;" for example the FEIS for the Skull Valley Utah ISFSI, which does not yet exist. The same difficulties apply to canister/cask environmental impact assessments, which are based on assumptions of reliability of a growing set of different designs, from which a "reference" model is selected which itself has no verified reliability. It is stated (p.2-12) that most dry cast storage systems fall into two main categories depending on how they are loaded. Loading is very differently handled for the two categories, posing different handling risks and different deterioration rates dependent on geographic location. Additional categories are implied by the statement that most dry casks fall into two categories. Other variants among the two categories are implied by the statements that "bare fuel casks...tend to be all metal construction" and in the canister-based system, "the canister is usually loaded while inside a transfer cask" and "transferred vertically into either a concrete or metal storage overpack or horizontally into a concrete storage module." So what "reference model is used for environmental impact assessment?" As no dry transfer systems exist in the U.S. (p. 2-19) and no design has been approved by the NRC, impact analysis is based on an arbitrarily selected reference DTS, which will be needed under the Long-Term and Indefinite storage scenarios. Performance can only be assumed and will be unverified, so no generic environmental impact assessment can be made. Reliance (p. 221) on the Transnuclear-EPRI DTS leads to an NRC conclusion "that some environmental impacts of the facility would be comparable to a DTS." (0553-15 [Wilshire, Howard])

Comment: A DTS would be built at each ISFSI location for fuel repackaging & (DTS) facilities would also be replaced every 100 years, along with casks and cask pads. Idaho National Lab report, INL/EXT-12-26218/FCRD-UFD-2012-000115 *Dry Transfer Systems for Used Nuclear Fuel*, B. Carlsen & M. Bard Raap, May 2012¹⁶ [footnote 16 text: <http://www.inl.gov/technicalpublications/Documents/5516346.pdf>] pointed out that a DTS is costly and if the Blue Ribbon's recommendation to develop one or more consolidated facilities were implemented in a timely fashion, the potential need for DTSs at ISFSIs would significantly decrease. There is no assurance that DTEs will ever be required and installed at ISFSIs--let alone replaced every 100 years.[TEXT BOX TITLED "2.3.1 At-Reactor ISFI Sites".] [TABLE 2-1 Summary of DTS Needs][Text Box and Table Submitted with Correspondence ML13354A021]. However, assuming that neither consolidated facilities nor permanent storage facilities are available, DTSs would be needed for age-related degradation of casks and unplanned events such as malicious attacks. Also a DTS would be needed if a site became available to repack assemblies in casks not suitable for transport. (0556-2-8 [Lampert, Mary])

Comment: Environmental impacts identified and specified by the Draft GEIS presume that there has been no degradation to waste fuel assemblies managed by ISFSI and DTS facilities. Because degradation will occur, however, environmental impacts must be reassessed in light of amount of waste that can reasonably be expected to experience degradation sufficient to affect DTS operations, for each degradation mode. (0608-18 [Crocker, George])

Comment: DTS-constructed during long-term time frame (160 years after operations cease): Section 2.1.4 discusses the dry transfer system (DTS) that could be constructed at or near ISFSI sites during the long-term and indefinite storage periods. According to the draft GEIS, the DTS would enable the retrieval of spent nuclear fuel for inspection or repackaging without the use of a spent fuel pool. Indeed, the concept of long-term or indefinite storage is dependent upon the ability to transfer the spent nuclear fuel, at some point in time, to new storage casks. We were therefore alarmed to read in the draft GEIS that while several DTS designs and related concepts have been put forward, there are "no dry transfer systems at US nuclear power plants sites today." Moreover, there is very little information about the "reference DTS" in the draft GEIS. Will all ISFSI sites use the same design? While there are general statements that the DTS would be licensed under 10 CFR Part 72 and would have to meet the radiological protection requirements of 10 CFR Part 20, we do not have any real licensing and operating experience with DTSs in which we can put our faith. Once again, we are asked to just trust the government. It is not clear whether dry casks will be required to be changed during the long-term or extended storage periods. We have no assurance that the casks in use can be used for 160 years or longer. As we understand from reviewing the NRC's May 2012 report, "Identification and Prioritization of the Technical Information Needs Affecting Potential Regulation of Extended Storage and Transportation of Spent Nuclear Fuel," there are a number of technical issues regarding extended dry cask storage that have yet to be resolved, such as the lack of monitoring or inspection capability for cladding, fuel cladding interactions, fuel assembly hardware and damaged fuel cans, fuel baskets, stainless steel canister, stainless steel canister, stainless steel canister and steel/cast iron and seals, polymer seals, neutron absorbers, neutron shielding and other components. Given that there seems to be no current way of internally monitoring a cask, we question whether or how a licensee can or will determine that a cask is no longer technically sound. Will the NRC make a determination, during Part 72 license renewals, that the dry casks in use are technically sound for the proposed re-licensing period? What is the expected operational life of a DTS? We have heard that the DTS could be a mobile facility, yet the DTS referenced in the draft GEIS appears to be a fixed facility. (0619-1-16 [Mahowald, Philip R.])

Comment: It is not clear which guidance document the NRC will use to evaluate DTS license applications to ensure that the requirements of NEPA are met. We remain very skeptical about the construction and operation of a facility that has never been built, but is an integral aspect of long-term and indefinite spent nuclear fuel storage. Greater detail regarding the licensing and other regulatory requirements of the DTS must be clarified and included in the final GEIS, and not just included as a reference for the reader to locate. The final GEIS should include a discussion regarding the minimum level of institutional controls that should be in place at each ISFSI and DTS during long-term and indefinite storage. There is no information regarding the skill level of workers expected to unload and re-load spent nuclear fuel that has been stored for dry casks for 100-150 years. Our Tribe is one of the closest communities in the nation to an ISFSI, and we expect assurances that environmental impacts will be thoroughly evaluated well before it is time to construct such a facility. (0619-1-17 [Mahowald, Philip R.])

Comment: It is with these questions in mind that we are reminded of the statement in the NRC's 1992 EA for the Prairie Island ISFSI: the TN-40 dry casks are designed to provide storage for spent nuclear fuel for at least 25 years. We remain very skeptical. It appears that the

technical capabilities of the dry casks in use at the Prairie Island ISFSI keep expanding and improving as time progresses and the prospect of an available repository diminishes. (0619-1-23 [Mahowald, Philip R.])

Comment: [T]he results of that research combined with results of intervening and ongoing policy, legislative, and legal activities will determine how best to carry out the acquisition, operation, and decommissioning of Dry Transfer Systems and/or the casks or ISFSI "pads" themselves. While the assumption that these are potential and envisioned steps for the period of storage that would provide continuing adequate protection of the public is understandable, much needs to be known about research results and the evolving policy and legal environment before such measures are proposed as NRC requirements. (0637-7 [Norton, Wayne])

Comment: Additionally, the draft GEIS "assumes that the licensee uses a DTS [dry transfer system] during long-term and indefinite storage timeframes to move the spent fuel to a new dry cask every 100 years." (1-14.) However, as the draft GEIS notes at 2-19, "there are no dry transfer systems (DTSS) at U.S. nuclear power plant sites today." In the same way that the Court held that it is unreasonable to assume the existence of a permanent repository for purpose of NEPA analysis on the waste confidence rule,⁹ [footnote 9 text: New York v. NRC, 681 F.3d 471 (D.C. Cir. 2012).] it is unreasonable to assume DTS exists for the purpose of analyzing impacts environmental impacts of long term storage. If nothing else, there should be analysis of impacts that does not assume the existence of DTS. (0669-11 [Walter, Joan])

Comment: Page 2-19. Discussion of Dry Transfer System[.] NRDC Comment[:] One of the fundamental linchpins of the conclusion of "small" environmental impacts in this Draft GEIS is reliance on institutional controls in perpetuity, and in particular, on the robust viability of the Dry Transfer System (DTS) discussed here. The DTS which does not, as far as NRDC is aware exist in actual form at any commercial operating reactor in this country. Further, there is not a licensed prototype in the country nor has NRC conducted any analysis to establish the ability of the DTS to isolate waste or protect public health in the event of any loss of institutional controls. NRDC has no doubt such a DTS can be constructed but we have no belief it will necessarily isolate the waste in perpetuity and to rely on such an assumption is arbitrary and capricious. (0706-3-23 [Fettus, Geoffrey])

Comment: Under section 2.1.4, pages 2-19 -2-21, the Draft GEIS addresses a DTS. The Draft GEIS should be modified to include a statement that a DTS is going to be necessary based upon the assumptions within the Draft GEIS. Not only is it going to be necessary based on these assumptions, but it will be required once interim storage or permanent disposal becomes an option. None of the casks currently used for storage are approved for transport and therefore the concept of a DTS is necessary. The Draft GEIS should also reference that one may be needed earlier if there is an incident involving a breach of the storage system. What happens in the interim when the DTS is being constructed? Is there a spent fuel pool or other containment facility? This needs to be addressed. (0783-2-17 [Harlan, Thomas])

Comment: Page 1-15, lines 16 and 17, reference is made to a dry transfer system and the construction of the same to facilitate spent fuel transfer and handling. Like the assumption of the storage facilities, there is no empirical evidence whatsoever with respect to the construction or operation of a dry transfer system (the "DTS"). The industry has no experience in building a DTS or, more importantly, transferring spent fuel or fuel assemblies from one cask to another. Will the spent fuel assemblies be intact enough to transfer in 100 years? The only experience to date does not support this supposition. The use of a DTS and the acceptability of the casks for the same must be more fully developed and cannot simply be an assumption. (0783-2-9 [Harlan, Thomas])

Comment: p. 4-76 to 4-Design Basis Events in Dry Cask Storage Systems. Comment: Potential impacts assessed by unverified assumptions of deterioration of spent fuel pools, canisters, and casks, are as site-dependent as risks related to site-specific geology, geohydrology, and climate change with its attendant increase in severe weather events. Obvious problems of guesswork appear in use of existing environmental impact determinations of particular sites as "reference models for impact assessment;" for example the FEIS for the Skull Valley Utah ISFSI, which does not yet exist. The same difficulties apply to canister/cask environmental impact assessments, which are based on assumptions of reliability of a growing set of different designs, from which a "reference" model is selected which itself has no verified reliability. It is stated (p.2-12) that most dry cast storage systems fall into two main categories depending on how they are loaded. Loading is very differently handled for the two categories, posing different handling risks and different deterioration rates dependent on geographic location. Additional categories are implied by the statement that most dry casks fall into two categories. Other variants among the two categories are implied by the statements that "bare fuel casks...tend to be all metal construction" and in the canister-based system, "the canister is usually loaded while inside a transfer cask" and "transferred vertically into either a concrete or metal storage overpack or horizontally into a concrete storage module." So what "reference model is used for environmental impact assessment?" As no dry transfer systems exist in the U.S. (p. 2-19) and no design has been approved by the NRC, impact analysis is based on an arbitrarily selected reference DTS, which will be needed under the Long-Term and Indefinite storage scenarios. Performance can only be assumed and will be unverified, so no generic environmental impact assessment can be made. Reliance (p. 2-21) on the Transnuclear-EPRI DTS leads to an NRC conclusion "that some environmental impacts of the facility would be comparable to a DTS." So, how many elements of comparability satisfy a generic assessment? (0805-14 [Wilshire, Howard])

Comment: Further, the NRC assures the public that this radioactive waste can be transferred into new casks every 100 years or less, yet no dry storage cask has ever been unloaded, and no safe, unloading procedure exists as evidenced by the 1993 Palisades situation when it was discovered that a VSC-24 cask had weld flaws. Consumers Energy "voluntary" promised to unload the irradiated fuel in the cask and put it back into the storage pool, but insurmountable technical difficulties prevented that from ever happening. Placing 400° F fuel back into 100° F pool water would result in radioactive steam hazardous to workers, and would thermally shock the fuel threatening to further degrade it. There was a short 50 hour window to cut open the welded inner cannister and unload the cask before the fuel would begin to overheat. So the cask remained fully loaded and dozens more fully loaded VSC-24 casks of questionable integrity sit on the shores of Lake Michigan. The NRC has failed to deal with the very real possibility that the irradiated fuel will so degrade with age that transfer operations cannot be accomplished safely. High burn-up fuel poses additional risk because it has spent more time in the reactor core making it significantly more radioactive and thermally hot. (0819-14 [Kline, Connie])

Comment: Experience further suggests that the installation of a DTS at each and every ISFSI location is also not likely to be necessary. If repackaging does become necessary, it is more likely that industry would consider bringing in portable systems for many locations or installing specially designed over-packs to prevent the need to open the existing canister. These activities could be accomplished with existing, proven technology and operational procedures. Portable transfer systems could be staged in central locations much like industry is currently doing with FLEX equipment as a preparedness measure for extremely severe events (earthquakes, floods, etc.) that might affect operating reactors. Furthermore, it is likely that advances in technology

over the centuries would provide for improved repackaging methods that would have even smaller impacts. (0827-2-1 [Ginsberg, Ellen])

Comment: On page xxviii, you list assumptions, and you say that the GEIS includes the assumption that "analyses in the draft GEIS are based on current technology and regulations". This statement should not be an assumption, and it is not correct. 1. The Dry Transfer Systems (DTS) are only conceptual, have never been built, and are NOT "current technology". Thus, the DGEIS is not based on current technology. 2. This statement should NOT be an assumption. Either the analyses ARE or ARE NOT based on current technology and regulations. Since the draft GEIS is your product, you should be able to state whether it is or is not based on current technology. We assert that it is not. But it is just simply wrong to assume this, that is pretty ridiculous. It would be like saying that we assume that this document has 100 pages in it. You don't need to assume if it is your own document. So this statement should be DELETED from the assumptions section, and placed in another section that makes statements of FACT. (0836-16 [Davis, Anonymous])

Comment: You rely on the existence on a Dry Transfer System (DTS) (section 2.1.4, Page 2-19) but these have never been built, are only a concept at this point, and may prove to be entirely unworkable. You can't rely on technology that does not exist as the single option! Instead, you should require either a wet-transfer system (such as a fuel pool) OR dry transfer system (that is still a figment of the designer's imagination) at any ISFSI site. Indeed, it may be easier for the ISFSI's co-located at an existing plant where a Fuel Pool already exists, to continue to utilize the fuel pool as long as practicable as a wet transfer system. The DTS envisioned cannot deal with casks and canisters that have been compromised and have significantly diverged from specifications. What happens when the fuel assemblies degrade for some reason to the point where they cannot be pulled out of the canister or cask? What if we discover the fuel assemblies have all experienced extreme embrittlement to the point that many have started to decompose? What happens if a canister starts to leak and we need to immerse it in a fuel pool to stop the leakage? From my reading, it may take 11 days or more to deal with a problem like this, with radioactivity released to the environment all the while. THIS IS UNACCEPTABLE. (0836-41 [Davis, Anonymous])

Comment: The details regarding how radiation releases will not occur by the DTS when the casks/canisters are removed from the DTS is not clear. If there is a severe problem with one of the canisters, such as a leak or accidental criticality event, then it may be necessary to immerse the cask in a fuel pool for safety until it can be stabilized. The fact that you are relying on untried and conceptual technology is yet another example of an "issue that requires resolution" that you claim does not exist. Sure, you can try to quantify releases from a conceptual DTS system, but this is yet another example of a wild-ass guess. The problem is not when the system works as it is supposed to, if it works at all, but when things go wrong. What happens if the DTS fails? is it contained in a containment building that will help to contain the release of radiation? Not addressed. (0836-42 [Davis, Anonymous])

Comment: Page 2-21 Line 20-21 "This draft GEIS considers the environmental impacts of constructing a reference DTS to provide a complete picture of the environmental impacts of continued storage." What a joke! This is only a CONCEPTUAL design of a DTS. No such thing exists. It has never been made, and the concept that you are providing a "complete picture" by analyzing a conceptual DTS as if it was a real thing, only makes us believe that you are so used to deceiving yourself that you don't even realize it when you are talking about something that does not even exist, as if it were a real thing and creates a real picture. You can't create a reference design based on a concept. (0836-43 [Davis, Anonymous])

Comment: Page 2-28, Line 4-5, you say the NRC assumes a DTS "or its equivalent" would be used to transfer fuel. What is "its equivalent" -- do you mean, as we assert, that a fuel pool should be described as THE option unless there is such a thing as a DTS that actually works? And, it may be necessary, we believe, and prudent, to maintain a (small) fuel pool as an emergency backup even if a DTS can work in some situations. (0836-45 [Davis, Anonymous])

Comment: The use of the DTS, which is all conceptual and speculative, as a key component that allows NWOs to continue to operate for 100s of years a severe defect, as these systems do not exist, and there is no track record to show that they work safely. Until these actually exist, the plan put forward MUST include a transfer system that we know will work, i.e. the wet transfer system. In other words, the fuel pools should be emptied but should not be decommissioned but remain available for an emergency. (0836-66 [Davis, Anonymous])

Comment: *A DTS will be built at each ISFSI location during long-term storage timeframe to facilitate spent fuel transfer and handling. The NRC assumes a 100-year replacement cycle for spent fuel canisters and casks. This assumption is consistent with assumptions made in the Yucca Mountain Final EIS (DOE 2008). The 100-year replacement cycle also assumes replacement of the ISFSI facility and DTS. Based on currently available information, the 100-year replacement cycle provides a reasonably conservative assumption for a storage facility that would require replacement at a future point in time. However, this assumption does not mean that dry cask storage systems and facilities need to be replaced every 100 years to maintain safe storage.* The NRC here assumes that there will be money, equipment, available expertise and an ISFSI capable of handling the waste. In addition there are no operating DTS facilities in the US and no DTS facilities of the size and complexity needed for the task that would be created by having to move 60 years of spent fuel from one group of dry casks to another group of dry casks. In addition, the DGEIS does not look at the environmental impacts that would be associated with the construction of a DTS at each reactor site or the environmental impacts that will be caused by the process of moving the wastes from the dry casks. (0867-2-10 [Griffin, William])

Comment: Additionally, the radiological risks of packaging and repackaging the materials will vary by fuel type, age, and volume. Degradation to the fuel assemblies may also adversely impact the transfer. A generic assessment may not be appropriate for these types of variability. (0867-2-20 [Griffin, William])

Comment: There is no DTS facility currently in operation in the U.S. Overseas DTS facilities are small in size and are custom designed for research reactors. The EPRI did a 2010 report (updated in 2012) that estimated the costs for operation of such systems and the early withdrawal of fuel from spent fuel pools. The report concluded there would be significant radiological doses and costs between \$3.5 and \$3.9 billion dollars. The NRC DGEIS assumes that these operations will be indefinitely feasible. (0867-2-7 [Griffin, William])

Comment: One of the underpinning assumptions of the DGEIS is that it will be possible to readily move the SNF from one storage canister system to another e.g. from a NUHOMS to a NAC type of canister. This assumption is made despite the fact that there is no system of this type currently operating in the US. There are small systems currently used for research reactors (NAC). There is no DTS currently working at any US nuclear power plant. A DTS system of the type and size envisaged by the DGEIS would require additional research and development, which would in turn require additional funding. Construction and operation of these facilities will create substantial environmental impacts, none of which are considered in the DGEIS. These facilities will need to be designed to withstand all the dangers that current reactors are

supposed to withstand, including natural events like floods and earthquakes and malevolent acts. The costs for such facilities can be substantial but the DGEIS gives that concern no consideration. The absence of the DTS raises the larger issue about how the NRC drew its conclusions about impacts. What is the basis for the NRC's conclusions about the risks and environmental impacts of its alternatives, if those conclusions are based on assumptions about the safe operation of equipment that does not exist? (0867-3-12 [Griffin, William])

Comment: According to some estimates, 10% of the inventory of SNF is damaged to one extent or another. The Blue Ribbon Commission on America's Nuclear Future received testimony about the seriousness of the damaged fuel problem. A study prepared by Bechtel SAIC (2005) concluded that for the purposes of designing a facility to handle the SNF it was necessary to assume that: a. Failed fuel quantities and types of damage arriving at the repository include: approximately 4 percent of he1 assemblies received are expected to have an average of 2.2 failed he1 rods per assembly; b. 90 percent of the failed fuel is estimated to be known and identified prior to shipment to the repository; 10 percent of the failed fuel is expected to have pinhole leaks and hairline cracks that will not be identified prior to shipment. The DGEIS mentions damaged fuel as a potential problem only twice (p. 471, p. 478). The DGEIS does not address the safety or risk implications of this damaged fuel. The Generic assessment does not include any severely damaged fuel and the long-term degradation of the damaged fuel containers is not considered. (0867-3-13 [Griffin, William])

Comment: Indeed, it should be noted in this context, that no spent fuel bundle, damaged or not, has ever been transferred from one dry cask to another. Further, while the Draft GEIS postulates a Dry Transfer System for fuel inspection, repackaging and transfer, such a facility has never been built in the United States. (0898-2-16 [Curran, Diane] [Makhijani, Arjun])

Comment: And as discussed in paragraph 4.27, the NRC even refuses to say how it would handle and repackage failed fuel. This makes the lack of discussion of the impacts of the transfer of failed spent fuel bundles even more problematic since the NRC lacks sufficient empirical basis for estimating the probabilities and consequences of the spread of radioactivity during transfers in the normal case. (0898-2-19 [Curran, Diane] [Makhijani, Arjun])

Comment: Additional details describing the projected, long-term, required aging management program using the DTS and its impact must be included in the GEIS. The program must address potential, long-term concerns that may result from long-term storage. (0913-10 [Bevill, Bernard])

Comment: While it is understood that much of the cited work that has formed the basis for the GEIS remains valid, the question must be asked as to whether the science, engineering, and operational experience (if any) has changed or is anticipated to change in the near-term that may possibly cast uncertainty on this basis. As an example, it is understood for purposes of this analysis the NRC "relies on" the facility description of a DTS (DOE 1996) that was reviewed and "the DTS concept" was found to have "merit" by the NRC (NRC 2000a), but was never licensed for operations. Also, some impact assessments contained in the GEIS were taken from the INEEL EIS (NRC 2004b), a facility that was eventually licensed by the NRC, but was never constructed, and thus no operational experience was available. It would seem that design engineering improvements or revisions would have certainly been made over time that may have revised the impact evaluation. (0913-5 [Bevill, Bernard])

Comment: Will the aging management inspections and required corrective actions that are currently performed in Spent Fuel Pools also be performed at on-site Dry Transfer Systems? (0913-8 [Bevill, Bernard])

Comment: Dry Transfer Systems Facility (DTS) Availability[:] For its "indefinite storage" scenario, the draft GEIS assumes that DTS facilities will be licensed, built, and replaced periodically on an as-needed basis (Sections 2.1.4 and 2.2.2. 1). In support of this assumption, the draft GEIS refers to the submission by the Department of Energy (DOE) to the NRC for the review of a topical safety analysis report (TSAR) on the Transnuclear-EPRI DTS design, and the NRC 's issuance of a license in 2004 to DOE for the Proposed Idaho Spent Fuel Facility. However, we are concerned that the applicability of these precedents may be limited, as neither of these proposed facilities has as yet been constructed. We also note that these facilities were conceptually less complex than the DTS envisioned in the draft GEIS. *Recommendation:* Acknowledge that these facilities have not yet been constructed and discuss how that may affect any assumptions. Provide a discussion that addresses the technical and regulatory challenges that have hindered the development of such systems in the past, as well as the potential for these challenges to be encountered in future efforts to construct and license more sophisticated facilities. Provide additional discussion of the past development and capabilities of DTS facilities. Include the following information: (i) the current status of these facilities, (ii) whether these facilities were licensed to retrieve, inspect, and repackage the fuel after prolonged storage as proposed for DTSS, (iii) whether high-burnup commercial fuel was licensed for storage, (iv) the reasons why facilities have not been constructed, and (v) whether these reasons would prevent licensing, construction and operation of similar facilities in the future. (0915-1 [Bromm, Susan E.])

Comment: Fuel Transfer/Repackaging[:] The feasibility of safe fuel transfers after long-term storage is uncertain. For example, when "new" replacement DTS facilities are built in the future, based on the degree of fuel and storage system degradation, fuel inspections may determine that it would be safer to leave some fuel in the "old" casks rather than transferring it to a "new" receiving cask. This scenario may be more likely if fuel must be transferred more than once in intervals of 100 years. Another scenario is that after an inspection, it may be determined that it would be unsafe to transfer assemblies to a new cask. These scenarios would essentially have the same consequences as not having a DTS facility available, with the additional potential for damage to the existing assembly (and subsequent releases of radionuclides) as it is being inspected. (0915-13 [Bromm, Susan E.])

Comment: *Recommendation:* Provide an additional discussion of circumstances that would affect the feasibility of repackaging in the DTS. Include fuel, cladding, and storage system degradation over long-term storage, and the likelihood of encountering such conditions. Consider the consequences of a "leave as is" scenario. Provide information on the frequency of assembly misloads based on industry data. Based on this information, provide an evaluation on how many assemblies will be impacted during long-term storage and what the radiological consequences would be during fuel storage and transfers. (0915-15 [Bromm, Susan E.])

Comment: Fuel Inspections[:] Page 2-21 of the draft GEIS states that " ...For the purposes of analysis in this draft GEIS, the NRC relies primarily on the facility description of the Transnuclear-EPRI DTS ..." However, it is EPA's understanding that the proposed Transnuclear-EPRI DTS did not have the capability of fuel inspection and remediation. Fuel inspection and remediation capabilities are critical for the assumed DTS. To support this assumption, the GEIS references pages 17 and 24 of the Carlsen (2012) report. Page 17 states that " ... The two primary DTS functions are to retrieve fuel for inspection and to transfer fuels into another package ..." Page 24 states " ...repackaging and remediation capability should be integrated into the design of future facilities." In addition, the draft GEIS provides a theoretical description of a conceptual DTS but not for an operating DTS. These conceptual descriptions do not include information on how fuel inspections will be performed or the potential impacts. Fuel

inspections would likely require cutting canisters open and repackaging the fuel in new canisters. In addition, it is our understanding that neither the license to Private Fuel Storage LLC (PFS) or to DOE for the Proposed Idaho Spent Fuel Facility included authorization to cut canisters open and inspect fuel for degradation and damages. It is also our understanding that although PFS submitted a request to the NRC to terminate its ISFSI license, DOE's facility was not licensed to handle commercial fuel that is used in commercial reactors. *Recommendation:* Provide information on how fuel inspections and remediation will be implemented at the assumed DTS facility in Section 2.1.4. Include potential radiological consequences of these operations. In addition, provide information on the potential public health and environmental impacts of the proposed fuel inspection, repackaging, and remediation at the DTS. (0915-5 [Bromm, Susan E.]

Comment: The draft GEIS relies on the fuel inspection performed during repackaging. While it may be inferred that inspections will take place within the DTS ("without the need to return the spent fuel to a pool"), this is not stated directly and the details on fuel inspections are not provided. In addition, information is not provided on the remediation actions if the fuel fails the inspection. *Recommendation:* Provide information on the fuel inspections during repackaging. Specifically, clarify whether the inspection will be performed in the pool under water or in inert atmosphere, or in air. Also provide information on remediation actions if the fuel fails the inspection. Where fuel inspections will need to be performed at a DTS either underwater or in an inert atmosphere, provide a discussion on the practicality and current regulations that would support licensing, construction, and operation of such an additional pool facility at DTSs. If fuel inspections will be performed in air, provide a discussion on potential fuel oxidation during inspections. (0915-6 [Bromm, Susan E.]

Comment: Regulation Requirements[:] The draft GEIS states that the analyses are based on current technology and regulations, and assume that a DTS will be licensed, constructed, operated, and completely replaced on a 100-year cycle. However, it is not clear which current regulations address the DTS's licensing, construction, operation, and 100-year cycle replacement. The stated capacity of the assumed DTS (to handle assembly transfers at an ISFSI licensed to store 40,000 MTU) is large, yet the draft GEIS does not discuss the practicality and feasibility of licensing, constructing, operating, and periodic replacements of a DTS at this scale. *Recommendation:* Provide information on the current regulations that address the construction, operation, and periodic replacement of DTSs with a stated capacity to serve an ISFSI storing up to 40,000 MTU and fuel inspection, remediation, and repackaging capabilities. Provide a discussion of the practicality and feasibility of constructing, operating, and periodically replacing DTSs at existing and future ISFSs. (0915-8 [Bromm, Susan E.]

Comment: Re: Page 1-14's discussion of Dry Transfer Systems (DTS), has this ever been done anywhere? At such a scale? How much will that cost at each site? NRC describes a prototype DTS that was actually abandoned before completion at Idaho National Lab. How can NRC assume all will go swimmingly with DTSs, till the end of time, when the prototype DTS, at INL, did not even go well? Given the power of fanciful assumptions, why did NRC not assume replacement pools at reactor sites? Because pools would cost more than DTSs? But NRC hasn't identified how much DTSs would cost, nor where the money would come from. What are the risks with DTSs? Although NRC has described a stuck fuel assembly during a DTS operation, that could remain stuck for two weeks, it assumes the incident would be resolved (without explaining how), with no significant impacts. NRC has largely, again, assumed safety, rather than analyzing risks. In this way, the DGEIS is meaningless, and violates NEPA, as well as the Atomic Energy Act. (0919-3-1 [Kamps, Kevin])

Comment: Steve Frishman, a consultant to the State of Nevada Agency for Nuclear Projects, has shared the story of a Yucca dump public meeting at which DOE officials presented ideas for the use of a large-scale pool for irradiated nuclear fuel storage, and transfer into disposal containers, at the Yucca site. After Mr. Frishman presented a number of concerns about pool storage during the discussion period, the DOE moderator called for a break in the meeting. When the meeting resumed, the DOE officials announced that the proposed pool, previously under discussion, was no longer under consideration. Dry transfer would not be the approach followed at Yucca. Cancelled, just like that, during a 15 minute coffee break!! I tell this story only to point out that a comprehensive DGEIS, which NRC should have carried out here, should have included a transparent examination of various options going forward. Pools? DTSs? Some combination thereof? No such comparisons have been carried out. No explanation has been given as to why DTSs were assumed, as opposed to pools. Given the large risks associated with irradiated nuclear fuel, NRC should have carried out a particularly "hard look" under NEPA at the pros and cons of various options, but has not done so. (0919-4-10 [Kamps, Kevin])

Comment: At Page 2-28, lines 20 and following, NRC states "the receiving cask lid and outer and inner canister lids are removed. Finally, the receiving cask is moved into the lower access area and mated to the transfer confinement area...", and so on. NRC makes transfer of irradiated nuclear fuel sound so smooth and simple. Reality will be different, especially considering fuel degradation with age. Irradiated nuclear fuel could simply fall apart. What can be done then? Build a sarcophagus over the DTS? What about criticality risks, if fuel debris falls to the bottom of DTS, and a later flood were to inundate the inside of the structure? What about the radiological leakage risks from such a scenario, in addition to the criticality risks? NRC has simply "assumed safety" rather than analyze such potential, and even likely (over time, given age related degradation of irradiated nuclear fuel), risks. Besides age related degradation, there is irradiated fuel that has already failed, or begun to fail, in the present day, as due to design defects, fabrication mistakes, operational damage, etc. These risks may not be off into the future - they have already begun to unfold in the present. (0919-4-11 [Kamps, Kevin])

Comment: Page 2-29, line 3: the NRC's mention of "effluent radiation monitoring" is a clear admission that there will be radiological releases from the DTSs over time. (0919-4-12 [Kamps, Kevin])

Comment: Re: Page 2-28, Section 2.2.2.1, Construction and Operation of a DTS [Dry Transfer System], the question is begged, why has NRC assumed DTSs, instead of newly constructed wet pools for transfer of irradiated nuclear fuel? For example, a GAO study published in 2009, comparing the costs of the Yucca dump, to centralized interim storage, to long-term on-site storage, did consider the potential for installing new pools (after the old ones had been dismantled during decommissioning) for the transfer of irradiated nuclear fuel from old dry casks to new ones as containers degraded with age. However, building new pools at each site would be staggeringly expensive, measured in the tens or hundreds of millions of dollars per pool. (0919-4-9 [Kamps, Kevin])

Comment: I also do not share your confidence about safe, sound, and smooth transfers between dry casks as the old ones wear out over time. In fact, as documented by Dr. Arjun Makhijani of IEER in his expert witness comments on behalf of an environmental coalition, including Beyond Nuclear, not a single cask to cask transfer of irradiated nuclear fuel has yet taken place in the U.S. (0929-2 [Kamps, Kevin])

Comment: On page xxviii, you list assumptions, and you say that the GEIS includes the assumption that "analyses in the draft GEIS are based on current technology and regulations".

This statement should not be an assumption, and it is not correct. 1. The Dry Transfer Systems (DTS) are only conceptual, have never been built, and are NOT "current technology". Thus, the DGEIS is not based on current technology. 2. This statement should NOT be an assumption. Either the analyses ARE or ARE NOT based on current technology and regulations. Since the draft GEIS is your product, you should be able to state whether it is or is not based on current technology. We assert that it is not. But it is just simply wrong to assume this, that is pretty ridiculous. It would be like saying that we assume that this document has 100 pages in it. You don't need to assume if it is your own document. So this statement should be DELETED from the assumptions section, and placed in another section that makes statements of FACT. (0930-1-9 [Lutz, Ray])

Comment: You rely on the existence on a Dry Transfer System (DTS) (section 2.1.4, Page 2-19) but these have never been built, are only a concept at this point, and may prove to be entirely unworkable. You can't rely on technology that does not exist as the single option. Instead, you should require either a wet-transfer system (such as a fuel pool) OR dry transfer system (that is still a figment of the designer's imagination) at any ISFSI site. Indeed, it may be easier for the ISFSI's co-located at an existing plant where a Fuel Pool already exists, to continue to utilize the fuel pool as long as practicable as a wet transfer system. The DTS envisioned cannot deal with casks and canisters that have been compromised and have significantly diverged from specifications. What happens when the fuel assemblies degrade for some reason to the point where they cannot be pulled out of the canister or cask? What if we discover the fuel assemblies have all experienced extreme embrittlement to the point that many have started to decompose? What happens if a canister starts to leak and we need to immerse it in a fuel pool to stop the leakage? From my reading, it may take 11 days or more to deal with a problem like this, with radioactivity released to the environment all the while. THIS IS UNACCEPTABLE. (0930-2-15 [Lutz, Ray])

Comment: The details regarding how radiation releases will not occur by the DTS when the casks/canisters are removed from the DTS is not clear. If there is a severe problem with one of the canisters, such as a leak or accidental criticality event, then it may be necessary to immerse the cask in a fuel pool for safety until it can be stabilized. The fact that you are relying on untried and conceptual technology is yet another example of an "issue that requires resolution" that you claim does not exist. Sure, you can try to quantify releases from a conceptual DTS system, but this is yet another example of a wild-ass guess. The problem is not when the system works as it is supposed to, if it works at all, but when things go wrong. What happens if the DTS fails? is it contained in a containment building that will help to contain the release of radiation? Not addressed. (0930-2-16 [Lutz, Ray])

Comment: Page 2-21 Line 20-21 "This draft GEIS considers the environmental impacts of constructing a reference DTS to provide a complete picture of the environmental impacts of continued storage." What a joke. This is only a CONCEPTUAL design of a DTS. No such thing exists. It has never been made, and the concept that you are providing a "complete picture" by analyzing a conceptual DTS as if it was a real thing, only makes us believe that you are so used to deceiving yourself that you don't even realize it when you are talking about something that does not even exist, as if it were a real thing and creates a real picture. You can't create a reference design based on a concept. (0930-2-17 [Lutz, Ray])

Comment: Page 2-28, Line 4-5, you say the NRC assumes a DTS "or its equivalent" would be used to transfer fuel. What is "its equivalent" -- do you mean, as we assert, that a fuel pool should be described as THE option unless there is such a thing as a DTS that actually works?

And, it may be necessary, we believe, and prudent, to maintain a (small) fuel pool as an emergency backup even if a DTS can work in some situations. (0930-2-19 [Lutz, Ray])

Comment: The use of the DTS, which is all conceptual and speculative, as a key component that allows NWOs to continue to operate for 100s of years a severe defect, as these systems do not exist, and there is no track record to show that they work safely. Until these actually exist, the plan put forward MUST include a transfer system that we know will work, i.e. the wet transfer system. In other words, the fuel pools should be emptied but should not be decommissioned but remain available for an emergency. (0930-3-18 [Lutz, Ray])

18. Comments Concerning GEIS Assumptions – Timeframes

Comment: The only legitimate reply to the courts should have been that NRC has no confidence that waste repositories will ever be available, let alone that NRC will even exist within these long time intervals. The DEIS, like the so called Blue Ribbon Commission on Nuclear Futures, simply puts off to a distant future any resolve to solve the problems of spent fuel. It is ludicrous to extend the definition of short term to be 60 years beyond the closure of nuclear plant operation. (0059-10 [Andrews, Richard])

Comment: Now, I only had maybe an hour and a half to review this document so I spot checked. You know, nobody's paying me to do this, nobody gave me talking points. And I hadn't seen the list of questions that they really wanted to answered. But it turns out within an hour and a half I'd spotted one of them anyway. And that's the issue of indefinite storage. And one of the things people haven't mentioned is the timeframe for indefinite storage is a million years according to the EPA, just to put that into perspective. So I obviously don't believe the document adequately addresses the environmental impacts of indefinite time storage. And, for example, Section ES.9 of the executive summary states that the indefinite timeframe is highly unlikely. This would appear to reflect a myopic and naive assumption that a repository will become available. That's in the face of mounting evidence to the contrary. We must face reality. The Yucca Mountain team consisted of the best people we have and they had unlimited resources, yet they failed. They didn't fail due to incompetent management nor did they fail for lack of resources, they failed because they were given an impossible task. (0112-20-1 [Robinson, Herb])

Comment: The document doesn't properly address the environmental impact of the indefinite timeframe because that is an impossible task. We should be using proper engineering methodology. And we better be talking engineering here, not experimental science projects. Proper engineering methodology uses proven technology to achieve a practical result. There is no proven technology to displace something for a million years. Not for 100,000 years, not even for 10,000 years. The longest lived man-made structures I know of are the pyramids. They've been around for 5,000 years and they failed at their intended purpose in prehistoric times. (0112-20-2 [Robinson, Herb])

Comment: The NRC also assumed with no factual basis that all nuclear waste would be gone from spent fuel pools by 60 years after the licensed life a nuclear power plant. (0163-1-5 [Schneiderman, Eric])

Comment: [S]o you're actually considering 200 years in the future and you're making this -- the assumption that you understand all the possible developments of climate change, of seismic activity, of terrorist threat, of the cyber issue alone, which has emerged as a major current threat, is not only just to Indian Point but a threat to the grid, which in turn affects Indian Point. (0163-12-2 [Lee, Michelle])

Comment: So when we look at the Proposed Rule here and we're talking about 60 years, or 160 years, or indefinitely, I think that the most important thing to do is to realize that we cannot look that far ahead, so that we have to come up with a solution that will enable our country to move forward. (0163-16-7 [Wolf, Peter])

Comment: The second reason, the NRC relied on a number of assumptions to write this EIS that RiverKeeper believes are completely divorced from reality. And I'll go through these very quickly. I know I don't have a lot of time. The first one is that as Ms. Dean said, all the waste will be out of the spent fuel pools 60 years after the plan is permanently shut down. I could tell you I've never heard Entergy commit to removing all the waste from the pools and there's no sign that they will do so in those 60 years. And there's also regulation with the NRC that would allow them to ask for an exemption from this requirement, so there's a way out of this. (0163-2-4 [Musegaas, Philip])

Comment: I believe that the general response here tonight has been enough to show you that we are not confident at all, so where does this confidence come from that you think you can handle nuclear radioactive waste for 240,000 years? I have a grandson who is going to be four years old this week, and the idea of 160 years, I mean that's going to be even after his lifetime. So let me see, that's his child, that's his grandchildren, his -- I can't think. (0163-24-2 [Allen, Judy])

Comment: When I contemplate 250,000 years, I just ask everyone to think a moment who could even imagine that span of time, and that's the amount of time that this, what is referred to as "Poison Fire" by Joanna Macy, who has thought about these issues a lot, has called it. And how can we conceive words like "always, certainty, leak-proof, safe, rigorously inspected, safely and reliably, and confidence." (0163-39-1 [Sack, Emily])

Comment: [T]here is a stated rush to complete this within a two year period. This is probably the largest decision this country has to make for long term throughout the nation, and to rush it, when we know that after 60 years of nuclear fission we don't know how to handle the waste, is ridiculous. And this idea that there's a possibility, there's magical thinking that there's going to be -- in 60 years there's going to be -- we're going to figure it out makes absolutely no sense. And that's what this GEIS relies upon. (0163-7-3 [Shapiro, Susan])

Comment: [T]he changing of the waist barrels every 100 years for ever just isn't realistic. (0200-3 [Individual, Anonymous])

Comment: I am going to begin my comments by quoting the executive summary at the beginning of the document: "The Court identified deficiencies in the 2010 Waste Confidence rule and supporting decision related to the NRC's environmental analysis of spent fuel pool fires and leaks, and the environmental impacts should a repository not become available." Let me repeat the last part of that sentence: "and the environmental impacts should a repository not become available." In the document, this is called the indefinite timeframe. Nowhere in the document does it mention that the indefinite time frame is one million years (according to the EPA). This document doesn't adequately address the environmental impacts of the indefinite time frame. (0208-1 [Robinson, Herb])

Comment: Section ES.9 of the executive summary states that the indefinitely timeframe is "highly unlikely." This would appear to reflect a myopic and naive assumption that a repository will become available in the face of mounting evidence to the contrary. Let's face reality. The Yucca Mountain team consisted of the best people we have and they had essentially unlimited resources. Yet, they failed. They didn't fail due to incompetent management. Nor did they fail for lack of resources. They failed because they were given an impossible task. (0208-2 [Robinson, Herb])

Comment: There is a parallel situation here. The document doesn't properly address the environmental impact of the indefinite time frame, because that is an impossible task. We should be using proper engineering methodology -- and we had better be talking engineering here -- not experimental science projects. Proper engineering methodology uses proven technology to achieve a practical result. There is no proven technology to sequester something for a million years. Not for 100,000 years. Not even for 10,000 years. The longest-lived man made structures I know of are the pyramids. They been around for very roughly 5,000 years and they failed at their intended purpose in prehistoric times. (0208-3 [Robinson, Herb])

Comment: NEPA law requires alternatives to be analyzed for a full understanding of possibilities. The DGEIS alternatives are lacking in understanding, complexity, or foresight. The 60-year time frame appears arbitrary. If you review previous decisions by the NRC, this is a doubling of an earlier 30-year recommendation (Arbitrary). I claim that the 60 year "short term" storage after license expiration is too long, that the 160 year "long term" storage is too long and that the "indefinite" storage of the materials stored in perpetuity lacks responsibility, is naive and is absolutely impossible (way beyond reasonable and foreseeable) to analyze and fails NEPA and the NRC mission. Although you do not wish to consider the "worse case scenario", other alternatives must be considered. It was disappointing to read the section on other alternatives considered but eliminated. I arbitrarily and for your consideration select 10 years post licensing expiration for the short term, 20 years post licensing for the longer term and a denial of an indefinite storage without the absolute need and accessibility of either of the following two technical solutions. 1. An approved and environmentally analyzed deep geologic repository OR 2. A reprocessing facility for nuclear materials proven to be technically adequate for recycling this highly dangerous material. Without a continued and safe final conclusion of the waste material in a safe manner, the indefinite storage is impossible and the discontinuation of the generation of the spent nuclear material should occur. There are no reasonable and foreseeable considerations for indefinite storage as described in the DGEIS. (0219-8 [Olmstead, Stan])

Comment: In their internal scoping for irradiated nuclear fuel, the NRC staff identified three scenarios: 1) evaluate storage until a repository is available mid-century, 2) evaluate storage until a repository is available at the end of the century and 3) continued storage if a repository is not available. Scenario Three is "unavailability of a national nuclear waste repository." The scenario of a repository being unavailable is the most likely of the three and the yellow arrow in slide number 13 should extend for at least 10,000 years and have 65 arrow points. (0222-13 [Zeller, Lou])

Comment: No one can predict what will happen during 100,000 years of necessary storage. Any waste MUST be neutralized as soon as it is categorized as waste. (0239-2 [Rasmussen, Kenneth])

Comment: You know, to me the answer is in the way NRC has done this GEIS. You see a lot of bounding analysis, you see looking at things like spent fuel staying open for 60 years after a plant closes when in reality the average, since we developed dry cask storage technology, is around 11 years. You know, you see us building dry transfer facilities and repackaging at all these places every 100 years. Well, not likely to be there for 100 years when you look at repository developments around the world, but even if it is we'd come up with better ways. We would bring in portable systems and different technologies, but that's okay. That what it means to be bounding. This analysis is appropriate for every site because it bounds and envelopes what is likely to happen at any site. This is where it's a good job. It is factually based. Because I've heard tonight and we've heard before, it's all assumptions, you don't know. (0244-11-6 [McCullum, Rod])

Comment: The Commission has determined that continued onsite storage of spent nuclear fuel, beyond the licensed life, for operation of a reactor is feasible. They also make the assumption that having a mined geologic repository within 60 years following the licensed life or operation of a reactor is also feasible. In the event that repository is not developed in the future when necessary, the NRC assumes that the nuclear industry will successfully develop alternative methods of storage. (0244-14-3 [Prescott, Lisa Marie])

Comment: Why does the NRC, an official regulatory agency, incorporate terminologies such as, "when necessary" in reference to permanent spent fuel disposal? (0244-14-4 [Prescott, Lisa Marie])

Comment: The NRC's draft waste confidence GEIS skirts the issue of long-time storage safety by assuming fuel and dry casks can be managed indefinitely for hundreds of years. It is not considered an impossibility, but imagine the impacts of pool leaks, especially tritium where there is a significant history of such accidents nor show concern for earthquakes, tornadoes, floods which grow stronger with climate change. (0245-14-4 [Kurz, Carol])

Comment: I read your report and I admire the effort you put forth to look at everything from tornados to terrorism, but I got hung up on time. And being an ex-teacher, I produced a visual aid here to explain what I'm concerned about. What I have here are some fishing lines, and I took the first six inches here and I measured off the time equivalent to the first -- 2,000 years from 0 A.D. up here to the present. So, if you let 2,000 years be six inches, it becomes a math problem just to fix other points along the line. The part I marked off in black here which you probably can barely see is the industrial revolution, roughly about from 1850 up to the present. And there's a little red band here at the end that you might not be able to see. That's out to the year 2100 at the end of the century. When I'm thinking about time, that's the time I'm mainly thinking about, you know, what's going to happen just by the end of this century. And scientists predict not a lot of good things. In addition to climate change, we may lose a quarter to half the world's species; we're going to lose our fisheries; our water tables are threatened. Add another half an inch if you want to extend time a little bit. We're going to run out of oil, we're going to run out of coal, and we're going to run out of natural gas. The point is, scientists right now have not a very clear idea of what the world is going to look like in just 100 years, and you're saying you know what the world is going to look like 250,000 years from now, a place where can store radioactive waste safely. To me, that's just ludicrous. To help you get a handle on the length of time that we're talking about here now, Sally is going to pull out this fishing line. And it doesn't take long until she gets just to 6 feet. And there it is, 6 feet. That represents the half-life of plutonium-239. That's out 24,000 years on this scale. Don't be too excited about that being a short distance because one half-life isn't what we need to worry about. We need to worry about several half-lives when we're storing these wastes. Now she's going out and you're going to have to move pretty quickly here. She's going out to technetium-99, which has a half-life of 210,000 years, she's going to go out 53 feet. And she's not quite there yet. Go, Sally. If she were to continue to do tin-126 she'd go out 58 feet; selenium-79, 82 feet; zirconium-93, 375 feet; neptunium-237, 500 feet; cesium-135, 575 feet; palladium-107, 1,625 feet; and iodine-129, 3,925 feet. That's three quarters of a mile. [MODERATOR CAMERON: I think we're losing Sally back there.] MR. KNEIDEL: Yes, right. Well, we'll lose more than that. How can you believe we can store waste that long with the technology we have today? That's just absolutely ridiculous. There'll be several ice ages during the length of this time. Over 500 million species have evolved and gone extinct on earth and none have left a burden like this for the species that followed. (0250-17-1 [Kneidel, Ken])

Comment: How can you believe we can store waste that long with the technology we have today? That's just absolutely ridiculous. There'll be several ice ages during the length of this time. Over 500 million species have evolved and gone extinct on earth and none have left a burden like this for the species that followed. (0250-17-2 [Kneidel, Ken])

Comment: Whether in pools or dry casks, with proper maintenance and monitoring there's no reason that used nuclear fuel cannot be stored onsite indefinitely. (0250-18-5 [Lang, Amanda])

Comment: I hear all this technical stuff. Well, you know, it's been good for 50 years. It's been good for 60 years, but it's not going to be good forever. We know that. We know it through history. (0250-26-2 [Maphet, Sheila])

Comment: One of most tenuous assumptions is 100 percent success at keeping this waste contained for the centuries, for the eons, for the million years that it needs to be contained. These assumptions have proven to be false at Chernobyl and Fukushima. (0250-5-4 [Safer, Don])

Comment: With these timelines, you know, on the short frame 60 years, mid frame 160 years, you know, you really can't see a lot of things, you know, or plan for a lot of things that are out there. And when I think back 160 years, where were we 160 years ago? I mean, you know, we were ten years before the Civil War. I mean, Abe Lincoln couldn't even see that coming in the mid-1850s. (0250-69-3 [Rundle, Steve])

Comment: I think it's also problematic to think that communities are going to take spent fuel storage indefinitely. (0250-7-4 [Corbett, Susan])

Comment: So how are we going to assume that we can contain something that has a life of 100,000, 200,000, 300,000 years? (0250-9-3 [Tomlin, Willie])

Comment: As an aside, we question the conclusion that storing used fuel essentially forever would necessarily have "small" environmental impacts in the aggregate. (0262-4 [Patterson, Karen])

Comment: We hasten to add that the NRC's short-term and long-term timeframes appear founded on reasonable assumptions and information in the record. (0262-6 [Patterson, Karen])

Comment: So first, I would just like to say, or perhaps, last, the DEIS is inadequate because it fails to articulate a method to safely store waste out west for 250,000 years. We think the future is going to be better than we are. I'd like to think so, but our pattern hasn't proven that point. Keep the faith, keep standing up, and you're right, we're going to fight you at every turn, because we have not done what we're supposed to do to make nuclear power safe. (0326-21-3 [Conn, Diane])

Comment: When I first read over your proposal tonight, or the Rule proposal, given that my long-term planning at this point is about 30 years, you lost me on short-term planning that would make my, as yet, unconceived grandchild, the father of a very old man or woman before we get into your long-term planning. (0326-43-1 [Rippner, Sharon])

Comment: A question I ask is why is there no permanent safe storage? And the answer is because that's an oxymoron. There is no permanent safe storage. This toxic waste will be a liability for millions of years, with the half-life of plutonium-239 at 250,000 years. These are time spans that really have no meaning. What are we talking about? 250,000 years? A million years?

And when we talk about infinity, I mean, do we understand what infinity is? Do we understand what a trillion dollars is? These are all words that are just thrown out there. We have no idea what we're talking about. Civilized man hasn't even been around for 250,000 years, let alone a million years. How can you possibly project that far ahead in time with any confidence at all? You can't. (0326-53-4 [McGibney, Patrick])

Comment: I wanted to say some site-specific stuff about Davis-Besse. We knew as early as a decade or 15 years ago that the new homes casks manufactured by Vectra Technologies, which are now owned by Transnuclear, which is Areva, which is the French government, and fully loaded with high-level radioactive waste at Davis-Besse were discovered to have been built below technical specifications. The aggregate used to fabricate the cask's outer concrete shells was poor quality, and the shells themselves were ground too thin. And then another Transnuclear cask located in Virginia at the Surry Nuclear Power Plant had developed six-inch-long cracks in its outer concrete shield, had loose bolts, and had a helium leak, the same cask model. So, in the NRC's Nuclear Waste Confidence Draft Generic Environmental Impact Statement, they have confidence in essentially dry cask storage forever, when we haven't gotten it right yet in this country due to massive quality assurance violations on the design and manufacture. (0327-10-3 [Kamps, Kevin])

Comment: At the outset, the GEIS needs to be refocused to separate from a Waste Confidence standpoint the continued operations of the nuclear power plant from the waste storage. The purpose of the Waste Confidence Rule is to provide a benchmark for the time that the NRC believes the spent fuel can be safely stored. Assuming that the storage is in dry casks, which the GEIS does, the identifiable time frame that has been selected by the NRC is 100 years; that is, spent fuel can be safely stored for a period of 100 years before a cask has to be replaced. This time frame does not take into account any information from the manufacturer, such as its declarations of warranty or useful life of the cask. Despite this determination, the GEIS and the Waste Confidence Rule upon which it is based uses as a starting mark the date the plant ceases operations. There is no accounting for the many casks that have been loaded and are sitting for years, indeed decades before the plant operations cease. It would be more appropriate, therefore, for the GEIS to separate operations from storage and focus solely on storage since, after all, that is the reason for the existence of it in the first place. In other words, the statement from the NRC for the confidence in storage should run from the date that the spent fuel is put into a cask, not the date that the plant that has generated that spent fuel ceases operations. (0328-2-4 [Rauterkus, Ralph])

Comment: All attestations as to the containment of large quantities of nuclear waste for 60 years, 70 years, a century, and beyond are hypothetical, based on limited collections of experiential data, and untested by reality. (0341-1-16 [Mermelstein, Richard])

Comment: The conceit advanced in the GEIS is that a protective scheme for nuclear waste can be broken down, into the following three (almost incandescently euphemistic) categories: * "Short Term" - referring to storage in spent fuel pools for the period of the next 100 years; * "Long-Term" - referring to storage in dry casks for the coming 200 years; and * "Indefinite Storage" - an indefinitely defined term, presumably to be for effectively forever. Putting the problems of hubris and absurdity aside for the moment, the entire GEIS suffers from the following fatal flaw: It does not incorporate time into its time analysis. Yes, there are lots of iterations of "aging management" plans (which, incidentally, are plans, not realities). True too, there is acknowledgement of population growth, and climate scientists' warnings of climate change bringing droughts, rising sea levels and sundry other altered climate conditions. However there is no actual analysis of the effects of time. Nor is there recognition

that long durations of time bring into play factors and events that cannot be anticipated. Reflection upon the past provides perspective. (0341-1-20 [Mermelstein, Richard])

Comment: There is nothing scientific about NRC claims that it can guarantee the safe storage of nuclear waste for a million years. This waste contains plutonium & uranium with half-lives of 24,000 years and ten billion years, respectively. You needn't have any expertise, just a little commonsense to realize how insane this is. One million years takes us to the Calabrian stage of the Pleistocene era, a period of which we know very little, hundreds of thousands of years prior to the emergence of the Neanderthal. But going forward in time, we know little if anything about events a decade from now, and we have no way to know anything about conditions ten thousand centuries from now. That the word 'confidence' is used by the NRC when talking about safeguarding radwaste for a period of time five hundred times greater than the Christian era is preposterous! There is no proven technology to displace something for a million years. Not for 100,000 years, not even for 10,000 years. The longest lived man-made structures are the pyramids. They've been around for 5,000 years and they failed at their intended purpose. (0373-10 [O'Malley, Brian])

Comment: The NRC's claim that the indefinite storage of such waste in fuel pools and dry casks provides confidence that this waste will never cause a threat has no scientific validity, particularly since neither casks nor fuel pools are designed for permanent storage. The court itself found that the NRC had no technical basis to simply assume temporary storage methods (fuel pools and dry casks) are adequate for indefinite storage. (0402-3 [Gross, Cheryl])

Comment: The time-frame of the Waste Confidence plan does not make good sense. The time-frame should start now. The environmental impact of stored nuclear waste on site or in interim sites must be considered from the start of when it is first stored. The applicability of the GEIS should not take effect as far in the future as 60 years from now. (0417-1 [Clark, Terrence])

Comment: Decisions regarding nuclear waste management have a long-term impact. Such decisions impact generations to come. The time frame that nuclear waste can impact the environment and human health was referred to by Judge Sentelle in a court document as "for time spans seemingly beyond human comprehension". The GEIS needs to consider such long term impact in the decisions pertaining to waste management. (0417-10 [Clark, Terrence])

Comment: The Sierra Club policy speaks of attainment of the fundamental safety objectives central to the federal nuclear waste isolation program. At no point does it suggest that waste storage at a retired nuclear plant site could qualify as a repository. (0431-5 [Pascall, Glenn] [Watland, George])

Comment: Another shortcoming of the EIS process is that it focuses on specific forms of environmental degradation resulting from human activity within predictable and relatively immediate time periods. It is not designed to assess systemic risk arising from a range of factors, including those that could precipitate emergency events, over indefinite time periods. (0431-7 [Pascall, Glenn] [Watland, George])

Comment: The DGEIS, like the so called Blue Ribbon Commission on Nuclear Futures, simply puts off to a distant and uncertain future any solution to the problems of spent fuel. It is ludicrous for NRC to extend the definition of short term to be 60 years, more than 100 years beyond the dawn of the nuclear age. It is even more so with cases 160 years or indefinitely beyond the closure of nuclear plant operation. (0447-2-20 [Andrews, Richard])

Comment: The extreme time frames in the NRC identified alternatives are simply unacceptable due to these major risks to human health, safety and the environment. It is even questionable that an NRC agency will even exist within these long time intervals. (0447-2-3 [Andrews, Richard])

Comment: Finally, Eureka County agrees that it is reasonable to use a scenario in the assessment that includes development of a repository sited through a consensus based process as recommended by the Blue Ribbon Commission on America's Nuclear Future. However, assuming that a geologic repository will be available by 2048 based solely on DOE's stated goal of having a repository operational by 2048 is unreasonable. This is important since then, the NRC continues to believe that 25 to 35 years is a reasonable period for repository development (e.g., candidate site selection and characterization, final site selection, licensing review, and initial construction for acceptance of waste (Draft GEIS page 2-18). This ignores a critical finding by the Blue Ribbon Commission that a problem with the previous siting effort was the reliance on arbitrary dates. No action to date indicates that it is reasonable to assume that a repository can be operational in the 25 to 35 year time frame. If anything, past experience would suggest that a much longer time frame should be considered as the short term time frame to be analyzed as one of the scenarios. (0459-7 [Johnson, Abigail])

Comment: Until NRC Completes A Legally Sufficient NEPA Analysis, Its Decisions To Allow Nuclear Reactors to Continue to Store Spent Fuel In Spent Fuel Pools At Reactor Sites and to Continue to Generate Spent Fuel for Which There is No Permanent Waste Repository Violate NEPA The initial waste confidence findings were modified over the years but, until 2010, continued to conclude that (1) a permanent waste repository would be available by a date certain and (2) the storage of spent fuel at reactors could be accomplished without undue adverse environmental impacts for 30 years after plant shutdown, provided the permanent waste repository was operational no later than 2025. However, in 2010 the Commission concluded that: there are issues beyond the Commission's control, including the political and societal challenges of siting a HLW repository, that make it premature to predict a precise date or time frame when a repository will become available. The Commission has therefore decided not to adopt a specific time frame in Finding 2 or its final rule. Instead, the Commission is expressing its reasonable assurance that a repository will be available 'when necessary.'; Waste Confidence Decision Update (75 Fed. Reg. 81037, 81042 (Dec. 23, 2010) (footnote omitted)). The finding that it was "premature to predict a precise date or time frame when a repository will become available" was undisturbed by New York v. NRC, 681 F.3d 471 (D.C. Cir. 2012). (0473-10-1 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Indeed, a number of the "assumptions" the DGEIS makes--such as requiring the replacement of dry casks every 100 years--are only "assumptions" and the NRC explains that it is not actually requiring such measures. The NRC provides no explanation for why it is not imposing -- as a mitigation measure -- the regular replacement of dry casks every 100 years. This could be because such a measure would fail to meet NRC's backfit requirements (which impose by regulation a cost- benefit analysis that is markedly different from the statutorily-required NEPA analysis). This is precisely the situation where NEPA requires assumptions to be imposed as actual mitigation measures if the agency intends to rely on them in its environmental analysis. In short, the environmental analysis required by NEPA should refer to the actual regulations that are currently in place as well as mitigation measures actually imposed by the NRC. (0473-11-2 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Instead, the DGEIS relies only on 10 C.F.R. § 50.82, the regulation requiring decommissioning of power plants within 60 years of the permanent cessation of operation of the

reactor, as the basis for its assertion that all waste will be out of pools within sixty years of the licensed life of a facility. But this regulation explicitly authorizes the Commission to extend decommissioning beyond sixty years - thus leaving spent fuel in pools - when there is no place to put the waste: Decommissioning will be completed within 60 years of permanent cessation of operations. Completion of decommissioning beyond 60 years will be approved by the Commission only when necessary to protect public health and safety. Factors that will be considered by the Commission in evaluating an alternative that provides for completion of decommissioning beyond 60 years of permanent cessation of operations include unavailability of waste disposal capacity and other site-specific factors affecting the licensee's capability to carry out decommissioning, including presence of other nuclear facilities at the site. 10 C.F.R. § 50.82(a)(3) (emphasis added). The Court explicitly required the NRC to do a full analysis spent fuel pool fires assuming that no repository or other waste disposal option is available if the probability of a fire was not zero. This same analysis applies equally to leaks. Nowhere has NRC shown that the chance of spent fuel pool fire is zero after 60 years because no spent fuel will remain in pools. In fact, the DGEIS acknowledges that an act of sabotage or terrorism on a spent fuel pool could be catastrophic. DGEIS at 4-84, 4-86, 4-89. (0473-12-11 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: As to radioactive leaks, the D.C. Circuit invalidated the 2010 findings and rule in part on grounds that, although the NRC "has addressed, or is in the process of addressing" spent fuel pool leaks, those actions were untested and that the court could not defer to the Commission's conclusion that no harm would result from leaks. NRC has even less to rely on here, as it has not even pointed to any action it is currently taking to ensure that waste is indeed moved within 60 years of a reactor's licensed life. Using the court's language, NRC has not even asserted that it is "on duty" (681 F.3d at 481) when it comes to moving waste out of pools; instead there are no "considerable enforcement and inspection efforts" underway at all to support the NRC's wishful thinking that all waste will be out of pools in time such that no analysis of spent fuel pool fires or leaks in the long-term time period is warranted here. The court required NRC to do this analysis and NRC has not done it in this DGEIS. A proper analysis here would result in adjustments to other sections of the DGEIS, for example, increased impacts on fish kill and water usage resulting from additional years of intake for cooling. (0473-12-14 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The Court recognized that finding that the probability of a given harm is nonzero does not in and of itself require an EIS, but faulted the Commission for "not undertak[ing] to examine the consequences of pool fires at all." Id. The NRC in response again fails to examine the consequences of pool fires or leaks at all for any time period other than the short-term. (0473-12-8 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: There is no basis in the DGEIS for the assumption that all waste will be moved from pools to dry cask by the end of 60 years after licensed life. See DGEIS at 1-14 (acknowledging that the precise time spent fuel is stored in pools will vary from one reactor to another, but characterizing the assumption that waste will remain in pools for the longer-term as "reasonable."). (Similarly, the NRC has also not provided a basis for its assertion that a permanent repository will be available within 60 years). The NRC did not state that it is unambiguously requiring all nuclear power plant operators to move all spent fuel, for example, or even that it intends to do so (0473-12-9 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The DGEIS states that "[t]he consideration of climate change impacts for pool storage only needs to address the short-term timeframe." DGEIS at 4-75. As discussed above, there is no basis for the NRC's assertion that all waste will be removed from pools within sixty years of the licensed life of a facility. As such, the DGEIS must analyze the potential impacts of climate change on pool storage in the long-term and indefinite timeframes. Anything less falls short of the D.C. Circuit's very clear directive. Moreover, the DGEIS houses its climate change impact within Section 4.18, entitled "Environmental Impacts of Postulated Accidents." But the NRC must examine the impacts of climate change as to ongoing waste storage in the long-term and indefinite timeframes as to everyday operations as well as in the accident scenarios the NRC considers so unlikely. The DGEIS is bereft of any discussion of the impacts of climate change on everyday operations in the waste storage context. (0473-17-2 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: In its analysis, the Commission projected that, based on international experience, 25-30 years is a reasonable estimate to site, characterize, construct, license and open a geologic repository using a consent-based process, as recommended by the President's Blue Ribbon Commission. The Commission failed to consider certain key factors in its analysis that are peculiar to the U.S. situation. These factors make the NRC's evaluation and examination of international experience less applicable to the realization of a U.S. repository, and render NRC's projected timeframe overly optimistic. (0532-6 [Kotra, Janet])

Comment: The GEIS section 1.8.3, Analysis Assumptions, assumes that spent fuel in dry cask storage systems is moved to new dry casks every 100 years during the long-term and indefinite storage periods. In other GEIS sections it is stated that the 100-year replacement cycle is a conservative estimate and that replacement may not need to occur as frequently. For instance, it is noted in Appendix B that NRC is making the 100-year replacement assumption, "even though studies and experience to date do not preclude a longer service life." NRC should acknowledge that future spent fuel storage studies are planned as a joint effort between the Department of Energy and the Electric Power Research Institute. These multi-decade studies should be described in the GEIS and a commitment made by NRC to stay involved in the studies and review the results on a real-time basis. If at any time should there be indications that spent fuel safety requires actions other than assumed in this GEIS, NRC should commit to relook at its waste confidence decisions. On the other hand, if the study results show spent fuel to be safe without 100-year repackaging, NRC should also update the assumptions in this GEIS. In any case, NRC should acknowledge the importance of collecting empirical data on spent fuel over many decades to verify the analytical assumptions in this GEIS. (0544-13 [Enriquez, Elizabeth])

Comment: The timeframes evaluated in the GEIS are confusing. This is because the discussion flip-flops between an analytical model that is forward looking only, but also includes discussion of when Dresden fuel would enter the short term continued storage phase. The only time waste confidence determinations will ever be used is during (forward looking) facility specific licensing proceedings for reactors or interim storage facilities. Safety and environmental impacts for the period of the license will be the subject of a facility specific NEPA evaluation. Waste confidence addresses the period after the licensed facility life. While the phases identified are a perfectly reasonable analytical scenario, spent fuel is currently under NRC licenses and will remain under NRC licenses until it is disposed in a geologic repository. In essence, no spent fuel will ever reach any continued storage phase. New or renewed licenses will be issued instead that ensure the fuel's safety. NWRPO suggests that the waste confidence documents be revised to address forward looking analysis only. It doesn't matter when Dresden fuel or any other spent fuel will enter the short term continued storage phase, as long as all fuel

is evaluated. Added to the confusion is the reference to the recent DOE strategy document that includes unsupported declarations of when interim storage or repository disposal capacity will be available. Since issuance of the DOE strategy, there has been no action by DOE to implement either an interim storage facility or a repository. The proposed rule and GEIS already show spent fuel to be safe for all extended storage phases and that is enough. What would be more reassuring to the public would be for the Federal government to do something that leads to spent fuel disposal, but of course, without Yucca Mountain, there is nothing to point to. (0544-14 [Enriquez, Elizabeth])

Comment: GEIS Section ES.9, pp. xxvii and xxviii. The discussion of the continued storage timeline in this section, without the confusing references to Dresden fuel and the DOE Used Fuel Strategy, makes more sense that the discussion in section 1.8.2. Consideration should be given to deleting the confusing information in section 1.8.2. (0544-20 [Enriquez, Elizabeth])

Comment: GEIS Section 1.2, p. 1-4, lines 27-29. The reference to DOE expressing its intention to provide repository capacity by 2048 should be removed. If that is the basis for NRC's conclusion that a repository will be available within 25 to 30 years, then it should not be believed. The DOE timeline is in its used fuel strategy document, but there is no basis for that timeline. In fact, DOE has taken no steps to ensure a repository will be available subsequent to its shutdown of the Yucca Mountain Project or issuance of its strategy document. The only way a repository will be available in that time frame (within 25-30 years) is if Yucca Mountain is completed. This GEIS should not cite DOE's strategy document, but instead should use Yucca Mountain as an example of how a repository can be available because current Federal law requires that the Yucca Mountain repository be licensed and operated, if possible. Why would NRC's NEPA analysis ignore what is required by Federal law while at the same time assume a scenario that is not allowed by Federal law? (0544-23 [Enriquez, Elizabeth])

Comment: GEIS Section 1.8.2, p.1-12, Figure 1-1 and associated text. Continued Storage timeframes for analytical purposes are defined in this section. An addition to the text should emphasize that the timeframes presented are just one analytical approach that ensures all spent fuel is analyzed for the entire period before geologic disposal. Other analytical approaches could have been chosen and worked just as well. Adding such emphasis in this section might help avoid confusion in later sections of the GEIS when the continued storage phases are discussed. (0544-24 [Enriquez, Elizabeth])

Comment: GEIS Section 2.2.1.1, pp. 2-22 and 2-23. This section including Figure 2-4, shows the overlap of reactor decommissioning and short-term continued storage. Both periods are 60 years after reactor operations. The analytical assumption of 60 years of short term continued storage based on the 60 year decommissioning period makes more sense that dependence on a DOE strategy document that has no basis for its timelines. (0544-29 [Enriquez, Elizabeth])

Comment: This GEIS makes an argument that it is most likely that a repository will be available for spent nuclear fuel within 60 years after an assumed 80-year licensed operating life of nuclear power plants. However, without an active repository program in the United States, this argument is weak. Further, dealing with the primary issue by stating that the disposal technology will be available when necessary, is exactly the approach that that led to the U.S. Court of Appeals for the District of Columbia Circuit in 1979 to reject the Atomic Safety and Licensing Appeal Board ruling and find it not sufficient under the National Environmental Policy Act. Additionally, the remand of NRC's 2010 waste confidence decision was largely on the basis that evidence of a repository by any particular date does not exist. The DC Circuit ruling appears to say what NRC is unwilling to say, that disposal may not be available when a

reactor's license expires (even assuming 80 years of licensed operations). So, even though NRC is having trouble admitting it, the condition noted by Judge Tamm has been met and it is time to evaluate the conditional circumstance, whether it is reasonably probable that the spent fuel can be stored safely onsite (this GEIS also considers an offsite option) for an indefinite period. (0544-5 [Enriquez, Elizabeth])

Comment: On the other hand, there is a limit to the at-reactor dry storage concept. Under its "indefinite storage" scenario, NRC has assumed that dry cask storage--cask pads, inner canisters, and the dry casks themselves--will be replaced once every 100 years, indefinitely into the future. NRC assumes that Dry Transfer Systems will be built (and also replaced every 100 years), since pools will have been dismantled during decommissioning by at most 60 years after permanent reactor shutdown. (0552-1-25 [Macks, Vic])

Comment: It is my conclusion that this DGEIS is premature and establishes an impact rating system solely related to inferred magnitude of very poorly described potential environmental impacts. It is, in the general absence or severe shortage of relevant evidence, model-driven by use of "Reference guides." None of the critical storage items-cask performance in many different environments and inadequately tested over a very short time period (14 years, one casket), the potential for catastrophic impacts on storage facilities, which can have far greater environmental consequences than any considered in the GEIS, and the human impact factor that has great potential for environmental harm, but which doesn't fit the format for this GEIS and so is ignored. The evidence base is so deficient that the indefinite time frame considerations are not credible. (0553-1 [Wilshire, Howard])

Comment: The unsupported assumptions include: • All spent fuel will be removed from spent fuel pools to dry storage by the end of the short-term storage time-frame (60 years)--Pilgrim NPS 2092. • Spent fuel canisters will be replaced approximately once every 100 years. For Pilgrim on 2192, 2292, 2392 and so on. • ISFSIs and Dry Transfer Systems (DTS) facilities will also be replaced every 100 years. (0556-2-4 [Lampert, Mary])

Comment: All spent fuel would be removed from spent fuel pools to dry storage by the end of the short-term storage time-frame (60 years). The public is not relying on NRC's crystal ball. NRC fails to provide factual support and analyses for this assumption. There is no analysis regarding the probability that a repository will be successfully sited, built, and ready and willing to accept spent fuel from every licensee by the end of the short term. There is nothing in experience or history, on which any realistic assumption must be based, that supports this unrealistic assumption. (0556-2-7 [Lampert, Mary])

Comment: Because waste fuel assembly degradation will occur during storage periods, it will not be possible to perform the functions necessary to validate the following assumptions 100% of the time: -Spent fuel canisters and casks would be replaced approximately once every 100 years; and, -Independent spent fuel storage installations (ISFSI) and dry transfer system (DTS) facilities would also be replaced approximately once every 100 years (Draft GEIS at xxviii). Unless these assumptions are completely validated, the Draft GEIS fails to provide the support necessary for the proposed revisions to 10 CFR 51.23. (0608-14 [Crocker, George])

Comment: The NRC cannot guarantee that waste Permanent disposal will be available "when necessary" or ever. There is no reasonable basis for the NRC to assume that in 60 years or 160 years there will be a storage solution to manage the massive stockpiles of radioactive waste. When nuclear energy was first developed sixty years ago the same assumption/promise was made. This promise was broken. The GEIS contemplates continued operations of nuclear plants

based on the false assumption at either in 60 or 160 years a solution for nuclear waste storage will exist There is no evidence this is true, especially since for nearly 60 years science is not one step closer to finding a nuclear waste storage solution. No other industry would be permitted continue operations creating waste when the regulatory structure originally created to protect the public does not to exist. For the past 60 years atomic scientists still have not figured out how to safely manage the tons of radioactive nuclear waste produced each year. (0611-25 [Shapiro, Susan])

Comment: Storing spent fuel above-ground indefinitely, at reactor sites or away from reactor sites, is not an acceptable alternative for disposing of spent fuel. The Nuclear Waste Policy Act (NWPA) mandates that spent fuel be stored above ground only on an interim basis while a federal repository is developed. Assuming that spent fuel will be stored above ground indefinitely is inconsistent with the NWPA. (0622-1-11 [Vale, Karen])

Comment: The DGEIS outlines impacts in three timeframes - short-term (60 years post reactor license), long term (100 years post short-term) and indefinite storage. However, it is incredibly difficult to accurately predict environmental conditions at every reactor site in the long-term timeframe and nearly impossible for the indefinite timeframe. An EIS -particularly one that is generic in nature -cannot accurately predict direct, indirect, and cumulative environmental impacts of continued spent fuel storage in these timeframes without knowing how the environment will change in particular locations or how certain ecosystems will respond to future stressors (e.g., climate change impacts, changes in community development, etc.). (0622-1-14 [Vale, Karen])

Comment: [W]e believe that the ISFSIs and casks at our sites have shown to be robust, safe, and secure. The conservatism that is built into each cask and each ISFSI is acknowledged to be more than enough to provide safety and security for long beyond the term of their initial licenses. Research done so far confirms this. We believe that these systems could be safe for a minimum of 100 years. Second, there remain additional research projects that will yield additional information to specify just what specific additional periods ISFSIs and casks can be relied upon to fulfill their safety function. (0637-6 [Norton, Wayne])

Comment: Therefore, we believe that the GEIS adequately analyzes an achievable intermediate scenario that should be viewed as an adequate surrogate for the requirements that will be developed during the next 20 -100 years. (0637-8 [Norton, Wayne])

Comment: The base assumptions upon which the draft GEIS rests not only defy logic but violate the Nuclear Waste Policy Act as well as the NRC's own regulations. The longer term storage scenarios envisaged in the draft GEIS are all but guaranteed to lead to defacto permanent storage in the biosphere. That is exactly the outcome US nuclear waste policy was developed to avoid. (0646-17 [Hanson, Courtney])

Comment: It is just plain foolish to generically say there will be minimal environmental impact: 2. regardless of the time frame. Whether it be 60 years, 160 years or (arrogantly) indefinitely. (0652-2 [Maurer, William])

Comment: The assumptions on which the draft GEIS relies are problematic. Specifically, the draft GEIS assumes that "that all spent fuel is removed from the spent fuel pool and placed in dry cask storage in an ISFSI no later than 60 years after the end of the reactor's licensed life for operation [i.e., within 120-140 years]." (1-14.) However, there are currently no rules requiring that spent fuel ever be stored in dry casks, much less within a certain time. The assumption

should, at the very least, note that NRC regulations do not specify a maximum time for storing spent fuel in pool or cask. (0669-10 [Walter, Joan])

Comment: Whether in pools or dry casks, with proper maintenance and monitoring, there is no reason that used nuclear fuel could not be stored onsite indefinitely. Many may think it is arrogant to assume we can have confidence in storing something for 100,000's of years. (0674-5 [Lang, Amanda])

Comment: We appreciate the NRC's efforts to develop bounding generic environmental analyses that address the issues raised by the D.C. Circuit Court's 2012 decision. However, we are concerned that all of the scenarios evaluated in your draft Generic Environmental Impact Statement (GEIS) involve protracted used fuel storage at reactor sites or away-from-reactor sites. One scenario even assumes indefinite at- or away-from-reactor storage accompanied by periodic (every hundred years) on-site transfer of used fuel to new dry storage canisters. Without question, indefinite storage is the wrong policy. While it is perhaps necessary to assess such a scenario in order to bound potential environmental impacts, we must point out that the scenario is entirely at odds with both the letter and spirit of the Nuclear Waste Policy Act (NWPA) and absolutely not an acceptable outcome for the citizens of the United States. (0689-3 [Boyd, David])

Comment: I do not share your confidence, expressed in your Waste Confidence Draft Generic Environmental Impact Statement (WC DGEIS, NUREG-2157), that dry cask storage of irradiated nuclear fuel is currently safe and sound, and will remain so not only for up to 80 years of reactor operations, up to 60 years beyond reactor operations during so-called 'short-term storage, up to 100 years beyond that during so-called long-term storage, and up to forevermore beyond that, during so-called indefinite storage (infinite storage?!). (0698-1 [Kamps, Kevin])

Comment: Spent fuel has such a long radioactive life where it is dangerous to people makes it impossible to guarantee the safety of all life on Planet Earth for 250,000 years. For anyone to think there is a way to store spent fuel for 250,000 years is attempting to make an assumption that will never become reality. (0701-4 [Wilson, Greg])

Comment: The Canadian Coalition for Nuclear Responsibility (CCNR) finds that it is imprudent for NRC to base its entire analysis on the assumption that a geologic repository will become available within a few decades. To provide a thorough analysis of potential environmental impacts of spent fuel storage, NRC needs to analyze the consequences of an indeterminate delay in the availability of such a geologic repository, as well as the implications of such a repository never becoming available. Anything less than that would be tantamount to basing policy decisions on wishful thinking. (0714-1-1 [Edwards, Gordon])

Comment: The NRC continues to assume that a geologic repository for the safe permanent disposal of irradiated nuclear fuel from power reactors (whether in the form of fuel assemblies or as solidified post-reprocessing waste) will become available within a few decades. There are good reasons to distrust that assumption. According to the California Energy Resources and Conservation Commission's 1977 Report on the concept of geologic disposal of nuclear waste, the USA had (up until that time) attempted on seven different occasions to locate an underground repository for the safe long-term disposal of high-level nuclear waste, and failed all seven times. (0714-1-10 [Edwards, Gordon])

Comment: The Waste Confidence Rule Should Start After Spent Fuel is Placed In Dry Storage. Throughout the scoping decision and the Draft GEIS, the timeframe being analyzed by

the NRC commences with when a particular plant ceases operation. In other words, the NRC is expressing its confidence the waste can safely be stored for a period of time after a plant ceases operation. This timeframe misses the mark. The origin of the Waste Confidence Rule stems from the failure of the Federal Government to remove spent fuel to a temporary or permanent repository after an appropriate cooling period. The Waste Management Rule was recognition that spent fuel had to be stored on site for a period of time and an expression by the Commission that such storage could be accomplished safely for a set and re-set period of time. The origin, then, of the confidence for the storage of spent fuel had nothing to do with the continued operations of the plant which generated the fuel that needed to be removed. Rather, it was an expression that it could be safely stored at the plant until such time that temporary or permanent repository could be found. (0783-1-5 [Harlan, Thomas])

Comment: Under section 1.8.2, starting on page 1-12 and continuing to 1-13, the entire section should delete any reference to the storage timeframe including operations of the plant. As noted before, the continued operation of the plant is separate and distinct from storage. (0783-2-5 [Harlan, Thomas])

Comment: On page 1-14, lines 13-18, there is an assumption regarding normal life of the storage facilities. This assumption is based upon the knowledge and experience with structure and operation of these storage facilities. This assumption does not, in any way, reference the manufacturers' information on the casks including, without limitation, any warranties or anticipated life. Rather, it is based solely upon the NRC's experience with the same. This assumption does not pass muster since the NRC does not have any experience relative to the lifetime of the structure to store the spent fuel. A full evaluation of the proposed storage facilities needs to be provided. (0783-2-7 [Harlan, Thomas])

Comment: Under section B.3.2, the Draft GEIS addresses technical feasibility of dry cask storage. Within its analysis, it includes a discussion of the "robust design of dry cask storage systems." As state above, this assumption has no support for the time frames being analyzed. (0783-3-21 [Harlan, Thomas])

Comment: It is my conclusion that this DGEIS is premature and establishes an impact rating system solely related to inferred magnitude of very poorly described potential environmental impacts. It is, in the general absence or severe shortage of relevant evidence, model-driven by use of "Reference guides." None of the critical storage items--casket performance in many different environments and inadequately tested over a very short time period (14 years, one casket), the potential for catastrophic impacts on storage facilities, which can have far greater environmental consequences than any considered in the GEIS, and the human impact factor that has great potential for environmental harm, but which doesn't fit the format for this GEIS and so is ignored. The evidence base is so deficient that the indefinite time frame considerations are not credible. (0805-1 [Wilshire, Howard])

Comment: Much of what the NRC depends upon for waste confidence is that a geological repository will be available when needed. This availability becomes a matter of timing. Timing does not stand alone. Our government, our money and all other issues that make up the nuclear fuel cycle must survive to an extent. (0818-1 [Lewis, Marvin])

Comment: Chief among my concerns is that highly radioactive, lethal commercial reactor spent fuel could remain ad infinitum at reactors never intended to be defacto disposal sites. This conflicts with NRC regulations which state that even "low-level" radioactive waste can only be safely and reliably contained for 100 years. At one time, the NRC used to oppose at-reactor

waste storage "beyond five years as a significant safety and environmental matter." This faulty DGEIS assumption is also contrary to the 1982 Nuclear Waste Policy Act (NWPA) which states that spent fuel can only be stored above ground on an interim basis while a mandated deep geological repository is being constructed. (0819-2 [Kline, Connie])

Comment: Safety assessments require thorough review of the facts surrounding expansion, contraction, and gravity upon each form of matter and upon their individual elemental forms and ionizing isotopes. This review must thoroughly identify, research, and analyze any and all weaknesses or tendencies to compromise isolation over thousands of years. (0823-76 [Michetti, Susan])

Comment: The long term timeframe introduces a major impossibility to any prerequisite of safety. This requires that we revisit and examine the irrationality or recklessness of decision-makers for the past 65 years to approve of the processes that generated the most lethal toxic substances on earth. As soon as such ionizing isotopes were measured to have extremely long term cumulated sets of half-lives that were lethally toxic, the logical reaction required to stop producing this waste until a safe solution was known. The extremely long term cumulated sets of half-lives will dangerously persist longer than almost all evidence of humanity's life on earth. It will dangerously persist longer than the records passed down from the ancients. How will we communicate that far into the future? How will we provide safety that far into the future? The extremes of this measurement in time is an indicator that prudent decision-making requires an immediate ban on man-made manufacture of such long-term persistent lethal and toxic substances. (0823-77 [Michetti, Susan])

Comment: NEI also believes that the short-term storage scenario is the most likely, and that the long-term and indefinite storage scenarios are unlikely. With respect to the indefinite storage timeframe, NEI concurs with the NRC staff's assessment in Section 1.8.3 of the draft GEIS that it would be unreasonable to assume a gross and permanent failure of the Federal government to meet its responsibility for used nuclear fuel disposal. Moreover, the draft GEIS, Appendix B, Section B.2, supports a conclusion that the "no repository" scenario is highly unlikely. In the 2010 WCD update, the NRC reached fact-based conclusions regarding the technical feasibility of a repository and the progress of other nations to site and develop disposal facilities. Those conclusions are still valid, and the record supports the NRC's determination that the time period needed to develop a repository is approximately 25 to 35 years.⁵¹ [footnote 51 text: *Id.* at B-6.] Furthermore, within the long-term timeframe there will be ample opportunity for the government to address its obligation, license a repository, and construct the facility. Therefore, the indefinite storage scenario is highly unlikely. (0827-2-4 [Ginsberg, Ellen])

Comment: The indefinite storage scenario is also remote and speculative because it is contrary to existing federal law and assumes a complete and permanent government failure to fulfill the clear need and obligation to develop a repository.⁵² [footnote 52 text: *See In Re Aiken County, et al.*, 725 F.3d 255 (D.C. Cir. 2013). In determining whether an alternative is reasonable, courts also take into account legislation that forbids the alternative. "We do not suppose Congress intended an agency to devote itself to extended discussion of the environmental impact of alternatives so remote from reality as to depend on, say, the repeal of the antitrust laws." *Kilroy v. Ruckelshaus*, 738 F.2d 1448, 1454 (9th Cir. 1984)(internal citations omitted). Although the no repository scenario is not an "alternative" to the proposed action, the same principle applies in that a scenario that is contrary to the law should not be considered "reasonably foreseeable" under NEPA.] In that regard, the "no repository" scenario arguably is a "worst-case scenario" that should not need to be considered under NEPA.⁵³ [footnote 53 text: *Robertson v. Methow Valley Citizens Council*, 490 U.S. at 359.] Nonetheless, the Court of

Appeals specifically directed the agency to assess the environmental impacts of failing to establish a permanent repository, and NEI agrees that the NRC's consideration of an indefinite storage timeframe addresses the remand on this issue. (0827-2-5 [Ginsberg, Ellen])

Comment: NRC has determined that it is feasible to have a repository "within 60 years following the licensed life for operation of a reactor."¹⁰⁵ [footnote 105 text: Proposed 10 C.F.R. § 51.23(2)(ii).] This is strongly supported by international experience. Sweden, Finland, and France all expect to have operating repositories in the first quarter of this century.¹⁰⁶ [footnote 106 text: US Nuclear Waste Technical Review Board, *Experience Gained From Programs to Manage High-level Radioactive Waste and Spent Nuclear Fuel in the United States and Other Countries*, April 2011.] The primary purpose of predicting a timeframe for repository availability is to provide a reasonable analytical timeline that ensures that all periods of continued storage are evaluated. NRC has done this. After the period of licensed operations (80 years for reactors), NRC segments the timeline for continued storage into three phases - 1) short term (between 0 and 60 years after licensed operations that have already been covered by operational NEPA analysis), 2) long-term (a period from 0 to 100 years after short-term), and 3) indefinite (a period that begins after long-term and can extend in 100-year cycles far into the future). Thus, the environmental impacts of continued storage, for any length of time, are appropriately analyzed. (0827-5-6 [Ginsberg, Ellen])

Comment: Page 1-14, Lines 5-7 "the NRC assumes that all spent fuel is removed from the spent fuel pool and placed in dry cask storage in an ISFSI no later than 60 years after the end of the reactor's licensed life for operation." -- According to testimony by SCE in the recent Nuclear Decommissioning Cost Triennial Proceeding of the California Public Utilities Commission, SCE believes they cannot terminate their license until the ISFSI is completely gone. Thus the license will still be open (although not for operation) until the ISFSI is completely decommissioned as well. There seems to be a lot of confusion here. (0836-35 [Davis, Anonymous])

Comment: Section 4.0 -- You attempt to address continued storage of spent fuel at ISFSIs with DTS, and the notion that the ISFSIs can persist for that period of time, and the contents of the canisters will be fine, even if the fuel assemblies may have completely degraded by then. WE BELIEVE YOU CANNOT ADEQUATELY ADDRESS THIS ISSUE THIS FAR IN ADVANCE. THERE MUST NOT BE A GENERAL PURPOSE "APPROVAL" OF ISFSIs "forever" using technology that does not exist (like DTSSs) and total speculation about how these structures degrade over time. I know you want to get these approved "forever" but to do so is COMPLETELY IRRESPONSIBLE! WE BELIEVE THAT AT THIS TIME, THE ISFSIs MUST NOT BE APPROVED FOR INDETERMINATE TIME PERIODS, and to even suggest it points out how far the NRC has gone astray. Thus, it is IMPRUDENT for the NRC to create a GEIS for any time exceeding the initial 60-year timeframe which was the original concept for the decommissioning period. Contrary to your assertion, there are too many unresolved items at this time, and we must work quickly to establish a permanent deep-geologic repository, which DOES HAVE safety differences in terms of fewer vulnerabilities to terrorist or wartime attack. (0836-52 [Davis, Anonymous])

Comment: Suggesting that we will be able to rely on unproven or non-existent technology for safe storage of nuclear waste for thousands of years puts the future of our entire nation at risk. (0860-3 [Headrick, Gary])

Comment: Secondly, the NRC could have written a scenario describing in detail the expected impacts on the environment at each of the time frames used in the DGEIS. The description

would have provided insight into how the NRC envisions the environmental conditions at various time periods. (0867-1-6 [Griffin, William])

Comment: Of concern in this regard is the statement by Dr. Allison Macfarlane to the Nuclear Energy Institute where she said: "In the area of subsequent license renewal, there are even greater unknowns. Due to the age of the U.S. fleet, the United States is in large measure a pioneer in this area. I must be clear that the NRC is not yet in a position to pass judgment on the viability of operation beyond 60 years" (NRC News S-13-006, February 27, 2013). There is a fundamental disjunction with a DGEIS that purports to analyze 60 and 160 year and indefinite time frames and the NRC Chairperson's admission which suggests that the agency has no expertise in predicting to those timeframes. While the NRC Chairperson's statement was about the viability of NPP, not SNF storage, the same philosophy may hold true for aspects of SNF storage as envisioned in the DGEIS. (0867-2-4 [Griffin, William])

Comment: The Proposed Rule's Determination that it is Feasible to Safely Store Spent Fuel for an Indefinite Period Violates NEPA Because it is Devoid of Valid Technical Support and Fails to Consider a Range of Factors Affecting the Long-Term Safety of Spent Fuel Storage[.] The DGEIS asserts that spent fuel can be stored safely and without significant impacts for an indefinite period of time. DGEIS at xlv-xlv, lv, 8-2 – 8-3. But the NRC's findings on this issue are almost devoid of valid technical support. Makhijani Declaration, par. 4.1 et seq. The studies cited by the NRC do not support the broad generalizations in the DGEIS. For instance, the DGEIS relies on a pilot study that was never intended to be used for regulatory purposes; and it relies on other studies that are limited to short time frames. Makhijani Declaration, pars. 4.2 – 4.5. But even the short-term studies show evidence of spent fuel degradation during storage. Makhijani Declaration, par. 4.5. As discussed in Dr. Makhijani's declaration, the DGEIS assumes that spent fuel bundles can be stored for millennia and repeatedly transferred hundreds of times from one cask to another without large releases of radioactivity. But the DGEIS contains almost no information about spent fuel characteristics that could cause adverse safety risks and environmental impacts in case of long-term or indefinite storage, both during storage and during the many transfers that must take place. Makhijani Declaration, par. 4.6. The DGEIS contains no analysis of how spent fuel characteristics may contribute to the risk of an accidental release of radioactivity during extended storage of dry casks; or how these factors may contribute to accident risks during the many transfers that would take place over an extended period of time, *i.e.*, transfers between pools and casks, transfers between storage casks, transfers between storage and transportation casks, and transfers between transportation casks and casks used for ultimate disposal of spent fuel. *Id.* (0897-4-1 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Section 1.8.6 of the draft GEIS, titled Issues Eliminated from Review in this GEIS, contains the statement:⁸¹ [footnote 81 text: NRC, 2013b, pages 1-23 and 1-24.] "The NRC is evaluating the continued storage of commercial spent fuel in this draft GEIS. Thus, certain topics are not addressed because they are not within the scope of this review. These topics include: noncommercial spent fuel (e.g., defense waste), commercial high level waste generated from reprocessing, greater-than-class-C LLW, advanced reactors (e.g., high-temperature and gas-cooled reactors), foreign spent fuel nonpower reactor spent fuel (e.g., test and research reactors), need for nuclear power reprocessing of commercial spent fuel" (IX-2) By excluding from consideration the "need for nuclear power", the draft GEIS cripples its ability to assess the environmental impacts of storing spent fuel. Nowhere in the draft GEIS is this grave deficiency corrected. The draft GEIS does not set forth any scenario for the future use of nuclear power or, more specifically, for the future creation of spent fuel. Thus, in the draft GEIS, the timeframe for creation of spent fuel spans an unknown but potentially vast range, as does

the quantity of spent fuel created in that timeframe. (IX-3) At the lower end of its range, the timeframe for creation of spent fuel will end when the last of the currently licensed reactors ceases to operate. However, since the draft GEIS sets no upper limit on the time period that it considers, the creation of spent fuel could continue ad infinitum. Thus, the upper end of the range of timeframes is undefined. (0916-2-1 [Curran, Diane] [Thompson, Gordon R.]

Comment: (IX-4) At the lower end of its range, the quantity of spent fuel that is created will be the quantity that is discharged from the currently licensed reactors. However, since the draft GEIS says nothing about the future use of nuclear power, it sets no upper limit to the quantity of spent fuel that will be created. Consider a simple, illustrative example. Suppose that nuclear power soon revives in the United States, leading to a tenfold increase in annual creation of spent fuel by the mid-21st century. Further suppose that this rate of creation continues for a few centuries. At the end of that period, the cumulative quantity of spent fuel that has been created would far exceed the quantity that is discharged from the currently licensed reactors. (IX-5) If the total quantity of spent fuel that is created were at the lower end of its range, the radiological risk posed by storing this fuel would be bounded. As the inventory of fuel aged, its radiological risk would decline, other factors being equal. Moreover, the inventory would gradually move from pools to ISFSIs, which would reduce its risk. In principle, one could assess the cumulative radiological risk of storing spent fuel, from the present until the moment when the last fuel assembly in the inventory is emplaced in a repository. (IX-6) If, however, the total quantity of spent fuel that is created is unbounded, then the radiological risk posed by storing this fuel would be similarly unbounded.⁸² [footnote 82 text: This statement holds at any given time, and cumulatively.] The draft GEIS allows for this outcome. Thus, the draft GEIS has denied itself the ability to assess the long-term radiological risk of storing spent fuel. One cannot assess a quantity that is unbounded. (0916-2-2 [Curran, Diane] [Thompson, Gordon R.]

Comment: The U.S. Court of Appeals for the District of Columbia Circuit, however, in its *New York versus NRC* ruling of June 8, 2012, seems not to have agreed with Mr. McIntyre's description of NRC's "opinion." On Page 1-13, NRC states under "long-term storage," that "one-time replacement of ISFSIs and spent fuel canisters and casks" will occur, as will "construction and operation of a DTS [dry transfer system] (including replacement)." It then goes on to state, under "indefinite storage," that "replacement of ISFSIs and spent fuel cansiters and casks every 100 years...construction and operation of an away-from-reactor ISFSI (including replacement every 100 years)...construction and operation of a DTS (including replacement every 100 years)" will also take place. NRC concludes Section 1.8.2, Timeframes Evaluated, by stating, under "indefinite storage," that "These activities are the same as those that would occur for long-term storage, but without a repository, they would occur repeatedly." At a September 11, 2013 meeting with NRC Nuclear Waste Confidence Directorate Director, Keith McConnell, he confirmed that this assumption of safe and smooth, repeated replacements would continue forever into the future. In fact, beyond the one million year hazard the U.S. EPA has acknowledged, under court-order, for high-level radioactive waste, in the context of the Yucca Mountain dump licensing proceeding. In fact, even beyond the known hazardous persistence of the various radioactive isotopes constituting high-level radioactive waste, such as Iodine-129, with a half-life of 15.7 million years, and thus a hazardous persistence of 157 to 314 million years. (0919-2-1 [Kamps, Kevin])

Comment: (Nor can nuclear power even be considered a low carbon source of electricity, much less zero carbon, or "emissions-free," electricity source, as nuclear power industry public relations campaigns like to claim. Replacing high-level radioactive waste dry cask storage systems, structures, and components, once every hundred years from now till the end of time, will require significant quantities of concrete, steel, energy, etc., and hence a large carbon

footprint. Technically speaking, assuming forever replacement of dry cask storage would mean multiplying costs, as above, as well as greenhouse gas emissions, by infinity - yielding infinite costs, and carbon emissions. These are NRC's absurd assumptions worked out, not mine!) (0919-2-3 [Kamps, Kevin])

Comment: On Page 1-16, at lines 13-14, NRC states: "The spent fuel is moved from the spent fuel pool to dry cask storage within the short-term storage timeframe." By NRC definitions, this means that high-level radioactive waste could remain in the storage pool throughout the decommissioning period, for up to 60-years post reactor shutdown. The Atomic Age has given new, Orwellian meanings to words, such as "short-term storage timeframe" referring to up to 140 years of pool storage (including during up to 80 years of reactor operations, and up to an additional 60 years post-reactor shutdown), well over half as long in terms of years into the future, as our country has been independent from the British Empire in terms of years into the past (1776 to 2013, 238 years). (0919-3-5 [Kamps, Kevin])

Comment: At line 23, NRC states: "If a repository becomes available, operations could include the transfer of spent fuel canisters to shipping casks and transportation to the repository." While the federal courts have ordered NRC to address the potential for no repository ever opening, NRC's admission here of "if, but not when" a repository ever open underscores the risk that on-site or away-from-reactor ISFSIs could well become de facto permanent, surface storage "parking lot dumps." (0919-4-8 [Kamps, Kevin])

Comment: Re: Page 4-1, at line 10, where NRC states "In the short-term storage timeframe, the NRC evaluates the impacts of continued storage of spent fuel for 60 years beyond the licensed life for operations of a reference reactor."...60 years as "short-term"? But this is 60 years of pool storage beyond the cessation of reactor operations, which themselves could have gone on not 40 years (initial operating license), not 60 years (including one 20-year license extension), but 80 years (including a second 20-year license extension). That's up to 80 + 60 = 140 years of pool storage, referred to by NRC as "short-term." The Atomic Age has certainly given Orwellian new meanings to words like "short-term," if 140 years of high-level radioactive waste storage pool risks are included in that definition! Longer-term, if 200 to 300 years of on-site storage are under consideration, it must be pointed out that this would be longer-term than our country has even had its independence from Great Britain thus far (1776 to 2014 is 238 years). But of course, NRC has - absurdly --blessed forever on-site storage as "adequately" safe! (0919-6-6 [Kamps, Kevin])

Comment: Re: Pages 4-29 to 4-34, "short-term" (60 years post reactor shutdown, after as many as 80 years of operations - at Palisades, for example, 80 years of operations would end in 2051, so 60 years of pool storage beyond that would end in 2111), "long-term" (another 100 years beyond "short-term" at Palisades, ending in 2211), and "indefinite" (aka forevermore), Nukespeak has given a whole new meaning to the word "temporary"! (0919-7-20 [Kamps, Kevin])

Comment: With about 12.5% of the plants already having spent fuel pool leaks, and the fact that they were still within their original license time frame when the leak occurred, it is not unreasonable to believe that most of the spent fuel pools will have developed leaks before end of the 60 year beyond the end of the licensed life of the reactor. Three of those leaks are at one facility here in New Jersey and two of them reached the environment: The first leak in New Jersey occurred 25 years or less after startup. With 17% of reactors that have spent fuel pools already leaking, it is not a valid assumption to say the life expectancy of a spent fuel pool would be as long as 140 years after the plant went online. (0920-24 [Foster, Ruth])

Comment: Page 1-14, Lines 5-7 "the NRC assumes that all spent fuel is removed from the spent fuel pool and placed in dry cask storage in an ISFSI no later than 60 years after the end of the reactor's licensed life for operation." -- According to testimony by SCE in the recent Nuclear Decommissioning Cost Triennial Proceeding of the California Public Utilities Commission, SCE believes they cannot terminate their license until the ISFSI is completely gone. Thus the license will still be open (although not for operation) until the ISFSI is completely decommissioned as well. There seems to be a lot of confusion here. (0930-2-9 [Lutz, Ray])

Comment: Section 4.0 -- You attempt to address continued storage of spent fuel at ISFSIs with DTS, and the notion that the ISFSIs can persist for that period of time, and the contents of the canisters will be fine, even if the fuel assemblies may have completely degraded by then. WE BELIEVE YOU CANNOT ADEQUATELY ADDRESS THIS ISSUE THIS FAR IN ADVANCE. THERE MUST NOT BE A GENERAL PURPOSE "APPROVAL" OF ISFSIs "forever" using technology that does not exist (like DTSS) and total speculation about how these structures degrade over time. I know you want to get these approved "forever" but to do so is COMPLETELY IRRESPONSIBLE. WE BELIEVE THAT AT THIS TIME, THE ISFSIs MUST NOT BE APPROVED FOR INDETERMINATE TIME PERIODS, and to even suggest it points out how far the NRC has gone astray. Thus, it is IMPRUDENT for the NRC to create a GEIS for any time exceeding the initial 60-year timeframe which was the original concept for the decommissioning period. Contrary to your assertion, there are too many unresolved items at this time, and we must work quickly to establish a permanent deep-geologic repository, which DOES HAVE safety differences in terms of fewer vulnerabilities to terrorist or wartime attack. (0930-3-4 [Lutz, Ray])

Comment: Exelon agrees with the NRC's determination that it is feasible to have a repository "within 60 years following the licensed life for operation of a reactor." This is strongly supported by international experience. Sweden, Finland, and France all expect to have operating repositories in the first quarter of this century. The primary purpose of predicting a timeframe for repository availability is to provide a reasonable analytical timeline that ensures that all periods of continued storage are evaluated. The NRC has done this. Therefore, the environmental impacts of continued storage, for any length of time, are appropriately analyzed. (0942-9 [Helker, David P.])

19. Comments Concerning GEIS Assumptions – Institutional Controls

Comment: NRC's assumption that "indefinite storage" at reactor sites can go on literally forever, without a loss of institutional control, is absurd. As the environmental coalition's expert witness, Dr. Makhijani of IEER, has pointed out, one of the oldest continuous human institutions in the world, the Catholic Church, is only 2,000 years old. Plutonium-239, for one, will remain hazardous for at least 240,000 years. (0002-3 [Commenters, Multiple])

Comment: There is simply not enough political and financial security in the long term (the real timeline for radionuclides) to support the 'Waste Confidence' rule. (0004-1 [Kelly, Dan])

Comment: I wanted to start by putting this exercise in context today. We all know the government is shutting down, and nobody really expected that, and it hopefully will be a temporary shutdown. But this radioactive waste is going to stay toxic for millions of years, and our government will not exist certainly in that timeframe to make sure that this stuff does not harm future generations. So I think we need to be humble in our relationship to future generations and stop making this radioactive waste. (0030-5-1 [Safer, Don])

Comment: And the shutdown of the government is an indication that it can't be trusted to take care of -- to have institutional controls over radioactive materials for as long as they remain dangerous. It seems incredulous to me that the -- incredible to me that the NRC is seriously talking about being able to afford and have institutional controls and re-containerize the waste indefinitely. Sixty years is a stretch; 160 years is a much longer stretch, but then into infinity pretty much. (0030-8-2 [D'Arrigo, Diane])

Comment: And I know that we have scientists lined up that will tell us that the scientific facilities are available to safely store this nuclear waste, but what we heard earlier is it's the politics. And it's the politics that always makes the mess. As we can see now, this panel might not even be able to function next week because of politics. So while I have faith in our science ability to store this radioactive material, I don't exactly have faith in the humans that are directing a lot of these administrative procedures that are supposed to make this safe, particularly as our friend from Laramie [Mr. Bern Haggerty] was telling us about the transportation difficulties and some of the other people are going to talk about some other things here tonight. (0045-8-3 [Bartlett, Bill])

Comment: So that is the Green Party position. Can we store things in an ideal political climate for long terms? Quite possibly. I'm sure the science is there. But is the human touch there? Is the finesse of our political system there? Is the political will to keep us safe there, when we already know that the shareholders of multinational corporations have the reins of our government. It's been proven. (0045-8-6 [Bartlett, Bill])

Comment: The assumption of facilities being replaced every 100 years has no historically justifiable basis. Historically, no culture or government has existed indefinitely. We cannot assume that our culture and society will continue indefinitely and that resources to maintain these facilities in a properly maintained state will continue indefinitely. Indefinite storage must include a scenario that ISFSI and DTS facilities cease to be replaced and maintained. (0093-1 [Dennis, Harold E.B.])

Comment: The probability of geologic and/or climatologic damage to a storage facility will approach certainty over time. Therefore, the indefinite storage analyses should include such scenarios as likely possibilities. One of the possible results of climate change is a run-away greenhouse effect on our climate and the extinction of human beings (and a significant number of other species). The effect of abandonment of the facilities to such species as might remain needs to be addressed in the indefinite storage analyses. (0093-2 [Dennis, Harold E.B.])

Comment: Conclusions of "SMALL" impact with regard to long term storage under sections: ES.13.1.4 Air Quality, ES.13.1.5 Climate Change, ES.13.1.6 Geology and Soils, ES.13.1.7 Surface-Water Quality and Use, ES.13.1.8 Groundwater Quality and Use, ES.13.1.9 Terrestrial Resources, ES.13.1.10 Aquatic Ecology are not justifiable and are based upon the faulty assumption that the facilities will be properly maintained and replaced at 100 year intervals. As mentioned previously, this assumption is not historically justifiable. The probability that facilities will eventually not be maintained and will be subject to degradation and disruption must be included in the indefinite analyses in order for the conclusions to be scientifically valid. (0093-5 [Dennis, Harold E.B.])

Comment: From a log scale graph on your own website last time waste confidence came up, it takes at least 3,000 years for a spent nuclear fuel rod to cool down enough for its radiological hazard to get down to the same as the ore it was made of. King David of ancient Israel reigned 3,000 years ago. So far about the longest any nation has existed as a sovereign nation, with

rule over an established territory is maybe somewhat over 2,000 years China might have lasted that long. Ancient Egypt until Mark Anthony defeated Cleopatra may have last about 2,000 years. Rome from republic to end of the Byzantine Easter Roman Empire lasted about 1,400. It is NOT acceptable to create hazardous waste that will remain hazardous longer than any sovereign nation has remained a sovereign nation and/or longer than the United States is likely to remain a sovereign nation. (0097-1 [Adams, Grace])

Comment: [T]his document is making the assumption that government will remain unchanged, that everyone will follow the rules, and that there will be no accidents for a million years. This reminds me a lot of Lily Tomlin asking for a dime on Saturday Night Live. It's a joke and it's a rather bad one. There is this little thing called entropy, or Murphy's Law for the colloquial term, and that isn't addressed by this document at all. So just how stupid is this? (0112-20-3 [Robinson, Herb])

Comment: I fortunately don't have the experience of living near a facility nor am I well-educated about nuclear plants. But I do know a bit about history. And remember history class, empires, the rise and they fall? Languages, dead languages, Latin, Greek, no one speaks them anymore. The language of the Egyptians no one knew what -- how to read it until, you know, one of Napoleon's soldiers found the Rosetta Stone. The secrets of old cultures are known to us. The new stones at Turkey, Gobekli Tepe, there's mass standing stones and they date from 1100 years ago. It's a whole culture and it's unknown to us and it's only 1100 years old. Nuclear waste is going to be around a lot longer, okay. Now, the -- going back to the proposed short-term storage, 60 years. What was life like 60 years ago? Okay. When we built things 60 years ago what were they like? What will things be like 60 years from now? Okay. How about 120 years ago? That was 1893. The technology between 1893 and today is significant. Going forward that's 2133. Those are leap years. That's talking about a big difference. So when you think about 60 years, 120 years in our country's social history 60 years we saw a lot of social and political change. 120 years, the same thing. A lot of countries, a lot of peoples no longer exist. Look at old stamp albums, there are countries that no longer are. Those years mean a lot. Our country is an empire. It might no longer be. So how safe is 60 years? Will our empire be around in 120? Well, it hasn't been around for a long time. And so I'm not really sure that I'm good with indefinite storage. I know that there's a lot that's not safe. We don't inherit the wisdom from other empires. We lose it, okay. The Egyptians didn't inherit the wisdom from their previous cultures, the Greeks didn't pass it on, the marvelous interconnection from the -- of the Roman Empire fell apart, the wonderful wonders of the Byzantine Empire fell apart with the bite of a flea. (0112-35-1 [Boyes, Pam])

Comment: The buildings it [nuclear waste] is in will decay. The warnings around it will be unintelligible, okay. (0112-35-3 [Boyes, Pam])

Comment: And after a government shutdown last week, you know, who is going to -- who is watching the stuff when everybody is furloughed? So you know, I can't, you know, have confidence that you're going to keep this together for 240,000 years despite your best efforts. (0163-15-10 [Garner-Ritter, Maureen])

Comment: Who will monitor the waste if the government defaults? I understand from what you said tonight that the plant -- if the plant operates for five years, they have another like 60 years before they consider what they do with their waste. (0163-15-8 [Garner-Ritter, Maureen])

Comment: Second, the NRC assumes that its current regulations are safely managing the waste and that...current regulations will stay in force and will make sure that the waste is safely

managed indefinitely, and that means 60 years, 160 years, and indefinitely means as long as this waste is radioactive, which is 250,000 years. And do you all think Entergy is going to be around in 250,000 years or 60 years? And do you think the NRC is going to be around? So this idea that things are just going to go on as they do now for the indefinite future is just unacceptable to us (0163-2-5 [Musegaas, Philip])

Comment: The Draft Waste Confidence Rule, in this rule the NRC makes the assumption that the storage of spent nuclear fuel poses a sufficient hazard to the environment and to humans that Regulatory controls and oversight will continue indefinitely, decades even centuries after a reactor shuts down. (0163-34-8 [Azulay, Jessica])

Comment: As I'm sure you've been reminded repeatedly, the pyramids in Giza, Egypt are only 5000 years old and we struggle to try to interpret the hieroglyphics written on stones that have survived the ages. Even if we could somehow supernaturally contain this waste in leak-proof canisters forever, what language will we use to print warning signs to future civilizations that may unwittingly uncover our spent nuclear fuel rods 10,000, 50,000 or a hundred thousand years from now? Do we just shrug our collective shoulders and exclaim, "Who cares about what happens that far in the future?" (0187-2 [Friedman, Avram])

Comment: [T]his document is making the assumption that government will remain unchanged, that everyone will follow the rules and that there will be no accidents: For a million years. This reminds me a lot of Lilly Tomlin asking for a dime on Saturday Night live. It's a joke -- and a rather bad one. There is this little thing called Entropy (or Murphy's law if you prefer the colloquial term) and that isn't addressed by this document. Just how stupid is this? (0208-4 [Robinson, Herb])

Comment: The NRC in its consideration of indefinite storage, as identified, cannot assume institutional controls would remain in place for the time frame analyzed. The NRC cannot assure that the spent fuel canisters and casks would be replaced approximately once every 100 years and also that the Independent spent fuel storage installation (ISFSI) and dry transfer system (DTS) facilities would be replaced approximately once every 100 years. The spent fuel material has an extremely long half-life (consider the dawn of civilization to the present the waste material would be hazardous much longer). (0219-6 [Olmstead, Stan])

Comment: The NRC's assumption that "indefinite storage" at reactor sites can go on literally forever, without loss of institutional control, is absurd. As has been pointed out by others, one of the oldest continuous human institutions in the world, the Catholic Church, is only 2,000 years old. Plutonium-239, for one, will remain hazardous for at least 240,000 years. (0230-4 [Garb, James])

Comment: While the NRC has confidence that long-term geologic storage will eventually be found, the public has lost confidence in the NRC to adequately address their unique and important concerns. This is especially true in light of the Draft GEIS and is based on erroneous assumptions and has the NRC confident that spent fuel will be safe onsite for an indefinite period, a period that could be literally forever. Just last month, much of our government was shut down for two weeks prompting the NRC to furlough roughly 90 percent of its employees. How can the NRC guarantee that radioactive waste here in Florida and across the country can remain safely onsite for thousands of years when the public can't even be guaranteed that the Government will be operating next year? The bottom line is this, the public's confidence has run out. We respectfully request that the NRC stop assuming that spent nuclear fuel can be safely stored forever. (0244-3-7 [Hancock, Mandy])

Comment: And then I hear, oh, 60 years, 100 years, and this is well thought out science here, oh, maybe 100, hundreds of years. Hundreds of years? Deadly radioactive for hundreds of thousands of years. Who's going to be the watchdog? This is a joke. (0244-5-3 [Klutho, Mark])

Comment: Assuming that institutional controls will work is absurd. Like this landfill that I mentioned, the Environmental Protection Agency doesn't know our pile of radioactive dirt land. It said so in its documents. It's ridiculous to think that institutional controls will work for centuries let alone a couple of decades. (0245-19-7 [Smith, Ed])

Comment: Lack of assurance exists that institutional controls will be in place 240,000 years or more in the future, the half life of plutonium is only 40,000 years, to oversee continued safe storage. (0245-29-6 [Shineflug, Marilyn])

Comment: We ask that you withdraw all statements to the effect that, because of NRC oversight programs, NRC asserts and guarantees that spent fuel can be stored safely at reactor sites indefinitely. Such a guarantee implies that the NRC will be providing constant oversight into that indefinite period of time. Yet, one month ago, the NRC could not even guarantee that its workers would be able to come to work the next day. The hubris of such an assertion, therefore, borders on colossal. (0245-3-4 [Kraft, David])

Comment: So, my question, based on the NRC's own figure, I have a bunch of them actually, does the NRC have a plan for the next 250,000 years of nuclear waste storage and disaster response? Does the NRC have a financial plan to manage nuclear waste for 250,000 years? Is the NRC prepared to consider potential disasters for the next 250,000 years? Does the NRC feel confident that factors of climate change, change into its 250,000-year plan which would include predicting water shortages, super storms, increased flooding and droughts? Has the NRC planned for the likely population explosion over the next few hundred years? Considering how fracking has been proven by the USGS to produce earthquakes in previously inactive faults, has the NRC figured a way to predict that future generations won't be fracking within a region of nuclear waste storage? Can the NRC prove that humans will be in existence in 50,000, 100,000, 200,000 years to manage this waste? (0245-43-3 [Michaud, Debra])

Comment: "The problem with nuclear," says Hubert Reeves, an astrophysicist, "is that it mortgages the future." Between the time you launch a reactor and the time you dismantle it, more than a century can go by. As a political -- more than a century, there are very few of them in history. We can't talk about political stability on the scale of a thousand years. Imagine the Egyptians had stored nuclear waste, who would manage it today? It's outrageous to think we can manage the future at such times as these. When we look at the history of mankind and all its in our peoples, it's totally outrageous. (0245-43-4 [Michaud, Debra])

Comment: I just want to give some numbers and some people did give already, and one is the 240,000 years that we're talking about when plutonium generates to the point that it doesn't pose a significant threat. And the other is how old is the homo sapiens as a species. And that's probably -- that was jacked up from 150 million to about 200 million. And it may go a little higher, but in fact this stuff is going to be around and be very dangerous longer than we've been a species on this Earth. (0245-45-1 [Aguilar, Margaret])

Comment: [I]t is a very bold assertion about the functionality of this Agency over the next 100 years and more. (0246-22-3 [Fisher, Allison])

Comment: [B]e sure that the Waste Confidence Rule and the GEIS endure changes in national policy that the Congress and the Executive may make or agree upon, or the changes in regulatory policy that this, or a future Commission may make. (0246-4-2 [Callahan, Mike])

Comment: So, basically, I see -- you know, I hear things that sound sort of reasonable, you know. If you don't think that things are ever going to change, but I know they do. I've lived long enough to see that things do not stay the same, and we don't have the control. And with our environment getting worse day by day, we have no idea what kind of weather we might have in South Carolina. (0250-26-4 [Maphet, Sheila])

Comment: As I'm sure you've heard repeatedly, the pyramids in Giza are only about 5,000 years old and we struggle to try to interpret the hieroglyphics written on stones that have survived the ages. Even if we could somehow supernaturally contain this waste in leak-proof containers forever, what language will we use to print warning signs to future civilizations that may unwittingly uncover our spent nuclear fuels 10,000, 50,000 years, or 100,000 years from now? Do we just shrug our collective shoulders and exclaim, "Who cares what happens that far in the future?" (0250-33-2 [Friedman, Avram])

Comment: The Roman Empire would have had to maintain that level of control, if they had made this type of waste. That's not going to happen. I'm sorry. Human history does not support it. (0250-5-7 [Safer, Don])

Comment: What caught my attention is our hubris that we could make nuclear waste safe for 10,000 years. We are thinking the unthinkable. (0250-52-2 [Amos, T.J.])

Comment: If you look up here, you see the lower part of the NRC logo, "Protecting people and the environment." I think that logo needs to be changed to "Protecting people and the environment for all time" because the wastes that we're talking about tonight are going to last a very, very long time. And the NRC has to accept its responsibilities for overseeing it. It is the precursor to the organization of -- how do you say? -- the high priesthood that will be looking after nuclear waste for hundreds of thousands of years. And I hope the NRC will step up to its extreme responsibility in a way that is not obvious from this document. (0250-68-3 [Robinson, David])

Comment: We ask that you withdraw all statements to the effect that because of NRC oversight programs, NRC asserts and guarantees that spent fuel can be stored at reactor sites indefinitely. Such a guarantee implies that NRC will be providing constant oversight into that indefinite period of time. One month ago, NRC could not even guarantee that its workers would be able to come to work the next day. The hubris of such an assertion, therefore, borders on colossal, if not outright psychotic. (0274-4 [Kraft, David])

Comment: Another absurd statement in the draft GEIS is that the wastes will be transferred to new storage casks every 100 years. This would require that government institutions function safely for the quarter of a million years that these wastes will remain lethal. No human institutions have been known to last even ten thousand years, let alone 250,000 years. (0287-6 [Swanson, Jane])

Comment: Section 1-14, institutional controls; we heard that alluded to briefly, earlier, that is the concept that some form of governmental control over this process could possibly exist to an indefinite period in the future. I think we heard mention of societies for 10,000 years, was Jane

Swanson, and so forth; I don't think we need to look that far. Institutional controls, the continued regulation of spent nuclear fuel will continue. This assumption avoids unreasonable speculation regarding what might happen in the future regarding Federal actions to provide for the safe storage of spent fuel. For purpose of this analysis, the NRC assumes regulatory control of radiation safety will remain at the same level as currently exists today. Let me say, we don't need to look back 10,000 years. They are making a provision for 160 years. So I did a little math and I went back 160 years, arrived in the year 1853. There was Federal regulation, or a Federal program in effect at that time. We talk about institutional policies, this was a peculiar institution, you may recognize that phrase; it was called slavery, and it was assumed to be unchanging, and in place, and going to continue. Other metaphors aside for the way we live today, it isn't. You can have a major change in the policy and the Federal government approach to regulation, like human cattle and property, for example, actually changing in our Constitution. So the idea that you can have any form of governmental institution you can be secure about for that long of period is, in our own, almost living memory, an impossibility. (0326-13-1 [Weisman, David])

Comment: My major concern is with the long-lasting nuclear waste. You can tell me anything tonight about how fine the plant is working, and how safe it is for right now; what about the thousands of years in the future? Can you look into the future and say you could guarantee that that will be safe then? (0326-29-1 [Groot, Henriette])

Comment: This is particularly true with complex systems, and it's particularly true with long timespans. The nuclear waste that's generated by these power plants, according to the EPA, I know I've heard numbers like 250,000 years, but the EPA thinks it's a million years. That's 50,000 generations of our descendants who are going to have to take care of this waste so we can boil water for 50 years. One of my deep concerns is that somewhere in those 50,000 generations they're going to learn time travel and they're going to come back and kick our ass for doing this to them. And the people who support the continued operation of these plants, I just want to know what they're response is to these 50,000 generations. What do you say to them to justify your boiling water for 50 years? (0326-34-2 [Phillips, Mark])

Comment: I have serious concerns about the long-term, and potentially, indefinite onsite storage of spent nuclear fuels, and the DGEIS did not lessen those concerns at all. I disagree with it when it determines that environmental impacts of continued onsite storage of spent fuel will be small. In almost every category that they assessed, small, in big capital letters, SMALL, not just over the short-term, up to 140 years old spent fuel, not for the next 100, but of course, indefinitely. And that small means, not detectable, so minor that they won't destabilize or noticeably alter the resources. No one has certain knowledge about the future. We can assess risks, but then we can only conjecture. We don't know what the economic, social, political, geologic, or climactic constraints will be facing future communities and states with the power plants. We don't know how much funding will be available for the personnel, for the maintenance, for the security, that continues to guarantee safety in the storage, no matter what the term, short or long. We don't know, for example, what future emergency response, or evacuation, or relocation capacity would exist, for example, in the area surrounding Diablo Canyon in the event of a catastrophe. No one knows the future water demands of communities across the United States in the future and how that will be impacted by the need for water use or continued storage of spent fuel. We don't know if the licensees will still be in business decades from now, or if funding will be sufficient for the NRC to be adequately monitoring the more and more accumulated fuel that's in storage. I will wrap-up. Yes. I believe that a fundamental flaw, then, in this DGEIS statement are these conclusions as to knowing what is going to happen, and I am deeply concerned that this overconfidence can promote government, industry, and public complacency instead of the vigilance that's needed, instead of

the allocation of resources that is needed. Yes, they are very good at making regulations, but I rarely hear about the word enforcement, and without that, we are all in great danger. (0326-39-3 [Weissglass, Theresa])

Comment: If the ancient Egyptians had built nuclear reactors instead of pyramids, we'd still be guarding their waste for 235,000 years. (0326-40-2 [Wilvert, Rosemary])

Comment: I'm also Maya Lenca. My civilization peaked about 1000 years ago. Our pyramids are still standing. There's no one manning them in terms of dry casking, which requires about, every 100 years, that you swap them out. That is the design. What is the ROI of indefinite cask replacement every 100 years? Indefinite. I understand infinity, and that usually doesn't play very well into ROI calculations. (0326-47-3 [Monge, Roberto])

Comment: Okay, and the thing which is not discussed in this is societal collapse. No civilization has lasted more than 1000 years on this planet. So for us to say that we can safeguard radioactive waste for the next 25 millennia or longer, I think is foolhardy. (0326-56-6 [Homick, Nick])

Comment: I live off Johnson. Everybody speeds down Johnson except for when? Except for when the cop is there. Otherwise they're doing whatever they want. And to think that we can monitor this for time immemorial is insane. (0326-61-2 [Henry, Anita])

Comment: We keep hearing-- now we have PG&E saying it's the government's fault, because my lobbyists made them write these rules that turned everything upside down. I feel like I live in a parallel universe. The people that are in here telling you that, still telling me, that it's safe and clean, what do, who do they think they're talking to? I mean, we've been around for decades, using simple logic, saying what are you going to do with the waste. 250,000 years. We can't read hieroglyphics in Egypt and that's only a couple thousand years ago. (0326-64-4 [Nelson, David])

Comment: Another statement in the Draft GEIS is that the waste will be transferred to new storage casks every 100 years. This would require that government institutions function safely for the quarter of the million years that these wastes will remain lethal. No human institutions have been known to last even 10,000 years, let alone 250,000 years. (0326-8-6 [Swanson, Jane])

Comment: [H]ere we are in the Commodore Ballroom, Commodore Perry, Perrysburg, War of 1812, 200 years ago there was a war raging in this neck of the woods. What's going to happen in the next 200 years, the next million years that this waste will remain dangerous. (0327-10-6 [Kamps, Kevin])

Comment: I'm an architect, and I can attest that humanity has never built anything that lasted this long no matter how many plumbers and electricians were involved. And if you give me \$500 billion, we'll have as many jobs as anybody needs, and they won't involve nuclear pollution. I think there's a dangerous presumption that's being made, and that is that we will have ongoing agency, government, corporate, or public competence. (0327-14-1 [Ellison, David])

Comment: Rolling stewardship of the radioactive mess we made should not be an option. It is a requirement. (0327-20-4 [Clemons, Victoria])

Comment: Everyone is familiar with the Seven Wonders of the Ancient World. Six no longer survive. Only the pyramids are still standing, but they have been dealing with problems from erosion, even though they have been in a mostly dry environment over their four- to five-

thousand-year existence. Now, we, as a society, are talking about constructing facilities that must last 50 times as long, a minimum of 240,000 years -- that's ten plutonium half-lives -- probably longer to contain plutonium, one of the most poisonous substances on earth. We cannot afford errors, even minor errors, if future generations are to live normal lives as we have. We must be absolutely sure that such waste containment will succeed. Here are a few questions that I have. What evidence do we have that waste-containment structures will survive for 50 times as long as the longest surviving structures, especially when they are continuously bombarded by radiation and extreme heat? How can we be sure that for the next 7,000 generations that people will, at all times, be able to maintain waste-storage casks as needed? With climate change and geological changes over this period, will there be geological changes that we cannot foresee now that will affect the integrity of waste containment or geological repositories? Nuclear waste can be reprocessed into nuclear weapons or into dirty bombs used by terrorists. How can we guarantee that these facilities will be continuously guarded for 7,000 generations? (0327-30-1 [Parker, Bob])

Comment: In the 1950s, the nuclear energy agency promoted nuclear power as too cheap to meter, meaning atomic energy was so cheap that there would be only installation costs, not usage fees. This turned out to be far from the truth. Today, we cannot accept the proclamations of safe nuclear disposal by proponents of nuclear power who have a vested interest in the construction of more nuclear plants. Already at the Hanford Reservation, radioactive waste containers are weakening after only 70 years or less. Of course, there have been fixes, but will they last 200,000 years? (0327-30-3 [Parker, Bob])

Comment: The time periods that are assumed that there will be institutional controls is quite a stretch to being ridiculous. Remember, the lifetimes of the pyramids and, I'm sorry, the Roman Empire is not very long. Underground storage is the only thing that will come anywhere near close to indefinite containment, and when you lose institutional controls you lose the ability to demand action to re-cask things. (0327-36-6 [Lamberger, Paul])

Comment: How long has the longest civilization in history lasted? The Roman Empire lasted around 2,000 years. How will nuclear waste be guarded when civilizations collapse? (0327-4-2 [Marida, Patricia])

Comment: Whether or not we wish to speak it, there will be a rolling custody of the waste and the canisters through the generations to come. They will have to deal with it in the manner of their best technology as radioactivity and time weaken the canisters and the rods must be placed in new isolation. For this to happen, we must also make every effort to ensure that civilization itself does not collapse. (0327-4-6 [Marida, Patricia])

Comment: As Dakota people, we know how the world can change in 100 years. Just last year we commemorated the 150-year anniversary of the Dakota Conflict. The Dakota ceded the first tract of land in what is now the State of Minnesota in 1805; 208 years later our land base is reduced to just 3,000 acres, and our reservation is along the flood plain of the Mississippi River. And the Federal government thinks it can make a 10,000-year promise to deal with nuclear waste. (0328-1-9 [Johnson, Ron])

Comment: So, instead of saying that we assume, we will assume that institutional controls will remain in place, what this document -- what I, as a citizen of the United States need this document to do is to lay out guidance for institutional controls for each of those storage periods. (0328-12-3 [Eide-Tollefson, Kristen])

Comment: Finally, the third issue, the GEIS assumes that there is going to be institutional control or a longevity to ensure that all of the obligations associated with the spent fuel left behind are met. The underlying assumption of institutional control is that there will be appropriate funds to insure that these activities of inspection, maintenance, repair, and replacement are taken care of. Yet, nowhere does the GEIS indicate where these funds are, or how they will be provided. This assumption that the funds will be available at some far future date without actual verification of their existence today represents potentially an intergenerational shift. Those whom receive the benefits of the low-cost electricity from nuclear power will not be obligated for the byproduct of the same. Rather, the cost will be shifted onto the next generation, two, three, or four, or as Ron says, seven, to that it is properly stored and disposed of. Sharing this burden and responsibility as a host city like Red Wing, whose residents many generations down the line will still have the obligation to maintain emergency preparedness. In the event that there is failure of institutional control, pick up the burden themselves. The assumption of institutional control,.....is simply too important to assume. (0328-2-7 [Rauterkus, Ralph])

Comment: The Draft Environmental Impact Statement simply raises more questions than it answers. What is the legal and factual basis for the NRC's assumptions that the casks will be reloaded every 100 years? Considering that the operating licenses for many plants, including the plant at Prairie Island will expire in 20 years, how do we know that the utilities will even be around in 100 years? What if the United States Government reneges on its promise and fails to rebuild the casks, rebuild the ISFSIs and to reload the casks every 100 years? (0328-3-3 [Mahowald, Philip])

Comment: But institutional controls, we have a definition of what that means provided for the record this evening from the City of Red Wing, what that means. What it means at just a very superficial level, where's the money? Considering the rate at which we are eroding the ecological foundation of this society, not just with the reactors but with central station energy, in general, in 100 years, in 50 years, in 200 years, by what right do we claim there will be a United States of America? By what right? (0328-7-1 [Crocker, George])

Comment: Institutional controls, and that's an assumption that you guys need to go forward with this. I think you need to reconsider your institutional control assumption. (0328-7-3 [Crocker, George])

Comment: I think assuming that our societal institutions will be intact and able to replace these dry casks once per century, even if it's less often than that, it's a huge assumption and I think it borders on the absurd to assume that even our current culture and society will be able to do this indefinitely into the future when, in fact, Keith McConnell, the director of the Nuclear Waste Confidence Directorate, did confirm several weeks ago that there is no cutoff point on this confidence and this assumption that the dry cask storage infrastructure will be replaced once per century forever, literally forever. So that right away is absurd. That cannot be assumed. And just to conclude this, I want to point out that some of the oldest known human institutions, things like the Catholic Church, about 2,000 years old, Buddhism perhaps 2,500 years old, perhaps some indigenous people or cultures could be looked to that extend even further back in time. But any of those examples are small by way of comparison with the radiological toxicity of the material this industry generates in order to make its profits. So I think that those assumptions have to be corrected in the final Generic Environmental Impact Statement. A strong dose of reality needs to be introduced. (0329-11-2 [Kamps, Kevin])

Comment: And the courts did order the Nuclear Regulatory Commission to look at the list of storage, well, certainly onsite in dry casks and pools, but also NRC has a whole chapter of away-from-reactor storage, and so there, too. The risks of these containers failing or lack of institutional control, abandonment of these facilities and their eventual simple corrosion and erosion with the elements and releasing their contents into the living environment, that is the risk that we face. The NRC has not analyzed it in any meaningful way in this document and needs to do so. (0329-11-3 [Kamps, Kevin])

Comment: The TVA has not been around for a hundred years and, quite frankly, there's a pretty good question about whether the Tennessee Valley Authority will look anything like it does or even exist a hundred years from now. So that assumption that this human institution, subject as it is to both economic and political frailties, is going to be here to protect the public from cask storage waste is pretty unrealistic. (0329-12-5 [Paddock, Brian])

Comment: I could see -- did we ever manage to contain, long-term, these casks that we're talking about, dry storage, or whatever? Future generations, way in the future, if we are ever even around still then, are going to come upon this and could recontaminate because they won't understand. But I don't want to get too far down that pathway. (0329-29-2 [Messer, Diane])

Comment: [Y]ou do not address the fact that no civilization and no human institution has lasted for thousands of years. And so you don't have a credible plan for mitigating the risks of environmental contamination in the event of the government's failure. Our government has been here for what, 250, 80, 75 -- I don't know -- years. I don't know how many governments have lasted for thousands of years. I think zero. I think zero is the number. So your foresight is very inadequate. (0329-32-7 [Seeley, Linda])

Comment: The NRC's assumption that "indefinite storage" at reactor sites can go on literally forever, without a loss of institutional control, is absurd. As Dr. Makhijani of the Institute for Energy and Environmental Research has pointed out, the Catholic Church-one of the oldest continuous human institutions in the world-is only 2,000 years old. Plutonium-239, for one, will remain hazardous for at least 240,000 years. (0336-7 [Lish, Christopher])

Comment: Between 11,000 and 23,000 years ago, the Bering Strait - also known as the lost continent of Berengia - formed a land bridge between Asia and North America which people crossed during the Ice Age to form some of the founding populations of Native Americans.³ [footnote 3 text: About 12,000 years ago, a major outbreak occurred on Lake Agassiz, which some experts estimate was as large as the current Black Sea. And 14,800 years ago, areas of the current Sahara desert were wet and fertile with full aquifers. Some 25,000 years ago the area now occupied by New York City was covered with ice roughly a mile high. These facts are noted to illustrate that dramatic natural events occur which dramatically transform waterways and landscapes.] (Interesting aside, Native American tribal lands are among the areas most ravaged by 20th Century uranium mining and Native American lands are identified in the GEIS as a place for large long-term nuclear waste storage! But we digress.) The half-life of Plutonium 239 (Pu-239)⁴ [footnote 4 text: Plutonium emits alpha particles that can be inhaled into the lungs. If it enters the bloodstream, plutonium moves throughout the body and into the bones, liver, or other body organs. Plutonium that reaches body organs usually stays in the body for decades and continues to expose the surrounding tissue to radiation.] is 24,100 years. So, if Upper Paleolithic cultures had come up with nuclear power, we would still be dealing with their nuclear waste. Luckily for us, they were just spearing mammoths. The point which we hope is not being too subtly made is that the NRC's assertion that it can surmise the impacts of nuclear waste tens of thousands of years - hundreds of thousands of years, or whatever the notion of

"indefinite" is - is simply ludicrous. It is so absurd that it casts serious doubt on the credibility of the GEIS in its entirety. (0341-1-21 [Mermelstein, Richard])

Comment: Less inane, but also implausible, is the assertion the NRC can predict the situation over the "Long-Term Storage" period of 200 years hence. Again, reflection upon the past provides perspective. Two hundred years ago, Napoleon Bonaparte was battling Prussia, James Madison was president, and America was fighting the War of 1812 against England. In fact in December 2013, the British burned Buffalo, New York. Two hundred years ago America still had slavery. Two hundred years ago, the population of the United States was 7.5 million. The petroleum industry did not yet exist. Sperm whale oil was still a major source of energy. There was, of course, no automobile pollution (although horse manure droppings were evidently an issue), there were no Superfund sites. Rivers were still clean enough to drink and fisheries were barely imperiled. (See, e.g., Daniels.) Thus, while it may be reasonable to believe that dry casks and independent spent fuel storage installations (ISFSs) have the technological capacity under specified conditions to contain nuclear waste for that duration, there is no reasoned basis to conclude that prevailing environmental, political, or social conditions will properly support enduring containment. (0341-1-22 [Mermelstein, Richard])

Comment: Further, today's viable and well-operated company can become tomorrow's failed corporation. This does not require a nuclear accident, just a financial disaster. (Enron.) In fact, the NRC regulatory scheme seems to have given no thought to what would or could happen if an operator goes bankrupt. This is exactly what has led to the nation's numerous (and desperately underfunded) Superfund sites. Who will be left footing the bill for all this waste?¹¹ [footnote 11 text: Answer: The American taxpayers. (See Taxpayers for Common Sense; Wald, 2008)] If the NRC really believes that nuclear operators who will no longer be pumping profits out of their old machines in 10 or 20 years will stick around to spend the following 100 or 200 years maintaining and cleaning up their defunct operations, we have a wonderful deal for you: Mars condo, ready for move-in, river view. (0341-2-11 [Mermelstein, Richard])

Comment: Plans and Laws on the Books Suffice. Over and over again the GEIS notes a potential hazard or impact and then just waves it away with the wand that the NRC/ industry has a plans or will have plan to deal with the issue. Similarly, again and again, the GEIS cites legislation or postulates that laws will be passed to deal with potential problems. But having plans and laws does not constitute evidence of either adequate protection or lack of major impact. To put it as a math equation: Plans + Laws ? SMALL impact. (0341-2-13 [Mermelstein, Richard])

Comment: At the top of the list of overoptimistic assumptions is the GEIS's repeated assertion that if there is a problem, the NRC will catch it in time. There is, of course, a vast library of documentation of past NRC failures. (See, e.g., GAO; NRC; Lochbaum; and UCS.) Allowing the possibility that the current NRC is comprised of omniscient and perfect actors, the GEIS still cannot assert that this state of affairs will continue for hundreds (or thousands) of years. Alas, as a matter of pure logic, the current NRC cannot reliably depend upon the future NRC being as fabulous as the present. The GEIS also postulates that other agencies will step in as needed, as needed. The same logical flaw applies here as well. Perhaps the most silly assertion is that Congress will step in to help as needed with just the right legislation. Do we even need to respond to that one? (0341-2-9 [Mermelstein, Richard])

Comment: There is nothing scientific about NRC claims that it can guarantee the safe storage of nuclear waste for a million years. This waste contains plutonium & uranium with half-lives of 24,000 years and ten billion years, respectively. You needn't have any expertise, just a little

commonsense to realize how insane this is. One million years takes us to the Calabrian stage of the Pleistocene era, a period of which we know very little, hundreds of thousands of years prior to the emergence of the Neanderthal. But going forward in time, we know little if anything about events a decade from now, and we have no way to know anything about conditions ten thousand centuries from now. That the word 'confidence' is used by the NRC when talking about safeguarding radwaste for a period of time five hundred times greater than the Christian era is preposterous! There is no proven technology to displace something for a million years. Not for 100,000 years, not even for 10,000 years. The longest lived man-made structures are the pyramids. They've been around for 5,000 years and they failed at their intended purpose. (0348-10 [Agnew, David] [Roscoe, Lee])

Comment: There is nothing scientific about NRC claims that it can guarantee the safe storage of nuclear waste for a million years. This waste contains plutonium & uranium with half-lives of 24,000 years and ten billion years, respectively. You needn't have any expertise, just a little commonsense to realize how insane this is. One million years takes us to the Calabrian stage of the Pleistocene era, a period of which we know very little, hundreds of thousands of years prior to the emergence of the Neanderthal. But going forward in time, we know little if anything about events a decade from now, and we have no way to know anything about conditions ten thousand centuries from now. That the word 'confidence' is used by the NRC when talking about safeguarding radwaste for a period of time five hundred times greater than the Christian era is preposterous! There is no proven technology to displace something for a million years. Not for 100,000 years, not even for 10,000 years. The longest lived man-made structures are the pyramids. They've been around for 5,000 years and they failed at their intended purpose. (0352-10 [Roscoe, Lee])

Comment: NRC's assumption that "indefinite storage" at reactor sites can go on literally forever, without a loss of institutional control, is absurd. Dr. Makhijani of IEER, has pointed out, one of the oldest continuous human institutions in the world, the Catholic Church, is only 2,000 years old. Plutonium-239, for one, will remain hazardous for at least 240,000 years. NRC "indefinite storage" scenario is delusional. It assumes dry cask storage -- cask pads, inner canisters, and the dry casks themselves --will be replaced once every 100 years, forevermore into the future. (0377-5-17 [Cuthbert, Lewis])

Comment: The long time period of spent fuel storage presents another problem, that of securing the fissionable material from misappropriation and misuse. As the fuel ages and the radioactivity decreases it becomes more attractive as a target for theft and extraction of its plutonium content. The USA is less than 240 years old so that is all the experience we have as a republic. Over the next few centuries, while the fuel remains "hot," I submit that we have no way of predicting what sorts of situations might occur. We cannot, therefore, be "confident" that the current political and economic systems will continue to provide the physical security, in perpetuity, needed to keep the fissionable materials safe. (0410-22 [Nelson, Dennis])

Comment: It is telling that the NRC uses the term "confidence" when talking about safeguarding nuclear waste. Going BACK in time, one million years takes us to the Calabrian stage of the Pleistocene era, a period of which we know very little, hundreds of thousands of years prior to the emergence of the Neanderthal. But going forward in time, we know little if anything about events a decade from now, and we have no way to know anything about conditions ten thousand centuries from now. That you dare use the word 'confidence' when talking about safeguarding radwaste for a period of time five hundred times greater than the Christian era is preposterous! (0419-2 [Agnew, David])

Comment: Rolling Stewardship is a relatively new concept. It was first introduced in the 1995 by the National Research Council, the working arm of the United States National Academies, which produces reports that shape policies. The study, "Improving the Environment", called direct attention to the concept of "Rolling Stewardship" as an important option for addressing contaminated sites that pose significant cleanup challenges. "Rolling stewardship" means planning for stewardship one generation ahead; by doing it one generation at a time with continuity of knowledge and effort. Rolling Stewardship of the radioactive mess we have made...IS NOT AN OPTION...IT IS A REQUIREMENT. (0421-6 [Clemons, Victoria])

Comment: Spent fuel rods take about 3,000 years to cool down to the same amount of radioactivity as in all the ore it took to make the fuel rods. 3,000 years is as long as from the reign of King David of ancient Israel to now and longer than any sovereign nation has lasted as a sovereign nation so far. (0439-1 [Adams, Grace])

Comment: Given NRC's flawed use of probabilities in risk assessment, the agency should also critically examine the probability of the very existence of a functional regulatory agency within the extended time frames described. (0447-2-4 [Andrews, Richard])

Comment: Enriched and used in the reactors fission process, the so-called "spent" fuel becomes more radioactive and unstable so must be removed and stored under very controlled conditions for A MILLION YEARS! BUT NO SAFE PLACE EXISTS OR HAS BEEN PLANNED TO STORE IT. How many human generations will be responsible for those controlled conditions? What geologic changes will take place on this dynamic planet in that period? Will humans even exist to safeguard the planet from it? It is not within human power to foresee cataclysmic natural events and less so volatile political events in the next 60 years, or even until 2024. (0450-2 [Bast, Nancy])

Comment: For the long term, a plan which assumes a stable society and social fabric which will continue required maintenance of on-site nuclear waste storage for many hundreds to thousands of years into the future is a stretch too far. History teaches us that governments, countries and civilizations arise, change and collapse quite frequently. There is no reason to believe the United States is exempt from this process of change and collapse. (0451-4 [Rippner, Sharon] [Rippner, Thomas])

Comment: This type of irrationality only lends strength to the argument that we cannot confidently predict that future generations will act responsibly when handling the dangerous waste we're leaving in their hands. (0454-11 [Waldstein, Joe])

Comment: The NRC's flawed environmental study is based on a number of unrealistic assumptions that must be reconsidered. The NRC assumes that current regulations and oversight, and the current corporate ownership of each reactor, will continue indefinitely after the reactors are shut down, and will be enough to ensure that the waste is stored safely for thousands of years. By relying on this assumption, NRC has improperly failed to consider what impacts would occur if so-called "institutional controls" fail. (0465-2 [Commenters, Multiple])

Comment: The GEIS assumes that "institutional controls" (i.e. NRC regulation of site owners/operators who are willing and able to meet NRC regulations) are in place as long as there is wet or dry storage on any commercial site. The recent government shutdown should give pause to the assumption that institutional controls will remain in place and effective indefinitely. Current NRC regulation is of an industry that is profitably generating power, assumes it has a future, and understands that an assurance of safety is a necessary pre-

condition for its future. Under "continued storage", alternative assumptions regarding institutional controls warrant consideration? e.g. a future in which a less well-funded NRC is regulating an industry that is no longer producing power, and an industry for which regulatory costs are no longer a manageable expense in a profitable overall operation. Does the GEIS and proposed rule consider that "institutional controls" might become weaker and less effective, even if still "on the books"? (0505-8 [Williams, Jim])

Comment: The Fukushima disaster makes clear that the problem of nuclear waste storage is ongoing. To pretend to be able to guarantee safe storage of nuclear waste for a quarter of a million years is preposterous. You know it, we all know it. (0530-1 [Proeller, John])

Comment: No human social structure has been stable on the time scale required to handle nuclear waste. The continued presence of these wastes is an ongoing threat to our health, democracy and transparency (0531-2-16 [Morgan, Sally])

Comment: The environmental impact determinations that impacts would be small in almost all scenarios are accurate and should not be surprising. Storage is a largely passive activity requiring a relatively small construction scope followed by monitoring. Assuming institutional controls to exist in perpetuity, guarantees impacts to be small. Any responsible implementer (e.g., utilities) and regulator (e.g., NRC) would make sure of that. The real issue for this analysis is whether or not a "no institutional control" scenario must be evaluated in more detail. NRC states that such a scenario is not reasonable and points to its comments on the Yucca Mountain EIS, where a no institutional control scenario was evaluated, that it has not changed its opinion on the reasonableness of such a scenario. Regardless of reasonableness, NWRPO agrees with NRC that reevaluation of such a scenario is unnecessary. However, the reference to such a scenario in GEIS section 1.8.3, Analysis Assumptions, should be expanded to explicitly acknowledge that if all maintenance and monitoring of spent fuel storage was to end, after 1,000 years or so at some locations, environmental impacts would be large. This assumes no human action to keep storage facilities maintained and safe or even action to avoid impacts. Any new analysis would yield similar results. Perhaps the no institutional control scenario is speculative and not reasonable as NRC states, but the GEIS should at least acknowledge that a repository scenario under the same no institutional control assumptions results in extremely small impacts. At a repository under Yucca Mountain standards and likely any other future standard, the environmental and safety impacts for 10,000 years and beyond, even assuming no human intervention, would be a very small radiation dose to a reasonably maximally exposed individual. Essentially there would be no human health and safety impacts from repository disposal. (0544-11 [Enriquez, Elizabeth])

Comment: The following sentences in the footnote [Footnote 2 on pages 1-14 and 1-15 of the GEIS] related to the Yucca Mountain FEIS contain inaccurate statements shown in bold [italics] below. DOE's approach to the loss of institutional controls at a dry cask storage facility was provided in its Yucca Mountain EIS (DOE 2008). In its analysis, DOE found that the loss of institutional controls resulted in catastrophic impacts for several resource areas. *These approaches to institutional controls were related to post-closure buried radioactive waste and are not relevant to the indefinite dry cask storage of licensed spent nuclear fuel considered in Waste Confidence. A dry cask spent nuclear fuel storage facility is not sited, designed, or built to avoid active maintenance like a low-level waste disposal facility.* Further, at some period beyond the closure of the disposal facility, increasing the likelihood that an inadvertent intrusion could occur. In contrast, a dry storage facility is typically a visible surface structure requiring active maintenance and security, making loss of institutional control so unlikely that it is a remote and speculative occurrence. Given that the National Environmental Policy Act does not

require consideration of remote and speculative issues, this analysis has not been included in the GEIS. In fact, the Yucca Mountain Final EIS did evaluate loss of institutional controls related to continued storage of commercial spent nuclear fuel. GEIS page 1-15, lines 6 to 15 accurately reflect what the FEIS analyzed, although the reference should be DOE 2002 (the FEIS) versus DOE 2008 (the Supplemental EIS). The words in the footnote could be modified, as follows, to be correct. DOE's approach to the loss of institutional controls at a dry cask storage facility was provided in its Yucca Mountain Final EIS (DOE 2002). In its analysis, DOE found that the loss of institutional controls resulted in catastrophic impacts for several resource areas. A dry storage facility is typically a visible surface structure requiring active maintenance and security, making loss of institutional control so unlikely that it is a remote and speculative occurrence. Given that the National Environmental Policy Act does not require consideration of remote and speculative issues, further analysis has not been included in this GEIS. Perhaps a better alternative (or in addition to) the suggestion noted above for the footnote would be to expand the discussion of the Yucca Mountain Final EIS (DOE 2002) in the bullet beginning on p. 1-15, lines 6 to 15. An addition should be added after the statement beginning on line 7, "In particular, the DOE considered a specific scenario in which spent fuel and high-level radioactive waste would remain in dry storage at commercial and DOE sites and would be under institutional controls for approximately 100 years, and beyond that time, it was assumed there would be no institutional controls." The addition should pick up the point made in the footnote and provide a slight expansion. Suggested words follow. Suggested Addition: In its analysis, DOE found that the loss of institutional controls resulted in catastrophic impacts for several resource areas. At the end of the same bullet on p. 1-15, line 15, the following addition is also suggested. Suggested Addition: Repeating the existing DOE Yucca Mountain Final EIS analysis would serve no useful purpose. NRC continues to believe that a no-institutional-control scenario is highly speculative and does not represent a reasonable assumption. Given that the National Environmental Policy Act does not require consideration of remote and speculative issues, the Yucca Mountain Final EIS no institutional-control analysis has not been replicated in this GEIS. (0544-26 [Enriquez, Elizabeth])

Comment: First, how can the NRC assume the utility in question will remain solvent or fiscally whole for a period of up to 160 years after cessation of energy production at a nuclear facility? Bankruptcy in the energy producing field is not an unknown occurrence and a protracted proceeding could take decades, involving federal intervention (SEC), litigation among insurance companies, and host of widely unpredictable variables. (0547-2 [Weisman, David])

Comment: Assumptions about long term "Institutional controls" are haphazard at best. The GEIS at (1-14) is captioned: Institutional controls would be in place. Institutional controls, i.e., the continued regulation of spent nuclear fuel, will continue. This assumption avoids unreasonable speculation regarding what might happen in the future regarding Federal actions to provide for the safe storage of spent fuel. Although government agencies and regulatory safety approaches can be expected to change over long periods of time into the future, the history of radiation protection has generally been towards ensuring increased safety as knowledge of radiation and effectiveness of safety measures has improved. For the purpose of the analyses in this draft GEIS, the NRC assumes that regulatory control of radiation safety will remain at the same level of regulatory control as currently exists today. [emphasis added] Such assumptions about the long term stability of regulatory control and institutional succession are baseless for an agenda that has a presumed time span upwards of 160 years. 160 years ago, in the United States, there was a "peculiar institution" of slavery, the enforcement of which was codified in law and justified in the Constitution. To a large segment of the U.S population for which an entire economy was dependent, this was largely viewed as not just viable, but justified and unchanging. And yet, this institution and the population which was dependent--or subject--

to it, was completely overturned in a span of time less than the current licensed life of a radioactive waste cask. (0547-4 [Weisman, David])

Comment: The unsupported assumptions include: Institutional controls will indefinitely remain in place and be at same level of regulatory control as currently exists today. (0556-2-2 [Lampert, Mary])

Comment: Institutional controls/current technology & regulations are not consistently followed today. There is no reason to believe that they will be in the future--especially into a future of 300 or more years. Examples where regulations are not consistently followed today: a. A report, "*Safety Culture is not Possible without Regulatory Compliance*" Paul Blanch, September 2013 ¹³ [footnote 13 text: <http://allthingsnuclear.org/wp-content/uploads/2013/09/20130900-blanch-regulatory-compliancereport-.pdf>] shows that the NRC has neither identified nor enforced, and licensees have not complied with NRC regulations so that the assumption that institutional controls would be in place and enforced does not hold in the future anymore than today. [Images of Text Box Submitted with Correspondence ML13354A021] b. The Union of Concerned Scientists reports that fire poses a very significant safety risk and NRC issued fire safety regulations in 1980 and an alternate set in 2004. But thirty years later, nearly half of the licensees do not comply with the regulations. The NRC is playing with fire and not enforcing its own regulations.¹⁴ [footnote 14 text: http://www.ucsusa.org/assets/documents/nuclear_power/ucs-nrc-fire-regulations-5-2-13.pdf] c. UCS's third annual review of the Nuclear Regulatory Commission's performance in policing the U.S. nuclear power industry:¹⁵ [footnote 15 text: http://www.ucsusa.org/nuclear_power/making-nuclear-power-safer/who-is-responsible/nrc-and-nuclear-powersafety-annual.html] The report takes the NRC to task for its failure to consistently enforce its own regulations, effectively leaving long-term holes in the safety net that is supposed to protect the public from the inherent hazards of nuclear power. According to the report, the NRC's lax oversight "reflects a poor safety culture," including a disconnection between the NRC's workforce and its senior management, with managers tending to downplay safety problems and react negatively when workers point them out. d. As discussed in the foregoing, there is evidence of regulators covering up problems during operations. There is basis for projecting that the same will hold true after operations have ceased. For example: "In a letter submitted Friday afternoon to internal investigators at the Nuclear Regulatory Commission, a whistleblower engineer within the agency accused regulators of deliberately covering up information relating to the vulnerability of U.S. nuclear power facilities that sit downstream from large dams and reservoirs. The letter also accuses the agency of failing to act to correct these vulnerabilities despite being aware of the risks for years." (Flood Threat to Nuclear Plants Covered Up By Regulators, NRC Whistleblower Claims, Huffington Post, Sept. 14, 2013) e. As shown in the foregoing, federal, state and NRC requirements are not followed to protect Cape Cod Bay and its aquatic resources, special status species & habitats. f. It is absurd to rely on a "crystal ball" to project assurance into the distant future. NRC cannot rely on its "crystal ball." It is one thing to make future projections based on actual past history. But there is no long history here to rely upon to make projections about future decades and centuries. No reactors have operated more than 45 years. There is no assurance that the same or equivalent regulatory bodies will exist 100, 200 300 years or more into the future. Simply by looking back to institutions and technology in 1713, 1813, and 1913 shows the absurdity of the assumption that institutional controls/current technology & regulations would be in place and be at same level of regulatory control as currently exists today. (0556-2-5 [Lampert, Mary])

Comment: The GEIS assumes institutional controls would be in place into the future, and that spent fuel canisters, casks, independent spent fuel storage installations and dry transfers

system facilities would be replaced once every 100 years. (ES, p. xxviii) The NRC believes this will be enough to ensure that the waste is stored safely hundreds and thousands of years into the future, and fails to consider what impacts would occur if these institutional controls fail. (0604-6 [Pisha, Gayla])

Comment: During our circle discussion toward the end of the December 4, 2013 Hearing in Minnetonka, NRC staff acknowledged that cost factors analyzed by the Draft GEIS were limited to administrative costs associated with the various scenarios examined by the Draft GEIS, and that the administrative cost-benefit balance between the proposed administrative action and administrative alternatives was the reason for selecting revisions to 10 CFR 51.23 as the preferred alternative. However, NRC Staff also acknowledged that nowhere in the Draft GEIS is there any accounting of the financial costs of actually performing the functions specified in the various spent fuel management scenarios. Without accounting for the costs of performing the functions required for institutional control of irradiated fuel, which are massive, any assumption of institutional control is deluded nonsense. (0608-10 [Crocker, George])

Comment: Miss-Assumption Regarding Institutional Controls Being In Place. Without the assumption that institutional controls would be in place (Draft GEIS, xxviii), the entire Draft GEIS totally unravels. Yet, the primary if not the entire justification for this assumption is contained in a footnote in Section 1.8.3, which says in significant part that several Federal agencies rely on institutional controls that, "typically include enforcement tools to address potential problems involving improper or incomplete implementation, maintenance, and breaches of institutional controls. Examples of institutional controls include permits, Federal Facility Agreements, and environmental covenants that apply continuously with present and future ownership of the subject property (under either state statute or common law (EPA 2012))." Ignoring the circular logic, that institutional controls would be in place because Federal agencies rely on institutional controls, this list of attributes is fatally incomplete in terms of identifying and defining the types of institutional control required for long-term safe and secure nuclear waste management in the scenarios presented by the Draft GEIS. For example, where is the analysis that allows us to assume that the nuclear industry will be able to maintain a work force with enough technical knowledge and expertise to perform the functions needed to manage Independent Spent Fuel Storage Installation (ISFSI) and Dry Transfer System (DTS) facilities 60 years from now, or 160 years from now, or 260 years from now? Where is the probability analysis that establishes the confidence boundaries that the required skills will be available? (0608-6 [Crocker, George])

Comment: If commercial nuclear power fails to compete economically in terms of providing electric utility services throughout the storage period, the talent pool of engineers and technicians possessing the required skills will continue diminishing and then, without extraordinary measures, disappear. What is the probability that this will happen? What is the contingency for managing ISFSI and DTS facilities if it does happen? The assumption that institutional control will be in place cannot be valid without answers to these questions, but the analysis required to answer these questions is not contained in the Draft GEIS and the need for such an analysis is not even discussed. This glaring failure pales in comparison to issues surrounding financial costs of maintaining institutional control. For any business plan to have validity, whether it's for a football stadium, operating a shopping mall, or managing nuclear waste, it must include viable financing. Pretending that institutional control can exist without accounting financially for that control, which this draft GEIS does, is grotesquely self-serving but stunningly incompetent. (0608-9 [Crocker, George])

Comment: The EIS should include past studies such as "Expert Judgement on Inadvertent Human Intrusion into the Waste Isolation Pilot Plant" Sandia Report SAND90 -- 3063, UC -- 721,

December 1991) and Expert Judgement on Markers to Deter Inadvertent Human Intrusion into the Waste Isolation Pilot Plant (SAND92 -- 1382, UC -- 721, November 1993). (0610-8 [Brechtin, Vernon])

Comment: The lethal legacy of nuclear waste is the Achilles heel of the nuclear industry. There is clearly a lack of confidence in any plan for short term, long term or indefinite nuclear waste storage, since human knowledge is limited to less than 24,000 years. (0611-23 [Shapiro, Susan])

Comment: Prof Guy McPherson of the University of Arizona states that collapse of many systems is imminent. I state that the collapse of the funding for a geological repository will depend on many of these societal structures that may not survive global warming for the next few decades per Dr. McPherson. Will the NRC analyze and explain how the NRC can expect a financial stream to build a geological repository in the face of collapse of the money system as a consequence of global warming? (0615-3 [Lewis, Marvin])

Comment: It blatantly sidesteps the fact that most of this waste will last tens of thousands of years and that recent history has demonstrated that "institutional controls" in no way guarantee that the public health and safety can be protected from its ill effects. (0620-5 [Rivera, Evelyn])

Comment: Chief among the issues to address environmental impacts of continued storage is the capacity of the owner to maintain safe and efficient operations around the clock. For pool storage, this includes maintaining electrical power at 100% reliability for the life of all facilities in the U.S. However, no owner accountability is discussed in the DGEIS. The analysis assumptions in Section 1.8.3 discusses spent fuel and high-level radioactive waste stored under institutional controls at DOE sites. Are we to assume that DOE will maintain institutional controls-i.e., ownership of all national spent fuel repositories and thereby assure continued maintenance? When is a spent fuel pool or ISFSI considered a national "repository"? (0622-1-10 [Vale, Karen])

Comment: In short, the Commission must simply be sure that the Waste Confidence rule and the GEIS endure through changes in national policy that the Congress and the Executive Branch may agree upon or the changes in safety policy that this or a future Commission may make. (0637-11 [Norton, Wayne])

Comment: Instead of fully examining the risks of spent fuel storage, the NRC incorrectly assumes that spent fuel can and will be safely stored above ground indefinitely and that government institutions will be able to adequately regulate and oversee that activity forever. It assumes a physical, social, and political world so static that spent fuel storage containers can be replaced approximately once every 100 years until the end of time. (0646-16 [Hanson, Courtney])

Comment: The United States is less than a quarter millennia old, civilization took root a bare 6,000 years ago and a scant 10,000 years ago our ancestors began to develop agriculture. Clearly the world can change drastically over time, and yet we are asked to believe the NRC and whatever follows it in time will safeguard this poison for ten times as long as mankind has lived in settled communities. We are being led to believe that under the "indefinite storage" system, the NRC or someone in the future would regularly replace the dry cask storage --cask pads, inner canisters, and the dry casks themselves every century or so in the future, through sea level fluctuation and ice ages, essentially forever, but even assuming some sense of historical memory and continuity over the eons for which there is no evidence. (0648-6 [Price, Scott])

Comment: NIC encourages NRC to include in its EIS by reference a scenario in which used fuel remains at reactor sites in perpetuity, but is under institutional controls for only about 100 years. This scenario was one of the "no action" alternatives evaluated by the Department of Energy in its Yucca Mountain Environmental Impact Statement. NIC believes that this scenario is theoretical, and not reasonably likely to actually occur. However, the analysis of the scenario was prepared by the DOE in conjunction with its EIS accompanying the Yucca Mountain License Application. Accordingly, including the scenario by reference would ensure that the pertinent information is made available to the public as part of this rulemaking. (0685-7 [Davis, Ed])

Comment: Unrecognized in the Draft GEIS is the fact that no civilization and no human institutions have lasted for hundreds of thousands of years. Any credible plan must include ways to mitigate the risks of environmental contamination in the event of failure of governments or institutions. A realistic plan must be devised to keep manmade radioactive elements isolated from the biosphere for the million years the EPA declares them to be lethal. (0686-5 [Malboeuf, Simone])

Comment: We are citing the reality of nuclear waste facilities across the nation as examples of the current loss of institutional control. These failures are also a technically sound basis for the large amount of public mistrust that exists in this country around the potential for resolving nuclear waste responsibly. (0693-2-10 [Warren, Barbara])

Comment: II. Loss of Institutional Control exists at many sites around the country and is strongly associated with a loss of public trust. (0693-2-6 [Warren, Barbara])

Comment: In the background discussion above we reviewed briefly the history of the nuclear waste problem and the failure to find a scientific or technical solution. However, we only reviewed a portion of the problem- that pertaining to spent nuclear fuel. We did not discuss the hundreds of waste sites across the country leaking and spreading radioactive contamination that impacts land, water and air as well as threatens nearby communities. There is an enormous inventory of poorly managed nuclear materials from the front end of the nuclear fuel chain to the back end. In most cases there is a federally responsible agency, often DOE, charged with site clean-up. Inadequate resources, poor management, other national priorities and lengthy delays have resulted in contamination that definitely should be described as the loss of institutional control. We find this situation completely unacceptable, given that we are dealing with just decades of experience with nuclear waste, while NRC is assuming institutional controls will be in place indefinitely. (0693-2-7 [Warren, Barbara])

Comment: It is not necessary to lose an institution in order to have the loss of institutional control. All that is necessary is for the institution or government to be ineffective at carrying out its responsibilities. Therefore, it is not credible that NRC relied on the long term maintenance of institutional control in its GEIS analysis. In fact NRC stated that loss of institutional control is "so unlikely that it is a remote and speculative occurrence." (p. 56788 FR notice proposed rule) Our government made promises about the simple problem of nuclear waste, about nuclear waste repositories, and about nuclear safety. (0693-2-8 [Warren, Barbara])

Comment: Government has failed at Hanford, at Savannah River, at West Valley and many other sites. How can so many problems be remote and speculative occurrences? These sites don't have long term multi-year cleanup funds. Each year funding must be allocated from the discretionary budget and lack of funding is frequently cited as the reason clean-ups are delayed

and spreading contamination continues. In 2013, the US government shutdown as a result of budget disagreements in Congress. (0693-2-9 [Warren, Barbara])

Comment: It is therefore reasonable under NEPA to assume that the Federal Government ultimately will accept responsibility for TVA's and other commercial SNF. (0694-2-11 [Shea, Joseph])

Comment: The NRC also has made reasonable assumptions regarding the continued availability of institutional controls over spent fuel storage. (0694-3-20 [Shea, Joseph])

Comment: It is therefore reasonable under NEPA to assume that the Federal Government ultimately will accept responsibility for Entergy's and other commercial SNF. (0697-1-28 [Bessette, Paul] [Kuyler, Raphael])

Comment: [R]egulatory requirements and the NRC's continued oversight and evolution of the requirements in response to new information or developments provide additional assurance that spent fuel will be stored and managed in a safe and secure manner. (0697-3-1 [Bessette, Paul] [Kuyler, Raphael])

Comment: No one can predict the future and no one can positively predict what humans will be doing in 10,000 years or in 100,000 years. No one can build a secure shelter for a very destructive nuclear material that will last the length of time it takes for uranium or plutonium to become safe in the environment. (0701-18 [Wilson, Greg])

Comment: *Reliance vs. Erosion of Institutional Controls as a Function of Time* —"The Draft GEIS assumes institutional controls will necessarily ensure continued public safety and security of SNF surface storage facilities, with no significant increases in environmental consequences (we address this misguided proposition later). While this may be deemed reasonable over a short term (e.g. storage during the entire extended term of licensed operation), based on the sad history of managing radioactive and other forms of hazardous waste generated by large U.S. industrial programs, such as the production of nuclear weapons and rocket fuel, this is not a reasonable assumption to apply to the full terms of more extended storage scenarios, in which various levels of degradation and loss of such controls could well occur. Based on historical experience, for any scenario in which nuclear waste (SNF) is stored on the surface longer than 20 years following expiration of the extended reactor license term – which means some spent fuel could already be 80 years old – the agency must evaluate plausible scenarios in which the responsible commercial entities go bankrupt, or otherwise assert the federal government's sole fiduciary responsibility, which the government then fails with sufficient alacrity to assume, and thus institutional controls are lost, forcing primary reliance on the engineered barriers designed into the storage systems. It is critically important for NRC to assess, and the public to know, the inherent resilience of such storage systems and how long they may reasonably be relied upon to passively protect the environment and the public without active intervention by external institutional managers. (0706-2-24 [Fettus, Geoffrey])

Comment: NRDC Comment[:] The assumptions underlying NRC's evaluation of timeframes are arbitrary and capricious and fail to meet the "hard look" requirements of NEPA. With respect to NRC's evaluation of the licensed life of the reactor and short-term storage timeframes, we direct the agency to our comments on Appendix E, Analysis of Spent Fuel Pool Leaks, found below. NRC's fourth timeframe—indefinite storage—consistent with the DC Circuit's directions, assumes a geologic repository does not become available at any point and at-reactor or away-from-reactor ISFSIs would continue to store spent nuclear fuel in dry casks indefinitely.

However, NRC goes on to presume the following activities continue uninterrupted for the next several millennia, beyond the span of human history. Specific assumptions articulated by NRC include: •Continued storage of spent fuel in ISFSIs, including routine maintenance; •Replacement of ISFSIs and spent fuel canisters and casks every 100 years and thereafter; •Construction and operation of an away-from-reactor ISFSI (including replacement every 100 years); •Construction and operation of a Dry Transfer Storage facility (DTS), including replacing the DTS every 100 years thereafter for the millennia to follow. The NRC acknowledges these activities are the same as those occurring during the "long-term storage period," but, without a repository they must occur repeatedly, forever. NRC defends these assumptions on pages 1-14 and 1-15 and note 2 on those pages. Described in detail below, NRC's assumptions are arbitrary, capricious and violate NEPA. Institutional controls will fail over the long term and the agency's arbitrary refusal to analyze the consequences of those failures at nuclear waste storage sites around the country violates NEPA's hard look requirement and renders meaningless NRC's response to the DC Circuit's clear directions. Such a perspective is not NRDC's mere assertion. The National Academy of Sciences and every federal agency that has adopted regulatory requirements related to institutional controls, *including the NRC*, expect failure and have drafted requirements with such an eventuality in mind. Further, every scientific body and federal agency that has examined institutional controls in any context (chemical or radioactive contamination) has evidence of institutional failure. As such is the case, NRC must take account of such failure in its analysis of the environmental impacts of the nuclear waste permitted to be produced under the agency's licensing decisions. And it must do so in this particular EIS. (0706-3-1 [Fettus, Geoffrey])

Comment: As a "no-action" alternative in the context of the Yucca Mountain EIS, DOE posited two scenarios for nuclear waste over a 10,000 year period. Scenario 1 assumed institutional controls last for the entirety of the 10,000 year period. Scenario 2 assumed no effective institutional control of the storage facilities after approximately the first 100 years. Such an analysis is consistent with regulatory understandings of the efficacy of institutional controls (no reliance on them after 100 years) and, as DOE itself noted, "provide[s] a basis for evaluating an upper limit of potential adverse human health impacts to the public from the continued storage of spent nuclear fuel and high-level radioactive waste." At 7-33. However, we also concur with the views of Dr. Arjun Makhijani on this precise subject.³⁷ [footnote 37 text: See Declaration of Dr. Arjun Makhijani Regarding the Scope of Proposed Waste Confidence Environmental Impact Statement, Section 8.0, pages 24-28, January 2, 2013, http://ieer.org/wp/wpcontent/uploads/2013/01/WasteConfidence_EIS_Scoping_MakhijaniDeclaration2013.pdf.] Scenario 2 is a useful starting point for NRC as an analytical tool, but only that – a starting point. Dr. Makhijani provided several examples of assumptions in Scenario 2 that are scientifically inappropriate for a Waste Confidence EIS and examples of DOE underestimating the impacts of the no-action alternative scenarios in a number of ways. *Id.* But in any event, the probabilities and consequences of the harm that should have been subjected to a "hard look" in this Draft GEIS were at least initially examined by a federal agency several years ago, no matter the weakness of the initial analysis. Here's how DOE did the work and it could have at least served as a starting point for NRC. (0706-3-10 [Fettus, Geoffrey])

Comment: DOE's Scenario 2. As noted, after 100 years, Scenario 2 assumes no effective institutional control and storage facilities are essentially abandoned (but the engineered barriers remain). DOE assumes no health risks for workers during the initial century. For the remaining 9,900 years, DOE assumes spent nuclear fuel and high-level radioactive waste storage facilities at 72 commercial and 5 DOE sites would begin to deteriorate and that radioactive materials is released to the environment, contaminating the local atmosphere, soil, surface water, and groundwater. Appendix K of the EIS provides details of facility degradation, radioactive material

environmental transport, and human radiological exposure and dose models. See discussion at 7-33. Although the size of the affected area would be impossible to predict accurately for each site, DOE believed it would involve tens to hundreds of acres at each of the 77 sites.³⁸ [footnote 38 text: For its analysis (see Appendix K, Section K.2.1), DOE collected information from each of the 77 sites where spent nuclear fuel and high-level radioactive waste was located at that time and then divided the country into five regions. Then DOE posed a single hypothetical site in each region (see Appendix K, Section K.2.1.6), and estimated the potential release rate of the radionuclide inventory from the spent nuclear fuel and high-level radioactive waste, based on forecast interactions of the environment (rainfall, freeze-thaw cycle) with the engineered barrier (concrete storage modules). See discussion in FEIS at 7-45.] (0706-3-11 [Fettus, Geoffrey])

Comment: Impacts of Scenario 2. DOE's environmental impacts analysis, while inadequate as Dr. Makhijani describes, speaks for itself and make clear why NRC should have at least endeavored to use it as a starting point for examining the environmental impacts of nuclear waste in the event of never developing a repository: During the early period (200 to 400 years after the assumed loss of institutional control), acute exposures to external radiation from the spent nuclear fuel and high-level radioactive waste material could result in prompt fatalities. In addition, after a few thousand years onsite shallow aquifers could be contaminated to such a degree that consumption of water from those aquifers could result in severe adverse health effects, including premature death. Uncertainties about these localized impacts are related primarily to the inability to predict accurately how many individuals could be affected at each of the 77 sites over the 10,000-year analysis period. See FEIS at 7-41. DOE went also noted: In addition to the 3,300 potential cancer fatalities under Scenario 2, more than 20 major waterways of the United States that currently supply domestic water to about 31 million people (for example, the Great Lakes; the Mississippi, Ohio, and Columbia Rivers; and many smaller rivers along the Eastern Seaboard) could be contaminated with radioactive material. Under this scenario, the shorelines could be contaminated with long-lived radioactive materials (for example, plutonium, uranium, and americium), resulting in exposures to individuals who came in contact with the sediments and, potentially, an increase in latent cancer fatalities. Because individuals would not be in constant contact with the sediments, these impacts represent a small fraction of the impacts estimated for the drinking water pathways listed in Table 7-7.³⁹ [footnote 39 text: *Id.* at 7-39.] It should be noted, as Dr. Makhijani points out (Makhijani Declaration at 27), when food pathways other than drinking water are considered in Scenario 2, the radiation doses and fatalities substantially increase. Dr. Makhijani went on to note: "[t]he impact of dispersed waste on vast aquifers, areas of land, and the country's most important rivers that could not be used again because of contamination is not explored in detail. The Fukushima accident that began on March 11, 2011, has shown that the economic, social, and ecological impacts of the spread of radiation contamination are far larger than a narrow view of latent cancer fatalities may indicate." NRDC concurs. (0706-3-12 [Fettus, Geoffrey])

Comment: Summing up its view of the magnitude of potential local impacts, DOE explains: For Scenario 2, localized impacts to individuals from degraded facilities at the 77 sites could be severe. DOE estimated that within a few hundred years at the several sites where early concrete failure was predicted, hypothetical individuals living close to the storage facilities would receive lethal doses of external radiation [800 millirem per hour at a distance of 10 meters (33 feet)] from the exposed dry storage containers (see Appendix K, Section K.2.4.2). To evaluate impacts from ingestion of radioactive materials, the analysis assumed that individuals would live near the degraded storage facilities and would consume contaminated groundwater and food from gardens irrigated with groundwater withdrawn from the contaminated aquifer directly below their locations. DOE estimated that within 6,000 years from now a hypothetical individual living within several hundred meters of a degraded facility could receive an internal committed

effective dose equivalent to several thousand rem per year from ingestion of plutonium-239 and -240 (see Appendix F for further information on committed dose equivalent). Using the National Council on Radiation Protection and Measurements risk factors (DIRS 101857-NCRP 1993, p. 112), ingestion of plutonium at this rate could increase the individual's lifetime risk of contracting a fatal cancer after only a few years of exposure. FEIS at 7-38-40. Dr. Makhijani questions many of the scientific assumptions in Scenario 2. He notes even "estimates of latent cancer fatalities are presented in a very skewed way. Cladding degradation once the spent fuel is put into dry storage is assumed to begin after thousands of years and 'less than 0.01 percent' of the cladding would fail in the first 10,000 years" – a proposition Dr. Makhijani and NRDC find implausible. Makhijani Declaration at 27. And as a final technical matter, Dr. Makhijani points out the Yucca Mountain EIS was completed before any physical evaluation of high burnup fuel that had been in dry storage for any length of time. *Id.* Given what we know now about the myriad of technical problems with long-term storage associated with high burnup fuel, DOE's Scenario 2 is dated and deficient, useful only as a rough starting point for the "hard look" analysis NRC must conduct for a NEPA compliant draft GEIS. But the fact that it even exists demonstrates the degree to which NRC has acted in an arbitrary and capricious fashion by positing institutional controls will last forever. (0706-3-13 [Fettus, Geoffrey])

Comment: NRC's suggested defense for why it failed to analyze the potential environmental impacts of spent nuclear fuel in the event no repository is ever sited can be concisely summarized —the loss of institutional control so unlikely that it is a remote and speculative occurrence. Draft GEIS at 1-14, 15, note 2. NRC provides no technical, regulatory, or historic support for this assertion. Rather, NRC dismisses DOE's approach in its 2002 EIS to the loss of institutional controls at a dry cask storage facility as "not relevant" and asserts DOE's approach was related to post-closure buried radioactive waste and not relevant to the indefinite dry cask storage of licensed spent nuclear fuel. This dismissal has no merit as, seen in Appendix K of DOE's analysis, DOE examined the loss of institutional controls at dry cask storage facilities. More pertinent, contrary to the finding of the National Academies, the GAO, federal agency regulations, and human history, NRC's unsupported suggestion—the loss of institutional controls over thousands of years at a dry storage facility is so unlikely it is a remote and speculative occurrence—is without merit.⁴⁰ [footnote 40 text: It should also be noted NRC has asserted active maintenance and security will continue for centuries, and has made this assertion in a timeframe where the federal government shut down for several weeks. See, *White House Puts Price on Government Shutdown*, New York Times, Annie Lowrey, November 8, 2013, <http://www.nytimes.com/2013/11/08/us/politics/white-house-puts-price-ongovernment-shutdown.html>. ("The report said that the government had not calculated the costs of actually shutting the government down and reopening it. But it described them as significant. "Disruptions at nuclear cleanup sites associated with the shutdown will cost two to three weeks of productivity," it said. The shutdown "may cause the Department of Energy to miss cleanup milestones agreed to with the states where cleanup is underway.""). During that shutdown period, much of the NRC staff stayed on duty as a result of carryover funding. However, near the end of the shutdown, much of NRC staff was furloughed. NRDC makes no suggestion government shutdowns will be more or less frequent, more or less damaging to the public health, or more or less meaningful to the proper management of nuclear waste. We merely subscribe to the observation of the National Academies—institutional controls will fail.] NRC must return to the drawing board and perform an analysis of extended storage of SNF with a failure of institutional controls. (0706-3-14 [Fettus, Geoffrey])

Comment: And finally, in bypassing performing this analysis, NRC would not have had to commence this analysis from whole cloth. DOE, in its Yucca Mountain EIS, provided NRC with at least an initial (albeit inadequate) draft to examine the environmental impacts of the failures of

institutional controls at nuclear storage sites. At bare minimum, NRC must return to the drawing board and analyze the environmental impacts of nuclear waste when a geologic repository does not become available and at-reactor or away from-reactor ISFSIs store spent nuclear fuel in dry casks indefinitely – and institutional controls then fail. (0706-3-2 [Fettus, Geoffrey])

Comment: Page 2-21. "This draft GEIS considers the environmental impacts of constructing a reference DTS to provide a complete picture of the environmental impacts of continued storage." NRDC Comment[:] This Draft GEIS does nothing of the sort and fails provide a complete picture of the environmental impacts of continued storage. See discussion (at comment #4) of failure of institutional controls and DOE's Scenario 2 as a starting point for the area NRC should have covered to being providing a complete picture of the environmental impacts of failing to secure permanent storage. (0706-3-24 [Fettus, Geoffrey])

Comment: Thus, institutional controls exist, agencies adopt policies to implement those controls, and in this Draft GEIS, NRC proposes to conduct nuclear waste management operations for the next several thousand years without any explanation of how those institutional controls might persevere. Draft GEIS at 1-14, 1-15. (0706-3-3 [Fettus, Geoffrey])

Comment: "Institutional Controls Will Fail" — National Academy of Sciences. As seen above, the efficacy and use of institutional controls is a significant and growing element of environmental policy. They have become necessities for the simple reason the polluting entity or government cannot remove the entirety of contamination from a particular site. Federal agencies have adopted regulations explicitly recognizing the difficulties of long-term reliance on institutional controls. And more to the point, there are numerous examples of how and why the institutional controls fail. Even a few examples illustrate the problems facing reliance on institutional controls and the difficulties in formulating "durable," protective remedies for long-term contaminated sites. The DOE, for example, has created the Office of Legacy Management in its Environmental Management Program. The Office of Legacy Management's mission is to manage the long term stewardship of contaminated nuclear weapons sites *after* whatever cleanup has been done has concluded.²⁴ [footnote 24 text: See DOE's Office of Legacy Management online at <http://energy.gov/lm/office-legacymanagement>.] Despite a multi-billion per year cleanup program and an Office of Legacy Management, the government appears to have lost track of significant numbers of formerly utilized sites that remain contaminated. A recent series in the Wall Street Journal by John Emshwiller documented continuing problems at a variety of sites which have receded from the institutional memory of the agencies responsible for assuring they are cleaned up.²⁵ [footnote 25 text: See, e.g., Emshwiller and Singer-Vine, "Waste-Lands: A Forgotten Legacy of Nuclear Buildup," *Wall Street Journal*, October 30, 2013.] (0706-3-4 [Fettus, Geoffrey])

Comment: Then there is waste the nation has abandoned it cannot track, but evidence of it remains with us today. From 1946 to approximately 1970, the Atomic Energy Commission approved disposing of radioactive wastes by dumping at sea. Wastes were placed in various kinds of packages, predominantly 55-gallon drums, placed on tugs or ships, taken out to ocean dumpsites, and tossed overboard. Radioactivity released from degrading canisters was subsequently found to adsorb instead onto and concentrate in bottom sediments. Bottom-dwelling organisms root through those sediments, ingesting the radionuclides and concentrating them in their bodies. They are then consumed by other marine organisms, and then by higher organisms, with radionuclides concentrating as they go up the food chain through a process called bioaccumulation. So, rather than dilution, it turned out there were radioactivity concentration phenomena at work.²⁶ [footnote 26 text: For a full treatment of this sad history, see Jacob Darwin Hamblin, *Poison in the Well: Radioactive Waste in the Oceans at the Dawn of*

the Nuclear Age, Rutgers University Press, 2008; and W. Jackson Davis, John Van Dyke, Daniel Hirsch, Mary Anne Magnier, Sherry P. Broeder, *Evaluation of Oceanic Radioactive Dumping Programs*, study presented by the nations of Nauru and Kiribati to the London Dumping Convention, LDC7/INF.2, 1982.] Further, a study done by attaching monitoring devices on barrels being dumped found roughly a third of those drums imploded before hitting the ocean floor via the differential pressure. Investigations by EPA personnel in the Alvin submersible of the Farallons Islands dumpsite and one off the East Coast, and earlier similar submersible inspections of the Santa Cruz Basin dumpsite off Santa Barbara, found that in just a few years the barrels had degraded substantially. There was significant corrosion and deformation, and radioactivity was found in the sediments nearby at levels far in excess of fallout background, having leaked from the drums.²⁷ [footnote 27 text: *Id.* And for a full recitation of this history in the context of this Draft GEIS and the proposed Waste Confidence rule, see *50 Years of Power: 500,000 Years of Radioactive Waste*, Daniel Hirsch, Committee to Bridge the Gap, Physicians for Social Responsibility-Los Angeles, Southern California Federation of Scientists 20 December 2013.] (0706-3-5 [Fettus, Geoffrey])

Comment: Failures of institutional controls in the chemical cleanup context have also been significant. In southern New Jersey, children at a daycare were exposed for significant periods of time to unacceptably high levels of mercury at a former thermometer factory.²⁸ [footnote 28 text: *See After Mercury Pollutes a Day Care Center, Everyone Points Elsewhere*, New York Times, Tina Kelly, August 19, 2006, <http://www.nytimes.com/2006/08/19/nyregion/19mercury.html?pagewanted=all>.] There are numerous lessons in this particular story, but failure to either clean up the property, or at the least to put a lien on the property and erect signs and fences around it to notify neighbors about the possible hazards, resulted in this statement: "Lisa P. Jackson, the commissioner of the environmental department, conceded in an interview this week that the agency needed better tracking of contaminated sites, clearer cleanup priorities and stronger enforcement efforts. 'This is an example when all three of those kind of collide in a bad way,' she said. 'It crystallizes some of the things we need to do differently.'"²⁹ [footnote 29 text: Another excellent press treatment of the long term and related problem of "brownfields," (which allow certain types of pollution to be left in place and capped), is the New York Times's examination of the cleanup of chromium ore in Jersey City, NJ. See *Finding the Bottom of a Polluted Field*, Anthony DePalma, February 5, 2006, <http://www.nytimes.com/2006/02/05/nyregion/05chromium.html?pagewanted=all>.] There are thousands of sites across the country where unexploded bombs, mortar rounds and other munitions, covering about 10 million acres, according to government records and experts interviewed by ABC News.³⁰ [footnote 30 text: *See Casualties of War*, Chris Francescani, ABC NEWS Law & Justice Unit, Jan. 24, 2008, <http://abcnews.go.com/TheLaw/story?id=4179408&page=1>.] Even items such as munitions from recent past are unrecognized or not properly handled. ABC News wrote "officials have undertaken an awareness and education campaign to avoid situations like that of Henry Owens, the Tennessee boy whose hand was blown off. 'People have found these things, and they think they are souvenirs, and they bring them home,' Davis said. While 'in most cases, there has to be some kind of force [to detonate a buried ordnance], we really stress what we call the three Rs: recognize, retreat and report. We do not want people picking things up and driving them to the police, or bringing them home,' Davis said."³¹ [footnote 31 text: *Id.*] (0706-3-6 [Fettus, Geoffrey])

Comment: Finally, in a thorough report addressing concerns that institutional controls may not effectively protecting human health and the environment in the context of chemical contamination, in 2005 the Government Accountability Office reviewed (1) the extent to which

institutional controls are used at sites addressed by EPA's Superfund and RCRA corrective action programs; (2) the extent to which EPA ensures that institutional controls at these sites are implemented, monitored, and enforced; and (3) EPA's challenges in implementing systems to track these controls.³² [footnote 32 text: See *Hazardous Waste Sites: Improved Effectiveness Of Controls At Sites Could Better Protect The Public*, Government Accountability Office, GAO-05-163, January 2005, <http://www.gao.gov/assets/250/245140.pdf>.] The GAO found institutional controls were used at most of the Superfund and RCRA sites where cleanup was completed and waste was left in place. Further, the GAO found that while EPA's guidance advises that four key factors be taken into account in selecting controls for a site (the objective, mechanism, timing and responsibility for the institutional control), 69 of the 108 remedy decision documents examined did not demonstrate that all of these factors were sufficiently considered to ensure that planned controls will be adequately implemented, monitored, and enforced.³³ [footnote 33 text: *Id.* at 5.] The GAO explained: Although EPA has taken a number of steps to improve the management of institutional controls in recent years, we found that controls at the Superfund sites we reviewed were often not implemented before site deletion, as EPA requires. In some cases, institutional controls were implemented after site deletion while, in other cases, controls were not implemented at all. An EPA program official believed that these deviations from EPA's guidance may have occurred because, during the sometimes lengthy period between the completion of the cleanup and site deletion, site managers may have inadvertently overlooked the need to implement the institutional controls.³⁴ [footnote 34 text: *Id.* at 6.] (0706-3-7 [Fettus, Geoffrey])

Comment: We conclude this subsection of our response to the NRC's arbitrary and capricious assertion, "[i]nstitutional controls, i.e., the continued regulation of spent nuclear fuel, *will continue*," by noting the observation of the National Academy of Sciences: "institutional controls *will fail*."³⁵ [footnote 35 text: See National Academy of Sciences/National Research Council, Board on Radioactive Waste Management, *Committee on the Remediation of Buried and Tank Waste, Long-Term Institutional Management of the U.S. Department of Energy Legacy Waste Sites*, August 2000, at page 97 (emphasis added).] (0706-3-8 [Fettus, Geoffrey])

Comment: The NRC Should Have Analyzed the Environmental Impacts of Nuclear Waste in the Event a Repository Never Opens. The DC Circuit was explicit in its directions to NRC, "[u]nder NEPA, an agency must, look at both the probabilities of potentially harmful events and the consequences if those events come to pass." *New York et al.* at 478, citing *Carolina Env'tl. Study Grp. v. U.S.*, 510 F.2d 796, 799 (D.C. Cir. 1975). In light of federal and state regulatory understanding of institutional controls, the views espoused by the National Academy of Sciences and the GAO – indeed, the entire trajectory of nearly any entity that has addressed the topic of protection of public health and the environment from significant sources of contamination left in place, NRDC finds astonishing NRC's conclusion, without a shred of support, that "[i]nstitutional controls, i.e., the continued regulation of spent nuclear fuel, *will continue*." Rather, NRC should have, at minimum, commenced work on a thorough analysis of the environmental impacts of the failure of institutional controls at reactor storage sites or IFSIs. Here, as the NRC acknowledges, (note 2 on page 1-15), a first cut at just such an analysis to at least serve as a starting point was available to them. DOE performed just such an analysis in its Final Yucca Mountain EIS, even though it is inadequate to the task for this Draft GEIS in several important ways, discussed below.³⁶ [footnote 36 text: See *Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250), found online in full at <http://energy.gov/nepa/downloads/eis-0250-final-environmentalimpact-statement>; and http://energy.gov/sites/prod/files/EIS-0250-FEIS-01-2002_0.pdf.] (0706-3-9 [Fettus, Geoffrey])

Comment: Page 2-28. "As described in Section 2.1.4, the NRC assumes a DTS, or its equivalent, would be used to transfer fuel as needed for inspection or repackaging. For purposes of this draft GEIS, the NRC assumes the reference DTS would be constructed, operated, and replaced once during the long-term storage timeframe, and every 100 years thereafter... As shown in Figure 2-3, receiving casks and source casks enter the preparation area and exit the DTS on rail-mounted trolleys. To begin spent fuel transfer operations, a receiving cask (i.e., the cask into which fuel will be transferred) is transported to the DTS. The receiving cask is positioned and loaded on a receiving cask transfer trolley at the DTS and rolled into the preparation area. Next, the receiving cask lid and outer and inner canister lids are removed. Finally, the receiving cask is moved into the lower access area and mated to the transfer confinement area. A source cask (i.e., the cask from which fuel will be transferred) follows a similar path as the receiving cask into the lower access area and is mated to the transfer confinement area. *No personnel are present in the lower access area for the transfer operations; all transfer operations are controlled remotely.* The lids on both the receiving cask and source cask are removed to prepare for spent fuel transfer. The fuel-assembly-handling subsystem in the transfer confinement area is used to grab and lift a spent fuel assembly from the source cask. The spent fuel assembly is lifted inside a transfer tube and then moved over an empty position in the receiving cask. The spent fuel assembly is lowered into the receiving cask and detached from the lifting device. When spent fuel transfers are complete, both casks are closed, detached from the transfer confinement area, and ultimately removed from the lower access area back to the preparation area." (emphasis added). NRDC Comment[:] Construction and operation of a DTS, while within the capacity of current technology, is a complicated business where operations are managed and performed remotely. Presuming this ability to remotely operate equipment for the thousands and tens of thousands of years flies directly in the face of the intergenerational justice concerns at the heart of the national consensus for geologic disposal. Further, and more important, such a conception of constantly increasing technological prowess runs directly contrary to history and the theory of appropriate reliance on institutional controls. See our discussion above in comment #9 on the failure of institutional controls. (0706-4-1 [Fettus, Geoffrey])

Comment: Turning to more specifics in the section, sections B.3.1.1.-2, *Technical Feasibility of Wet Storage*, and B.3.3 *Regulatory Oversight of Wet and Dry Spent Fuel Storage*, have little support in light of the Mr. Lochbaum's declaration, submitted this day and referenced above. And with respect to NRC's B.3.4., *Summary of Technical Feasibility of Continued Storage*, particularly its reliance on the proposition institutional controls can exist is perpetuity, has no evidentiary support and runs counter to the regulatory structure of every federal agency and the findings of independent observers such as the NAS. See our comment #6. (0706-4-7 [Fettus, Geoffrey])

Comment: Due to the absence of a viable repository program, the "Waste Confidence" GEIS assumes that irradiated fuel may be stored in temporary storage facilities indefinitely (or, in lay terms, possibly forever) and that "institutional controls" will remain in place to manage the waste safely for as long as that happens to be. NRC routinely justifies its institutional controls assumption by asserting that, to assume otherwise (i.e., that a similar waste management regime would not be maintained at some point in the future), amounts to wild speculation. However, not to even analyze the environmental impact of a different course of events is simply an exercise in constructing the study to support pre-determined conclusions. (0711-16 [Olson, Mary])

Comment: During the public comment period, the government was shut down due to political conflict over the nation's finances, and in addition a federal court blocked the ability of the

government to generate revenue via the Waste Fund Fee to pay for the high-level waste storage program. In the first instance, the willingness of a political faction to bring the very operation of the government to a halt over disagreements about the cost of its operations, the legitimacy of certain of those operations, and the levying of taxes to fund them is directly relevant to the reliability of institutional controls throughout the timeframes necessary to assure safe management of irradiated fuel without a repository or other permanent storage method. NRC's assumption that the repackaging and maintenance of irradiated fuel in dry storage facilities, indefinitely, forever, will not be subject to political conflicts – or will even be seen as politically relevant – one-hundred years or more in the future is wildly speculative and a manifestly unscientific assumption. (0711-18 [Olson, Mary])

Comment: [H]ow will they babysit the wastes after the fossil fuels are gone? (0711-42 [Olson, Mary])

Comment: In the absence of a safe permanent one-shot solution to the challenge of keeping nuclear waste out of the environment of living things for the indefinite future, the only responsible course of action is to adopt a policy of "Rolling Stewardship". We do know how to package nuclear waste and store it in a safe manner for decades at a time. Rolling stewardship is an intergenerational management concept. It requires monitoring and maintenance of the waste for an indefinite period of time, with responsibility being passed on from one generation to the next, including episodes of retrieval, recharacterization and repackaging of the waste. It also requires a mechanism for reinstructing the next generation, providing detailed information on the nature of the wastes and the associated hazards, and ensuring that the next generation is fully aware of the need to spend time and money on the wastes and to see that corrective action is taken on a timely basis if need be. (0714-1-21 [Edwards, Gordon])

Comment: *Rolling Stewardship gives each generation the tools to deal with the wastes. Abandonment leads to amnesia – future generations are at risk but ignorant.* (0714-1-22 [Edwards, Gordon])

Comment: CCNR [Canadian Coalition for Nuclear Responsibility] recommends that NRC elaborate a set of rules and policies related to the concept of Rolling Stewardship as applied to the intergenerational management of irradiated nuclear fuel, including detailed mechanisms for transferring responsibility for managing the wastes from one generation to the next, mechanisms for funding the long-term management of the waste including monitoring, retrieval, recharacterization and repackaging of the waste and reinstructing each successive generation. (0714-1-4 [Edwards, Gordon])

Comment: Nuclear proponents often argue that a permanent walk-away solution to the nuclear waste problem is required so as not to burden future generations. If such a solution is not available, however, then in fact future generations have already been burdened. In such a case NRC has a responsibility to address itself to the task of laying out a program of Rolling Stewardship that will make the burden manageable for future generations. The NRC also has an obligation not to add to that burden unnecessarily. (0714-2-5 [Edwards, Gordon])

Comment: Worse, history has also amply demonstrated what travesties can occur at reactors even under those watchful NRC eyes (e.g., Davis Besse; Dresden 2&3 remaining on the "close watch list" for 15 consecutive evaluation cycles; SONGS). So, the conclusion that institutional control is somehow guaranteed by the mere presence of NRC onsite resident inspectors, or whatever institutions replace them in the future, is a tautology, not proof. "Presence" does not guarantee adequate "oversight." While necessary, it by itself is insufficient. Until NRC can again

demonstrate that it is a regulatory agency (see list below), it has no business making absurd claims that HLRW can be stored safely indefinitely at nuclear stations. (0716-10 [Kraft, Dave])

Comment: As such, NRC is not an agency that can be trusted to "go beyond what's required" even today, let alone into an indefinite future of radioactive waste storage at reactor sites. It has no demonstrated interest in behaving in this manner; and it cannot even guarantee it can field a workforce on a given day, should the U.S. Government decide to shut down again in the future. This is an Agency that has accrued the following track record (a few salient examples, not an all-inclusive record)[.] (0716-19 [Kraft, Dave])

Comment: NEIS asks that you withdraw all statements to the effect that, because of NRC oversight programs, NRC asserts and guarantees that spent fuel can be stored at reactor sites indefinitely. Such a guarantee implies that NRC will be providing constant oversight into that indefinite period of time. In October of 2013, NRC could not even guarantee that its workers would be able to come to work the next day. The hubris of such an assertion that NRC oversight and institutional controls will be available ad infinitum, therefore, borders on colossal, if not outright psychotic. (0716-3 [Kraft, Dave])

Comment: NRC should withdraw all statements to the effect that, because of NRC oversight programs, NRC asserts and guarantees that spent fuel can be stored at reactor sites indefinitely. As mentioned previously, and below, the NRC cannot even guarantee its own day-to-day operation, let alone pledge "institutional control" for decades or indefinitely. This is not opinion. It is historically demonstrated FACT. Therefore, it cannot in all seriousness propose that HLRW will be afforded the everwatchful eyes of NRC onsite inspectors indefinitely. (0716-9 [Kraft, Dave])

Comment: The NRC license for nuclear power plants is 60 years, yet these plants produce radioactive waste that requires storage in a controlled environment for 100 or 1,000 times that span. This EIS says that the impact of indefinite would be "small" because storage facilities will be replaced every 100 years. That assumption is totally unreasonable for numerous economic, social, scientific and historical reasons. (0724-2 [Gamble, Dan])

Comment: What will happen if no maintenance ever occurs, or if replacement of the facilities ceases entirely? What happens when the social "reset button" is pressed, and the world as we know it is erased? Geological records show that massive changes in climate occur on the timescale in question – for example, the most recent ice age ended just ten thousand years ago, and we have absolutely no written record from human societies existing before that event. Other catastrophes: volcanoes, famines, plagues and wars all have a far shorter time line of global recurrence and resulting dramatic social changes. Unless this document considers the possibility of the storage facilities NEVER being replaced or repaired, the document is fundamentally invalid. (0724-3 [Gamble, Dan])

Comment: Right now, it looks like the waste will be stored indefinitely on-site and you are trying to create a regulatory system for it but can you even imagine that far into the future? America as you know it has only been around for a couple hundred years. Europeans have only been on this land for several hundred. Maybe you need to talk to those who have lived here continuously for over 20,000 years. Moreover, even in the very short term, there are governmental problems. The Waste Confidence meetings were postponed because of a government shut down. The very government and organization responsible for the extremely toxic radioactive waste. This hardly inspired confidence. (0734-5 [Hisasue, Carole])

Comment: NRC also assumes that the regulatory institutions will also continue to function over these time periods, and, presumably, that if the utilities cease to exist, government will take over the responsibility for the maintenance, guarding, and repackaging. But the NRC itself has only existed for less than forty years, a century less than even the first time period under consideration, 140 years. The U.S. government has existed for less than the 240 years of the second time period. And all of recorded history is two orders of magnitude shorter than the hazardous life of the plutonium-239 in the waste. Assuming institutions will be around to guard, maintain, and repackage these wastes over these time periods is exceedingly hard to defend. But NRC does not try to technically defend this proposition—it just assumes it. And it relegates to a footnote (fn. 2) its discussion of this extraordinarily consequential assumption. (0738-12 [Hirsch, Daniel])

Comment: After conceding numerous situations where long-term reliance on institutional controls is not allowed, including disposal of HLW in a geologic repository and disposal of LLRW in nearsurface sites,³⁷ [footnote 37 text: 10 CFR 20 Subpart E, rules for cleanup of contaminated sites and license termination, also bars reliance on institutional controls, unless one can show that failure of the controls would not result in doses exceeding specified limits. So even for cleanups, the impact of failure of institutional controls must be evaluated and cannot be relied upon unless that impact is within limits.] NRC proceeds to assert that indefinite surface storage of HLW is somehow different and the prospect of institutional controls being ineffective or non-existent at some point is so unlikely as to be completely speculative and thus should not be considered. (0738-13 [Hirsch, Daniel])

Comment: NRC says the casks will be visible and the consequences of not guarding, maintaining, and repackaging them indefinitely so severe, that future institutions *will* without question supply the resources, essentially forever, to so protect them. This proposition appears to turn the actual situation on its head. NRC is refusing to analyze in its draft GEIS the consequences of institutions failing. Its sole basis for doing so is its assertion that institutional controls will not fail. And its argument as to why institutional controls will not fail is because the consequences of failing are so severe. This is completely circular. Additionally, the fact that the HLW casks will be on the surface and visible increases rather than eliminates the prospect of them being broken into. Like the pyramids of Egypt, they are likely to be seen as tombs or vaults containing items of great value, worth stealing. (0738-14 [Hirsch, Daniel])

Comment: NRC also assumes that long into the future, unspecified institutions will somehow remember what is inside the HLW casks and how dangerous that material is, and therefore spend precious resources to indefinitely protect material from which they received no benefit. But such institutional memory is rather quickly lost. We still do not understand well, for example, for what purpose the *moai*, the monumental statues of Easter Island, were constructed. And what language would one write the documentation about the risks and the necessary technology needed for repackaging the casks so it can be understood far into the future? Most Americans cannot readily read even the early English of Chaucer, let alone the languages of ancient peoples. And how would those instruction manuals for repackaging the waste be preserved for future generations? And on what media? Floppy disks went the way of the dinosaurs after just a few years; operating systems become obsolete in very brief intervals; paper disintegrates, burns, or just gets lost. (0738-15 [Hirsch, Daniel])

Comment: In far shorter periods, institutional reliability appears questionable. It is not without its own irony that the NRC had to cancel several of its scheduled hearings on the Waste Confidence Rule because the U.S. government shut down. Sequesters and other budget cuts, depressions, wars, and natural catastrophes all can result in institutional obligations not being

met, even in relatively modest time frames. To count on institutional controls over centuries, millennia, or longer is difficult to defend. The recent history of waste disposal, recounted briefly in this paper, demonstrates that even in a period of just a few decades, institutions have lost track of waste disposal sites, failed to meet legally binding cleanup requirements or monitoring obligations, and otherwise have not been reliable. Long-term reliance on such institutions and institutional controls seems without basis. (0738-16 [Hirsch, Daniel])

Comment: In a 1972 article in *Science Magazine*, Alvin Weinberg, then Director of the AEC's Oak Ridge National Laboratory, famously wrote: "We nuclear people have made a Faustian bargain with society." On the one hand reactors offer an extraordinary source of energy. "But the price that we demand of society for this magical energy source is both a vigilance and a longevity of our social institutions that we are quite unaccustomed to." He went on to suggest that what might be needed was a kind of nuclear priesthood to manage these risks over the long time periods involved. He concluded by asking the fundamental question: "Is mankind prepared to exert the eternal vigilance needed to ensure proper and safe operation of its nuclear energy system?"³⁸ [footnote 38 text: Weinberg, Alvin, "Social Institutions and Nuclear Energy," *Science*, Vol. 177, No. 4043 (Jul. 7, 1972), pp. 27-34.] (0738-18 [Hirsch, Daniel])

Comment: NRC's analysis relies almost exclusively on a self-described "assumption" that institutional controls will remain in place and effective for these time periods, in order to assure that the waste is guarded 24 hours a day, seven days a week, year after year, century after century, and that someone will undertake the technically challenging task of repackage the HLW every century into eternity. It is exceedingly difficult to view this assumption as anything but arbitrary and capricious in the extreme. The NRC itself has only been in existence for forty years. Our government was not in existence 240 years ago; indeed, the United States of America did not even exist as a nation then. And with the longevity of the waste being 500,000 years or more, it is important to recall that recorded history only goes back a few thousand years. We are talking about time periods that far exceed any reasonable assumption of the longevity of institutions, let alone institutional controls. NRC arbitrarily dismisses—in a footnote—the prospect that institutional controls may not be durable and effective over these extraordinary time periods, asserting that loss of institutional controls is "so unlikely that it is a remote and speculative occurrence."⁴ [footnote 4 text: GEIS, footnote 2, pp. 1-14 – 1-15.] In this paper we review that issue and conclude the opposite, that continued and effective institutional controls over the time periods involved are so unlikely as to be a remote and speculative occurrence. In any case, the potential for such failure is real, and the environmental consequences must be examined carefully. This the NRC GEIS does not do. Among the "best evidence," the most viable datasets available, for judging the NRC claim that institutions can be relied upon to effectively manage radioactive waste over these kind of extraordinary time frames is the history of efforts by institutions to date to deal with radioactive waste. That history is examined in this study. (0738-6 [Hirsch, Daniel])

Comment: It is because of the very long hazardous life of HLW that the National Academy of Sciences (NAS) recommended, and the Court of Appeals for the District of Columbia directed, that adequate performance of HLW disposal plans be demonstrated out hundreds of thousands of years.¹¹ [footnote 11 text: National Academy of Sciences/National Research Council, *Technical Bases for Yucca Mountain Standards*, 1995; U.S. Court of Appeals for the District of Columbia, *Nuclear Energy Institute v. U.S. Environmental Protection Agency*, July 9, 2004.] EPA had adopted regulations to only require that analyses demonstrate compliance for the first 10,000 years. NAS pointed out that the wastes were hazardous for vastly longer than that; that Yucca Mountain analyses suggested peak exposures to the public from Yucca leakage occurring at several hundred thousand years; and that one should analyze for at least

one million years, the time scale for long-term geologic processes at Yucca Mountain. The Court of Appeals agreed, saying the law required the rules to be consistent with the NAS recommendations. But to have confidence that institutional controls will remain in place even for the first ten thousand years -or even the shorter periods of 140 years and 240 years--seems extraordinarily difficult to defend. (0738-7 [Hirsch, Daniel])

Comment: NRC then proceeds to indicate its confidence that irradiated nuclear fuel not just can but will be safely stored on the surface, at reactor sites or elsewhere, for three different periods: (1) 140 years from the time the reactor started operations, (2) 240 years from startup, and (3) indefinitely. NRC presumes that after a certain point, spent fuel is moved to dry casks and that there is continuity of institutional controls for these time scales for guarding, maintaining, and at regular intervals, repackaging the fuel in new casks. These are rather extraordinary assumptions. For hundreds of years the fuel gives off enough heat that they must be constantly cooled. The dry casks involve passive cooling, but this requires the cooling vents to be kept free of snow, leaves, dirt and other debris, so regular maintenance is needed. (0738-9 [Hirsch, Daniel])

Comment: Unrecognized in the Draft GEIS is the fact that no civilization and no human institutions have lasted for hundreds of thousands of years. Any credible plan must include ways to mitigate the risks of environmental contamination in the event of failure of governments or institutions. A realistic plan must be devised to keep manmade radioactive elements isolated from the biosphere for the million years that the EPA declares them to be lethal. (0757-6 [Lynch, Laura])

Comment: A principle assumption throughout the Draft GEIS is that there will be institutional control to meet the necessary obligations for long-term storage of spent fuel. At its core, this assumption concludes that the corporations and limited liability companies that generating the spent fuel will have sufficient funds to meet the requirements for long-term storage and that the regulations promulgated and enforced by the Commission will be enough to ensure safety, maintenance and good storage procedures. There is nothing in the Draft GEIS, other than this statement, to support this conclusion.⁵ [footnote 5 text: Interestingly, as is described in more detail below, the Draft GEIS focuses on oversight and regulatory control on being controlling and providing the basis for an assumption of institutional control. It does not because it presumes there is an entity to oversee and regulate. The real issue is not an entity to control, it is the availability of the funds to ensure that the activities necessary to ensure storage, transfer and transport are completed.] Unlike decommissioning funds, which are required to be set aside in order to decommission a power plant or return it to its natural habitat, there are no such funds for the handling and storage of spent fuel. Likewise, there is no assurance that an entity will even be viable in 100 years. This assumption of institutional control must be addressed – and removed. (0783-1-12 [Harlan, Thomas])

Comment: On page 1-14, lines 19-22 and carrying over to 1-15, lines 1-5, there are assumptions on institutional control. The assumption with institutional control is that the Federal Government will somehow provide safe storage of spent fuel through regulation. However, that is not what is happening in the field. The obligation to temporarily store spent fuel belongs to the generator of that fuel. Even corrected, the assumption of institutional control misses the mark. There is no reference, whatsoever, to how the generators are going to pay or provide for safe storage or whether these corporate entities are even going to exist. This assumption must be removed. On page 1-15, lines 6-15, the assumption regarding institutional control continues. Again the Draft GEIS solely focuses on Federal control. This is not the Federal Government's

obligation. Institutional control needs to be analyzed through the generators and the measures in place to ensure responsible storage and maintenance. (0783-2-8 [Harlan, Thomas])

Comment: Under section B.3.3, there is analysis of the regulatory oversight of wet and dry spent fuel storage. In this analysis, there is an assumption of institutional control through regulatory oversight and license compliance. Institutional control goes beyond oversight and must include an analysis, or at least a description, of the entities that are to be providing the structures, systems and programs for responsible storage before a permanent repository can be found. In addition, the analysis must identify where the funds will come from to properly ensure these items are completed. (0783-3-22 [Harlan, Thomas])

Comment: Interestingly enough, the Draft GEIS, consistent with current practice, assumes that the responsibility for the disposal of low-level waste lies with the generator and assumes that the industry will take care of this particular issue. Yet, for purposes of institutional control, the Draft GEIS substitutes in the Federal Government for the generator and its obligations to maintain storage until such time that the spent fuel is retrieved for either interim or permanent disposal. To be consistent, the Draft GEIS should analyze institutional control with the generator being the institution. (0783-3-6 [Harlan, Thomas])

Comment: The evidence base is so deficient that the indefinite time frame considerations are not credible. I would give pigs a better chance of flying than protocols followed indefinitely would protect the environment. (0805-16 [Wilshire, Howard])

Comment: The assumptions on which the Waste Confidence GEIS is based (listed on p. xxvi) are absurd. "Spent fuel canisters and casks would be replaced approximately once every 100 years." and "Independent spent fuel storage installation (ISFSI) and dry transfer system (DTS) facilities would also be replaced approximately once every 100 years." What this says is that the NRC believes no known design for dry storage of spent fuel can be expected to last for more than 100 years. There is no way to guarantee a future society will have resources or social organization to replace such facilities, and yet the NRC insists-by blandly making an assumption -that this capability will exist into the indefinite future. (0815-3 [Gunter, Keith] [Izant, Carol])

Comment: Prof Guy McPherson of the University of Arizona states that collapse of many systems is imminent. I state that the collapse of the funding for a geological repository will depend on many of these societal structures that may not survive global warming for the next few decades per Dr. McPherson. Will the NRC analyze and explain how the NRC can expect a financial stream to build a geological repository in the face of collapse of the money system as a consequence of global warming? (0818-4 [Lewis, Marvin])

Comment: The NRC has acknowledged that no known engineered structure (spent fuel pools, dry casks) can last the infinite length of time required to isolate these radioactive wastes from humans and the environment. As noted, the DGEIS speaks of waste management in terms of decades (spent fuel pool usage up to 60 years after reactor closure) or a century (when the waste will need to be transferred into new casks, an untested and potentially impossible procedure); however, the hazard and longevity of this waste is measured in millions or even billions of years, far longer than human civilization has existed. How can the NRC possibly assume that adequate institutional controls will exist into the future? (0819-7 [Kline, Connie])

Comment: NRC oversight has been unacceptably weak or erratic at many reactors. It will be decreased post-operation storage. We are concerned that the environmental impacts of leaks always appear to be more significant at reactors with less oversight. Safety assurances require

NRC oversight to be consistently strong with sufficient inspections and enforcement. This requires improvement. (0823-2 [Michetti, Susan])

Comment: Assuming continued institutional controls is reasonable in both the short-term and long-term timeframes. In those timeframes, the nuclear fuel storage facilities will remain under NRC license and NRC oversight. The NRC will maintain authority to compel any actions required to assure protection of public health and safety and the environment. Control of the licenses and nuclear material may not be transferred without NRC approval. The timeframes involved do not dictate a need for unreasonable, hypothetical scenarios that would involve loss of control of the facility or nuclear material, or loss of legitimate regulatory oversight.⁵⁶ [footnote 56 text: See, e.g., *Natural Res. Def. Council v. Kleppe*, 429 U.S. 1307 (1976).] (0827-2-6 [Ginsberg, Ellen])

Comment: In the "no repository" scenario, the NRC staff remains justifiably reluctant to incorporate the additional conservative assumption that there will be a loss of institutional controls at the interim storage facilities. The existing WCD record and the draft GEIS support conclusions that the no repository scenario is highly unlikely, and that the no repository scenario without institutional controls at interim facilities is even more so. That notwithstanding, NEI recommends that - to very conservatively address the remand - the NRC even more clearly acknowledge that a conservative assessment of the impacts of a no repository scenario, without reliance on institutional controls, has already been completed. The "no action alternative" in DOE's Yucca Mountain EIS provides sufficient scope and depth to fully evaluate the extremely unlikely possibility that a repository will never be developed and that institutional controls will be lost. DOE evaluated two scenarios in its "no action" alternative to Yucca Mountain: (1) spent fuel would remain at existing commercial sites under institutional controls for at least 10,000 years, and (2) spent fuel would remain at existing commercial sites in perpetuity, but under institutional controls for only about 100 years, after which time, institutional controls would be lost.⁵⁷ [footnote 57 text: DOE pointed to 10 C.F.R. Part 61 - the NRC's regulations governing disposal of low-level radioactive material - as one the sources it used when choosing the 100-year timeframe for institutional controls. Part 61 states that active institutional controls cannot be relied on for more than 100 years. Substantive safety regulations that restrict the reliance on institutional controls do not diminish the reasonableness of assuming that institutional controls will continue to exist for purpose of environmental assessments under NEPA. Regardless, assuming that institutional controls will be lost after 100 years in the waste confidence GEIS would have resulted in an overly conservative assessment.] The second of these scenarios - loss of institutional controls after 100 years - is clearly a "worst case scenario" beyond the scope of NEPA. At the time of the Yucca Mountain EIS, the NRC commented that a no repository scenario, coupled with the assumption of a loss of institutional controls, was unreasonable.⁵⁸ [footnote 58 text: Draft GEIS at 1-15.] DOE explained that neither scenario considered in its "no action alternative" was likely, but that its assumptions regarding institutional controls were meant to bound potential environmental impacts. The same reasoning applies here. The NRC could more expansively respond to the remand by referencing the DOE EIS as bounding the environmental impacts of indefinite spent fuel storage for the no repository scenario, assuming a loss of institutional controls. (0827-2-7 [Ginsberg, Ellen])

Comment: In the draft GEIS, the NRC appears to distinguish the scenario assessed in DOE's no-action alternative from the indefinite storage scenario assessed in the draft GEIS to explain the differences in assumptions regarding institutional controls.⁵⁹ [footnote 59 text: Draft GEIS at 1-14 - 1-15, n.2.] The NRC states that the approach to institutional controls in DOE's EIS was related to the post-closure burial of radioactive waste, which is not relevant to the indefinite dry cask storage considered for the purposes of Waste Confidence.⁶⁰ [footnote 60 text: *Id.*] Although

NEI concurs with the NRC's approach to institutional controls in examining the indefinite storage scenario, this distinction is unnecessary. DOE specifically stated that the no-action alternative in the Yucca Mountain EIS "assumes that all commercial spent nuclear fuel would be stored in dry configurations in independent spent fuel storage installations at existing locations."⁶¹ [footnote 61 text: Department of Energy, "Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada," Vol. I at 7-18 (Feb. 2002).] These dry storage systems are the very ones analyzed in the NRC's draft GEIS. Including a reference to the Yucca Mountain EIS would not mean that the NRC would have arrived at the same factual or policy conclusions as DOE. Instead, a reference to the DOE analysis would simply recognize that the Yucca Mountain EIS contains information available to the public, which addresses the potential environmental impacts of a worst-case scenario of government inaction, coupled with failure of institutional controls - a scenario that the NRC described as requiring "unreasonable speculation."⁶² [footnote 62 text: Draft GEIS at 1-14 - 1-15.] Although evaluation of such a worst-case scenario is not required by NEPA, such a reference would clearly and definitively demonstrate that the NRC has more than adequately satisfied NEPA's disclosure objectives. While referencing the DOE analysis, the NRC should continue to stress that the reference is not based on any conclusion that it addresses a likely or even reasonable scenario. Although we encourage the NRC to reference DOE's analysis, replicating the existing DOE Yucca Mountain Final EIS analysis would serve no useful purpose. For one thing, given that such an analysis would be addressing the very same casks over the very same time periods, it would not yield any new information. The Commission recognized the efficiencies that could be gained by referencing (but not repeating) DOE's analysis of the Yucca Mountain "no action alternative" in SRM-COMSECY-12-0016, which stated that the staff "may adopt or incorporate by reference all or part of another agency's EIS. For example, the "no action alternative" in DOE's Yucca Mountain EIS contains a foundation that the NRC should build upon."⁶³ [footnote 63 text: SRM-COMSECY-12-0016 at 1.] (0827-2-8 [Ginsberg, Ellen])

Comment: Page 1-14, Line 19+, The assumption that institutional controls will be in place for an indefinite period of time is nonsense. Our country has only been in existence for a bit over 200 years. To assume that no changes will occur for an indeterminate time into the future is an assumption we believe you cannot make. Instead, these sites must not be contemplated for that extensive period of time, and should be limited to the decommissioning time period, as we describe with respect to other issues as well. (0836-15 [Davis, Anonymous])

Comment: Thirdly, the NRC could have used scenarios to address the very real possibility of a loss of institutional control at the sites. Such a loss of control does not have to be dramatic as was the case in Japan at *Fukushima Daiichi*; rather it can represent a gradual loss of institutional command of the site and its operations as was evidenced by various DOE projects related to nuclear weapons production. The history of lost control over the byproducts of nuclear weapons production, failed oversight by DOE/NRC in their stewardship of the environment and failures in regulatory oversight by government agencies provide strong evidence that the loss of institutional control is far more common than the DGEIS would admit (See appendix A). This slide into mediocrity as a scenario could have been augmented with a more dramatic scenario like evidenced by *Fukushima Daiichi*. Such opposing scenarios, or even the use of a continuum of possibilities representing the loss of institutional control, would have better addressed real world conditions. It would have represented more accurately historical experiences with lost institutional controls by agencies like the DOE and NRC in their oversight of the fuel cycle, weapons production and more directly, the issues associated with SNF. (0867-1-7 [Griffin, William])

Comment: Closely related and fourthly, the DGEIS should have examined multi-dimensional scenarios in which institutional controls are lost after 30, 60, 100, 160 years and indefinite periods of time. These scenarios would then be looked at as to their potential impacts on the environment and over time. This combination of variables is a more robust approach to analysis that could have been chosen by the NRC staff if they had been given enough time to do their analysis. (0867-1-8 [Griffin, William])

Comment: To illustrate, as has happened in the past, high-level wastes could be exposed to the environment (e.g., Hanford, Washington). The scenarios the NRC could use should be constructed to examine specific components of institutional control in order to examine the consequences that the loss of control would have on the environment. For example a common sociological phenomenon is the attenuation of vigilance. That is, as a system is shown to be reliable and safe, the safety features are slowly removed to reduce costs. A reasonable and useful kind of scenario construction would have examined the cost of institutional control, over certain time periods and then what withdrawal of part or all of that vigilance would mean to the environment. (0867-1-9 [Griffin, William])

Comment: *Based on its knowledge of and experience with the structure and operation of the various facilities that will provide continued storage, including the normal life of those facilities, the NRC believes that spent fuel pool storage could last for about 60 years beyond the licensed life for operation of the reactor where it is stored, and that each ISFSI will last about 100 years, for a total of 160 years or less of likely continued storage if a repository becomes available.* Although it may be valid, there is little empirical data to support it. In fact a recent statement by the director of the NRC may offer insight into the questions NRC has about such timeframes (see MacFarlane statement elsewhere). Other questions arise when the details of such assumptions are questioned. For example, what about the availability of human capital and experience to address the operations of these facilities? What about the financial concerns the long term operations represent? (0867-2-8 [Griffin, William])

Comment: The NRC assumes that any loss of institutional control is unreasonable. This assumption is not valid. The NRC's assumption is also ahistorical. In the recent past, two operating NPP have been without institutional controls. April 26, 1986 the Chernobyl reactor was evacuated except for staff performing emergency cooling operations. Although firefighters responded to the accident, the site was out of control. On March 16, 2011, all of the workers of the *Fukushima Daiichi* NPP were evacuated. The NRC should prepare an assessment that assumes there is a partial or complete loss of institutional control, particularly after an extended period. This may also be true for unused facilities in remote areas, a result of decommissioning. The NRC also assumes that there will be an agency to oversee and ensure the quality and safety of the process. Additionally, the environmental consequences of a loss of institutional control cannot be assessed generically because it is inherently dependent on the NPP site, surrounding demographics and geology. (0867-2-9 [Griffin, William])

Comment: For the purposes of these comments, the EPA defines institutional controls "as non-engineered instruments, such as administrative and legal controls, that help to minimize the potential for exposure to contamination and/or protect the integrity of a response action" (EPA). The NRC does not provide a precise definition of what it considers institutional controls. Excellent insight into the range of policies that combine to form institutional controls can be found at the State of New York (<http://www.dec.ny.gov/chemical/8665.html>). The DGEIS assessment of the environmental impacts of radiological storage is insufficient because it assumes that institutional control will be maintained throughout the future. A review of the lifecycle of nuclear materials suggests that the norm may be better expressed as a partial or

complete loss of institutional control rather than a consistent level of institutional control. There have been multiple instances where institutional control of nuclear facilities has been lost. These instances have occurred throughout the nuclear fuel cycle. NRC should use analytical methods that will enable them to assess the environmental consequences of the loss of institutional control for various lengths of time. The two most prominent examples of this are the Chernobyl NPP which was evacuated in 1986 and the Fukushima NPP's which was briefly evacuated in 2011. In both cases for long and short periods of time operating nuclear facilities were completely out of control. But there are other relevant cases throughout the nuclear fuel cycle. These cases emphasize that the management of these materials has been sporadic, incomplete, and performed without sufficient institutional controls. These breakdowns have occurred worldwide and include the United States. (0867-3-1 [Griffin, William])

Comment: In fact, the DGEIS flouts both NEPA and the Court's application of NEPA in *New York*, 681 F.3d 481 (D.C. Cir. 2012) in multiple ways: In blatant violation of NEPA and the Court's decision in *New York*, the DGEIS fails to examine the probability and consequences of failure to site a repository. Instead of examining the risk of failing to site a repository, the DGEIS rationalizes the risk away, by arbitrarily assuming that spent fuel will be protected by "institutional controls" for an infinite period of time at reactor sites. This assumption is not only absurd and inconsistent with the Nuclear Waste Policy Act ("NWPA"), but it also defeats the Court's purpose of forcing NRC to reckon with the environmental consequences of its failure to site a repository. (0897-1-7 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In *New York*, the Court concluded that the NRC's "reasonable assurance" finding that a repository will be available is insufficient to satisfy NEPA because it does not show that the "likelihood of nonavailability" is "remote and speculative." 681 F.3d at 479. Therefore the Court ordered NRC to conduct a "full analysis" of "the potential environmental effects" of storing spent fuel onsite at nuclear plants "on a permanent basis." 681 F.3d at 479. The Court stated quite clearly that the EIS must address the impacts of a "failure to secure permanent storage." *Id.* Under NEPA's rule of reason standard, the analysis of the risk of failure to secure permanent storage for spent fuel must include the following: the risk that sufficient repository capacity that meets NRC's Part 63 standards for containment will not be found; the risk that even if sufficient repository capacity is found it will not be licensed before substantial environmental harm has occurred; and the nature of the harm that could occur if interim measures to protect spent fuel from exposure to the environment fail. But the DGEIS contains no such analysis. The DGEIS completely ignores the issue of the probability that sufficient repository capacity will be available in a timely way. See Makhijani Declaration, pars. 8.1-8.24. Moreover, instead of analyzing the environmental impacts that could occur if spent fuel remains undisposed of for many decades and escapes to the environment, the NRC assumes those impacts will not happen because they will be prevented by the indefinite maintenance of "institutional controls." See DGEIS at 1-14 (stating the assumption that "[i]nstitutional controls, i.e., the continued regulation of spent nuclear fuel, will continue"). (0897-3-18 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The DGEIS' Assumption of Indefinitely Effective Institutional Controls Violates NEPA[.] Instead of complying with NEPA and the Court's decision in *New York* by examining the risk of failing to site a repository, the DGEIS rationalizes the risk away by arbitrarily assuming that spent fuel will be protected by "institutional controls" for an infinite period of time at reactor sites or away-from-reactor storage sites. This assumption is not only absurd and inconsistent with the NWPA, but it flouts the Court's requirement to reckon with the environmental consequences of its failure to site a repository. (0897-3-19 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: NRC's assumption of indefinitely effective institutional controls violates NEPA because it is inconsistent with the NWA and NRC regulations[.] NRC's determination that spent fuel can be safely stored for an indefinite amount of time above- ground is inconsistent with the NWA and NRC's own regulations. As discussed above in Section V, the NWA establishes a national policy of disposing of spent nuclear fuel in a deep geologic repository. By labeling the consideration of permanent on-site storage of spent nuclear fuel as "indefinite storage" the NRC seeks to avoid the necessary conclusion that when on-site storage becomes permanent it becomes disposal. This assumption of de facto above-ground disposal directly violates the NWA. The DGEIS' assumption of indefinite institutional controls is also inconsistent with the NRC's own regulations. For instance, the NRC's low-level waste disposal regulations assume that active controls will fail after 100 years, and intruder barriers will fail around 500 years. 10 CFR § 61.7 (b)(4) & (b)(5). To state that institutional controls are likely to fail in the NRC's regulations, and then assume throughout this DGEIS that institutional controls will last forever is inconsistent and irrational. And the NRC's assumption is inconsistent with general federal policy regarding containment of hazardous materials. When reviewing the Department of Energy's ("DOE") cleanup plans for legacy waste sites, the NRC required the DOE to assume that "contamination isolation barriers and stewardship measures at sites where wastes are left in place will eventually fail." National Research Council, Board on Radioactive Waste Management, Commission on Geosciences, Environment, and Resources. *Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites* (Washington, DC: National Academy Press, 2000), available at <http://www.nap.edu/catalog.php?recordid=9949>. This directly contradicts the assumption of forever continuing institutional controls relied upon by the NRC in the DGEIS. Finally, as a matter of law, the NRC may not assume the effectiveness of institutional controls to prevent radiological releases to the environment during the extended period of spent fuel storage. As the Court held in *New York*, "merely pointing to [a] compliance program is in no way sufficient to support a scientific finding." 481 F.3d at 481. The question of whether institutional controls will remain in place for hundreds or thousands of years must be addressed as an element of risk. (0897-3-20 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: NRC's assumption of indefinitely effective institutional controls violates NEPA and *New York v. NRC* because it arbitrarily assumes the nonexistence of an impact instead of analyzing it[.] The NRC asserts that a loss of institutional controls is so remote and speculative that its consideration is outside the requirements of the National Environmental Policy Act ("NEPA"). *Id.* at 1-15, fn. 2. Given the many examples in history of loss of institutional controls, it is the NRC's assumption that institutions will remain intact and capable of caring effectively for spent fuel over an indefinite period of time that is more fairly characterized as remote and speculative. Makhijani Declaration, pars. 6.4, 10.3. As Dr. Makhijani discusses in Section 6 of his declaration, this assumption in the DGEIS flies in the face of facts, history and common sense. For instance, the U.S. has been in two world wars in less than 100 years. Just over a decade ago, the financial capital of the U.S. suffered a devastating attack that could have targeted a nuclear power plant. There have been a dozen government shutdowns since 1981. In the most recent shutdown, in October 2013, some waste management functions – even for "visible" facilities – almost came to a halt. For instance, the Fernald Preserve, which includes a large visible mound of radioactive waste from the Fernald uranium plant that was part of the nuclear weapons complex was closed. Had the government shutdown lasted much longer, the pump and treat operations that are a mandated part of water quality objectives, would have come to a halt. Makhijani Declaration, par. 6.7 –6.8. The NRC asserts that the purpose of its assumption of continued institutional controls is to "avoid unreasonable speculation regarding what might happen in the future regarding Federal actions to provide for the safe storage of spent fuel." DGEIS at 1-14. Admitting a lack of information satisfies the first

obligation for agencies faced with uncertainties in an EIS, but the NRC fails to complete any of the remaining three obligations under the CEQ regulation for incomplete or unavailable information. 40 C.F.R. § 1502.22(b). After admitting uncertainty, under section 1502.22(b) the agency must include within the EIS: (2) [A] statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; (3) a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment, and (4) the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community.⁶ [footnote 6 text: The Supreme Court has held that Council on Environmental Quality regulations for the implementation of NEPA "impose a duty on all federal agencies." *Marsh v. Oregon Natural Res. Council*, 490 U.S. 360, 372 (1989). The NRC is a federal agency and therefore must answer this call to duty. "Reasonable forecasting and speculation is thus implicit in NEPA, and we must reject any attempt by agencies to shirk their responsibilities under NEPA by labeling any and all discussion of future environmental effects as 'crystal ball inquiry'." *Scientists' Inst. For Pub. Info. v. Atomic Energy Comm'n*, 481 F.2d 1079, 1086 (D.C. Cir. 1973).] (0897-3-21 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The draft GEIS sets forth a highly optimistic view of the future conditions that will affect stored spent fuel. It assumes that institutional controls will remain operative into the indefinite future, arguing that this assumption "avoids unreasonable speculation regarding what might happen in the future". This assumption, like other optimistic assumptions in the draft GEIS, is neither reasonable nor prudent. Moreover, assuming static conditions is speculative in the extreme, and shows a profound ignorance of human history. Given the long timeframes envisioned in the draft GEIS, the only reasonable approach is to consider a broad range of scenarios. Those scenarios would encompass substantial changes in the risk environment over time. The changes could be non-uniform across the United States. Thompson Declaration, par. VII-2. (0897-6-16 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The Impacts and Costs Related to Spent Fuel Storage and Disposal Are Significant[.] As demonstrated in the attached expert declarations by Dr. Arjun Makhijani, David Lochbaum, and Dr. Gordon Thompson, the environmental impacts of storing spent fuel are significant. Environmental impacts of indefinite storage of spent fuel may be catastrophic, as discussed in the declaration of Dr. Arjun Makhijani, Section 7. In the Yucca Mountain EIS, for instance, the DOE found that loss of institutional controls would result in the "unchecked deterioration and dissolution of the materials" in storage, with "catastrophic" effects. And the DOE conservatively underestimated those impacts. Makhijani Declaration, pars. 7.3 and 7.4. (0897-7-2 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: My second major criticism of these first findings is that they depend on the unsupported assumption that institutional controls will remain effective indefinitely. Instead of addressing the risk of accidental radioactivity releases posed by the poorly understood behavior of spent fuel in long-term storage, the NRC simply assumes that current regulations and institutional measures for managing spent fuel will remain in place indefinitely, and that any new problems that arise will be resolved, such that spent fuel storage will never pose a significant health or environmental problem. In my opinion, this assumption of active institutional control for an indefinite period of time lacks any factual, historical, or financial foundation and even common sense when it extends to very long time periods. First, it is fundamentally inconsistent with federal law and policy (including NRC's own regulations) that institutional controls should only be relied on for a period of decades, not hundreds of years. Second, it is contradicted by the experience of history that governments tend to fail or change substantially over time. To

assume that the federal government will exist for tens of millennia and each year appropriate significant sums of money to manage spent fuel at sites that produce no revenue flies in the face of current facts and U.S. history, including a dozen federal government shut downs since 1980, not to speak of the Civil War, when the United States did not have a single government, budget, or currency. In this century, the White House had received a number of petitions, some with thousands of signatures, for secession from the United States as of November 12, 2012.¹⁵ [footnote 15 text: Weiner 2012] (0898-1-5 [Curran, Diane] [Makhijani, Arjun])

Comment: The NRC may intend to use the phrase "remote and speculative" to avoid its legal obligation to analyze the impacts of the loss of institutional control. But the Draft GEIS has failed to recognize that simply throwing the phrase at the problem does not make loss of institutional control "remote and speculative" in legal or physical reality. On the contrary, it is the Draft GEIS's contention that institutional control will be maintained essentially forever to the required degree that is remote and speculative. (0898-3-10 [Curran, Diane] [Makhijani, Arjun])

Comment: Given U.S. and world history, it is not unreasonable to assume that the endurance of institutions to the degree required in paragraph 6.3 will persist for a 100 years. This is a common assumption about institutional control that is factually defensible, though even that is not without caveats (see paragraph 6.7 below). 6.5. For example, empires usually fade in a few centuries. During such periods governments and societies often suffer tremendous upheavals and internal institutional changes. The NRC's assumption of institutional control is so sweeping that it not only requires the U.S. government to endure for tens of thousands of years but that its functions and institutions remain operative and vigilant. (0898-3-11 [Curran, Diane] [Makhijani, Arjun])

Comment: Consider some elementary facts close to home. The half-life of plutonium-239 is more than 24,000 years. The U.S. government has existed for less than one percent of that time. In that period of time, the United States has suffered a Civil War during which it did not have a unified government. Indeed, it had two governments, with two budgets, two armies, two navies, and two currencies. The United States has also been in two world wars in less than 100 years. It has suffered a devastating terrorist attack just over a decade ago on September 11, 2001, that could have targeted a nuclear power plant. Even closer in time was the federal government shutdown in the first half of October 2013; there was a near-default on the U.S. sovereign debt in the same month. There have been a dozen federal government shutdowns since about 1981.⁹⁷ [footnote 97 text: As cataloged in Wikipedia at http://en.wikipedia.org/wiki/Government_shutdown_in_the_United_States.] During the October 2013 federal government shutdown, most of the NRC was shut down. Some waste management functions, even for "visible" facilities almost came to a halt. For instance, the Fernald Preserve, which includes a large visible mound of radioactive waste from the Fernald uranium plant that was part of the nuclear weapons complex was closed. Had the government shutdown lasted much longer, the pump and treat operations that are a mandated part of water quality objectives would have come to a halt.⁹⁸ [footnote 98 text: 98 Crawford 2013. Personal email communication from Lisa Crawford, Fernald Residents for Environmental Safety and Health, October 7, 2013. "Folks, the Fernald Preserve is CLOSED due to the Gov. Shut Down -- no big deal really except -- if this goes on much longer it will then begin to affect the pump and treat of the aquifer which is mandated by the OEPA & USEPA and DOE. The site is telling me that it can go about a month and then it's down to little or nothing or shut off. That could be a disaster. Since most of the site is contracted out to Stoller Co. -- those folks are still on the job, but the site is closed. Crazy if you ask me. Lc"] The NRC, without any analysis of these facts, has ruled it remote and speculative that the necessary degree of institutional controls will exist

for many half-lives of plutonium-239. In fact, the Draft GEIS puts no upper bound on the time for which such controls will exist. (0898-3-12 [Curran, Diane] [Makhijani, Arjun])

Comment: It is to be noted that there were no federal government shutdowns before 1981. There have been a dozen since then.⁹⁹ [footnote 99 text: 99 Wikipedia: http://en.wikipedia.org/wiki/Government_shutdown_in_the_United_States. Accessed on November 8, 2013.] This points to the need for a serious analysis of the reliability of federal government funding even over much shorter periods than the funding for millennia assumed in the Draft GEIS. Specifically, the short-term time frame of 60 years beyond the operating license life of "a" reactor needs to be considered, especially as it could be any reactor past, present, or future. It is also important to consider the "long-term" timeframe of 100 years beyond the "short-term." The federal government will have to continue to appropriate funds each year to compensate for its failure to fulfill its contracts with nuclear utilities to begin taking spent fuel from them starting on January 31, 1998. The discontinuities in the federal government's functioning and the uncertainties surrounding budgetary processes require specific analysis in the Draft GEIS in the context of its assumptions about institutional longevity. (0898-3-13 [Curran, Diane] [Makhijani, Arjun])

Comment: In view of the above-mentioned historical facts and current events, the attempt of the Draft GEIS to use the legalism of the phrase "remote and speculative" to avoid considering the consequences of the loss of institutional control is ridiculous, bizarre, and even surreal. Given the fact, an assumption of institutional control extending to millennia with the stringent set of controls required for spent fuel management, such as those listed in paragraph 6.3 above, is entirely remote, unreasonable, and speculative. (0898-3-14 [Curran, Diane] [Makhijani, Arjun])

Comment: Many existing authorities, including the National Research Council, have concluded that long-term waste and remediation policy should be based on the assumption that institutional controls will eventually fail. In reviewing Department of Energy cleanup plans the National Research Council stated the following: The Committee on Remediation of Buried and Tank Wastes finds that much regarding DOE's intended reliance on long-term stewardship is at this point problematic....[...]Other things being equal, contaminant reduction is preferred to contaminant isolation and imposition of stewardship measures whose risk of failure is high.[...] *The committee believes that the working assumption of DOE planners must be that many contamination isolation barriers and stewardship measures at sites where wastes are left in place will eventually fail, and that much of our current knowledge of the long-term behavior of wastes in environmental media may eventually be proven wrong. Planning and implementation at these sites must proceed in ways that are cognizant of this potential fallibility and uncertainty.*¹⁰⁰ [footnote 100 text: NAS-NRC 2000, pp. 3 and 5, original italics; bold added.] (0898-3-15 [Curran, Diane] [Makhijani, Arjun])

Comment: 6.10 Indeed, even the NRC itself put a time limit on institutional controls in its low-level waste disposal regulations at 10 CFR 61.7(b)(4) and (b)(5). These regulations effectively assume that active controls (as defined in 10 CFR 61.2) will fail after 100 years. Intruder barriers, which are passive controls, are assumed in the rule to last at most 500 years. NRC's low-level waste regulations are consistent with EPA regulations for managing and disposing of high-level waste and transuranic waste.¹⁰¹ [footnote 101 text: 40 CFR 191.14(a), 2011] The Draft GEIS has not taken account of the technical basis for these regulations. (0898-3-16 [Curran, Diane] [Makhijani, Arjun])

Comment: 6.11 It is to be noted that Department of Energy's (DOE) Yucca Mountain Final EIS "No-Action Scenario 1" examined the case of continued institutional control assumed for 10,000

years as well as an alternative "Scenario 2" in which that control was lost after 100 years.¹⁰² [footnote 102 text: DOE 2002, Vol. I, pp. 2-70 – 2-72] Similarly, EPA regulations for "Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes" at 40 CFR 191.14 mandate that "active institutional controls" be limited to 100 years after disposal. Since dry storage can be licensed after reactor closure, the 100 years may start after expiry of the dry storage license. EPA's regulation relating to uranium mill tailings, 40 CFR 192.02, requires active management measures for 200 years and, if feasible, up to 1,000 years. But, unlike the Draft GEIS, active measures are not assumed to be feasible beyond 1,000 years. (0898-3-17 [Curran, Diane] [Makhijani, Arjun])

Comment: 6.12 The Draft GEIS notes that the EPA allows for "permanent" institutional control under some Superfund scenarios and that DOE has also assumed perpetual control of portions of the Savannah River Site.¹⁰³ [footnote 103 text: NRC 2013a, footnote 2, pp. 1-14 and 1-15] However, just because these agencies assume perpetual control does not relieve the NRC from its obligation under NEPA to examine the environmental impacts of an eventuality that is reasonably foreseeable in case a repository is not developed. For instance, the DOE has assumed perpetual control under a variety of circumstances. However, the DOE also did consider loss of institutional control in its Yucca Mountain EIS, as noted below in paragraph 6.13. Similarly, the DOE considered and evaluated the loss of institutional controls in its EIS relating to the Waste Isolation Pilot Plant (WIPP),¹⁰⁴ [footnote 104 text: DOE 1997, p. 4-33] which is cited in the Draft GEIS.¹⁰⁵ [footnote 105 text: NRC 2013a, footnote 2, pp. 1-14 and 1-15] (0898-3-18 [Curran, Diane] [Makhijani, Arjun])

Comment: The main barrier preventing theft of spent fuel in case of a loss of institutional control is external radiation from cesium-137. This radiation barrier decays with a half-life of about 30 years and is therefore less and less effective after one to two centuries. After time of that order of magnitude, the obstacles to theft of spent fuel bundles extracted from the casks would be far lower - low enough to present a real proliferation problem. Every metric ton of spent fuel (heavy metal content) contains more than enough plutonium to make a nuclear weapon. Extracting the plutonium from the spent fuel would also be greatly simplified due the loss of almost all of the radiation barrier. It is therefore essential for the GEIS to evaluate the potential for theft of spent fuel in case of a loss of institutional control and the potential impacts of the possible resultant proliferation. (0898-3-19 [Curran, Diane] [Makhijani, Arjun])

Comment: I am not arguing here that the NRC should not evaluate a case where institutional control would be maintained for a prolonged period. If the NRC wants to examine a remote and speculative case, it is free to do so. But that cannot be the basis for scientifically valid conclusions about environmental impacts. The NRC is obligated under NEPA to consider the environmental impacts in case of a loss of institutional control because, contrary to the assertion in the Draft GEIS, such an eventuality is not "remote and speculative" for the extremely long periods in question. Rather, it is reasonably foreseeable, given the facts of history, though the exact process is not and though one might wish otherwise. (0898-3-20 [Curran, Diane] [Makhijani, Arjun])

Comment: THE DRAFT GEIS FLIES IN THE FACE OF FACTS, HISTORY, AND COMMON SENSE BECAUSE IT ASSUMES INDEFINITE RELIABILITY OF INSTITUTIONAL CONTROLS (0898-3-8 [Curran, Diane] [Makhijani, Arjun])

Comment: One of the Draft GEIS's greatest defects is its assumption that institutional controls of the most active sort will persist essentially forever, which in the context of spent fuel is tens or hundreds of thousands of years: Institutional controls, i.e., the continued regulation of spent

nuclear fuel, will continue. This assumption avoids *unreasonable speculation regarding what might happen in the future regarding Federal actions* to provide for the safe storage of spent fuel. Although government agencies and regulatory safety approaches can be expected to change over long periods of time into the future, the history of radiation protection has generally been towards ensuring increased safety as knowledge of radiation and effectiveness of safety measures has improved. For the purpose of the analyses in this draft GEIS, the NRC assumes that regulatory control of radiation safety will remain at the same level of regulatory control as currently exists today.⁹⁵ [footnote 95 text: NRC 2013a, pp. 1-14 - 1-15, italics added] (0898-3-9 [Curran, Diane] [Makhijani, Arjun])

Comment: As discussed in Section 6 above, it is essential for the NRC to evaluate the environmental impacts of indefinite storage in case of a loss of institutional control. These impacts are likely to be catastrophic under a variety of circumstances. (0898-4-1 [Curran, Diane] [Makhijani, Arjun])

Comment: The NRC has cited the catastrophic impacts in case of loss of institutional control that were found in the Yucca Mountain EIS: DOE's approach to the loss of institutional controls at a dry cask storage facility was provided in its Yucca Mountain EIS (DOE 2008). In its analysis, DOE found that the loss of institutional controls resulted in catastrophic impacts for several resource areas.¹⁰⁷ [footnote 107 text: NRC 2013a, footnote 2, pp. 1-14 and 1-15] 7.3. The 2008 Yucca Mountain EIS, which is a supplement to the DOE's 2002 Yucca Mountain EIS (DOE 2002), estimates that in case of loss of institutional control there would be 1,000 "latent" cancer fatalities in the first 10,000 years and a hundred times more in the period up to a million years after that – though it considers the latter figure to be very uncertain. The impact in the longer time frame is estimated to be the result of "the unchecked deterioration and dissolution of the materials." The document describes these impacts as "catastrophic."¹⁰⁸ [footnote 108 text: DOE 2008, p. S-51. We note here that in the 2002 EIS to which DOE 2008 is a supplement, the DOE estimated latent cancer fatalities in the first 10,000 years as 3,300. (DOE 2002, Vol. II, Appendix K, p. K-28)] 7.4. While I agree with DOE 2008 that the impacts of the loss of institutional control in case of indefinite onsite storage would be catastrophic, I also note that the DOE *deliberately underestimated the impacts in this scenario*. It did so because it did not want to overstate the relative environmental benefits of deep geologic disposal at Yucca Mountain, its preferred alternative, compared to the no-action alternative. Without any implications as to the overall merits of the Yucca Mountain EIS or the DOE's license application, DOE's approach to the loss of institutional control was reasonable. If the underestimated impacts of the no action alternative are much greater than those of the preferred action, it allows a technical case to be made for the preferred action, which was, after all, the goal of that EIS. However, for the waste confidence GEIS, such an underestimation is not permissible, since the court has explicitly asked it to estimate the impacts in case a repository never becomes available. This requires as full and complete estimation of impacts as reasonably as possible. (0898-4-2 [Curran, Diane] [Makhijani, Arjun])

Comment: I provide some examples of impacts that were ignored in the Yucca Mountain EIS loss of institutional control scenario that must be included in the waste confidence GEIS. The DOE "did not attempt to quantify adverse health impacts from chemical toxicity of the waste forms (principally uranium dioxide and *borosilicate glass*) that could occur within the exposed population."¹⁰⁹ [footnote 109 text: DOE 2002, Vol. I, p. 7-35, emphasis in original] (0898-4-3 [Curran, Diane] [Makhijani, Arjun])

Comment: I provide some examples of impacts that were ignored in the Yucca Mountain EIS loss of institutional control scenario that must be included in the waste confidence GEIS.[...]The

DOE did not quantify some of the most critical ecosystem and economic impacts of the deterioration of containers in storage after institutional control is lost, but noted the following: Under Scenario 2 [no institutional control after 100 years], more than 20 major waterways of the United States (for example, the Great Lakes, the Mississippi, Ohio, and Columbia rivers, and many smaller rivers along the Eastern Seaboard) that currently supply domestic water to 30.5 million people would be contaminated with radioactive material. The shorelines of these waterways would be contaminated with long-lived radioactive materials (plutonium, uranium, americium, etc.) that would result in exposures to individuals who came into contact with the sediments, potentially increasing the number of latent cancer fatalities.¹¹⁰ [footnote 110 text: DOE 2002, Vol. II, Appendix K, p. K-29] (0898-4-4 [Curran, Diane] [Makhijani, Arjun])

Comment: I provide some examples of impacts that were ignored in the Yucca Mountain EIS loss of institutional control scenario that must be included in the waste confidence GEIS.[...] When food pathways other than drinking water are considered, the DOE estimated that the radiation doses and, hence, fatalities would triple.¹¹¹ [footnote 111 text: DOE 2002, Vol. II, Appendix K, p. K-29 and K-32] The impact of dispersed waste on vast aquifers, areas of land, and the country's most important rivers that could not be used again because of contamination was not explored in detail. The Fukushima accident that began on March 11, 2011 has shown that the economic, social, and ecological impacts of the spread of radiation contamination are far larger than indicated by a narrow view of latent cancer fatalities alone. (0898-4-5 [Curran, Diane] [Makhijani, Arjun])

Comment: I provide some examples of impacts that were ignored in the Yucca Mountain EIS loss of institutional control scenario that must be included in the waste confidence GEIS.[...] Climate change uncertainties were not evaluated in the Yucca Mountain EIS No-Action Alternative. (0898-4-7 [Curran, Diane] [Makhijani, Arjun])

Comment: In conclusion, the impacts from a failure of institutional controls are likely to be catastrophic - much more so than estimated in the Yucca Mountain EIS. Since a failure of institutional controls over millennia is reasonably foreseeable, given the facts of world and U.S. history, the NRC must realistically analyze those impacts. (0898-4-8 [Curran, Diane] [Makhijani, Arjun])

Comment: The Draft GEIS has made an unsupported assumption that institutional controls will remain effective indefinitely on the ground. An assumption that the federal government will be there to protect health and safety even thousands of years from the present is remote and speculative. On the contrary, global and U.S. history shows that it is highly remote and speculative to assume institutional control for an indefinite period. It is also fundamentally inconsistent with federal law and policy (including NRC's own regulations) to assume that institutional controls will last forever. For instance, the NRC's low-level waste regulations assume that institutional controls will last no more than 100 years and that physical barriers to intruders will last no more than 500 years. To assume that the federal government will exist for tens of millennia and each year appropriate significant sums of money to manage spent fuel at sites that produce no revenue flies in the face of current facts and U.S. history, including a dozen federal government shut downs since 1980, not to speak of the Civil War, when the United States did not have a single government, budget, or currency. (0898-5-17 [Curran, Diane] [Makhijani, Arjun])

Comment: The Draft GEIS should be redone to remedy a number of fundamental defects. Among other things, it is necessary to include a scenario that posits indefinite storage and loss of institutional control 100 years after the end of reactor operating licenses. (0898-5-26 [Curran, Diane] [Makhijani, Arjun])

Comment: The GEIS must evaluate the increasing likelihood of theft after loss of institutional control and a decay of the cesium-137 radiation barrier after 200 to 300 years. It must also evaluate the environmental and proliferation consequences of such theft. (0898-5-27 [Curran, Diane] [Makhijani, Arjun])

Comment: Unrecognized in the Draft GEIS is the fact that no civilization and no human institutions have lasted for hundreds of thousands of years. Any credible plan must include ways to mitigate the risks of environmental contamination in the event of failure of governments or institutions. A realistic plan must be devised to keep manmade radioactive elements isolated from the biosphere for the million years the EPA declares them to be lethal. (0908-5 [Mikkelsen, Sara])

Comment: (VII-4) A report from Argonne National Laboratory examines the challenge of safeguarding spent fuel during very long-term storage (VLTS), which it defines as above-ground, interim, dry storage for a period of more than 50 years.⁶⁵ [footnote text 65: Kollar et al, 2013.] That report accompanies this declaration as Exhibit #32. The challenges identified in the report arise partly from potential changes in the risk environment. Thus, the report illustrates the significance of a potentially changing risk environment for the assessment of radiological risk. The report makes the following statement:⁶⁶ [footnote text 66: Kollar et al, 2013, page 6.] "Safeguarding a VLTS facility with nuclear material for 50, 100, or 200 years will present many challenges. First of all, the integrity of the fuel or cask may deteriorate. The radioactive signature of the fuel will also change. As the fuel cools, it may become more attractive for diversion. Even though the State has the means to handle very radioactive spent fuel, cooler spent fuel will still be more attractive to divert because it is easier to handle and reprocess. Keeping data on the facility for that long may also be a challenge. If the past 50 years are any indication of the future, it is difficult to predict what the safeguards challenges and needs will be in just the next 50 years." (0916-1-14 [Curran, Diane] [Thompson, Gordon R.]

Comment: (VII-5) The draft GEIS does consider one aspect of potential change in the risk environment over coming decades. In its Section 4.18, it discusses the influence of climate change on design-basis accidents or severe accidents at spent-fuel pools or at dry cask storage facilities (i.e., ISFSIs). It acknowledges various potential outcomes of climate change, such as increased intensity and frequency of severe weather events, sea level rise, increased storm surges, shoreline retreat, and inland flooding. It assumes, however, that mitigating actions could prevent significant increase in radiological risk as a result of climate change, that NRC will continue to exist and will require the necessary mitigating actions, and that licensees will be willing and able to implement these actions. (VII-6) Section 1.8.3 of the draft GEIS, titled Analysis Assumptions, sets forth a highly optimistic view of the future conditions that will affect stored spent fuel. It assumes that institutional controls will remain operative into the indefinite future, arguing that this assumption "avoids unreasonable speculation regarding what might happen in the future regarding Federal actions to provide for the safe storage of spent fuel".⁶⁷ [footnote text 67: NRC, 2013b, page 1-14.] It further assumes that each ISFSI will be replaced on a 100-year cycle, into the indefinite future. (VII-7) For the reasons set forth in Section V of the Thompson scoping declaration, the highly optimistic assumptions used in the draft GEIS are neither reasonable nor prudent. Moreover, assuming static conditions is speculative in the extreme, and shows a profound ignorance of human history. Given the long timeframes

envisioned in the draft GEIS, the only reasonable approach is to consider a broad range of scenarios. Section VI of the Thompson scoping declaration discussed this approach. That discussion yielded three recommendations, each of which is pertinent to radiological risk, as follows:⁶⁸ [footnote text 68: Thompson, 2013b, Section VI and Section X.] "Recommendation #8: The scenarios considered in the proposed EIS should cover a range of potential outcomes regarding the role of nuclear power, including: (i) shrinkage in the number of operating reactors, with potential shutdown of all reactors by the middle of the 21st century; (ii) expansion in the number of operating reactors; and (iii) introduction of new technology." "Recommendation #9: The scenarios considered in the proposed EIS should cover future societies exhibiting a range of variation in prosperity, technological capability, and the quality of governance." "Recommendation #10: The scenarios considered in the proposed EIS should cover a range of potential future outcomes regarding the propensity for violent conflict, and should cover situations in which stored SNF or HLW would experience attacks involving States or non-State actors." (VII-8) The draft GEIS does not implement any of my Recommendations #7 through #10. Instead, the draft GEIS takes the unreasonable, imprudent, and highly speculative position that the risk environment will remain unchanged into the indefinite future. (0916-1-15 [Curran, Diane] [Thompson, Gordon R.]

Comment: But if institutional control is lost, which is almost guaranteed over a long enough period of time, the radioactivity releases will be catastrophic-on the surface of the Earth! The U.S. Department of Energy has admitted to as much, in its 2002 FEIS on the now cancelled Yucca Mountain dump proposal. Although DOE didn't delve into the catastrophic details, it observed that simply abandoning high-level radioactive wastes on-site at reactors would eventually result in the release of their radioactive contents into the environment over time, as the containers failed, with catastrophic consequences. (0919-2-11 [Kamps, Kevin])

Comment: What does DOE know that NRC does not?! Perhaps DOE's own loss of institutional control over its own inventories of highly radioactive wastes, not after 100 years, but after just years and decades, has provided it with insights that NRC has chosen to blind itself to? Dr. Makhijani points out in his expert commentary in this proceeding that during the recent October 2013 government shutdown, active pumping of groundwater, at DOE's contaminated Fernald site in Ohio, was nearly interrupted due to lack of needed funding! And this after just a few years of active pumping thus far! (0919-2-13 [Kamps, Kevin])

Comment: Whereas NRC assumes institutional control forever, on Pages 1-14 to 1-15, NRC and the commercial nuclear power industry NRC supposedly regulates has managed to lose institutional control in real time. Examples abound. Irradiated nuclear fuel has been "lost," as at Vermont Yankee, Humboldt Bay (CA), and Millstone (CT) nuclear power plants, as but a few examples. (0919-2-15 [Kamps, Kevin])

Comment: Nor has NRC taken NEPA's requisite "hard look" at its mere assumption that such institutional controls will be maintained forevermore into the future. To the contrary, NRC has simply assumed it. In Section 1.8.3, Analysis Assumptions, on Page 1-14 to 1-15, NRC states: "Institutional controls, i.e., the continued regulation of spent nuclear fuel, will continue. This assumption avoids unreasonable speculation regarding what might happen in the future regarding Federal actions to provide for the safe storage of spent fuel. Although government agencies and regulatory approaches can be expected to change over long periods of time into the future, the history of radiation protection has generally been towards ensuring increased safety as knowledge of radiation and effectiveness of safety measures has improved. For the purpose of the analyses in this draft GEIS, the NRC assumes that regulatory control of radiation safety will remain at the same level of regulatory control as currently exists today." This is a

most convenient, and overly optimistic assumption, by NRC. History provides countless counter-examples regarding what NRC is now phrasing "institutional control." (0919-2-5 [Kamps, Kevin])

Comment: These may be dramatic examples of the fragility of "institutional control." Perhaps less dramatic, but very relevant, and ironically so, was the U.S. federal government shutdown of October 2013. It threw this very NRC WC DGEIS public comment meeting schedule into chaos. A number of meetings had to be postponed to a later date, greatly complicating public participation. As was pointed out by David Kraft of NEIS at the Oak Park, IL on November 12, 2013, once that meeting was rescheduled from its original October 24th date: "NRC expects the public to accept that spent-fuel can be safely stored at reactor sites indefinitely under its supervision. One month ago, NRC could not even guarantee that it could put a workforce in the field due to the government shutdown." The postponement of public meeting dates pushed the Minnetonka, MN date back to Dec. 4th - sure enough, just in time for severe winter weather, which dampened public turnout. (0919-2-6 [Kamps, Kevin])

Comment: Re: Page 4-2, lines 18-22, "the NRC assumes that the ISFSIs are completely replaced every 100 years. This replacement activity would require separate site-specific authorization from the NRC before the start of any replacement activities. NRC authorization to relicense or replace an ISFSI and NRC authorization to construct, operate, and replace a DTS are separate licensing actions that would require an NRC review. They are considered Federal actions under NEPA and would be undertakings under the National Historic Preservation Act (NHPA)."..."NRC's assumption, that it'll be around, and these laws still in force, centuries or millennia into the future, is absurd, with so historical, or rationale, basis whatsoever. No government has ever last that long. Few human institutions of any description have even lasted millennia, let alone forever, as NRC is assuming it will do, and the nuclear industry will do. (0919-6-7 [Kamps, Kevin])

Comment: On Page 4-4, lines 27-28, NRC states "ISFSIs are designed as passive systems that require no power or regular maintenance other than routine visual inspections and checks of the cask ventilation system (e.g., for blockages of ducts)."--But what about when institutional control is lost, and those manual inspections and checks are abandoned, along with the ISFSIs themselves? For a decade, NRC has allowed Big Rock Point personnel to limit "walk by" inspections to once every two weeks. So, an incident could be under at Big Rock Point even now - such as a vent blocked by trash, debris, sand, etc., and Entergy Nuclear would not even know about it for up to two weeks - risking overheating of the irradiated nuclear fuel, its degradation, etc. (0919-6-9 [Kamps, Kevin])

Comment: NRC expects the public to accept that spent-fuel can be safely stored at reactor sites indefinitely under its supervision. One month ago, NRC could not even guarantee that it could put a workforce in the field due to the government shutdown. (0921-4 [Kamps, Kevin])

Comment: Page 1-14, Line 19+, The assumption that institutional controls will be in place for an indefinite period of time is nonsense. Our country has only been in existence for a bit over 200 years. To assume that no changes will occur for an indeterminate time into the future is an assumption we believe you cannot make. Instead, these sites must not be contemplated for that extensive period of time, and should be limited to the decommissioning time period, as we describe with respect to other issues as well. (0930-1-8 [Lutz, Ray])

Comment: The waste we speak of has thousands to hundreds of thousands of years of known activity and necessary oversight, and its impact on the environment beyond radioactive exposure is not being assessed adequately by any U.S. government agency. (0935-3 [Uhls, Agnes])

Comment: Over forevermore, indefinite storage of HLRWs on the Lake Erie shore, the dry casks will erode and release their contents. NRC assumes forevermore institutional control, including once per century complete replacement of the pads, inner canisters, and dry casks -- by using a "Dry Transfer System," DTS, as the pools will be dismantled during decommissioning. No price tag is given for this once per century complete replacement, forevermore, nor where that mysterious amount of money (infinite amount of money, by definition) would supposedly come from. NRC's assumption of forevermore institutional control comes amidst a US federal government shutdown. As Arjun Makhijani has pointed out, in just the past couple-few hundred years, North America has seen multiple wars (the Revolutionary War, the War of 1812 -- including on the Lake Erie shores, where some of the worst battles took place, including in Monroe and Port Clinton -- the Civil War). Institutional control being maintained even just 300 or less years into the future is a huge domain assumption. (0945-6 [Keegan, Michael J.])

Comment: Unrecognized in the Draft GEIS is the fact that no civilization and no human institutions have lasted for hundreds of thousands of years. Any credible plan must include ways to mitigate the risks of environmental contamination in the event of failure of governments or institutions. A realistic plan must be devised to keep manmade radioactive elements isolated from the biosphere for the million years the EPA declares them to be lethal. (0951-5 [Commenters, Multiple])

Comment: No sane person would assert that radioactive waste, with a half-life of 20,000 years, can be stored safely, given that civilization has only existed for 10,000 years, and the government of the United States has only existed for 226 years. (0998-2 [Rosanelli, Donald])

Comment: WHEN YOU DEVISE A SIGN THAT STATES "THIS SHIT WILL KILL YOU AND ALL YOU LOVE" THAT WILL LAST 250,000 YEARS IN A LANGUAGE THE FUTURE PEOPLE WILL UNDERSTAND, THEN ASK US FOR A "WASTE DUMP" PERMIT. UNTIL THEN BUGGER OFF AND STOP MAKING MORE OF THE SHIT THAT WILL KILL US AND ALL WE LOVE. (1006-1 [Killpack, Gary])

20. Comments Concerning Site and Activity Descriptions

Comment: [F]irst off I'd like to talk a little bit about the storage of nuclear fuel. The fuel pools are large robust structures, some 40-feet deep with reinforced concrete walls several feet thick and steel liners. The water offers superb cooling for radiation and the fuel pools offer 25 to 30-feet of water shielding and fuel cooling. The volume of water in these pools is so large that any evaporative process associated with loss of cooling system would provide time for operators to establish backup water supply. All used fuel pools are designed to seismic standards consistent with other important safety related structures on the plant sites. (0045-13-1 [Allen, Rick])

Comment: The dry storage containers are robust, concrete steel structures with no moving parts. Multiple barriers provide an in-depth protection. More than 100 tons of concrete and steel forms precisely engineered structures to protect 10 tons of used fuel. Over the past 30 years the nuclear industry has safely loaded more than 1700 dry storage systems. All of these systems are in service today and there has been zero release with their radioactive contents. Dry storage systems have withstood several earthquakes, hurricanes, and other natural disasters. (0045-13-2 [Allen, Rick])

Comment: Further I have seen the dry fuel storage systems used at these sites. These designs, like our AREVA Trans Nuclear dry storage system, are licensed by the US Nuclear Regulatory Commission to extremely stringent safety requirements. The storage container's one inch thick stainless steel casing and the three foot thick reinforced concrete shield buildings are serving us all well. These structures have been demonstrated to safely withstand the direct impact of high velocity missiles. The used nuclear fuel is safely stored in anticipation of its ultimate disposition. (0138-3 [Cook, Dr. Andrew G.])

Comment: I'd like to take the opportunity into say a couple of things about how we store used fuel. Immediately after discharge from the reactor, the fuel is stored in large pools filled with hundreds of gallons of water. The pools are robust concrete structures, with stainless steel liners. The water removes decay passively and provides shielding from radiation. We've never had a situation in which we needed to provide emergency makeup water to one of our pools, but we have the equipment, procedures, and training for doing so, if necessary. After years in the pool, the decay heat drops significantly and the fuel is cool enough to be loaded into dry storage. We place the assemblies in steel canisters surrounded by large concrete overpacks for shielding and protection. The dry storage systems are thick and massive, weighing hundreds of thousands of pounds. Completely passive natural circulation of the atmosphere is all that is required to cool the dry storage systems. (0250-6-4 [Nesbit, Steve])

Comment: At the same time the capacity for storing all this waste was becoming a problem. Nuclear waste is not simply "spent fuel" or "energy used up; it has served its purpose," as the present Chief Nuclear Officer at PG&E called it a couple weeks ago at the County Board of Supervisors meeting. Nuclear fission is NOT a chemical reaction like burning a log in a fireplace, where the leftover is charcoal and ashes. No, nuclear fission is taking one heavy element, Uranium, bombarding it With a particle (a neutron) which creates a little heavier form of Uranium that is so unstable that it immediately breaks into lighter, daughter elements. These new creations are things like Cesium and Strontium and Plutonium. These are not charcoal and ashes. These are not "spent" elements-they are new, completely different elements, with their own horrible, highly radioactive, extremely dangerous characteristics. The reason this process works so well to generate electricity is because when the unstable uranium atom breaks apart into its lighter, daughter elements, a piece of energy is released, free to heat up the water in the reactor. And that is why fission (this "breaking apart") is considered "clean". No smoke or charcoal or carbon dioxide is created-just heat....Well, . . . just heat and the daughter elements of things like cesium, strontium, plutonium-all of which are very radioactive and very dangerous for a long time. (0293-3 [Lewis, Sherry])

Comment: The fuel pool over here is over 40-feet deep. It's almost 120-feet long. If you walked in-- you ever been inside there? You'd want to jump in that water. I'm telling you, it's the most beautiful water you've ever seen, I swear. I'm telling you, it's the most beautiful color you've ever seen. All lined with stainless steel and everything else, you know. Yes, it sounds crazy but I'm telling you, once you're in there and you look at it, it's really refreshing looking. (0325-14-3 [Sallis, Gary])

Comment: As many of you know, our wet storage systems are comprised of heavily reinforced concrete structures that are embedded in rock and lined with stainless steel. Although both wet and dry storage systems are safe, PG&E is systematically moving the used fuel from our wet storage systems into our dry storage facilities. Our dry storage system utilizes a multi-purpose canister that is designed to store and transport used fuel. The dry storage system was initially specified for the higher seismic requirements that are appropriate for our Central Coast. We licensed, permitted, and designed our dry storage facility to hold all of the fuel that is discharged

from the plant during its 40-year licensed life. Initial construction of our dry storage facility was limited to 38 of the 138 casks that it was designed for, and that was based on the premise that the Federal government would assume their responsibilities and develop Yucca Mountain in a timely manner. With the continued delays of the development of a Federal repository, PG&E will be expanding the number of foundations that we have in our storage facility in 2014 to be able to accommodate all 138 casks, to be able to accommodate all the fuel discharged during the 40-year licensed life. This will allow us to continue to move the used nuclear fuel from our wet storage systems into our dry storage systems. To date, a full 1/3 of the fuel that's been discharged through the operation at Diablo has been moved from wet storage to dry storage. PG&E is committed to the continued safe storage of used nuclear fuel using both our wet and dry storage technologies. (0326-3-2 [Strickland, Gerald])

Comment: Nuclear waste is not simply spent fuel or energy used up. It has served its purpose, as the present chief nuclear officer at PG&E called it a couple weeks ago at the County Board of Supervisors meeting. He referred to spent fuel as energy used up. It has served its purpose. It drove me nuts. Nuclear fission is not a chemical reaction like burning a log in a fireplace, where the leftover is charcoal and ashes. No, nuclear fission is taking one heavy element, uranium, bombarding it with a particle, a neutron, which creates a little heavier form of uranium that is so unstable that it immediately breaks into lighter daughter elements. These new creations are things like cesium, and strontium, and plutonium. These are not charcoal and ashes. These are not spent elements. They are new completely different elements with their own horrible, highly-radioactive, extremely dangerous characteristics. The reason this process works so well to generate electricity is because when the unstable uranium atom breaks apart into its lighter daughter elements, a piece of energy is released, free to heat up the water in the reactor. And that is why fission, this breaking apart, is considered clean. No smoke, or charcoal, or carbon dioxide is created; just heat. Well, just heat and the daughter elements of things like cesium, strontium, plutonium, all of which are very radioactive and very dangerous for a long time. (0326-44-2 [Lewis, Sherry])

Comment: I moved to Santa Barbara seven years ago from New York City, where I lived less than 30 miles from the most dangerous nuclear power plant in the United States, Indian Point, which affects over 20 million people. Since the catastrophic events of March 11, 2011, I've become deeply concerned about the fate of nuclear energy in California, especially the fate of Diablo Canyon. There are 430 commercial nuclear power reactors in the world, in 31 countries; 70 more are now under construction. These statistics that I'm reading came from the World Nuclear Association dated November 2013. Eleven percent of the world's electricity comes from nuclear power, only 11 percent. Fifty-six countries operate a total of about 240 research reactors and a further 180 nuclear reactors power some 150 ships and submarines. Of the 104 commercial nuclear reactors in this country, 4 have been closed this year, 4 are slated to close within the next year. Closed does not mean over. The highly radioactive fuel rods left behind as so-called waste pose catastrophic dangers that we must live with for 250,000 years per rod. Keep in mind that the fuel rods are only beneficial for somewhere between one to two, I'm sorry, one to three years and then they are retired, to be cooled down in pools, where they continue to generate enormous heat and produce a by-product of radioactive water. When cool enough, they are supposed to be stored in dry casks. The number of partially used fuel rods or, as you call them, spent fuel rods continues to grow at a staggering rate. The rods are not spent. Spent means used up. This is hardly the case when the rods are removed from the reactors. We know that, and so do you. (0326-57-1 [Livingston, Rosanne])

Comment: The NRC analysis of dry cask storage of spent fuel, for decades if not centuries, is totally inadequate. The description of how the fuel canisters are hermetically sealed is not

sufficient for the reader to assess risk. The report states that "fuel is loaded into canisters, (presumably steel); the air and water are pumped out; the canister is filled with "inert gas" (what inert gas?); and the top is welded in place" to seal-in the spent fuel and isolate it from the environment. In another section, describing the long-term maintenance of casks at the facility, a comment is made that, during replacement activities, "around 10% of the casks and support pads will need to be disposed of as low-level radioactive waste." There is no explanation as to how the casks and pads can become contaminated since they are supposed to be hermetically sealed. There are two obvious possibilities: (1) there is a failure of containment in the canister with the escape of the "inert gas" and the entry of air and water into the fuel canister with subsequent corrosion. This would compromise the integrity of the containment vessel and result in leakage. Continuous exposure of the canister metal to radiation from the enclosed fuel could also weaken its physical integrity and result in metal failure, corrosion and leakage; and (2) there is neutron activation of casks, canister components and the pads themselves. In case (1) the NRC presents no history of dry cask storage to support their contention that the risk from loss-of-containment accidents is small, particularly over the super long time frames envisioned. In case (2) we are informed by the statement that "casks are placed 15 feet apart to avoid criticality events." This would seem to indicate that spent fuel in dry casks still emits neutrons at a measurable rate, which are not absorbed by the cask shielding. This presents a problem for evaluation of dose to workers since neutrons have a biological effectiveness 20 to 50 times greater than an equivalent exposure to the same quantity of gamma or x-rays. Also since dry casks are cooled by circulating ambient air through the casks, inside the concrete shield, there is a significant potential for activation of atmospheric nitrogen by neutrons to form carbon-14-carbon dioxide. (0410-25 [Nelson, Dennis])

Comment: GEIS Section 2.1.2.2, p. 2-14, lines 7-9. This section deals with multipurpose canisters. The cited lines begin with, "However, in the absence of a repository program ..." This text should be modified to recognize that there is a repository program at Yucca Mountain and NRC has received a writ of mandamus to restart the Yucca Mountain licensing process. The section should also recognize the Transportation, Aging, and Disposal canisters (TADs) that are part of the Yucca Mountain Project. TADs are designed as multipurpose storage, transportation, and disposal canisters and detailed specifications exist. Because of the Federal court ruling that NRC's suspension of Yucca Mountain licensing process was illegal and must be restarted, this GEIS cannot continue to pretend that Yucca Mountain and the NWPA do not exist. (0544-27 [Enriquez, Elizabeth])

Comment: GEIS Section 2.1.3, p. 2-18, lines 33-35. This discussion says the Federal government supports interim storage. This is another example of the GEIS pretending that Yucca Mountain and the Nuclear Waste Policy Act do not exist. In fact, current Federal law prohibits the Federal government from construction and operation of an interim storage facility. This should be recognized in this section. The analytical scenario still makes sense based on the court order and the simple fact that interim storage is a good idea, especially if repository disposal capacity is not available. This GEIS should not cover up the fact that NRC's actions to terminate the Yucca Mountain licensing process were illegal. (0544-28 [Enriquez, Elizabeth])

Comment: As noted above, WBN Units 1 and 2 share a SFP, as do Sequoyah Units 1 and 2. However, they are not listed in DGEIS Table 2-1 ("U.S. Pressurized Water Reactors with Shared Spent Fuel Pools"). ⁸² [footnote 82 text: DGEIS at 2-5.] TVA recommends that DGEIS Table 2-1 be updated to include Sequoyah with 2091 locations and WBN with 1386 locations as sites with shared SFPs. (0694-2-24 [Shea, Joseph])

Comment: Page 2-14, lines 10-12: It might be useful to clarify that the 69 ISFSIs assigns two ISFSIs to PSEG (NRC considers Salem and Hope Creek separately) and includes PFS. It may be informative to explain that there are only 62 ISFSIs in operation. The difference is the dual-license ISFSIs at Robinson, Oconee, Surry, and North Anna; the INEL spent fuel facility that was never built; and Salem/Hope Creek, which is one ISFSI. Industry data indicates that, as of mid-2013, there are 1,771 casks in service at 53 General License ISFSIs (Salem and Hope Creek are one) and 14 Specific License ISFSIs (not including PFS). (0827-7-10 [Ginsberg, Ellen])

Comment: Page 2-14, lines 27-28: It is incorrect to say the NRC approval is sought for changes to the programs cited. Each of those programs is subject to a review of the proposed changes under 50.59, 50.54, or a license condition to determine whether prior NRC review and approval is required. (0827-7-11 [Ginsberg, Ellen])

Comment: Page 2-16, line 4 and Page 2-17, line 30: When stating that fuel will be transferred to an at-reactor or away-from-reactor ISFSI during decommissioning, NRC should recognize that decommissioned reactors may have the option of keeping their fuel in wet storage until DOE picks it up for either consolidated storage or disposal. (0827-7-12 [Ginsberg, Ellen])

Comment: Page 2-16, line 7: LaCrosse should be added to this list. (0827-7-13 [Ginsberg, Ellen])

Comment: Page 2-16, line 29: 1,600 will change if changes are made per earlier comment. (0827-7-14 [Ginsberg, Ellen])

Comment: Page 2-26, line 33: "loss of confinement" is not an "effect" being managed. It is a consequence of not managing the confinement boundary material condition properly. Industry recommends that this statement be changed to "cask and canister confinement boundary material condition." (0827-7-15 [Ginsberg, Ellen])

Comment: RULE, Discussion A.6, 56780 Col. 2: The statement that the rule covers MOX fuel because it is "substantially similar" to LWR fuel should be further supported by noting that DOE considered MOX fuel in the Yucca Mountain FEIS analysis. The DOE analysis concluded that low-enriched uranium fuel and MOX were similar and environmental impact differences would be small. The GEIS should reference the Yucca Mountain FEIS in its conclusion (Yucca Mountain FEIS (DOE 2008), Appendix A, Section A.2.4.5.1.1, p. A-52). (0827-7-16 [Ginsberg, Ellen])

Comment: GEIS Section 2.1.4: NRC should clarify its position on the licensing of dry transfer and repackaging under 10 CFR Part 72 to address an apparent inconsistency between what is stated in the GEIS and other recent NRC documents. On GEIS 2-21 NRC refers to a dry transfer system and repackaging being licensed under Part 72 at Idaho National Lab (INL). Although Part 72 (72.2, Scope) does mention packaging, on August 23, the NMSS director wrote a letter to the Commissioners stating that repackaging is not within the scope of Part 72. (0827-7-22 [Ginsberg, Ellen])

Comment: GEIS Section 2.1.1: Industry has reviewed the information provided in this section and has identified a number of instances where there appears to be some discrepancy between our data and what NRC has provided in this section. These discrepancies are identified below: • Page 2-6, line 23: The low end of the range for the number of fuel rods in a BWR assembly is stated to be 91. However, an 8x8 assembly (previously referred to in the same paragraph) would have only 64 fuel rods. (0827-7-5 [Ginsberg, Ellen])

Comment: Page 2-7, Table 2-2: Industry data indicates that Haddam Neck has 1,101 fuel assemblies discharged. 82 are at Morris and 1019 in dry storage on site. (0827-7-6 [Ginsberg, Ellen])

Comment: Page 2-7, lines 11-13.: There is a statement that fuel is removed from the reactor and replaced every 12-18 months. To our knowledge, only one reactor is currently operating on a 12-month cycle. NRC's statement should be changed to 18-24 months to represent nearly all reactors. For this reason the estimate of 20 MTU discharge per year is a slightly low. The 100 operating reactors discharge about 2240 per year on average. So, 22 MTU/yr is a more accurate number to use for a per-plant average. This would take the cited total of 1600 MTU per reactor over 80 years to 1,760. (0827-7-7 [Ginsberg, Ellen])

Comment: Page 2-7, Lines 22-24: The statement regarding the 25% reduction in average MTU discharged annually (from 20 to 15) to reflect higher burnup fuel and longer cycles is not correct. There are many factors other than the length of the operating cycles between refueling that affect the amount of used fuel discharged per year. Such factors include the generating capacity of each reactor and the percentage of time the reactor operates at full capacity. These factors are resulting in more power production over a shorter period of time than historical averages per reactor and cause more used fuel to be produced per year than in past operations - offsetting any reductions in fuel used because of longer operating cycles. Industry suggests removing this 15 MTU analysis and stating that higher burnup fuel may result in longer operating cycles, but a combination of other factors will result in about the same or slightly higher annual average MTU discharged per reactor. A better analytical assumption would be to use industry projections that show on average about 22 MTU per year will be discharged per reactor in the next six years. (0827-7-8 [Ginsberg, Ellen])

Comment: Page 2-10, line 22: The 2,000 MTU per year is slightly low. 2200 MTU/yr is based on industry data, which project about 2200 MTU/yr discharged by approximately 100 reactors over the next six years. (0827-7-9 [Ginsberg, Ellen])

Comment: Page 2-28, Lines 32-34: You describe the most critical step without much effort. The hard part is closing the casks and transitioning to "detached from the transfer containment area".... how do you do that without releasing some radiation? Not clear and probably nearly impossible to implement. (0836-46 [Davis, Anonymous])

Comment: (XII-9) Holtec is a US-based vendor of dry casks used for storing spent fuel at ISFSIs. The Holtec design approach is modular. Fuel is sealed inside a multi-purpose canister (MPC) that is designed to be placed inside overpacks of various types. Holtec has developed an overpack, known as the HI-STORM 100U, that would be more robust against attack than present overpacks. A standard MPC would be placed, in a vertical- axis position, inside the 100U overpack. The 100U overpack would be sunk below ground except for its lid. Holtec has described the robustness of the 100U system as follows:¹⁴⁵ [footnote 145 text: Holtec, 2007. A current description of the 100U system was accessed on 15 December 2013 from: <http://www.holtecinternational.com/productsandservices/wasteandfuelmanagement/hi-storm/>] "Release of radioactivity from the HI-STORM 100U by any mechanical means (crashing aircraft, missile, etc.) is virtually impossible. The only access path into the cavity for a missile is vertically downward, which is guarded by an arched, concrete-fortified steel lid weighing in excess of 10 tons. The lid design, at present configured to easily thwart a crashing aircraft, can be further buttressed to withstand more severe battlefield weapons, if required in the future for homeland security considerations. The lid is engineered to be conveniently replaceable by a later model, if

the potency of threat is deemed to escalate to levels that are considered non-credible today.” (0916-3-18 [Curran, Diane] [Thompson, Gordon R.]

Comment: Re: Page 2-6, footnote 4 ,and its associated text, NRC needs to update the EIS by clarifying that Crystal River and Kewaunee have not just announced plans to permanently shutdown, but have in fact done so. In addition, so have San Onofre 2 & 3. Vermont Yankee has also announced that it will shutdown by the end of 2014. (0919-3-10 [Kamps, Kevin])

Comment: Also on Page 2-8 (lines 14-16), NRC states "Because the MOX fuel is substantially similar to existing uranium oxide light water reactor fuel and was, in fact, used in existing light water reactors in the United States, it is within the scope of this draft GEIS." (Similar text is stated at lines 24-27.) While MOX irradiated nuclear fuel certainly should be within the scope of this GEIS, given that its use is still on the table in the U.S., despite opposition to such use by countless groups, including Beyond Nuclear, it must be pointed out, and the record set straight, that MOX irradiated fuel is not like "typical" irradiated nuclear fuel. MOX irradiated nuclear fuel would be thermally hotter, as well as significantly more radioactive, in terms of its added plutonium content. MOX irradiated fuel could require more space and time in storage pools for cooling and radioactive decay, as well as enhanced safeguards against inadvertent criticality; could require upgrades to typical dry cask storage; and could require more space within a repository setting. (0919-3-13 [Kamps, Kevin])

Comment: On Page 2-27, line 5, it is unclear why NRC writes "private fuel storage facility environmental impact statement," all in lower case. Private Fuel Storage, LLC was a proper name. The phrase "Environmental Impact Statement" is also usually capitalized when used in this way. On Page 2-27, NRC writes "The proposed PFS facility was designed to store up to 40,000 MTU (44,000 tons of spent fuel) and was licensed to operate for 20 years. The NRC now allows an initial license term of 40 years with 40-year renewal terms, representing a decrease in safety regulatory oversight. (0919-4-4 [Kamps, Kevin])

Comment: Re: Page 4-3, beginning at line 1, where NRC states "The TMI.2 ISFSI is a modified NUHOMS spent fuel storage system (designated NUHOMS-12T) with 30 horizontal storage modules (DOE2012). It was licensed by the NRC in March 1999 and contains spent fuel from the damaged TMI-2 reactor (a single reactor core). Although the NUHOMS.12T storage module contents are core debris (not fuel assemblies) and the debris storage canisters could not be treated like fuel cladding, the design of the NUHOMS.12T accounts for these technical differences. Each NUHOMS.12T module provides for the horizontal dry storage of up to 12 TMI.2 stainless-steel canisters inside a dry shielded canister, which is placed inside a concrete horizontal storage module. The NUHOMS.12T modification includes venting of the dry shielded canister through high-efficiency particulate air grade filters during storage. The vent system allows for release of hydrogen gas, generated due to radiolysis, and monitoring and/or is still generating hydrogen, nearly 35 years since the meltdown! Is the venting required in order to prevent gas pressure damage, or even an explosion, in the container? Is the hydrogen gas tritiated? What radiological impact is tritium releases from TMI-2's damaged fuel storage having on Idaho residents downwind of the INL storage location? Are other radionuclides being released along with the vented hydrogen gas? Noble gases? What biologically interactive decay products do the escaping radioactive Noble gases convert into? (0919-6-8 [Kamps, Kevin])

Comment: Page 2-28, Lines 32-34: You describe the most critical step without much effort. The hard part is closing the casks and transitioning to "detached from the transfer containment area".... how do you do that without releasing some radiation? Not clear and probably nearly impossible to implement. (0930-2-20 [Lutz, Ray])

21. Comments Concerning Land Use

Comment: The public in those communities [with decommissioned reactors] have received significant financial benefits during the operation of the reactor which are no longer available. The lost economic activity in those communities should be considered in determining appropriate use for the land of the decommissioned reactor site including land that might be used for containing storage. If a community would feel burdened by containing storage under the principles of consent-based siting, that should also be considered. (0112-28-4 [Diaconeasa, Mihai])

Comment: I am writing in response to a proposed rule change to the NRC Waste Confidence Rule regarding the long term on-site storage of Spent Nuclear Fuel (SNF), as published in the Federal Register, Vol. 78, No. 178, September 13, 2013. I am writing as an individual, and not as a member or representative of any organization. The environmental impact statement for at-reactor continued storage of SNF appearing on page 56785 of the Federal Register entry identifies the land use and socioeconomic impacts of short-term, long-term, and indefinite storage as small." There is no reasonable basis for these conclusions; therefore the rule change should be rejected. (0146-1 [Buchanan, Tom])

Comment: Even if fuel is moved to dry storage in casks, there are pronounced local, regional, and state-wide economic and land use impacts that are not adequately addressed by the proposed changes, and the effects are not small. When SNF is stored at the site of a nuclear plant, the site must be secured and is not available for alternate economic development. Some nuclear plants occupy large tracts of land, and others occupy small tracts. The same is true for spent fuel pads at decommissioned reactors. The NRC offers no guidance or regulation regarding how much land is needed to store and safeguard SNF, and thus there is no means of determining how much land must be or will be committed to the maintenance of on-site SNF storage and security, rather than made available for an alternative higher economic use. Without a specific rule or regulation that defines the space needed for technical management and security of SNF it is not possible to determine generically or specifically what the land use impacts might be at more than 100 reactor sites around the country, and it is certainly not possible to determine that the land use impacts are "small." The storage of SNF at a reactor site necessarily ties up the land and decreases its availability for higher uses that might generate additional property tax revenue and employment, and it reduces the appraised and use value of surrounding land that is affected by radiological effects, security requirements, or visual impacts of the storage of SNF. The costs of managing SNF at the site of a nuclear reactor or a decommissioned reactor are generally reimbursable by the Department of Energy (DOE), but costs that are not reimbursable must be paid from another source such as a limited decommissioning trust fund or the ratepayers of a regulated utility. The DOE has not made any determination regarding a generic level of property taxes that will be reimbursable for the short-term, long-term, or indefinite storage of SNF. Without a clear determination as to how SNF storage facilities can be taxed or what level of reimbursement the DOE will allow for tax payments, it is not possible to evaluate economic value of the use of a generic site for SNF storage relative to the value of alternative uses. Without an ability to make an economic determination regarding relative tax benefits it is not possible to determine the socioeconomic impacts will be "small." (0146-3 [Buchanan, Tom])

Comment: Please consider the following passage regarding economic development from a brochure produced by Maine Yankee(<http://www.maineyankee.com/public/MaineYankee.pdf>): *"As long as the spent nuclear fuel is stored at the Bailey Point ISFSI, this valuable piece of property is unavailable for productive reuse. Among other attributes Bailey Point has a rail line*

to the site, a barge slip with deep water access, a 345 and 115 Kv switchyard, transmission lines, and municipal water and sewer." The same can be said of many other nuclear plants with ISFSI installations, and for plants that will be decommissioned in the future leaving behind just an ISFSI. While the Maine Yankee ISFSI occupies a licensed area of just 8 acres, it sits within an undeveloped 180 acre buffer zone (according to the Maine Yankee brochure). The entire 180 acre site remain undeveloped, and is not producing tax revenue equivalent to its value as developed industrial land in large part because of the presence of the ISFSI . (0146-4 [Buchanan, Tom])

Comment: Consider the case of Vermont Yankee (VY), a 148 acre site that hosts an operating nuclear station and an ISFSI. The site has access to road, river, rail, and power distribution infrastructure, and is prime industrial real estate of the highest order. Entergy Corporation, the parental owner of Vermont Yankee has announced an intention to cease operation in the fourth quarter of 2014 and to shift all the spent fuel to an ISFSI (or perhaps two separate ISFSI's). The Decommissioning Cost Analysis produced for the VY site in 2001 identified annual property taxes through SAFSTOR and SNF management of approximately \$1.47 million in 2001 dollars (this report was filed with the Vermont Public Service Board docket 7862 as exhibit PSD-Cross-12). The 2012 Decommissioning Cost Analysis produced for the VY site can be used to calculate the average annual property taxes for the site after shutdown as approximately \$7,614 to \$16,428 in 2011 dollars, based on an assumption the site will be taxed as vacant land (this report was filed with the Vermont Public Service Board docket 7862 as exhibit EN-TLG-2). The extraordinary difference in property taxes as projected by the owner/operator of the plant makes it clear that it is impossible to accurately calculate the generic or specific value of a site that hosts an ISFSI (please see the initial brief of the Windham Regional Commission (WRC) filed with the Vermont Public Service Board on August 16, 2013 in docket 7862, page 52, Section X, findings 132-141 and discussion, available at: <http://psb.vermont.gov/sites/psb/files/docket/7862relicense5/WRC%20Initial%20Brief%20Dkt%207862.pdf>). Nor has there been any determination as to the level of property tax payments the DOE will reimburse for storage of SNF, and thus it is impossible to determine the effect of property taxes for an ISFSI upon local or state municipalities that may not be able to collect the difference between the tax value allowed by DOE and the potential tax value for alternative uses. Likewise, it is not possible to determine what unreimbursed costs the ratepayers of regulated utilities will need to absorb in lieu of DOE's failure to completely reimburse all property taxes that a municipality might charge. (0146-5 [Buchanan, Tom])

Comment: Vermont Yankee occupies approximately 148 acres in the small Town of Vernon, in the state of Vermont. On October 28, 2013 the Chair of the Vernon Selectboard testified to a joint committee of the Vermont Legislature that the VY site is the primary area for industrial development in the town (in the State of Vermont a Selectboard is the governing body of a town). The loss of a viable industrial use of the land while the Station sits in SAFSTOR and following eventual decommissioning when development is limited to an ISFSI will have a significant effect on the tax base of the town, and upon the ability of the 2,200 residents to afford municipal services. The loss of the productive use of a large tract of industrial land within a small town is not a "small impact." (0146-6 [Buchanan, Tom])

Comment: In summary, the NRC does not require movement of SNF from wet to dry storage. The NRC does not regulate the amount of land needed to store and secure SNF, and it has made no meaningful effort to calculate the lost value of the land needed to store and secure SNF, or value of land that will be left fallow to buffer an ISFSI Neither the NRC nor DOE have established a standard property tax assessment for SNF or the surrounding land. Without clear regulatory guidance regarding the required size of an ISFSI and reimbursable property tax it is

simply not possible to make a generic or specific determination regarding the land use and socioeconomic impacts of the more than 100 nuclear plants in the United States. Likewise, since the NRC does not require movement of SNF from wet to dry storage it is not possible to make a generic assessment of impact of dispersed on-site storage of SNF by focusing primarily on dry storage. Absent these essential determinations the Waste Confidence Rule is built upon false premise, and should be rejected. (0146-7 [Buchanan, Tom])

Comment: As I understand it, the proposed rule seeks to replace the rule codified at 10 CFR 51.23(a) by among other things, substituting the Commission's "generic determination" that spent fuel can be safely stored "without significant environmental impact for at least 30 years beyond the licensed life...of that reactor" with a "generic environmental impact statement" that "supports the Commission's determinations that it is feasible to (i) Safely store spent nuclear fuel following the licensed life for operation of a reactor." What the proposed rule apparently fails to do is to provide any basis in fact for the conclusions in the "generic environmental impact statement." Particularly, as Table 1 (78 FR 56785) notes, the effect of at-reactor storage of radioactive waste on Environmental Impact components such as Land Use, Socioeconomics, are noted as "SMALL." (0354-3 [Oeser, Robert])

Comment: It is disingenuous on the part of the NRC to pretend that spent nuclear fuel storage is just like any other industrial enterprise with similar land and water use characteristics. Nuclear waste lasts "forever" and so will permanently alter the use possibilities of any affected site. It also bears a stigma in the public mind, largely because of its association with nuclear weapons and the proliferation problems that association represents. This perception will psychologically limit proposed future uses of any such site and will attract other equally obnoxious industrial operations. Thus the land must be considered a "sacrifice zone" from the beginning with no pretense that it will ever be reclaimed for general use. (0410-21 [Nelson, Dennis])

Comment: Additional concerns relate to aesthetics and suitability of land use given waste storage configurations that many see as inherently grotesque or problematic. This relates to the question of what if any beneficial or non-compromised land uses are currently occurring at the dozen decommissioned reactor sites that have been unconditionally released by the NRC in the past decade. To illustrate these concerns, here are two quotes from nationally-regarded experts who spoke on October 19 at a community symposium organized by the Sierra Club and other groups to inform the public on issues related to the closure of the San Onofre nuclear power plant. Marvin Resnikoff, Senior Associate, Radioactive Waste Management Associates: Edison has said spent fuel will be removed from the pool by 2034. After that, San Onofre will consist entirely of fuel casks or silos in a Stonehenge configuration. San Onofre has a blockhouse arrangement of 176 modules, including 10 for the reactor. What remains? A fuel mausoleum and the conversion of a valuable site into a wasteland. Arjun Makhijani, President, Institute for Energy and Environmental Research: The best kind of on-site storage has these kinds of characteristics: Low visual signature (low to the ground), which may include berms; the best casks, which currently may be the triple-top German model; and the best seismic science on withstanding earthquake shocks. (0431-9 [Pascall, Glenn] [Watland, George])

Comment: At best, permanent on-site storage would take these sites out of use for any purpose other than housing waste storage in above ground concrete "mausoleums." (0540-5 [Watland, George])

Comment: •In almost every area of NRC selected environmental impacts, NRC looks at the wrong impacts or those least likely to be adversely affected. (0693-3-16 [Warren, Barbara])

Comment: Land Use --the GEIS describes the land used and disturbed by construction, the types of land-- forest, field, agriculture-- and the buildings located there. Not analyzed are the potential consequences of a spent fuel pool fire and the vast area of permanent radioactive contamination that might necessitate evacuation and permanent abandonment of the land, as well as the related costs. (0693-3-17 [Warren, Barbara])

Comment: DGEIS Section 4.1 concludes that land use impacts would be SMALL because storage would only affect a small fraction of the land committed for a nuclear power plant.⁹⁵ [footnote 95 text: *Id.* at 4-4 to 4-6.] TVA agrees with this conclusion. (0694-3-3 [Shea, Joseph])

Comment: •DGEIS Section 4.1 concludes that land use impacts would be SMALL because storage would only affect a small fraction of the land committed for a nuclear power plant.⁷⁸ [footnote 78 text: *Id.* at 4-4 to 4-6.] Entergy agrees with this conclusion. (0697-2-12 [Bessette, Paul] [Kuyler, Raphael])

Comment: In summary, the generic evaluation of land use impacts in the DGEIS is sufficient for all plants, including IPEC. (0697-4-3 [Bessette, Paul] [Kuyler, Raphael])

Comment: 5) "Sites must not be located in areas where nearby facilities could ... mask or interfere with the disposal facility's environmental monitoring program." NEWGreen Legacy Services, located next to the Perry Nuclear Power Plant, received an Ohio Dept. of Health license in 2011 to "receive, acquire, possess, and transfer radioactive materials" and to decontaminate, refurbish, recycle all manner of radioactive parts and equipment, including steam generators, from commercial reactors as well as DOE facilities. (0819-21 [Kline, Connie])

Comment: GEIS Section 4.1.1: NRC has appropriately relied upon the precedent set by previously completed Environmental Assessments (EAs) to conclude that "continued operation of an at-reactor ISFSI is not anticipated to require new or additional maintenance activities that would affect current land use" (GEIS 4-4). Excerpts from the Trojan ISFSI Finding of No Significant Impact (FONSI) are provided below as an example. • *Environmental Impacts of the Proposed Action:* As discussed in the EA, no significant construction impacts are anticipated. Trojan ISFSI construction activities will affect only a small fraction of the land area of TNP. With good construction practices, the potential for fugitive dust, erosion, and noise, typical of the planned construction activities, can be controlled to insignificant levels. The only resources irretrievably committed are the steel, concrete, and other construction materials used in the ISFSI pad, storage casks, and any operating equipment. As discussed in the EA, there will be no radiological liquid or gaseous effluents during normal operation of the ISFSI. The estimated doses to both occupational workers and members of the public are below regulatory limits. As discussed in the EA, no significant radiological impacts are expected during operation of the ISFSI. The only environmental interface of the ISFSI is with the air surrounding the storage casks; the only discharge of waste to the environment is heated air from the cask's passive heat dissipation system. Climatological effects will be insignificant. • *Finding of No Significant Impact:* In summary, the TNP ISFSI is located in a small area within the confines of the TNP owner-controlled area and will require only a minor commitment of land resources. The proposed action is not expected to cause any significant release of effluents, and there will be no significant increases in individual and collective radiation doses to either the public or on-site workers. Potential offsite impacts from a postulated worst case credible accident are a small fraction of the regulatory limits of 10 CFR 72.106 and well below the U.S. Environmental Protection Agency's Protective Action Guides. Therefore, the proposed action will not significantly affect the quality of the human environment. Accordingly, pursuant to the requirements of 10 CFR 51.31 and 51.32, the Commission has determined that a finding of no

significant impact is appropriate and that an environmental impact statement need not be prepared for the issuance of a materials license for the Trojan ISFSI. (0827-7-25 [Ginsberg, Ellen])

Comment: *The NRC assumes that the land used for the ISFSI pads and DTS would be reclaimed after the facilities are demolished and, therefore, could be used again in the next 100-year replacement cycle. The NRC believes this assumption is reasonable because the characteristics of the previously disturbed land is already known and is suitable for ISFSI and DTS design and construction.* The environmental consequences of future land use cannot be assessed generically. Nor does NRC have special expertise. (0867-2-11 [Griffin, William])

Comment: At Page 3-2, lines 1 to 13, NRC states that nuclear power plants are often located in areas surrounded by "wooded or agricultural areas;" "undeveloped land (forest, wetlands, herbaceous cover, and shrub/scrub land), agricultural land, or open water;" "open water, forest, wetlands, and agricultural;" "agricultural land, open water, and forests." Left unstated is the reason for locating nuclear power plants in such undeveloped, or at least sparsely populated lands, or near open water: to create a buffer zone, so nearby, densely concentrated populations are not being exposed to "routine" radioactivity releases, and are further away if catastrophe strikes. But what about the radioactive contamination of food? Of drinking water? Of fisheries? That results from the location of U.S. nuclear power plants? (0919-4-18 [Kamps, Kevin])

Comment: Re: Page 3-3, lines 13 and following, "Some plant owners lease land for agricultural (farming) and forestry production, permit cemetery and historical site access, and designate portions of their sites for recreation, management of natural areas, and wildlife conservation." - what about the contamination of food that results? Should persons be allowed to come close to the nuclear power plants? Doesn't this increase their risk of radiogenic harm? Doesn't this increase security risks? Don't the nuclear plants irradiate wildlife? (0919-4-19 [Kamps, Kevin])

Comment: Re: Table 3-1 on Page 3-4 "Discussions of the land area requirements for dry cask storage can be significantly misleading, if context is not provided. An acre here, a half-acre there, 4/100ths of an acre there, sound like very small impacts in the grand scheme of things. Nuclear power proponents in the U.S., be they industry or government spokesmen, are wont to speak of the football stadium metaphor - all the irradiated fuel ever generated in the history of the U.S. nuclear power industry would only fill a football field to a certain height above the ground. The Canadian nuclear establishment equivalent utilizes a culturally-appropriate alternative- a hockey rink filled up so high with irradiated nuclear fuel. Of course, there's no discussion of what would happen if that much irradiated nuclear fuel were actually piled that deep in one place. It would likely catch fire, due to quickly overheating, and lead to the biggest radioactive inferno the world has ever seen. And you certainly wouldn't want to have fans in those stands - without radiation shielding, even those in the bleacher seats would be at grave risk of fatal doses, especially if the waste caught on fire. Of course, it's not the volume of the waste, or the land area of the containers needed to keep it cool and isolate it from the environment, that constitute the most significant impacts. It's the forever deadly nature of the material, and the risks should it ever escape into the environment, that much be addressed. (0919-5-1 [Kamps, Kevin])

Comment: Re: Pages 4-4 to 4-6 in the Section on Land Use--this entire Land Use section doesn't discuss radioactivity, only physical use of land. But of course, the radioactive risks are the real issue. They impair, limit, even preclude the use of the land for other purposes. (0919-6-10 [Kamps, Kevin])

22. Comments Concerning Socioeconomics

Comment: Assertions of continued tax revenue assumes the continued existence of a corporate entity owning this property and being subject to its liability. In the long term, there is no historical justification for such an assumption. The most likely scenario in the long term is that the government will end up purchasing or taking control of such properties in order to assure continued safety for the public. Long term and Indefinite storage analyses cannot assure continuation of Tax payments continuing from such properties. (0093-3 [Dennis, Harold E.B.]

Comment: The second issue, the GEIS in numerous spots references taxes, and how there will be a continued socioeconomic benefit arising from continued storage. This statement is a phantom and does not take into account the continued obligation of a whole city like Red Wing to maintain the necessary public safety services to meet the emergency preparedness to respond to a release or a threatened release. Indeed, in Section 3.2.2, the GEIS cites a number of different of examples of reductions in and taxes from operations to a storage facility alone. This precipitous drop is something similar that the city is looking at when the Prairie Island Plant ceases operations. Yet, as stated before, the city as a first responder is still going to be held responsible for ensuring that it has the necessary preparedness to respond to an incident. This area of the GEIS must be further developed and addressed. (0328-2-6 [Rauterkus, Ralph])

Comment: As previously set forth, the NRC must conduct a legally adequate evaluation of the environmental effects of "failing to secure permanent storage for spent fuel" and "to properly examine future dangers and key consequences" of spent fuel storage at reactor sites. *New York v. NRC*, 681 F.3d 471, 473 (D.C. Cir. 2012). Among these "key consequences" are socioeconomic impacts. "NEPA requires an EIS to disclose the significant health, socioeconomic and cumulative consequences of the environmental impact of a proposed action." *Baltimore Gas and Elec. Co. v. NRDC*, 462 U.S. 87, 106-07 (emphasis added). *Accord Society Hill Towers Assoc. v. Rendell*, 210 F.3d 168, 176-178 (3d Cir. 2000) (project opponents who alleged, inter alia, that "the impact of the proposed project on their neighborhood will decrease their property values" had standing); *Kelley v. Selin*, 42 F.3d 1501 (6th Cir. 1995) (residents who lived near nuclear power facility that proposed to use dry cask storage had standing to protest alleged diminution in property value); *Matter of Connecticut Yankee (Haddam)*, 54 N.R.C. 33 (Jul. 9, 2001) at *44 (affidavits alleging impact to property values by nuclear facility that had contaminated groundwater and released radioactive waste established standing because alleged injuries were within NEPA "zone of interests"); see also App'x B to Subpart A of Part 51 ("Table B-1 . . . represents the analysis of the environmental impacts associated with renewal of any operating license"); id. (requiring analysis of "socioeconomics," including license renewal impacts on housing, public services, public utilities, education, offsite land use, historic and archaeological resources, and aesthetics). Environmental impact review must also analyze the potential impacts to off- site land use. Property values are affected by amenities and disamenities, including power plants. Nuisances and amenities are important considerations in determining property values, which, in turn, are an important driver in land use. In a peer reviewed article, Glenn Blomquist demonstrated that, after adjusting for other factors (property size, demographic composition of the neighborhood, and so on), the presence of a power plant had a statistically significant impact on property values. Glenn Blomquist, *The Effect of Electric Utility Power Plant Location on Area Property Value*, Land Economics, Vol. 50, No. 1 (Feb. 1974) (ML12334A750) at 97-100. The impact to property values was most clearly detectable up to a distance of 11,500 feet from the power plant. Within this zone, increasing the distance from the power plant by 10% was associated with an increase in market value of residential properties of 0.9 percent. This level of negative impact was evaluated for sample

mean properties, meaning that it could be expected to hold for typical properties in the area. (0473-16-3 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: A study of the impact on property values in the vicinity of Three Mile Island also found evidence of a positive relationship between distance from Three Mile Island and home sales price, suggesting that the plant had a small negative impact on residential housing prices. H. Gamble and R. Downing, Effects of Nuclear Power Plants on Residential Property Values, 22 J. of Regional Sci. 457 (1982) (ML12335A686). Scholars have also studied the impact on property values of spent nuclear fuel on residential property values. Spent Nuclear Fuel and Residential Property Values: The Influence of Proximity, Visual Cues and Public Information, David E. Clark and Tim Allison, Papers Reg. Sci. 78, 403-421 (1999) (ML12341A393 (non-public)). Indeed, nearly 40 years ago the Commission determined that the alternatives analysis for the handling and storage of spent fuel had to include a cost-benefit analysis of the environmental, social, and economic costs of each alternative. 40 Fed. Reg. 42801 (Intent to Prepare Generic Environmental Impact Statement on Handling and Storage of Spent Light Water Power Reactor Fuel (Aug. 1979)). Consistent with NEPA's mandate to study the potential "effects" of a proposed action on the "human environment," 40 C.F.R. §§ 1508.8, 1508.14, the Commission has acknowledged the potential for power plant relicensing and its alternatives to impact property values. GEIS for License Renewal of Nuclear Plants, NUREG-1437, at 4-133 (June 2013) ("Property values for nearby private residences could be affected positively if plant workers were to live locally. Property values could also be affected negatively, if there were impacts associated with noise, traffic, or if there were visual impacts associated with the plant"). Although the DGEIS purports to address the land use impacts of continued storage of spent fuel in (DGEIS §§ 4.1, 5.1) it does not even mention the impact of such storage on nearby property values, whether industrial, commercial or residential. The impact of long term spent fuel storage on property values is a fundamental socioeconomic impact, a determinant of land use, which must be addressed as to both on-site and away-from-reactor storage. Property values are a key driver of land use. Because land use and tax-driven impacts are among the socioeconomic factors that an EIS must examine, the DGEIS must examine the impacts to property value caused by long-term storage of spent nuclear fuel. Absent such analysis, the DGEIS's conclusion that "the environmental impacts on land use during the long-term storage timeframe would be SMALL" (see, e.g., DGEIS at 4-6), is unsupported, arbitrary and capricious. (0473-16-4 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The Draft GEIS incorporates many of the findings of the 2001 PFS FEIS without adequate support or justification. a. The Draft GEIS states that the NRC concluded that the PFS storage facility would provide large benefits to the Skull Valley Band of Goshute Indians ("Band") and the local county -Tooele County. The Draft GEIS assumes that local and state agencies would receive tax payments from the storage licensee. Staff then conclude that local impacts on the economy would be significant and beneficial.²² [footnote 22 text: Draft GEIS at 5-9.] i. As mentioned above, the Draft GEIS fails to consider negative impacts on the local or state economy, such as the real, not merely speculative, impacts from a community losing economic development projects due to the stigma associated with nuclear waste. ii. Depending upon the owner of the property and the facility (e.g., Native American or federal), local and state property taxes, or payment in lieu of taxes may not be assessed. iii. Furthermore, the Draft GEIS states that the PFS FEIS designated proposed payments made by PFS to the Band and to Tooele County as a large benefit. The Draft GEIS fails to discuss the agreements with PFS and why the PFS FEIS found those agreements to be beneficial. In addition, there is no discussion nor supporting documentation that DOE would enter a consent agreement with a local community in the amounts purported to be paid by PFS to the Band. Nor is there any support provided that DOE would agree to similar terms with a local government for law

enforcement as that agreed to by PFS and Tooele County. b. Based on the PFS FEIS, NRC concludes that a generic facility would have a small impact on public services.²³ [footnote 23 text: Draft GEIS at 5-9.] Staff assume that all storage facilities would be sited in a "sparse population," similar to the PFS facility where only 30 individuals live on the Reservation near the facility.²⁴ [footnote 24 text: Id.] Staff fail to support its assumption beyond mere speculation. For example, staff make no effort to compare the PFS demographics to G.E. Morris or proposed storage sites. Additionally, although the Draft GEIS assumes there would be a small impact on public services, staff fail to discuss the anticipated impact by the proposed PFS storage facility in an area where the availability of law enforcement and emergency services are limited as in Skull Valley. Additionally, while the BIA ROD was vacated, BIA's denial was in part based on the limited law enforcement available at the proposed facility.²⁵ [footnote 25 text: See Skull Valley Band of Goshute Indians v. Davis, 728 F. Supp. 2d 1287 (D. Utah 2010).] c. The Draft GEIS fails to mention potential impacts on local and state infrastructure which must be assessed in a site specific analysis. (0579-13 [Smith, Amanda])

Comment: The Draft GEIS notes that during construction the impacts at the PFS facility were determined to be small to moderate and concludes that impacts due to transportation, mostly traffic, would be also be small to moderate for an away-from-reactor site.³² [footnote 32 text: Draft GEIS at 5-46 to -48.] The Draft GEIS only discusses impacts due to congestion and accidents. However, the Draft GEIS does not address transportation impacts on the infrastructure or safety related to the infrastructure. Utah State Route 196 (SR-196) is a narrow, shoulder less, undivided two lane highway. The Draft GEIS does not discuss the impacts from heavy construction vehicles and heavy haul trucks traveling on SR-196. For example, the Draft GEIS does not address accident conditions when an oversized, heavy haul truck is traveling 20 miles per hour on the narrow, undivided highway. Nor does the Draft GEIS address local impacts to maintaining the highway due to the excessive vehicular and cask. (0579-17 [Smith, Amanda])

Comment: The Draft GEIS states that the socioeconomic analysis was limited to where spent fuel storage employees and their families reside, spend their income, and use their benefits. However, nuclear waste facilities may negatively impact regional and state economics, separate and apart from Environmental Justice issues; consequently, NRC should acknowledge that such impacts will be evaluated on a site specific basis. (0579-6 [Smith, Amanda])

Comment: The Draft GEIS finds that the socioeconomic benefits for an away-from-reactor storage facility are large. The BRC recommended a transparent, consent-based siting process which would allow affected communities an opportunity to accept siting decisions.¹³ [footnote 13 text: BRC Report at 47.] In direct response to the BRC Report, the bipartisan Senate Bill 1240, "allows affected communities to decide whether, and on what terms, the affected community will host a nuclear waste facility."¹⁴ [footnote 14 text: Senate Bill 1240, Sec. 304.(1).] As a potential host community has yet to negotiate the terms of an agreement, this generic EIS cannot support a conclusion that the socioeconomic benefits at an unknown site are large. (0579-9 [Smith, Amanda])

Comment: Long term and/or permanent storage on reactor sites were not contemplated when the States first granted permission for siting of nuclear reactors, therefore this is NEW USE OF LAND without prior informed consent of the State, and as such a re-assessment of state and local taxes is necessary. When nuclear power was first sited and implemented the United States government made a promise to reactor communities that it would take care of safely disposing the nuclear waste. This commitment has not and cannot be met. Currently since there is no safe way to manage radioactive waste operators who continue producing this radioactive waste must

be charged a premium compliance tariff, set by the State in which the nuclear facility is located. The actual property values in the New York City area, within the 50 mile radius of the Indian Point reactor community are approximately 8.5 trillion dollars, not including life or business values. (See attached Exhibit F: Indian Point Property Value Study). Indian Point itself has been paying a reduced property tax rate for years. Under Price Anderson Indian Point and all other reactors in the nation are only 13 billion is insured. That is clearly not enough to cover the costs of long term/permanent on site storage both from a physical and security perspective. The NRC has not established guarantees for on-going funding to protect nuclear waste now and into the future. (0611-48 [Shapiro, Susan])

Comment: Socioeconomic Impacts --the GEIS fails to consider the socioeconomic impacts of nuclear waste storage on property values and whether businesses will be interested in locating next to nuclear waste storage. Declines in property values also affect tax revenues. (0693-3-18 [Warren, Barbara])

Comment: Demography --here the GEIS discusses populations around nuclear reactors and some of the recreational benefits provided by other resources nearby such as beaches and parks. No attempt was made to analyze the increases in population since reactors were originally licensed or how that might complicate emergency response and evacuation. (0693-3-19 [Warren, Barbara])

Comment: The Draft GEIS Does Not Evaluate the Chilling Effect on the Local Economy. The Draft GEIS, while evaluating the positive impact that continued storage will have on the local economy, does not evaluate the chilling effect of the same. As set out before, the City [Red Wing, MN] finds itself in the untenable position of continuing to be a host community for the spent fuel that has been generated by the PINGP. Based on what is currently known, as well as past experiences and statements by the Federal Government, the City believes that this hosting or better yet storage will go on indefinitely. This will have a chilling effect on the City's economy and its development. It will impact its ability to grow in the area where the spent fuel is stored, including any adjacent parcels. The chilling effect will also extend to the City's ability to attract new businesses and to otherwise present itself in a positive fashion. All of this will stymie the City's ability to naturally develop and compete with other cities to attract and maintain businesses. This chilling effect of continued storage was noted by the Blue Ribbon Commission and served, in part, as a basis for its recommendation that temporary storage be developed. The Blue Ribbon Commission recognized that cities such as the City of Red Wing were, in many ways, hostages to the spent fuel: their futures were tied to the uncertainty of continued storage. The chilling effect was also noted in this Draft EA as it relates to the Prairie Island Indian Community (the "PUC") and its use of the land adjacent to the spent fuel storage area. The City, as noted in its comments to the Draft EA attached hereto, contends that this analysis should extend to the City's land use and development. This point needs to be further developed within the scope of the Draft GEIS so that a true evaluation on the impact to the human environment is addressed. (0783-1-10 [Harlan, Thomas])

Comment: Under section ES.13 , page xxxiv, lines 15-27, the Draft GEIS concludes that the impact of continued storage would be small under the various scenarios that it is analyzing. However, the analysis does not weigh the chilling effect that continued storage will have, the drain on public safety services as first responders (like the City [Red Wing, MN]) are required to maintain the necessary readiness to respond to an incident or are any of the other factor that will have a negative impact on the development and growth of the area surrounding the ISFSI. The simple notion that the socioeconomic impact, as determined by the number of workers, the construction on any ISFSI replacement or its ongoing operations, by itself, is a measure of the

impact of continued storage would have upon cities and other areas simply falls short of any meaningful analysis. One of the fundamental NEPA mandates is to evaluate how the proposed action, in this place long-term storage, would have a *negative* impact upon the human environment in which it is based. Part of that human environment consists of the socioeconomics of the area surrounding the storage. As such, an appropriate analysis would not be limited to just the direct impact (e.g. the number of workers at the storage facility), but would be the indirect impact – especially in the unique circumstances presented by stored, but continuing, radioactive material. (0783-1-16 [Harlan, Thomas])

Comment: The City [Red Wing, MN], in all respects, is a first responder to any incident at the PINGP or the ISFSI. It is obligated, under both federal and state law, to annually provide reasonable assurance that it has the necessary facilities and infrastructure to meet and respond to any incident at either facility. The City, then, is obligated to maintain a steady state of readiness through its investment in and maintenance of the necessary equipment and personnel, as well as the necessary buildings to locate the same, in order to meet its obligations. It has and continues to do so despite the continued reduction of revenue to the City from the Company for taxes on the PINGP. The City, in turn, has been forced to shift this burden to its other taxpayers who, since 1996, have seen their property taxes increase over 188%. Thus, the City is uniquely qualified to provide comments to the Draft GEIS. (0783-1-2 [Harlan, Thomas])

Comment: The Draft GEIS Provides and Incomplete Analysis on the Impact of Taxes from Continued Storage. In evaluating the impacts of continued storage, the Draft GEIS simply concludes that tax payments will continue. While it does, in some sense, appropriately defer this analysis based on local and state taxing ordinances, regulations, and codes, it does not appropriately or discuss the impact that a reduction in taxes will have as there is a switch from plant operation to storage only. It does not evaluate what impact this will have on the host community and its ability to maintain the necessary public safety services to respond to an incident at the storage facility. That host community will still be obligated to respond to an incident but not receive the same tax revenue to do so. As noted by the NRC in the Draft EA, the financial burden on first responders such as the City of Red Wing [MN] is not going to diminish over time. Draft EA, Section 4.4, page 4-3. It is going to stay the same as long as the spent fuel is stored on site. How does this burden impact the City and other host communities? What will happen when there is the precipitous drop in revenue to them generated by the power plants? These issues related to revenue need to be further evaluated. (0783-1-9 [Harlan, Thomas])

Comment: As an overview, the Draft GEIS is flawed because it does not address a broader scope of the affected environment. Indeed, it looks solely at direct impacts (employment, transportation, and land use of the storage system itself) and does not consider a broader indirect impact on the local community that hosts spent fuel or the surrounding area. The view on the affected environment should mirror the more expensive view taken in the Draft GEIS when an examination of social justice is provided. There, there is a more detailed and specific analysis of the impact of continued storage on minority, low-income, and other vulnerable communities. The failure to have a broader view in the Draft GEIS diminishes the impact of continued storage on the other stakeholders. Accordingly, the analysis should be broadened or it will not fully evaluate the impact of the proposed action on the human environment. (0783-2-18 [Harlan, Thomas])

Comment: Under section 3.1, page 3-1 and carrying over to 3-4, the Draft GEIS addresses land use. However, as set forth above, the focus is too narrow. For example, the PINGP is located within the City's [Red Wing, MN] limits. The PINGP's spent fuel, wet or dry, is also

temporarily stored within the City's limits. It is not outside, not near, nor close to but located specifically within the City's limits. The continued storage of spent fuel will have a material impact on the development of the City in both the short-term and long-term timeframes. It will be the center of a dead zone that will have little if any commercial activity and will disproportionately use public safety services. Moreover, and more appropriately for land use, it will have a chilling effect on the ability of the City to develop the area around it because of the continued stigma associated with the radioactivity, the spent fuel assemblies, and the uncertainty of disposal and, for purposes of the Draft GEIS, storage. The concept of land use must be expanded. (0783-2-19 [Harlan, Thomas])

Comment: Under section 3.2, pages 3-4 -3-8, the Draft GEIS is woefully deficient in its analysis of the socioeconomics associated with continued storage. The Draft GEIS focuses only upon the direct impact that continued storage will have and not on the indirect impact associated with the continued storage. This includes but is not limited to the chilling effect that it will have on other land development in that area. This, in turn, will have a fall out related to employment and income, taxes, demography, and housing that this development would naturally bring. The continued storage will also disproportionately utilize public safety services because the City [Red Wing, MN] will have to maintain the necessary preparedness to respond to an incident at the storage facility. This burden is unlike any other that the City would have to maintain for a normal commercial operation within the City limits. Continued storage will not provide sufficient taxes that would otherwise offset the need for the heightened public safety services and the necessary emergency preparedness associated with the requirements of responding to an incident. All of these factors need to be addressed and weighed. (0783-2-20 [Harlan, Thomas])

Comment: Under section 3.2.2, page 3-6, lines 5-24, the Draft GEIS identifies a number of instances where there is continued tax payment for storage facilities after plant operations cease. The Draft GEIS analysis must continue to analyze what impact this reduction of tax payments has on public safety services and how that is spread throughout the community. As noted in the Draft EA, the financial burden on the host cities will not lessen – but the revenue from property taxes will decrease. What is the impact of this? Can there be a lower level of public safety services provided? In doing so, the Draft GEIS should also address the necessary emergency preparedness and the costs associated with the same. This is a direct material impact that continued storage has on hosts communities such as the City [Red Wing, MN] and it must be analyzed under the Draft GEIS. (0783-2-21 [Harlan, Thomas])

Comment: Under section 6.4.1, starting on page 6-10 and going to 6-11, the Draft GEIS analyzes land use using the aforementioned general trends and activities. Nowhere does it reference the fact that there may be no development and that continued storage will be a deterrent to development. This analysis must be amended. (0783-3-11 [Harlan, Thomas])

Comment: Under section 6.4.1.3, the Draft GEIS concludes that cumulative impact of continued storage on land use will be small. The City [Red Wing, MN] believes there is insufficient information to come to this conclusion especially when the Draft GEIS does not analyze the chilling effect of continued storage. The cumulative impact should be changed from moderate to large after the analysis described above on the negative impact of continued storage is completed. (0783-3-12 [Harlan, Thomas])

Comment: Under section 6.4.2, starting on page 6-12 going through 6-15, the Draft GEIS analyzes cumulative trends and their impact on socioeconomics. Like previous sections within the Draft GEIS, there is no reference to the negative impact of continued storage. There is no reference to the costs associated with the emergency preparedness, the shift of the burden for

the preparation of the same, the decrease in taxes, the inability to develop land around the spent storage system and the inability to adequately pay for street, sewer, water for such development, among other things. All of these factors need to be appropriately weighed and set forth in this section. (0783-3-13 [Harlan, Thomas])

Comment: Under section 8.1, starting on page 8-2 and running to page 8-5, the Draft GEIS sets forth a number of tables that summarize the impact from continued storage both at a reactor and away from a reactor. These tables should be modified to reflect comments of the City [Red Wing, MN] and to increase the impact on land use, socioeconomic and other areas from small to moderate or large. Moreover, each of these should indicate that the impact is going to be site specific and will be dependent upon the immediate surrounding area. Again, for the City, with a location of the PINGP and the storage within the City limits, the impact on all of these will be large. (0783-3-17 [Harlan, Thomas])

Comment: Under section 8.4, starting on page 8-9 and continuing to 8-10, the productivity analysis needs to be expanded. This expanded analysis would include an evaluation of the long-term impact on productivity where there is an indefinite storage at a site. There is an indirect impact or chilling effect that continued storage will have on the natural development of the area around it. There will also be opportunity costs for the City [Red Wing, MN] (or any other entity that continues to provide first responder services) associated with the costs of continuing to maintain an emergency preparedness plan. These costs must be analyzed or at least put forth for an analysis in section 8-4.⁸ [footnote 8 text: This analysis would also find its way back into the cost benefit analysis set forth in chapter 7 of the Draft GEIS.] (0783-3-18 [Harlan, Thomas])

Comment: Under section 4.1, page 4-4 to 4-6, land use, the analysis for all time frames should be expanded to include an analysis of the chilling effect that continued storage would have on development. This would include, but not be limited to, actual land use, development of roads, sewer and gutter, as well as actual land development itself. The Draft GEIS does not, in any way, take into account the stigma associated with continued storage. (0783-3-2 [Harlan, Thomas])

Comment: Under section 4.20, starting on page 4-90 and carrying over to page 4-91, Table 4.2 should be modified to reflect the changes in the analysis set forth by the City [Red Wing, MN] in this letter. In particular, land use and socioeconomics, for all timeframes, should be modified from small or moderate to large. (0783-3-24 [Harlan, Thomas])

Comment: Under section 4.2, pages 4-6-4-8, the Draft GEIS should be modified to include a discussion on the indirect socioeconomic impacts of continued storage. This would include, but not be limited to, the inability to develop the land around the storage facility, decreased taxes, the continued requirement to maintain heightened public safety services and the other impacts associated with the same. There is nothing within the Draft GEIS that addresses the socioeconomic impact that this would have on an area. (0783-3-3 [Harlan, Thomas])

Comment: GEIS Sections 4.2 and 4.3: The worker estimates for wet storage and dry storage operations and maintenance appear reasonable, provided they include security (GEIS 4-7, lines 4-6). The logic for increasing the bottom of the range and decreasing the top of the range for dry storage versus wet is not clear. It seems the lower end of the range should be the same. (0827-7-17 [Ginsberg, Ellen])

Comment: SFP leaks, and the extensive cleanups associated with them, also may cause property devaluation. See Lochbaum Declaration, pars. 8.6, 8.9 (noting that a pipe leak at

Braidwood caused property devaluation for at least 15 property owners and the licensee either purchased the contaminated property outright or reimbursed landowners for their losses). The NRC fails to consider this impact. And, it also fails to consider the likelihood of increased impacts that will occur over time. From a socioeconomic perspective, given the typical lifespan of a corporation, an owner no longer receiving revenue from a permanently retired nuclear plant may not survive for six decades to clean up the leaks from its SFPs. Lochbaum Declaration, par. 8.10. (0897-5-14 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Re: the bottom of Page 3-4, top of Page 3-5 "NRC's socioeconomic analysis gives undue attention to the so-called "benefits" derived from "hosting" a long-term ISFSI. What about the negative economic consequences of being stuck with irradiated nuclear fuel for the long-term, perhaps forever? The radioactive stigma effect alone could prove very significant, in a negative way. As but two examples. Big Rock Point's decommissioning ended in 2006. NRC has blessed the release of that site for unrestricted reuse, despite the radioactive contamination of the environment that still lingers (something that environmental watchdogs have protested, as in this report I wrote in 2006:

<http://www.nirs.org/reactorwatch/decommissioning/bigrockbackgrounder272007.pdf>). But, because of the presence of 7 dry casks holding irradiated nuclear fuel, and an additional dry cask holding Greater-Than-Class-C so-called "low-level" radioactive waste, no development of that site can be expected anytime soon. (0919-5-4 [Kamps, Kevin])

Comment: Likewise, at an end of cycle annual meeting near the Kewaunee nuclear power plant in northern WI in June 2013, a number of concerned local residents - many of them farmers - expressed their dissatisfaction that irradiated nuclear fuel would remain on-site for the long-term future. They could not envision any alternative use of the land, while the irradiated nuclear fuel is stored there, not only due to safety and security concerns, but also because of the stigma involved. Certainly, those local residents who attended this NRC public meeting did not regard long-term ISFSI storage at Kewaunee as an economic boon for their area - quite to the contrary. (0919-5-5 [Kamps, Kevin])

Comment: Re: Page 3-5, line 1 and following "Again, NRC's flip examination of supposed economic benefits is all the more ironic, given its shallow analysis of the risks of irradiated nuclear fuel generation, storage, and disposition in this DGEIS. (0919-5-6 [Kamps, Kevin])

Comment: Re: Section 4.1.3 Indefinite Storage (page 4-6) - It's hard to understand how NRC can find SMALL impacts, when even current safety, security, health, and environmental risks due to irradiated nuclear fuel storage preclude the use of the land "hosting" the ISFSIs for any other use, as at Big Rock Point in MI. (0919-6-11 [Kamps, Kevin])

23. Comments Concerning Environmental Justice

Comment: It is inappropriate for NRC, in this GEIS, to use the Private Fuel Storage (PFS), LLC "centralized interim storage" proposal, targeted at the Skull Valley Goshutes Band of Indians in Utah, as a model for away-from-reactor storage. Although licensed by NRC for construction and operation, PFS was canceled in December 2012. NRC claims in its GEIS to observe Environmental Justice (EJ) principles, and yet PFS was a blatant violation of EJ. Nearly 500 organizations across the U.S. joined with Skull Valley Goshute traditionals urging NRC to disapprove PFS's license, due to its inherent violation of EJ. (0002-5 [Commenters, Multiple])

Comment: The EIS needs to take into consideration environmental justice questions such as who bears the burden and who reaps the benefits? Native peoples and peoples of color and those in poor communities have historically been disproportionately impacted by all the links in the nuclear chain from mining to radioactive waste dumping. Intergenerational equity should also be considered. The electricity has been used or wasted in this generation, but dozens of more generations to come must work to isolate it and protect themselves from it. (0030-21-5 [Carberry, Mike])

Comment: In my public comment, I would like to specifically focus my advocacy efforts toward the environmental justice aspect of the NRC's Waste Confidence GEIS. Under the National Environmental Policy Act (NEPA), which was established in 1969, Federal agencies must abide by Executive Order 12898. Executive Order 12898 mandates that Federal agencies must identify and address potential disproportionately high and adverse human health and environmental impacts on minority and low-income populations. Since these particular populations have been historically disregarded in the environmental decision-making process, it is imperative that these groups are granted equal opportunity to participate and have their voices and opinions heard. (0047-2 [Anonymous, Anonymous])

Comment: The primary focus of this regulatory document is to revise the initial 2010 Waste Confidence draft GEIS that was created by the NRC. Personally, I believe that the new and revised GEIS should adequately ponder local and intergenerational environmental justice. Ultimately, this would ensure that minority and low-income populations and future generations wouldn't receive the biggest burden of human health and environmental impacts due to the storage of spent nuclear fuel. According to the NRC's revised GEIS, which the intention was to address the deficiencies identified by the U.S. Court of Appeals, disproportionately high and adverse human health and environmental impacts resulting from the continued storage of spent nuclear fuel were not expected to affect minority and low-income populations. However, I would argue that these expectations could be flawed and incorrect. Although the NRC's updated GEIS projects that these certain populations won't be vulnerable to adverse human health and environmental impacts brought forth by the continued storage of spent nuclear fuel, I believe that their projections could potentially be challenged in future years. For example, the NRC truly believed that their 2010 Waste Confidence GEIS would satisfy all aspects of the NEPA obligations that they had to fulfill. Nevertheless, the NRC never suspected that their initial regulatory document would be challenged in court and identified with deficiencies. (0047-3 [Anonymous, Anonymous])

Comment: Based on the outcome of the 2010 Waste Confidence GEIS, I strongly believe that the expected projections in the revised GEIS regarding environmental justice, with respect disproportionately high and adverse human health and environmental impacts on minority and low-income populations, could also potentially be incorrect. Assuming that this is true, this could be extremely detrimental and problematic to these populations that believe they won't experience adverse impacts from the continued storage of nuclear spent fuel. (0047-4 [Anonymous, Anonymous])

Comment: I oppose locating the away-from-reactor storage of Private Fuel Storage (PFS), LLC "centralized interim storage" at the Skull Valley Goshutes Band of Indians in Utah. Although licensed by NRC for construction and operation, PFS was canceled in December 2012. Nearly 500 organizations across the U.S. joined with Skull Valley Goshute traditionals urging NRC to disapprove PFS's license, due to its inherent violation of Environmental Justice (EJ) principles. (0127-3 [Lee, Catherine])

Comment: It is inappropriate and unethical for the Nuclear regulatory Commission in this GEIS, to use the Private Fuel Storage (PFS), LLC "centralized interim storage" proposal, targeted at the Skull Valley Goshutes Band of Indians in Utah, as a model for "away-from-reactor" storage. As your agency knows, PFS was canceled in December 2012. NRC claims in its GEIS to observe Environmental Justice (EJ) principles, and yet PFS was a blatant violation of EJ. Nearly 500 organizations across the U.S. joined with Skull Valley Goshute traditionalists urging NRC to disapprove PFS's license, due to its inherent violation of EJ. (0142-1 [Solomon, Laurie])

Comment: Questions of environmental justice must be considered in the EIS. Low-income communities dominated by American Indians and people of color have historically been disproportionately impacted by nuclear energy production, from mining to radioactive waste dumping. (0143-7 [Arauz, Jorge])

Comment: So-called independent spent fuel storage installations (ISFSI) would be de facto nuclear waste dumps. The generic waste confidence rule would be based on finding one or more waste sites which would be located in economically stressed communities. Potential sites would be in the Southeast, such as Savannah River, or on Native American land, such as Yucca Mountain: This is fundamentally unjust. (0222-2 [Zeller, Lou])

Comment: And, yeah, I'd just really like to see a more -- basically a detail-oriented section in the Environmental Justice area, because aside from the very vague terminology that is provided, it goes on to say that the effects of these things -- well, they don't really specify what effects or what things are here. (0244-15-4 [Zuccarini, Ana])

Comment: And then I guess I would like to sort of, you know, make a little highlight point on here on the Environmental Justice section. It says, the ISFSIs would have minimal human health and environmental effects on minority and low-income populations. Since -- as I had asked before, you guys said that you did not have these facilities yet built and you were not able to answer my question or really address it. However, in your Draft you are already saying that it would have minimal effects on minority and low-income populations. My question is, why would you put that on here if you have no idea where you're going to locate these facilities? Is it some kind of like hint towards already you're heading in the direction of environmental inequalities? (0244-15-7 [Zuccarini, Ana])

Comment: I think a member of the audience asked a question before we got started about whether the issue of environmental justice had been considered. I think ostensibly from the perspective of where nuclear power plants are sited or whether they're sited, or the relative environmental injustice of that particular energy source that is relative to different people, I would suggest to you that it is nuclear energy that is needed more by our minority and underserved -- underprivileged communities than any other energy type. It is they who needs zero-emission energy more than anybody else. For the record, I would direct you to a wonderful guest column that was published, I think two or three months ago, by a lady named Luz Weinberg, who is the Mayor of Adventura and President of the National Association of Latin American Elected Officials, who pointed this very thing out; that it is minority communities, it is people who are -- who need clean air the most, it is people who -- also people who have health conditions who need clean air the most. It is those people who are served most by nuclear energy. Not just the nuclear energy we have today, but the prospect of more clean energy in the future. (0244-9-7 [Paul, Jerry])

Comment: So-called independent spent fuel storage installations would be de facto nuclear waste dumps. The generic Waste Confidence Rule would be based on finding one or more waste sites which would be located in economically stressed communities. Potential sites would be in the southeast, could be such as Savannah River or in the west, Native American land such as Yucca Mountain. This is fundamentally unjust. (0250-1-2 [Zeller, Lou])

Comment: I am here because I care for all the life of, for the life of all creatures on this planet. Most of my activism work has revolved around environmental racism that affects my community in Los Angeles. It is through being on the front line of environmental injustice that I have learned to be analytical of state sanctioned programs. I believe that nuclear power is not only inherently unsafe but also the entire process, including the extraction of uranium, has disproportionately affected indigenous and communities of color. (0326-51-2 [Gutierrez, Ingrid])

Comment: Within this document there are lies and misleading information. The first one I'd like to bring up is on Roman numeral Page 34 when it says that the environmental justice impact is small. Well, Fred Collins said that he was displaced from his ancestral homeland. And if I think about the people that, according to the 1805 Zebulon Pike Treaty, the Mdewakanton Dakota people that were displaced from their homeland of Prairie Island and now live with their childcare center 500 yards away from the waste storage facility on Prairie Island, I would say that the environmental justice impact is large, not small as this document states. (0326-56-2 [Homick, Nick])

Comment: And there's a lot of environmental racism going on, which nobody has mentioned, going on with the uranium because if you notice the open pits in the Navajo country, Africa, the mineral conflicts in the Congo, I mean, it just goes on and on and on and on. And even in their own statement, they mention the communities of color and low income as actually looking closer at the contamination. Why, you know -- okay, so you just can't trust them. (0327-22-4 [Muser, Mary Jo])

Comment: It is inappropriate for the NRC, in this Generic Environmental Impact Statement (GEIS), to use the Private Fuel Storage (PFS), LLC "centralized interim storage" proposal, which targets the Skull Valley Goshutes Band of Indians in Utah, as a model for away-from-reactor storage. Although licensed by the NRC for construction and operation, PFS was canceled in December 2012. The NRC claims in its GEIS to observe Environmental Justice principles, and yet PFS was a blatant violation of Environmental Justice. Nearly 500 organizations across the U.S. joined with Skull Valley Goshute traditionals urging the NRC to disapprove PFS's license, due to its inherent violation of Environmental Justice. (0336-9 [Lish, Christopher])

Comment: Curiously, the impact on Environmental Justice is noted as not being "disproportionately high [or] adverse." The support for these determinations is lacking. (0354-4 [Oeser, Robert])

Comment: Questions of environmental justice must be considered in the EIS. Low-income communities dominated by American Indians and people of color have historically been disproportionately impacted by nuclear energy production, from mining to radioactive waste dumping. (0357-6 [Daily, G. Allen])

Comment: NRC's "centralized interim storage" proposal is a despicable Environmental Injustice to any community victimized with massive lethal waste storage. NRC claims in its GEIS to observe Environmental Justice (EJ) principles, and yet this plan is a blatant violation of EJ. (0377-6-1 [Cuthbert, Lewis])

Comment: Questions of environmental justice must be considered in the EIS. Low-income communities dominated by American Indians and people of color have historically been disproportionately impacted by nuclear energy production, from mining to radioactive waste dumping. (0507-5 [Giese, Mark M.]

Comment: In addition shipping nuclear waste from the area which benefitted from the electricity to some poorer region who received no benefit from the waste as a dumping ground is a violation of Environmental Justice. (0611-31 [Shapiro, Susan])

Comment: Environmental Justice: We do not believe that the Environmental Justice impacts of long-term or indefinite storage have been fully evaluated in the draft GEIS. We fully understand that the Waste Confidence Rule is not a licensing decision and that each facility will go through a renewal licensing process. Nevertheless, the Waste Confidence Rule allows for long-term or indefinite storage by virtue of the conclusions in the draft GEIS that the environmental impacts of continued storage are SMALL (with the exception of impacts to historic and cultural resources). In the case of the Prairie Island ISFSI, which is now in the process of being relicensed for a proposed 40-year renewal term. We find it hard to believe that, given the status of the national repository (none) and the conclusions in this draft GEIS, that the storage term will be limited to just 40 years. The 40-year renewal term is an arbitrary time period, based on nothing more than the hope that a repository might be available by the end of the 40 years. The Tribe will continue to be impacted by the PINGP ISFSI long after this GEIS is final and sitting on a shelf. It will be left up to our descendants and their descendants to keep fighting for the removal of spent nuclear fuel from the Tribe's homeland. (0619-2-6 [Mahowald, Philip R.]

Comment: Quoting Beyond Nuclear's statement: "Although licensed by NRC for construction and operation, PFS was canceled in December 2012. NRC claims in its GEIS to observe Environmental Justice (EJ) principles, and yet PFS was a blatant violation of EJ. Nearly 500 organizations across the U.S. joined with Skull Valley Goshute traditionals urging NRC to disapprove PFS's license, due to its inherent violation of EJ." (0648-9 [Price, Scott])

Comment: The Environmental Justice (EJ) analysis highlights the limits of a generic EIS, and provides insufficient basis to support the findings that there would be "no disproportionately high and adverse impacts" on EJ communities (see, e.g., 8-2). The draft GEIS admits that "Demographic characteristics vary in the region around each nuclear power plant site and may be affected by the remoteness of the nuclear plant to regional population centers (NRC 2013a) . Nuclear power plants located in both rural and semi-urban areas can have varying concentrations of minority and low-income communities. (3-10 [emphasis added] .) It is therefore unreasonable for the NRC to claim that a survey of effects on a "generic" minority and low-income community provides the level of analysis that satisfies NEPA. The NRC acknowledges this in its discussion of effects on EJ communities. By way of example, in the section regarding "at-reactor continued storage" it states: "the site-specific NEPA analysis that is required prior to an NRC licensing action will include a discussion of the impacts on minority and low income populations, and will appropriately focus on the NRC decision directly related to specific licensing actions." (4-11) . Similarly, in the EJ analysis for long-term storage, which necessarily includes dry transfer systems (that don't yet exist), the draft GEIS states, "DTS license reviews would not rely on the analysis in this draft GEIS, because the site-specific NEPA analysis would consider the site-specific impacts on minority and low-income populations." (4-12.) These amount to admissions that no EJ analysis in a generic EIS is sufficient for NEPA purposes; yet they still form part of the rationale for a finding in a generic document that there would be "no disproportionately high and adverse impacts" on EJ communities (see, e.g., 8-2).

The analysis does not support the finding made, and the discrepancy should be corrected. (0669-12 [Walter, Joan])

Comment: Environmental Justice --while claiming compliance with the EJ Executive Order, which would necessitate a site-specific environmental analysis for a licensing action, NRC clearly indicates that there is no licensing action planned as part of this GEIS. (0693-3-20 [Warren, Barbara])

Comment: Questions of environmental justice must be considered in the EIS. Low-income communities dominated by American Indians and people of color have historically been disproportionately impacted by nuclear energy production, from mining to radioactive waste dumping. (0707-7 [Werner, Shahla M.])

Comment: Environmental Justice Sections: In the discussion of environmental justice impacts for at-reactor long-term storage⁹⁵ [footnote 95 text: GEIS, at Section 4.3.2, pp. 4-13.] and for indefinite at-reactor storage⁹⁶ [footnote 96 text: *Id.* at Section 4.3.3, pp. 4-14.] there is inappropriate and unnecessary reference to the possibility of moderate or large impacts to historic and cultural resources. Although the correct overall conclusion regarding environmental justice impacts is reached, i.e., small impacts in all cases, it should be recognized that for long-term or indefinite storage at decommissioned reactor sites there will be a large area of previously disturbed land that could be used for the storage facilities. A more reasonable assumption (that should be included in the historic and cultural resource sections) would be that the ISFSI can be sited to avoid significant historic and cultural resources, much like the appropriate assumption made for special status species and habitat in other sections of the GEIS. It should also be noted that the inappropriate and unnecessary references to potentially moderate/large historic and cultural resources is not included in the discussion of away-from-reactor environmental justice impacts for any phase of continued storage. (0827-4-5 [Ginsberg, Ellen])

Comment: GEIS Section 4.3: The statement that "human health and environmental effects from continued storage would be small compared to the impacts that are normally experienced during reactor operations" (GEIS 4-11) is unnecessary and could potentially be interpreted to mean that reactors have large health effects - which, experience has shown, is not the case. It is sufficient to just conclude that these impacts would be SMALL without making any comparison to reactors. (0827-7-21 [Ginsberg, Ellen])

Comment: Consider, for instance the Draft GEIS claim that a generic analysis would suffice for environmental justice issues: In the present case, however, the NRC has determined that it can provide an assessment of the environmental justice impacts during continued storage compared to environmental justice impacts of storage during reactor operations....[T]his draft GEIS and the Waste Confidence rule are not licensing actions and do not authorize the continued storage of spent fuel. The environmental analysis in this draft GEIS fulfills a small part of the NRC's NEPA obligation with respect to the licensing or relicensing of a nuclear reactor or spent fuel storage facility. Further, the site-specific NEPA analysis that is required prior to an NRC licensing action will include a discussion of the impacts on minority and low income populations, and will appropriately focus on the NRC decision directly related to specific licensing actions. As with all other resource areas, this site-specific analysis will allow the NRC to make an impact determination with respect to environmental justice for each NRC licensing action. *A generic determination of the human health and environmental effects impacts during continued storage is possible because the NRC understands how the environmental impacts change when a nuclear power plant site transitions from reactor operations to continued storage.* Based on this

knowledge, the NRC can provide an assessment of the potential human health and environmental effects during continued storage. As discussed in the following sections, the NRC has determined that the human health and environmental effects from continued storage would be small compared to the impacts that are normally experienced during reactor operations.¹³⁷ [footnote 137 text: NRC 2013a, p. 4-11, italics added] But once a determination is made that spent fuel storage impacts are small even for indefinite storage, they cannot be raised in a site-specific licensing process even if they were not considered in the waste confidence GEIS. (0898-5-7 [Curran, Diane] [Makhijani, Arjun])

Comment: The NRC's statement quoted above is an attempt to foreclose any consideration of radiation-related environmental justice site-specific issues, especially those associated with long-term or indefinite storage of spent fuel, notably in case of a failure to site a repository and indefinite on-site storage. (0898-5-9 [Curran, Diane] [Makhijani, Arjun])

Comment: On Page 2-18, NRC claims "The [PFS LLC] site would be located in the northwest corner of the reservation approximately 6 km (3.5 mi) from the Skull Valley Band's village." Having spent considerable time in the Skull Valley Band's village, as part of the resistance against the environmentally racist radioactive waste dump proposal, I find it hard to believe that the distance between the residences and targeted dumpsite was actually that great. I think the distance was shorter. Fortunately, this is now an academic point, as the dump proposal has been cancelled. NRC should really not be citing PFS, LLC in any positive way whatsoever, given the environmental injustice it represented, and its very welcome cancellation - that is, failure - despite NRC's rubberstamp of the construction and operating license. (0919-3-16 [Kamps, Kevin])

Comment: NRC continues to violate EJ, by citing PFS, LLC (even though it was cancelled a year ago) as a model, as proof positive that parking lot dumps can be licensed. (0919-3-17 [Kamps, Kevin])

Comment: Re: Page 4-9, Section 4.3, Environmental Justice, NRC states "Environmental justice refers to a Federal policy that ensures that minority, low-income, and tribal communities that have historically been excluded from environmental decision-making are given equal opportunities to participate in decision-making processes"...NRC has an odd notion what Environmental Justice means. In 2006, NRC rubberstamped, albeit by a split decision at the ASLB and NRC Commission levels, the PFS, LLC parking lot dump targeted at the Skull Valley Goshutes Indian Reservation in Utah. NRC had approved a nuclear power industry scheme to park 40,000 metric tons of irradiated nuclear fuel on the reservation homeland of a tiny, low income Native American tribe. This, despite the call by 437 environmental and environmental justice groups to "not go there." See: <http://www.nirs.org/radwaste/scullvalley/skullvalleygoshutesgroupltr772005.pdf>. NRC approving PFS, LLC anyway led me to dub the agency the "Nuclear Racism Commission," for its environmental injustice. Given PFS, LLC's inherent violation of EJ, as well as its welcome cancellation a year ago, NRC should not rely upon it as a positive example to point to, as proof that away-from-reactor storage can be licensed! (0919-6-13 [Kamps, Kevin])

Comment: NRC states on Page 4-10, that "environmental justice, as applied at the NRC, "means that the agency will make an effort under NEPA to become aware of the demographic and economic circumstances of local communities where nuclear facilities are to be sited, and take care to mitigate or avoid special impacts attributable to the special character of the community" (NRC 2002a, 2004b). How ironic then, that NRC approved the PFS, LLC license. (0919-6-14 [Kamps, Kevin])

Comment: At lines 13-14, NRC states "socioeconomic conditions affected by the continued storage of spent fuel as they relate to minority and low-income populations living near nuclear power plant sites would remain unchanged"...This is a strange logic applied by NRC. So, low income, and/or people of color communities, which already have "hosted" a nuclear power plant for 40 or 80 years, just have to deal with the radioactive waste forever, in addition, so there is no further disproportionate impact on them? This is a "nuclear sacrifice zone" attitude by NRC. It makes a "nuclear sacrifice zone" of a low income or people of color community, doomed forever to suffer radiological impacts, as by radioactive waste storage. (0919-6-15 [Kamps, Kevin])

Comment: At Page 4-10, lines 24 and following, NRC describes monitoring "releases from the spent fuel pools and at-reactor ISFSI." But any such talk, in an EJ context like this, is unacceptable. The Prairie Island Indian Community, as but one example, had suffered enough before NSP tricked their way onto the island, promoting the benefits to be gleaned from a "steam generating plant" - careful to keep the word "nuclear" out of the conversation for as long as possible. The two reactors were built against the will, and without the informed consent, of the tribe. And it's been all downhill since. There should be absolutely no discussion of radiological releases from irradiated nuclear fuel storage facilities at a place like Prairie Island. Enough is enough. NRC makes a mockery of "environmental justice" by attempting to explain how "acceptable" or "permissible" releases from radioactive waste storage at a place like Prairie Island will be "monitored" in order to assure "environmental justice" goals! (0919-6-16 [Kamps, Kevin])

Comment: Re: Page 4-11, lines 19 to 21, again, NRC is attempting to apply a "nuclear sacrifice zone" or "nuclear sacrifice community" logic here. The community is already negatively impacted by a nuclear power plant, so the relatively similar, albeit additional, impacts from radioactive waste storage are, therefore, no big deal. But another way of looking at it is, this community of color, low income community, etc. has already suffered enough from the nuclear reactors, and shouldn't be burdened again with the radioactive waste. (0919-6-17 [Kamps, Kevin])

Comment: The EIS needs to take into consideration environmental justice questions, such as who bears the burden and who reaps the benefits. Native peoples and peoples of color and those in poor communities have historically been disproportionately impacted by all links in the nuclear chain, from mining to radioactive waste dumping. (0938-7 [Sondheim, Steven])

24. Comments Concerning Air Quality

Comment: But they just go on to say that the potential for moderate impacts to air quality, terrestrial life, and transportation are based on construction-related potential fugitive dust emissions. However, there's not really like an outline of a measure of how much or which substances would be the ones that would be fugitive. (0244-15-5 [Zuccarini, Ana])

Comment: The assumption that ISFSIs would cause "some local atmospheric heating" (GEIS 4-15) based on a 1984 study (before there were any ISFSIs) appears to be without basis. Industry was unable to identify any instances in the 30 years of ISFSI operating experience since where any actual atmospheric temperature increase attributable to ISFSI operation has been documented. NRC should reconsider this statement. (0827-7-23 [Ginsberg, Ellen])

Comment: At Page 4-14, lines 28 to 29, how can NRC so confidently claim "there would be no increase in emissions during continued storage"? What if an explosion or fire occurs? That would "increase emissions"! (0919-6-18 [Kamps, Kevin])

Comment: At Page 4-15, line 12, why is it that "testing requirements may be reduced or eliminated for emergency diesel generators once the reactor is permanently shutdown."?--How smart is it to do away with EDGs when the pool is still full of waste? What if something very serious goes wrong with the primary electric grid, and it would be impossible to restore before significant boiling occurs in the pool? How will the water circulation pumps on the pool be restored before a boil down fire is sparked? (0919-6-19 [Kamps, Kevin])

Comment: NRC states at lines 18-19 that "dry cask storage systems do not have active systems (e.g., diesel generators), these activities do not involve significant releases of air pollutants."...But of course, as Dr. Gordon Thompson has warned, a malevolent act could result in a dry cask's contents going up in flames, in a Zr fire. Or, the cask could simply release radioactive gases and volatile particles over time due to nothing more dramatic than simple leakage, due to age degradation and decay under the elements. That is an impact on air quality. (0919-6-20 [Kamps, Kevin])

Comment: At Page 4-15, lines 21-22, NRC describes significant local temperature increases due to dry cask storage: "Thermal releases from the at-reactor ISFSI will cause some local atmospheric heating. Downwind from an ISFSI, ambient temperatures can increase by 2.1°C (3.8°F) at 1 km (0.6 mi) to 0.1°C (0.2°F) at 10 km (6.2 mi) from the site (NRC 1984)." Increasing the local area's temperature, out to a distance of 0.6 miles, by nearly 4 degrees F, is a significant air quality impact, just from the thermal heat of irradiated nuclear fuel alone! It is the equivalent, on a local level, of the dire global warming impacts that the UN IPCC warn about on a global level. In fact, the two should be considered together. What is the impact of raising a local area's temperature by nearly 4 degrees F just by storing irradiated nuclear fuel there, combined with another increase of temperature of several degrees F due to global warming? NRC has not carried out any such impact analysis. Such heat output from the dry casks would continue for how long? (0919-6-21 [Kamps, Kevin])

Comment: Re: Section 4.4.3, Indefinite Storage, Page 4-17 to 18 Leakage of radioactivity from one or more casks in the ISFSI would mean HUGE air impacts over time! But NRC conveniently just assumes they (who are "they"?!) will just keep replacing the casks forever! What's the price tag on THAT?! Too cheap to meter still? No! But with loss of institutional memory and control, and even societal collapse, how can NRC guarantee that will happen forevermore?! NRC can't guarantee that! (0919-6-22 [Kamps, Kevin])

Comment: The Waste Confidence Generic Environmental Impact Statement indicates that, "For the resource areas considered, this draft GEIS attempts to establish generic impact determinations that would be applicable to a wide range of existing and potential future spent fuel storage sites." The General Conformity regulation requires a Federal Agency to assess individual Federal actions (projects) through an Applicability Analysis to determine if a Conformity Determination is required. However, the General Conformity regulation provides a process, Presumed to Conform (40 CFR 93.153 Applicability), which allows a Federal Agency to address General Conformity by specific project type instead of on an individual basis. In order to make a generic determination for General Conformity and waste confidence, the presumed to conform process as described in 40 CFR 93.153 is the appropriate mechanism for making this determination. Therefore, in order to make any generic applicability statement regarding General Conformity, the "presumed to conform" process must be followed. (0920-48 [Foster, Ruth])

Comment: It is recommended that all non-road diesel construction equipment greater than 100 horsepower used on the project for more than ten days shall have engines that meet the

USEPA Tier 4 non-road emission standards, or the best available emission control technology that is technologically feasible for that application and is verified by the USEPA or the CARB as a diesel emission control strategy for reducing particulate matter emissions, except that: a. If there is no technologically feasible emission control technology verified by USEPA or CARB for specific diesel non-road construction equipment, the contractor may use the best available emission control technology verified by the Mine Safety and Health Administration or the Switzerland BUWAL program (VERT Filter List) to reduce particulate matter emissions. b. If there is no technologically feasible and appropriate emission control technology or installation of a control technology would create a safety hazard, such as impaired visibility for the operator. 4. It is recommended that all on-road diesel vehicles used to haul materials or traveling to and from the construction site shall use designated truck routes that are designed to minimize impacts on residential areas and sensitive receptors such as hospitals, schools, daycare facilities, senior citizen housing, and convalescent facilities. (0920-50 [Foster, Ruth])

Comment: Diesel exhaust contributes the highest cancer risk of all air toxics in New Jersey. State and Federal regulations require that the project complies with #1 and #2 listed below. In addition, the Department recommends that construction projects involving nonroad diesel construction equipment operating in a small geographic area over an extended period of time should implement the remaining measures to minimize the health impacts of diesel exhaust. a. All on-road vehicles and non-road construction equipment operating at, or visiting, the construction site shall comply with the three minute idling limit, pursuant to N.J.A.C. 7:27-14 and N.J.A.C. 7:27-15. b. All diesel non-road construction equipment operating at the construction site shall use ultra-low sulfur diesel fuel (<15 ppm sulfur) in accordance with the federal Nonroad Diesel Rule, 40 CFR Parts 9, 69, 80, 86, 89, 94, 1039, 1051, 1065, 1068. (0920-52 [Foster, Ruth])

Comment: Lastly, the portion of the document on Air Quality was notably insufficient since it failed to indicate how the air quality was being judged. Radionuclides often travel through the air and can be inhaled and result in cancer or worse down the road. Yet, I see no analysis of radionuclides in air (or water or on our highways for that matter) and the serious consequences on human health which some of these radioactive substances can cause. (0937-27 [Campbell, Bruce])

25. Comments Concerning Climate Change

Comment: The EIS also needs to include an investigation of the carbon effects of the fuel cycle. As we continue to try to decrease greenhouse gases in the United States, continuing to mine, mill, and process uranium is a contradiction. In fact, one of the most dangerous chemicals that depletes the ozone layer, freon, has been used in converting uranium to fuel. Construction and decommissioning nuclear power plants are also high carbon emitters. (0030-12-6 [March, Leslie])

Comment: In addition to a commitment to the safety and secure storage onsite of spent fuel, the industry is also a vital part to securing our future environmental health. Just last week the Intergovernmental Panel on Climate Change, the IPCC, released their updated executive summary on climate change and they found with 95 percent confidence that humans are behind climate change. The report also found that the surface temperature is likely to rise by 1.5, or in two cases more than 2 degrees Celsius, which is considered beyond tolerable and into the danger zone by the end of this century. (0030-18-4 [Curtin, Kenneth])

Comment: I want to talk about catastrophic climate change, because honestly we have decisions to make as a country. Are we willing to live in a world that is beset by unmitigated climate change? Are we ready to cope with the droughts, ocean acidification, collapsing crop yields, extreme weather events, species extinctions, and mass displacement of climate refugees? Clearly we are not prepared as a country or a society to deal with those sorts of challenges that will be brought by catastrophic global climate change. (0030-19-1 [Cohn, Jeremy])

Comment: To my generation action on climate change is not a heartwarming footnote to be written on our political legacy. Climate action is necessary now. The seeds of growth are being planted around the world and energy prosperity will lift billions out of poverty, but catastrophic climate change has the potential to turn that promise of prosperity into a Pyrrhic victory and to reverse the hard-won progress of those same people and our own families. (0030-19-5 [Cohn, Jeremy])

Comment: The dangerous and unpredictable effects of global warming on all aspects of the nuclear industry must also be taken into account. I've already talked about nuclear power is not a climate change solution. (0030-21-8 [Carberry, Mike])

Comment: The EIS also needs to include an investigation of the carbon effects of the fuel cycle. As we continue to try to decrease greenhouse gasses in the United States, continuing to mine, mill, and process uranium is a contradiction. In fact, one of the most dangerous chemicals that depletes the ozone layer, Freon, has been used in converting uranium to fuel. Construction and de-commissioning are also high carbon emitters. (0045-11-9 [March, Leslie])

Comment: In addition to a commitment to safely and securely storing spent fuel, the industry is also vital to the future of our environmental health. The Intergovernmental Panel on Climate Change recently released an update assessment of the state of global warming and found with 95% confidence that man is responsible. The report also found that surface temperatures are likely to exceed 1.5 degrees C and even 2 degrees C by the end of the century -2 degrees C is considered by most to be the dividing line between "tolerable" and dangerous. (0061-4 [Kirton, Kenneth])

Comment: Climate change is a reality that any safe storage plan must address. Experts agree that climate change is already causing more severe hurricanes, wind storms, tornadoes, ice storms and drought. All of these weather events increase the likelihood of both power failures and changes in water levels and well as increased scarcity of water for cooling spent fuel. Engineers can shut down the operation of a nuclear plant, but the spent fuel continues to require electricity and water to remain inactive. Climate change will make increasingly unstable sources of both. (0086-5 [Lewis, Carol])

Comment: I've dedicated all my schooling, my professional life to make sure that we can put our trust in nuclear energy. I did it because I am personally a climate change advocate. And looking at the realistic solutions towards achieving clean air, the clean-air standards that we want in the timeframe that we want, clean-energy has to be the cornerstone. (0112-12-1 [Garcia, Diego])

Comment: I think tonight you're going to hear from a group of young people that are realizing that for a realistic change in climate -- to curb a changing climate we need to embrace new technology for nuclear energy. (0112-12-4 [Garcia, Diego])

Comment: My first comment is that the draft GEIS estimates that sea level will rise less than 1 meter by the end of the century and this will not endanger any U.S. nuclear power plant. However, sea level rise will vary greatly by region. It's inaccurate to assume a blanket 1 meter rise for all plant locations and then conclude that all plants will not be in danger. 1 meter is a global average. It's been projected to be -- that it'll be much less in some areas. But it's also projected to be -- that it'll be much greater in some areas as well. Areas like the Eastern seaboard where many nuclear power plants are currently sited. Areas projected to experience the most significant sea level rise should be addressed in the GEIS using a global average to assume all plants are safe is a flawed approach. Just as an example, the projection of sea level rise for Cape Cod Bay, and this is where Entergy's Pilgrim nuclear power plant is located, ranges between 4 and 6-feet by 2100. And it's also projected that this rise will come with an increasing severity of storms, surge, and wave action on top of the higher water levels. (0112-16-1 [Vale, Karen])

Comment: My second comment is that the draft GEIS does not consider the impacts of rising temperatures on the water sources intended to cool the spent fuel pools. As an increasingly warming climate is heating the water temperatures of our oceans, lakes, and rivers, water is becoming too warm for plant's cooling systems. Cooling systems are only approved for certain incoming water temperatures and their ability to operate properly and safely has not been proven under higher temperatures. Warming water's an increasing problem. For example, just this past summer Pilgrim had to power down several times due to the water in Cape Cod Bay warming up and exceeding the 75-degree limit. Now, generally appears -- it appears that the bay is warming. And in recent years its average summer temperature has been several degrees warmer than its mean for the last century. (0112-16-2 [Vale, Karen])

Comment: If this issue [climate change impacts raising cooling water temperatures] is included in a future version of the EIS, a generic version would be unable to properly assess how individual plants would be affected. Plants have different equipment, different ages of infrastructure, different environmental conditions and changes. It's much more complicated than could be covered in a generic EIS. As with sea level rise, the NRC should consider a worst-case scenario for each facility then we might know if mitigation strategies, such as chillers, for example, would be required to sustain the temperature of wet pools during extended heat waves. (0112-16-3 [Vale, Karen])

Comment: Under NEPA, an EIS is intended to carefully investigate the environmental impacts of a potential action. One of NRC's assumptions underlying their opinion that the impacts of spent fuel storage can be considered generically, not on a site-by-site basis, is that changes in the environment around spent fuel storage facilities are sufficiently gradual and predictable to be addressed using a generic approach. This assumption clearly ignores past experience and the realities of a changing global climate. It ignores the very real possibility of severe storms and extreme circumstances. (0112-18-6 [Shaw, Sally])

Comment: Climate will be a part of the remaking of our empire. But the nuclear waste, wherever it is, is going to be burning away. (0112-35-2 [Boyce, Pam])

Comment: [O]ur nation gets 19 percent of its electricity from nuclear power. But when you look at what percentage does it get from its clean-air electricity, that number jumps up to over 60 percent. Almost two-thirds of our clean-air electricity comes from nuclear. Now, looking at everything that we know to be true in terms of climate change, looking at what the IPCC summary report that was recently released said in the upcoming meetings in Poland, climate change is a serious issue. So I personally see climate change as the largest threat that my

generation faces. And I do not understand from my personal perspective why we would try to shut down our largest source of clean-air energy and carbon-free energy. And finishing my statement I would just like to say as the Commission considers this issue and future issues, I would just encourage them to think about all we can do to strengthen our nation's commitment to all clean-air technologies, including nuclear. (0112-4-2 [Kirton, Stratton])

Comment: The NRC really needs to get to grips with the climate disruption issue. They need to be looking at what effects that's going to have on this waste especially if it ends up in the places it currently is. (0112-5-3 [Bogen, Doug])

Comment: And just to point out one of the frustrations I have with this discussion in general, one is that, as Mr. -- I believe it was Mr. Stratton [Stratton Kirton] said about clean-air electricity, it's really too bad that people from the climate front are pitting climate activists against nuclear -- or anti-nuclear activists because I think a lot of us are one in the same. I, myself, consider myself a climate activist. I believe that climate change is real and it's one of the biggest generational fights we'll have. But I also believe that even though I don't consider myself anti-nuclear, I do believe that many of the nuclear power plants are threatening us with one of the biggest lifetime threats we'll ever have. So we are not necessarily two different fronts. And I hope Mr. Stratton's point was not that you have to be pro-nuclear or pro-climate. You can be both. (0112-9-1 [Baker, Anna])

Comment: The unpredictable effects of global warming must be considered in all future licensing and waste storage decisions, including increased rising temperatures, droughts, flooding and fluctuating water levels, which increase the probability of catastrophic events involving nuclear plants and nuclear waste storage. (0143-9 [Arauz, Jorge])

Comment: Beyond the nuclear energy's commitment to safe storage of spent fuel, nuclear energy plays a crucial role in our country's future environmental health. The inter-governmental panel on climate change recently released an update assessment of the state of global warming and found with 95 percent confidence that humans are responsible. The report also found that the surface -- that surface temperatures are likely to exceed 1.5 degree Celsius and possibly even meet 2 degrees Celsius by the end of the century. Most consider 2 degrees Celsius to be the dividing line between tolerable and dangerous global warming. (0163-29-6 [Bailey, Savannah])

Comment: While nuclear energy provides about one-fifth of our country's electricity, it provides more clean-air energy than every other source of emissions free electricity combined accounting for nearly two-thirds of our clean-air energy. At a time when climate change is a paramount concern for all Americans, nuclear energy cannot be ignored, serving as one of our only forms of baseload, always on power that produces zero harmful emissions. (0163-29-7 [Bailey, Savannah])

Comment: I personally am feeling that climate change is personal. It's real. It's here. My personal pain, economic dislocation is nothing compared to what other people are suffering from climate change around the world. (0163-40-2 [Dengler, Allegra])

Comment: I am also concerned with the possible impacts of more severe weather patterns. We must take into account the effects of climate change as nuclear waste is active for hundreds to thousands of years. We cannot afford short term, short-sited strategies. The cost of being wrong is very substantial. If we don't learn from Fukushima we are doomed to repeat its tragedy. (0227-1 [Silver, Daniel])

Comment: Climate change may bring more superstorms up the coast like Sandy. (0233-4 [Dubois, Gwen L])

Comment: In the coming years, the impacts of climate change will be evident; sea level rise, stronger storms, flooding, erosion, intense storm surges, and increasingly frequent wildfires will have to be addressed with scientifically based planning. Nine U.S. nuclear reactor plants are within two miles of the ocean. Others far from the ocean already lie in regions prone to flooding. (0244-14-8 [Prescott, Lisa Marie])

Comment: You know, regardless of whether or not you believe that climate change is human-induced or if it's other factors, I think it's -- you can't deny that the seas are rising. And I think the science strongly points to the next 100 years we're going to have 2- to 5-foot increase in sea level rise. (0244-8-2 [Totoiu, Jason])

Comment: This member of the public does not share your confidence. You write as if you have access to a crystal ball providing you access to the state of our planet for a hundred plus years, when in fact with the accelerating global warming and increasingly apparent climate change, you have no idea what is to come. We are seeing an increasing detrimental super-storms wreaking unimaginable havoc, the level of which has never before occurred. (0245-11-2 [Pierman, Bette])

Comment: We need to be prepared for a super-storm and how you will handle the consequential impact on nuclear waste storage. Contrary to what you have presented, each plant's situation and environmental impact will be different, and all will be catastrophic. Climate change is real. Super-storms are occurring along with earthquakes in regions where they did not previously occur with regularity. If you do not begin to make responsible decisions regarding the protection of this planet and its humanity, then you need to remove your NRC motto, "protecting people and the environment," because your 'adequate' effort will have failed and all will be harmed as a result. (0245-11-4 [Pierman, Bette])

Comment: NRC is currently assuming what will happen in the distant future. Assumptions on the effect of climate change, for example, and some of these we can already see are wrong, for example, the GEIS says a meter rise in water level won't endanger any plant. There are in fact three plants that would be impacted by this rise in water level. (0245-15-2 [McComb, Sandy])

Comment: A healthy business climate, which was addressed earlier, is not necessarily a healthy future for mankind. Business operates generally in a current state at the expense of the public's health and the future of the planet. A lot of people think that this is hyperbole. Yet we cannot act to deal with climate change in a meaningful way. The NRC has no ability to assure me with confidence that a super-storm, a super tornado will not pass over any of the proposed future storage sites indefinitely. Can you guarantee me that 200 mile-an-hour winds will leave those fuel pools unaffected? Will you force the operators of those plants to upgrade to a level to ensure that? I don't think so, because they don't want to spend the money necessary to make an unsafe technology theoretically safe. There's a question of whether we're going to survive as a society just like Japan in the event of regional super-storms coming from increasing disturbances in the Arctic -- are big news, a real time website of observations documents what's happening there now and how it's affecting the Northern Hemisphere, especially over the Mid-Continent. We cannot be assured that a major, extreme freak storm will not pass over a nuclear power plant and drain a fuel pool of its water. (0245-25-3 [Lehman, Dale])

Comment: I'm also interested in the issue of climate change and I looked in a little bit more detail as to what they did in that section. And I saw that they had forecasted temperature range of about 5.5 degrees Celsius, and they were considering all up to that. So, I expected to see, okay, I've read the book Six Degrees and I know that when you get up to six degrees it gets pretty gripping. But I didn't see any analysis of water usage. I didn't see anything about the increasing water temperatures and how those would affect cooling. I didn't see anything about the push between climate change and water availability. Again, all of that seemed to underline the fact that I don't believe there was any scientific basis whatsoever for the risk analysis in this document. (0245-31-5 [Fox, Tracy])

Comment: We've heard about the three scenarios about the fire or things like that. But I'll just tell you, what had happened in the last couple of days, the typhoon Haiyan, 370 kilometers per hour. Climate is changing. So, that means, according to the prediction -- raised maybe half a meter high. What happens is that a lot of plants that we have here are going to completely store the fuel by the shore there and we're going to have problems. But I'm not too sure of all these climate issues after 60 years of operation here, that could become a reality. So, we are assessing the potential risk that's involved and that's the real issue. We don't see that as being analyzed. (0245-5-2 [Chen, S.Y.])

Comment: I think that the EIS does not do enough to address the issues related to the climate change and the things that may be coming along as part of, you know, as our climate is already changing, we're seeing things happening. What happens over the next 60 years, 160 years, and further into the future, I think that there's a lot of question marks there that really have not been adequately addressed. (0245-8-3 [Fox, Rick])

Comment: With the increasingly real prospect of catastrophic climate change, we are ill-advised to shrink from nuclear energy and the responsible handling of spent nuclear fuel from our energy portfolio. As with any major undertaking, there will be lessons to be learned, improvements to be made, and disagreements to be resolved. But none of these items should preclude us from pushing and pursuing anything other than an all-of-the above energy strategy. (0246-10-5 [Bennett, Nathan])

Comment: I chose to be nuclear engineer because I am a climate change advocate and I am realistic about the 21st century economy that we have, about how we are going to implement the changes that we need. And as James Hansen and the top climate change scientists have said, we need nuclear in order to make a transition before the real damage from CO2 feedback emissions happens, the irreparable damage that we will get from emissions going too high and in 2011, we know they jumped by three percent. So to conclude, I would like to thank the Commission for allowing me to speak today, to be part of the generation that is taking climate change seriously with engineering. (0246-21-4 [Garcia, Diego])

Comment: But it is hard to believe that anyone would claim that nuclear power is needed to slow global warming, which there was an article in the Associated Press in the Mercury in our town in the beginning of November. But anyway, the nuclear cycle contributes to global warming and power from nuclear plants is vulnerable to the consequences of global warming, such as more intense droughts, floods, earthquakes. (0246-23-1 [Ruppe, Lorraine])

Comment: With climate change, there are unforetold situations and circumstances that are going to be arising. And weather events are getting more and more extreme. (0246-31-2 [Sunderland, Mary Brooke])

Comment: You need to be prepared for a super storm and how you will handle the consequential impact on nuclear waste storage. Contrary to what you have presented, each plant's situation and environmental impact will be different and all will be catastrophic. Climate change is real. Super storms are occurring along with earthquakes in regions where they did not previously occur with greater regularity. (0277-10 [Pierman, Bette])

Comment: You write as if you have access to an omniscient crystal ball providing you access to the state of our planet for a 100 plus years when, in fact, with the accelerating global warming and increasingly apparent climate change, you have no idea what is to come. We are seeing increasing detrimental super storms wrecking unimaginable havoc the level of which has never before occurred. (0277-4 [Pierman, Bette])

Comment: The Commission's decision to "not [even] consider worst-case scenarios" (p. 55786) in the DGEIS is an unwarrantable omission. Important recent studies, such as by the New York Academy of Sciences and the French government's Institute of Radiological Protection have assessed and documented the almost unimaginably high human and environmental consequences and economic-damage cost in worst-scenario disasters. Under the rapidly changing climate, we must expect more Superstorm-Sandy-like events, floods, wildfires, water scarcity, lengthy power blackouts and other "abnormal" weather related events which pose threats to nuclear facilities. The assumption underlying the stated decision – that natural events and their consequences can still be "reasonably foreseen" many decades into the future – is indefensible today. A new EIS should analyze not only the potential damage effects from routine SNF storage leaks and other disturbances but also those which could befall in worst-case, catastrophic events. (0303-10 [Lamberts, Frances])

Comment: The nuclear industry has had a very good PR program that has allowed a lot of people to be totally confused and lied to. Storm surges and climate changes mean more risk for vulnerable, intensely radioactive waste sitting only 13 feet above high tide. And we don't need to choose between climate change and radioactive waste releases. That's a false choice. (0325-28-3 [Branigan, Mary Beth])

Comment: Now, I want to diverge just very briefly to talk about an issue that's personal to me, and that is climate change. I grew up on the coast. My family has seen storms, my family has seen storm surges at our house, and we understand very personally what climate change and angry sea level rises will mean. Now, I'm sure I'm speaking for a lot of people who already know this but the IEA released a World Energy Outlook, their annual World Energy Outlook report last week that found the world -- the globe was just on track to completely blow through the threshold, the ceiling that we need to keep temperatures below. And similar to that, the Intergovernmental Panel on Climate Change also found with 95 percent certainty that climate change is both manmade and that, again, we are on track to blow through that ceiling. (0325-5-4 [Kirton, Stratton])

Comment: Now, diverging a moment from the specific rulemaking here, why this is important to me is because of the issue of climate change. I grew up in a very small town on the water, and my town has seen increasing storms and increasing storm surges. Now, whether it's the IEA, or the IECC, we all know that right now, the globe is on path to reach almost 4 degrees Celsius by the end of the century, far surpassing what is said is the threshold in terms of safe rising temperatures, which is 2 degrees Celsius. (0326-16-3 [Kirton, Stratton])

Comment: I feel like we're faced with global warming. This is what we should keep our eye on; the big picture. I mean, nuclear may have an accident, there may be leak, there may be a

terrorist thing; maybe so, maybe not. We know for sure that global warming could kill a lot of people. I mean, James Lovelock, one of the leading scientists in earth science says, 4 to 5 billion people will be killed if emissions of CO2 are not curbed. I urge you to go ahead and read his book. He's got a book called, "The Vanishing Face of Gaia." By the way, he's the guy that came up with a solution to the ozone hole. He's a wonderful man, he's a U.K. scientist, and he invented something that could figure out what was causing the ozone hole. He's the same man that said global warming is going to kill a lot of people eventually. Read his book, "The Vanishing Face of Gaia." (0326-24-2 [Gloege, William])

Comment: I don't think that this document addresses the reality of global climate change, and the high probability that our society is going to be severely disrupted by it, that we're going to see great increases in, for example, the frequency of flooding and social disruption and discontinuity of business and security programs and so on. And all of this needs to be taken seriously when we consider the likely trajectory of nuclear waste management problems. (0328-11-6 [Muller, Alan])

Comment: As sea levels rise, food sources diminish because we Fukushima-ed them, there's no more food in the Pacific. And as that circulates through the globe, what happens when there's less and less food because of climate chaos and irradiation? And what happens when there's less and less space for the people to live because the sea levels are rising, and we have the chaos in society degenerating. (0328-7-2 [Crocker, George])

Comment: I just wanted to point out that to transport nuclear fuel to a safe place in south Florida, the trouble with south Florida is that due to global warming and climate change, the reactors will be underwater in probably less than 50 years. The ones at Turkey Point probably won't take as long. The entire southern part of Florida is only like eight to ten feet high. So it won't take very many years before we're looking at that whole area to be starting to go underwater. And that's seawater, which will pretty much rust out everything that comes in contact with it. So to transport, as I mentioned before, it would be the shortest possible distance from Miami or the East Coast, whether that's St. Lucie or Crystal River, to high ground, which would be in the middle of the state, to be able to store it. (0329-24-1 [Wilson, Greg])

Comment: So if I can just be specific and point to page 4-75? That's in section 4.18. And it's in addressing spent fuel pools and the climate change analysis. I think a speaker earlier, Greg Wilson in the Tampa area, had talked about some of the sea level rise concerns, among other things. And there's a line on that page in the draft GEIS that says specifically "The lowest rate above the sea level of concern for an NRC-licensed facility is currently about 4.3 meters, or 14 feet. In the event of climate change and sea level rise, the NRC requires licensees to implement corrective actions to identify and correct or mitigate conditions adverse to safety." In my comments and with our concerns is that I think this section needs further development and analysis because it's looking at the facilities themselves and we would argue first that we don't actually agree with those numbers and the sea level rise projections there. But there are infrastructures that facilities rely on: roadways, power lines, a number of things. So it's not just, for instance, Turkey Point Nuclear Plant in south Florida being able to solely operate and deal with dry casks or whatever is done with the spent fuel pool onsite for the indefinite future. Roadways are very likely to be underwater, a number of things that a facility would rely on, whether it's a nuclear plant or a hospital or something along those lines. And, therefore, that is somewhat of the nugget we were trying to get at with raising our sea level rise concerns if you have to look at the broader area, not the facility itself and where the onsite spent fuel pool storage or dry cask storage occurs. (0329-27-1 [Barczak, Sara])

Comment: [W]e have serious concerns about the impact climate change may have on the long-term storage and management of spent nuclear fuel. The effects of climate change and subsequent expected increases in storm surges and catastrophic weather events puts reactors that are along the country's coastline and even low-lying inland locations at great risk. For instance, given Florida Power and Light's Turkey Point location near Miami next to the Everglades and Biscayne Bay, storm surges are real threats that must be considered. We do not believe that the NRC and its licensees can ensure that spent nuclear fuel can safely sit at Turkey Point for even 100 years, let alone indefinitely. This is true of other reactor locations across the country, as well. The NRC must reevaluate the impact of climate change, as Section 4.18, Environmental Impact of Postulated Accidents, appears to be woefully inadequate. We do not agree with the NRC's conclusions made regarding climate change, specifically for design basis events and spent fuel pools on page 4-75 and dry casks on page 4-78 and severe accidents in spent fuel pools on page 4-81 and severe accidents with dry cask systems on page 4-83 and believes this analysis needs to be more robustly conducted. (0329-5-2 [Barczak, Sara])

Comment: We would like to make the NRC aware that, since the comment period began, a new sophisticated tool has been released, Surging Seas, a sea level rise analysis by Climate Central which can be found at sealevel.climatecentral.org. From that page, you'll start from sea level rise and storm surge to the more than 3,000 coastal towns, cities, counties, and states in the lower 48. Three states in particular, New Jersey, New York, and Florida now have expanded next generation maps and analysis available in the Surging Seas risk finder with more states to follow. (0329-5-3 [Barczak, Sara])

Comment: The unpredictable effects of global warming - from increased droughts to flooding to rising temperatures to fluctuating water levels - must be considered in all future licensing and waste storage decisions. (0357-8 [Daily, G. Allen])

Comment: The NRC makes many references to "climate change" both with respect to survivability of storage sites under expected extreme weather conditions, and the release of "greenhouse gasses" from nuclear facilities. One of the many myths about nuclear power is that it is a carbon-free energy source. Unfortunately, the construction of a nuclear plant, together with its containment structures, fuel storage pools, reactor vessels, heat exchangers, casks and storage pads and their replacement every 100 years, etc. requires prodigious amounts of steel and concrete. Steel production requires burning large amounts of coal and coke, concrete requires cement which is made by burning fossil fuels to heat limestone. Carbon dioxide is released both from the fuel combustion and the limestone decomposition. In short, the only energy source which releases more carbon dioxide into the atmosphere, during the construction phase, is hydro-power due to the massive amount of concrete used in dams. Renewable power sources such as wind, solar and biomass have a much smaller carbon footprint than fossil, nuclear or hydro. Another consideration is that thermal energy sources are only about 30% efficient in converting heat into electrical energy. The rest, 70%, of the energy produced must be discarded as waste heat which contributes to the heat load on the planet. Much of the incident radiative energy from the sun is reflected back into space because its visible wavelength remains unchanged on reflection. The waste heat from thermal sources of electricity such as nuclear and fossil fuels, on the other hand, is transmitted in the infra-red and so is mostly trapped in the atmosphere by greenhouse gasses, thus contributing to global warming. Also problematic is the fact that nuclear fuel continues to excrete waste heat into the environment even centuries after the plant has ceased to produce electricity. Fossil fuel plants cease to produce waste heat immediately upon shutdown. (0410-19 [Nelson, Dennis])

Comment: Utilize the best science as a basis for decisions. For example, incorporate the best scientific information regarding predicted climate and sea level changes and their impact on the safe management of nuclear waste storage. (0417-9 [Clark, Terrence])

Comment: The DGEIS offers only three paragraphs on climate change (4-75 -4-76). This section inexplicably only addresses the impacts of climate change on nuclear waste storage in the short term, relies on outdated climate change projections, and only addresses postulated design basis accidents instead of the potential for wholesale impacts on the storage of nuclear waste caused not only by accidents, but by increased temperatures and increased sea level rise. The DGEIS also improperly cites to the invalidated 2010 Waste Confidence Decision Update as the basis for certain scientific and technical assertions, rendering them meaningless. (0473-17-1 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The DGEIS cites out of date projections for sea level rise. The EIS says that sea levels are estimated to rise less than 1 meter by 2100. DGEIS at 4-75, citing 75 FR 81037.⁴⁸ [footnote 48 text: As a citation for this proposition, the DGEIS cites an NRC federal register notice from 2010, which in turn cites to a National Academy of Science transportation report, the IPCC 2001 report, (there have been two new IPCC reports since 2001, in 2007 and 2013) and the 2009 US Global Change report. 75 Fed. Reg. 81037, citing J.A. Church et al., Climate Change 2001: Impacts, Adaptation, and Vulnerability, Intergovernmental Panel on Climate Change, 642 (2001).] Based on this estimate, the DGEIS concludes that "none of the U.S. nuclear power plants (operational or decommissioned) will be under water or threatened by water levels by 2050. No basis for this conclusion is provided. *Id.* Indeed, the DGEIS merely repeats an uncited, unsubstantiated statement appearing in the now-vacated Waste Confidence Decision Update in support of this idea - no further information is given, including the name or location of the facility. As such, this statement cannot form the basis for any conclusions in the DGEIS regarding the impact of sea level rise on the short-term, long-term, or indefinite storage of nuclear waste. Regardless, the National Oceanic and Atmospheric Administration (NOAA) sea level rise estimates for the 2013 U.S. National Climate Assessment indicate that sea levels could rise as much as 2 meters (6.6 feet) by 2100 – double the sea level rise figures cited in the DGEIS. See Global Sea Level Rise Scenarios for the United States National Climate Assessment, NOAA, December 6, 2012 (giving a range of potential sea level rise from low (0.7 meters) to highest (2.0 meters)). The DGEIS states that "[t]he lowest grade above sea level of concern for an NRC- licensed facility is currently about 4.3 meters. DGEIS at 4-75, citing 75 FR 81037. ⁴⁹ [footnote 49 text: As discussed below, the NRC cannot cite to its own invalidated Federal Register notice in support of scientific arguments.] The basis for this conclusion, including how associated storm surge calculations were performed, precludes analysis of its accuracy. The updated 2 m sea level rise estimate should be used. NOAA suggests this "Highest Scenario should be considered in situations where there is little tolerance for risk (e.g. new infrastructure with a long anticipated life cycle such as a power plant)." *Id.* Certainly, the long-term storage of nuclear waste, especially in pools which require reliable cooling mechanisms, qualifies as a "situation where there is little tolerance for risk." The NRC does not use the NOAA estimates. As such, the DGEIS offers no reliable analysis - or adaptation measures - for the possible impact of sea level rise on nuclear waste storage. Apart from using outdated sea level rise projections, the DGEIS's conclusion that sea level rise is not a risk to nuclear waste storage due to their elevations - "[t]he lowest grade above sea level of concern for an NRC-licensed facility is currently about 4.3 meters" (DGEIS at 4-75) - is completely unsupported. The DGEIS includes no list of nuclear waste storage locations and their elevations vis-à-vis sea level, and does not even include the name or location of this one referenced facility. In support of this proposition the DGEIS cites back to the invalidated Nuclear Waste

Storage rule, which itself contains no citation for this assertion. (0473-17-3 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: DGEIS at 4-73. But the DGEIS nowhere references revisions to the design basis flood that may have occurred since facilities were initially licensed. The DGEIS should also evaluate the impacts of recent intense storms, such as Superstorm Sandy, which caused high water levels at the cooling water intakes of both the Salem Nuclear Power Plant Unit 1 and the Oyster Creek Nuclear Power Plant, forcing the shutdown of those New Jersey power reactors. See NRC Preliminary Notice of Event or Occurrence (PNO-I-12-007) issued October 31, 2012 (ML12305A460); B. Gallo, Jr., "Salem 1 nuclear reactor, shut down by Hurricane Sandy, returns to service," www.nj.com Nov. 4, 2012)(available at http://www.nj.com/salem/index.ssf/2012/11/salem_1_nuclear_reactor_shut_d_2.html), last accessed Nov. 30, 2013). Superstorm Sandy also knocked out power lines whose loss idled other power reactors, including Indian Point Unit 3. PNO-I-12-007. The NRC appears to consider storms like Superstorm Sandy design- basis events. See, e.g., 4-76 ("Summary"). If so, these northeastern plants were not able to withstand them. Other climate change impacts, such loss of cooling capacity due to increased cooling water temperatures also need to be considered. Summer heating of Long Island Sound waters put Millstone Power Station, Unit 2 offline in August 2012, and heating of Cape Cod Bay forced Pilgrim Nuclear Power Station to reduce output in July 2013. M. Wald, "Heat Shuts Down a Coastal Reactor," [NYTimes.com](http://green.blogs.nytimes.com/2012/08/13/heat-shuts-down-a-coastal-reactor/) (Aug. 13, 2012), available at <http://green.blogs.nytimes.com/2012/08/13/heat-shuts-down-a-coastal-reactor/> (last accessed Nov. 30, 2013). The increasing likelihood of climate-change-induced beyond-design basis events must be evaluated in this DGEIS , and the NRC must identify additional adaptation measures plants must take to respond to increasingly frequent, increasingly severe design conditions. (0473-17-5 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The DGEIS acknowledges that: * climate change can lead to an increased intensity and frequency of severe weather events, such as flooding and hurricanes, * in addition to impacts from sea level rise, spent fuel facilities may be affected by increased storm surges, erosion, shoreline retreat, and inland flooding, and * climate change can lead to an increase in the frequency of droughts, and that the frequency of droughts in the Southeast and West has already increased. DGEIS at 4-75. During an April 12, 2012 full committee hearing by the Senate Committee on Energy and Natural Resources that explored the Impacts of Rising Sea Levels on Domestic Infrastructure, the Committee heard testimony on the potential impacts of sea level rise on energy infrastructure. See <http://www.energy.senate.gov/public/index.cfm/2012/4/full-committee-hearing-impacts-of-rising-sea-levels-on-domestic-infrastructures-> (last visited Nov. 30, 2013). Compounding factors will further exacerbate the effect of global sea level rise due to climate change, "in some areas, especially for Louisiana, Texas, and mid- Atlantic states, sinking land will add to the total effective rise and compound problems," according to testimony from Benjamin H. Strauss, Director of the nonprofit organization Program on Sea Level Rise at Climate Central. Louisiana houses two of the nation's coastal nuclear power plants, and the Mid-Atlantic states25 power plants, and therefore nuclear waste storage facilities as well. Yet in light of that, the DGEIS offers only three paragraphs on climate change, does not mention land subsidence (though the Waste Confidence Decision Update did, 75 Fed. Reg. 81037, 81053, noting that land subsidence was already occurring in the central Gulf Coast region) and offers no adaptation measures to mitigate against the impact of these events, on the storage of nuclear waste. Nevertheless, it does acknowledge impacts, and yet offers no adaptation measures. As such, the DGEIS does not adequately assess the environmental impacts of the long-term or indefinite

storage of nuclear waste. (0473-17-6 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The unpredictable effects of global warming - from increased droughts to flooding to rising temperatures to fluctuating water levels - must be considered in all future licensing and waste storage decisions. (0507-7 [Giese, Mark M.])

Comment: By dismissing impacts to drinking water, the DGEIS is neglecting the fact that over the coming century, drinking water security will be low due to global climate change. Any prediction of environmental impacts should prioritize effects on drinking water sources. (0531-1-8 [Morgan, Sally])

Comment: By dismissing impacts to drinking water, the DGEIS is neglecting the fact that over the coming century, drinking water security will be low due to global climate change. Any prediction of environmental impacts should prioritize effects on drinking water sources. (0531-2-8 [Morgan, Sally])

Comment: The GEIS states that a one-meter water rise will not endanger any nuclear power plant, operational or decommissioned, in the U.S. This is simply false. Examples: A less than 1m water rise will completely flood Turkey Point, St. Lucie and Crystal River Nuclear power plants, just to name three near-coastal plants that would be affected by flooding. (Climate Central). 1. Surging seas interactive climate map, Climate Central, 2013. <http://sealevel.climatecentral.org/surgings seas/place/cities/FL/Miami#show=cities&per=12/25.3789/-80.3118&surge=2> or <http://sealevel.climatecentral.org/> (0552-1-19 [Macks, Vic])

Comment: GEIS on page 6-8, section 6.3.1, Table 6-1 summarizes the range of expected temperature rise by 2100 as falling between 1 degree C and 6.5 degrees C. But it fails to connect the dots between rising temperatures and the effects on water sources depended on to cool reactors and their spent fuel pools. During the summer of 2012 high temperatures interfered with the operations of several nuclear plants. (source 2 below) Over time, the warming of bodies of water used for cooling will impact the reliability of nuclear plants and potentially the safety of operations. 2. http://green.blogs.nytimes.com/2012/08/13/heat-shuts-down-a-coastal-reactor/?_r=0; As climate change makes water scarcity an ever-increasing event, the water necessary to cool spent fuel in pools becomes an unaffordable luxury. Dry casking all spent fuel is the only alternative in a world where the water necessary to sustain life is at a premium. (0552-1-20 [Macks, Vic])

Comment: Experts report that while it is too soon to say that Climate Chaos is increasing the numbers of weather events, they do report that Climate Change is causing greater severity of them. Whether hurricanes, wind storms, tornadoes, ice storms or drought, NRC has not yet upgraded its computer simulations and accident probability calculations to reflect the greater possibility that the electric power grid will go down. Loss of off-site power is a major contributor to reactor accident scenarios, many of which would also include the fuel pool and its back-logged inventories of waste. (0552-1-21 [Macks, Vic])

Comment: The assessment is not related to environmental impacts of climate change, only to increased hazards, which occur also with man-made climate change phenomena. The impacts described are related entirely activities that increase atmospheric GHGs, which are (correctly) dismissed as "Small". The section does not consider environmental impacts resulting from the effects of climate change on ISFSI facilities and their constituent dry storage casks. The integrity of dry casks is based on extremely limited data on performance of one cask in one

geographic/climate setting, and then extrapolated for a period of 100 years to all casks of whatever design, located in whatever climatic zone. This matter puts the use throughout this GEIS of "reference models" of various continued storage components on a very shaky basis, and dilutes actual potential environmental impacts with a host of assumptions rather than facts. Buttressed by a large assortment of regulations that ensure permanent protection of the integrity of constructed systems managed by humans, leads directly to an assessment of "SMALL" unspecified environmental impacts. (0553-7 [Wilshire, Howard])

Comment: Climate change is predicted to bring an increased number of severe storms and sea level rise. Sea level rise is predicted to be more extreme on the east coast and varies from location to location on the coast³ [footnote 3 text: Sea Level Rise Accelerating in U.S. Atlantic Coast, http://www.usgs.gov/newsroom/article.asp?ID=3256&from=rss_home (Released: 6/24/2012 1:00:00 PM)] . Therefore, where a reactor is located is important. For example, Pilgrim's ISFSI is located 25' above MSL and 100 yards from Cape Cod Bay. Over the short term to indefinite time frames, high storm waves on top of sea level rise will make flooding of the ISFSI far more probable than at an ISFSI located at higher elevation and not an issue at reactors located away from the coast. (0556-1-18 [Lampert, Mary])

Comment: Although the DGEIS acknowledges that climate change "may have impacts across a wide variety of resource areas including air, water, ecological, and human health," the DGEIS nevertheless states, without any explanation, that "[t]he consideration of climate change impacts for pool storage only needs to address the short term timeframe." DGEIS 4-75. Given that (a) spent nuclear fuel remains dangerously radioactive well beyond 60 years,² [footnote 2 text: The half lives of two components of spent nuclear fuel, plutonium-239 and plutonium-240, have half lives of 6,800 and 24,000 years, respectively. See, e.g., Nuclear Regulatory Commission, "Radioactive Waste: Production, Storage, Disposal," at 8, available at <http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0216/r2/br0216r2.pdf>.] and (b) the prospects of a completed and operational permanent waste repository for spent nuclear fuel within 60 years are speculative, artificially limiting the analysis to the short term cannot be considered the "hard look" required by NEPA. (0558-1 [Strell, Ethan])

Comment: As set forth below, the length of time waste is stored at individual nuclear plants is not an academic issue, since the projected effects of climate change, in particular sea level rise, will only increase over time, particularly when dealing with waste whose danger and potential environmental harm is measured in many thousands of years. Sea Level Rise Projections: The only discussion in the DGEIS of the potential effect of sea level rise on the numerous spent nuclear fuel storage facilities throughout the country is the following: Rise in sea level is controlled by complex processes, and it is estimated to rise less than 1 m by 2100 (75 FR 81037). Based on this projected change, none of the U.S. nuclear power plants (operational or decommissioned) will be under water or threatened by water levels by 2050 (75 FR 81037). In addition to sea-level rise, spent fuel facilities may be affected by increased storm surges, erosion, shoreline retreat, and inland flooding. Coastal area impacts may be exacerbated by land subsidence. NRC-licensed spent fuel storage facilities are designed to be robust. DGEIS at 4-75.³ [footnote 3 text: The Proposed Rule does not address the effects of climate change on spent fuel storage. See 78 Fed. Reg. 56776, Sept. 13, 2013.] There are several problems with this "analysis." First, merely stating that sea levels are estimated to rise less than one meter by 2010 does not account for uncertainty in sea level rise projections and may underestimate risk. Second, merely accounting for a static sea level rise does not consider risks due to more frequent and severe flooding. Finally, simply stating, without further discussion or support, that NRC design standards are sufficient to protect from future climate harm, does not satisfy NEPA. The only source cited for sea level rise projections in the DGEIS is the NRC's own Federal

Register notice for its 2010 Waste Confidence Rule, which itself cites to a National Academy of Sciences transportation report, a 2001 report of the International Panel on Climate Change ("IPCC"), and the 2009 United States Global Change National Climate Assessment. See 75 FR at 81053. Aside from the fact that the 2010 Waste Confidence Update was vacated by the DC Circuit, the sources referenced are dated, and more recent projections show potentially greater sea level rise and uncertainty. For instance, the current draft of the National Climate Assessment, which is in the process of updating the 2009 report cited in the NRC's 2010 Federal Register notice, indicates that sea levels could rise as much as 6.6 feet by 2010, *double* what is considered in the DGEIS. The Draft Assessment indicates that "[i]n the context of risk-based analysis, some decision makers may wish to use a wider range of scenarios, from 8 inches to 6.6 feet by 2010."⁴ [footnote 4 text: National Climate Assessment, Chap. 2, "Our Changing Climate," p. 63, Draft for Public Comment, v. 11, Jan. 2013. The recent Working Group 1 Contribution to the Fifth Assessment Report of the IPCC, "Climate Change 2013: The Physical Science Basis," Summary for Policymakers, acknowledges that many models project such higher sea level rise, but indicates that consensus on the reliability of those models is lacking, and has low confidence for those projections. IPCC WG1 2013 Summary for Policymakers, at 24]. The report continues that "the high end of these scenarios may be useful for decision makers with a low tolerance for risk." *Id.* Certainly, nuclear waste storage epitomizes an area where there is a "low tolerance for risk." Additionally, the DGEIS discussion only looks at static flood levels due to potential sea level rise, which does not accurately disclose the risk of flooding. If the base sea level rise is higher, then flooding at many locations will occur more frequently, and those locations will be more vulnerable to more powerful and frequent storm surges. The NRC's casual and generic dismissal of potential sea level rise on every waste storage facility in the country does not properly characterize potential risk, and does not constitute a hard look under NEPA. Additionally, sea level rise is not uniform and will vary considerably among different regions. *Id.* See also New York City Panel on Climate Change, Climate Risk Information 2013, June 2013, at 17. The NRC has not explained why its generic, one-size-fits-all analysis here is appropriate. (0558-4 [Strell, Ethan])

Comment: In discharging their NEPA responsibilities, agencies are subject to a "rule of reason," and must evaluate all reasonably foreseeable significant adverse impacts. When data is incomplete or unavailable, as it is with future sea level rise projections "reasonably foreseeable" includes "impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason." 40 CFR § 1502.22. Clearly, the consequences of underestimating potential sea level rise and storm surge could have catastrophic consequences. In the face of this incomplete or unavailable data, NEPA requires that the NRC consider greater potential sea levels based on existing credible scientific evidence. (0558-5 [Strell, Ethan])

Comment: Finally, the only assurance in the DGEIS that all storage facilities will be safe from rising seas and other effects of climate change is the statement that "NRC-licensed spent fuel storage facilities are designed to be robust." DGEIS at 4-75. (0558-7 [Strell, Ethan])

Comment: While waste storage facilities are no doubt required to be robust, simply saying so does not constitute the hard look required by NEPA. The DC Circuit similarly viewed with skepticism the Commission's self-serving assurances of robust design and administrative oversight: [T]he Commission refers to its monitoring and regulatory compliance program as a buffer against pool degradation. That argument is even less availing because it amounts to a conclusion that leaks will not occur because the NRC is 'on duty.' With full credit to the Commission's considerable enforcement and inspection efforts, merely pointing to the

compliance program is in no way sufficient to support a scientific finding that spent-fuel pools will not cause a significant environment impact during the extended storage period. This is particularly true when the period of time covered by the Commission's predictions may extend to nearly a century for some facilities. *New York v. Nuclear Regulatory Comm'n*, 681 F.3d at 481. (0558-8 [Strell, Ethan])

Comment: In sum, the DGEIS is insufficient in its consideration of how future climate change will affect the long-term storage of spent nuclear fuel. (0558-9 [Strell, Ethan])

Comment: Section 4.5 of the DGEIS evaluates the effect of continued storage on climate change. When considering greenhouse emissions (all timeframes), the NRC only considers the direct resulting CO2 footprint of continued storage. However, the DGEIS should consider the entire fuel life-cycle in its scope, including the effects of uranium mining, milling, and processing, the transport of fuel, reactor operation, decommissioning and final storage of radioactive waste. Without the entire fuel life-cycle being considered, the DGEIS is ineffective in properly examining potential environmental impacts occurring as a result of continued storage of spent fuel. (0622-1-16 [Vale, Karen])

Comment: The NRC claims to have already established criteria that provide reasonable assurance of public health and safety and due consideration of environmental impacts in the construction and operation of nuclear power plants, including facilities for continuing storage of spent fuel." However, given that the DGEIS fails to address sea level rise, proximity of installations to the coastal environment, or assess vulnerability to storm forces beyond a tornado-it does not meet the required "assurance of public health and safety" or "due consideration of environmental impacts, including facilities for continuing storage of spent fuel." (0622-4-12 [Vale, Karen])

Comment: The DGEIS estimates that sea level will rise less than 1 meter by 2100 (75 FR 81037), and this will not endanger any U.S. nuclear plant. However, sea level rise will vary greatly by region. It is inaccurate to assume a blanket 1-meter rise for all plant locations and then conclude that all plants will not be in danger. The 1 meter figure is a global average; sea level rise has been projected to be much less in some areas, but also projected to be much greater in others (like much of the eastern seaboard, where many nuclear plants are sited). Areas projected to experience the most significant sea level rise should be addressed in the DGEIS. Using a global average to assume all plants are safe is a flawed approach. For example, projections for sea level rise for Cape Cod Bay (where Entergy's Pilgrim plant is located) range between 4-6 feet by 2100. It's also projected that this rise will come with increasing severity of storms, surge and wave action on top of the higher water levels. (0622-4-3 [Vale, Karen])

Comment: The DGEIS does not consider the impacts of rising temperatures on the water sources intended to cool spent fuel pools. As an increasingly warming climate is heating the water temperature of our oceans, lakes, and rivers, water is becoming too warm for plants' cooling systems. Cooling systems are only approved for certain incoming water temperatures, and their ability to operate properly and safely has not been proven under higher temperatures. Warming water is becoming an increasing problem. For example, just this past summer, Entergy's Pilgrim plant was forced to power down several times to comply with its license when the water in Cape Cod Bay exceeded 75.. Generally, it appears that Cape Cod Bay is warming, and in recent years its average summer temperature has been several degrees warmer than its mean for the last century. (0622-4-4 [Vale, Karen])

Comment: The DGEIS also does not consider the issue of ocean acidification. This issue raises concerns about dry casks being built in close proximity to the ocean (for example, Pilgrim's dry casks will be about 100 feet from the shore of Cape Cod Bay). Dry casks are made of concrete and steel -materials already susceptible to deterioration by salt air and water. Adding even more acidic conditions raises serious concerns about carbonation-induced deterioration of the dry casks that are intended to protect the public and environment from the highly radioactive waste stored inside. If dry casks are to store nuclear waste in the long-term or indefinite time-frames, the NRC needs to consider the impact of ocean acidification, and not just salt. Again, a site-specific assessment would be needed since some regional characteristics can cause acidification to be a bigger problem in certain areas. One of these characteristics is eutrophication (when excess nitrates and phosphates enter coastal areas from lawn runoff, fertilizers, storm-water runoff, wastewater disposal, etc.). In areas experiencing eutrophication problems, such as along the Cape Cod Bay coastline, there is often die-off of algae and sea grass that produces even more CO₂. (0622-4-7 [Vale, Karen])

Comment: In general, the NRC assumes that flooding can be mitigated with pumps. In some areas this is true; however, there are some sites where flood events can occur where they were not anticipated. Over the next 60 to 150 years, this will be increasingly true at Pilgrim where sea levels will rise and storms will become more intense. As of February 28, 2013,²⁵ Entergy claims that Pilgrim is a "dry site," because it is a few feet above the previously predicted storm surge level. However, Entergy never addresses below ground installations (such as pumps and equipment that maintain proper reactor and pool cooling) that may be subject to flooding-or how flooding would be controlled during an extended storm event where the tide does not abate for several days. Entergy has not addressed the potential influences of the Atlantic Ocean on the Pilgrim site; therefore they are not likely to be prepared for a flooding event - leading to a potential disaster for the region. It is the responsibility of the DGEIS to evaluate all U.S. sites' vulnerability to a changing climate and its effects. Mitigation efforts (building barrier walls, elevation considerations, etc.) at specific locations should also be discussed in the DGEIS. (0622-4-9 [Vale, Karen])

Comment: With climate change making weather patterns ever more violent, such incidents will only make these rapidly aging plants more accident prone. (0633-5 [Kurz, Carol])

Comment: With climate change, these plants use up our water supply, increase the heat in our water supply thereby warming the planet and destroying our oceans, lakes and rivers. (0662-4 [McClintock, Francene])

Comment: The draft GEIS contains unsatisfactory analysis regarding threats posed by climate change. The draft GEIS states that "[r]ise in sea level is controlled by complex processes, and it is estimated to rise less than 1 m by 2100 (75 FR 81037). Based on this projected change, none of the U.S. nuclear power plants (operational or decommissioned) will be under water or threatened by water levels by 2050 (75 FR 81 037)." (4-75.) Confidence based on the year 2050 does not address the time-spans at issue with the waste confidence rule, which extend beyond that date. Furthermore, new information¹⁰ [footnote 10 text: Global Sea Level Rise Scenarios for the United States National Climate Assessment, December 2012 [http://cpo.noaa.gov/sites/cpo/Reports/2012/NOAA SLR r3 .pdf](http://cpo.noaa.gov/sites/cpo/Reports/2012/NOAA%20SLR%20r3.pdf). Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future (2012).] provides estimates of sea level rise 1 % to 2 times higher than those analyzed in draft GEIS , with some experts estimating an upper bound as high as 3 meters by the year 2300.¹¹ [footnote 11 text: Expert Assessment of Sea-level Rise by AD 2100 and AD 2300 <http://www.sciencedirect.com/science/article/pii/S0277379113004381>] (0669-13 [Walter, Joan])

Comment: The NRC did not provide any basis for its conclusion that the environmental risks due to increased intensity of thunderstorms is low for the short-term duration, despite the fact that as it states "climate models predict thunderstorms will intensify." (4-82.) Again, "short-term" could be well over half a century, or even longer for a new plant. This is an example of analysis where it would be reasonable and appropriate for the NRC to include a pledge to reevaluate as more information comes to light. (0669-15 [Walter, Joan])

Comment: •This GEIS failed to thoroughly consider the changing climate generically and made unsubstantiated assumptions about the absence of impacts. Climate change impacts for specific regions, individual plants and certain effects are just beginning to be clarified. Site-specific information can better analyze potential climate change impacts and incorporate plans for safe storage. (0693-2-14 [Warren, Barbara])

Comment: The unpredictable effects of global warming - from increased droughts to flooding to rising temperatures to fluctuating water levels - must be considered in all future licensing and waste storage decisions. (0707-9 [Werner, Shahla M.])

Comment: How many reactor sites will be under water within the next 100 years using the current (credible) prediction for sea level rise? (0711-39 [Olson, Mary])

Comment: *NRC has inadequately taken into account anticipated dramatic climate disruption and shifts weather patterns in reaching many of its conclusions.* For example, regarding the effects of leaks from spent fuel pools on surface drinking water supplies, NRC *assumes* (E-17), "...a large body of surface water is usually available, which would dilute any groundwater contaminants that flow into them." Illinois has 11 operating reactors, all sited on rivers. Climate models predict that by 2050 (certainly well within the timeframe envisioned by this DGEIS) Illinois is likely to have the climate of East Texas. In this case both the volumes and flow rates of these rivers - on which NRC depends in its assumption that dilution will occur - will be reduced significantly, and in cycles much different than today's climate provides. Unless NRC has done the volume and flow rate calculations for Illinois rivers permanently or even intermittently subjected to an East Texas climate, it has failed to provide any hard science to back up its dilution claims. Without these actual calculations, its conclusions are unfounded. (0716-12 [Kraft, Dave])

Comment: p. 4-18 to 4-20. Climate Change. This is not a resource area. "The NRC's evaluation of the effects of climate change on the intensity and frequency of natural phenomena hazards that may cause spent fuel storage accidents is provided. Comment: The assessment is not related to environmental impacts of climate change, only to increased hazards, which occur also with man-made climate change phenomena. The impacts described are related entirely activities that increase atmospheric GHGs, which are (correctly) dismissed as "Small". The section does not consider environmental impacts resulting from the effects of climate change on ISFSI facilities and their constituent dry storage casks. The integrity of dry casks is based on extremely limited data on performance of one cask in one geographic/climate setting, and then extrapolated for a period of 100 years to all casks of whatever design, located in whatever climatic zone. This matter puts the use throughout this GEIS of "reference models" of various continued storage components on a very shaky basis, and dilutes actual potential environmental impacts with a host of assumptions rather than facts. Buttressed by a large assortment of regulations that ensure permanent protection of the integrity of constructed systems managed by humans, leads directly to an assessment of "SMALL" unspecified environmental impacts. (0805-7 [Wilshire, Howard])

Comment: During the public comment period, there were a number of concerns expressed about the possibility that climate change might cause spent fuel storage sites to experience conditions beyond those considered in the GEIS. Those concerns tended to focus on the effects of sea level rise at coastal sites. It should be noted that sea level rise, while widely documented, is not occurring at a rate that would compromise the ability of those who manage spent fuel storage facilities (ISFSIs) to continue to assure their safety. Even the most extreme scenarios postulated in recent climate studies indicate sea level rise will occur at a pace of less than 10 mm/year.⁹³ [footnote 93 text: Intergovernmental Panel on Climate Change, *Climate Change 2013: The Physical Science Basis*, Working Group I Contribution to the 5th Assessment Report of the Intergovernmental Panel on Climate Change, October 2013.] At this rate, ISFSI licensees will have ample opportunity to prepare and take necessary mitigative actions (including the movement of casks to higher ground, if necessary). Such measures will be addressed, as required by NRC regulations, in license renewal applications that will be submitted every 20 to 40 years for as long as the casks are in service. (0827-4-2 [Ginsberg, Ellen])

Comment: In addition to making weather events more severe, climate change is increasing water scarcity, giving us yet another reason to move away from fuel pools as rapidly as possible: we simply cannot be sure that water of sufficient quantity will be available in the case of accident. (0864-13 [Gellert, Sally Jane])

Comment: Re: Page 4-20, Section 4.5.3, Indefinite Storage, indefinite could mean forever. So that rate of CO₂ emission X infinity = infinity, which isn't good for the climate, that much greenhouse gas emission! (0919-7-2 [Kamps, Kevin])

Comment: The impact from the spent fuel storage on climate change is indicated as small. The impact from climate change on the storage facilities should be evaluated instead. For instance, for facilities located in coastal and estuarine areas the increased rate of sea level rise coupled with the potential increase in storm frequency due to climate change will make these facilities more prone to flooding and loss of power, such as occurred from Sandy. Facilities in the inner parts of the country may experience more severe droughts which would put greater strain on local aquifers and change the ground water flow in and around these facilities. It is likely that when most or all of the current power plants and storage facilities, including those in the coastal or estuarine areas, were designed, there was never any concern for sea level rise or climate change over the life of the plant, even though it was known that both were occurring. (0920-13 [Foster, Ruth])

Comment: Lines 2 to 4 indicate they are using the License Renewal GEIS (NRC 2012) as the baseline which for the climate. That document used data from 1971 to 2000. The most significant changes in climate have occurred since 2000 and now more scientists realize that climate changes over the next hundred years will be most significant than the changes that were experienced up until 2000. Also the effect of climate on sea level changes will be greater than predictions from before 2000. Change in climate will have significant impacts on surface-water and ground water in most areas of the country. (0920-26 [Foster, Ruth])

Comment: [T]he effect of the operation on climate change is examined; but not an impact assessment of climate change on storage facility. For instance, sea level rise will have an impact on facilities near the coast or on estuaries. (0920-29 [Foster, Ruth])

Comment: The dangerous and unpredictable effects of global warming on all aspects of the nuclear industry must be taken into account. Nuclear power is not green. The chain of events that leads to the creation of nuclear fuel is very carbon intensive. The disposal and

decommissioning of nuclear reactors is a carbon cost that is not often calculated into the footprint of reactors. Nuclear power routinely emits radioactive carbon. Sea levels are rising; extreme weather events are increasing in frequency; and catastrophic damage to nuclear stations becomes even more likely. (0938-11 [Sondheim, Steven])

Comment: We have had many smaller accidents in the US due to weather. As we all know, global climate change will be bringing us much, much stronger storms, hurricanes, tornados and floods. (1001-1 [Goudeau, Terry])

26. Comments Concerning Geology and Soils

Comment: The "cure" for offsite soil and groundwater contamination is ensured by regulation and monitoring, which translates to a "SMALL" assigned impact. However, migration of contaminants in soils involve soil biota and biota all the way up the predatory scale, which can lead to distant off-site migrations. The preparers of this document need to study Hanford's remarkable history of biological pathways for spread of contaminants. The ready dismissal of leaking storage facilities is not warranted by their commonplace occurrence in nuclear power plant facilities. (0553-8 [Wilshire, Howard])

Comment: The NRC concludes in Section 4.6 of the DGEIS that the environmental impacts on geology and soils from continued storage of spent fuel would be "SMALL" (pool and ISFSI; all timeframes). However, this would depend on site-specific factors, including the soils present at each location (and general geomorphology for coastally-sited plants), the sites' vulnerability to erosion, the amount of fuel stored in pools, and the type of storage facility being planned. (0622-2-1 [Vale, Karen])

Comment: Furthermore, the NRC should not only consider the impact of storing spent fuel in ISFSI on the geology and soil, but also the impacts that varying soil types would have on the long term stability - and therefore the risk for a potential accident - of a plant's ISFSI. For example, "variable and erratic sandy soil" has been described at Entergy's Pilgrim plant in Plymouth, Massachusetts, with dense and compact material located below a depth of about 35 ft.⁷ [footnote 7 text: Department of Public Health, Environmental Toxicology Program. June 25, 2010. Memorandum: Status of Groundwater Monitoring Program at Pilgrim Nuclear Power Plant.] The impacts that sandy soil types might have on the stability of an ISFSI should be assessed by the NRC. (0622-2-3 [Vale, Karen])

Comment: p. 4-20 to 4-21. Geology and Soils. "Continued spent fuel pool operation is not anticipated to increase impacts on local geology and soils," but "spent fuel leaks could result in radiological contamination of offsite soils." **Comment:** The "cure" for offsite soil and groundwater contamination is ensured by regulation and monitoring, which translates to a "SMALL" assigned impact. However, migration of contaminants in soils involve soil biota and biota all the way up the predatory scale, which can lead to distant off-site migrations. The preparers of this document need to study Hanford's remarkable history of biological pathways for spread of contaminants. The ready dismissal of leaking storage facilities is not warranted by their commonplace occurrence in nuclear power plant facilities. (0805-8 [Wilshire, Howard])

Comment: Re: Page 4-20, Section 4.6, Geology and Soils, lines 26-28, NRC states "the NRC expects that most soil contamination from spent fuel pool leaks would remain onsite and, therefore, offsite soil contamination is unlikely to occur. Therefore, the NRC concludes that the environmental impact of spent fuel pool leaks to offsite soils (i.e., outside the power plant's

exclusion area) would be SMALL." This is preposterous. What about the leaks already documented?! NRC lists such pool leaks in Table E-4 on Page E-20. The leaks at Hatch in GA, Indian Point 1 & 2 in NY, Palo Verde in AZ, Salem 1 & 2 in NJ, San Onofre in CA, Seabrook in NH, and Watts Bar in TN, NRC admits have released radioactive liquid to the environment. Now NRC claims offsite soil contamination is not likely to occur?! As David Lochbaum of UCS points out in his expert witness commentary, the Brookhaven National Lab pool leak should have been included in Table E-4, or at least somewhere else in this DGEIS, rather than being left out. So too should have the Yankee Rowe pool leak. This growing list of pool leaks to the environment across the U.S. has included serious contamination of groundwater, and hence, soil. (0919-7-3 [Kamps, Kevin])

Comment: This section evaluates the storage impact on geology. They are not evaluating the impact of the geology on the continued storage. They are not considering any new theories, data collection, mapping of the local and regional geology around a facility and how that would impact the original estimations of the potential severity of such natural disasters such as landslides, earthquakes or sinkholes at a facility. (0920-14 [Foster, Ruth])

Comment: Lines 26 to 28 indicate that facilities are designed and built on natural or engineered strata to ensure that no safety-related facilities are on unstable material. Lines 12 to 20 indicate that the seismic hazards of the regions form the design basis for the spent fuel pools and dry cask storage systems. Lines 23 to 25 indicate that the general characteristics are discussed in this GEIS, the License Renewal GEIS and the impact statements prepared for the initial-construction and operation of the plants. This section indicates no use of more modern interpretations of the local or regional geology or a review of changes in seismic hazard ratings for the area which would be based on data obtained since the earlier plants were built. The reinterpretation of the geology of a region based on modern geologic mapping done since the 1980's to the current time is allowing hydrogeologists to better map and understand the aquifers of the various regions of the country. (0920-27 [Foster, Ruth])

Comment: By use of this GEIS's, the NRC is essentially refusing to allow any modern information on the geology and ground water interpretations at a facility when they evaluate continued storage or license extensions. (0920-32 [Foster, Ruth])

27. Comments Concerning Hydrology

Comment: We already have more than 100 reactor sites with ground water contaminated through routine operations. (0023-7 [Bridges, Martha])

Comment: The EIS must address reactor need for water and consequences related to the use of that water. Nuclear reactors use large amounts of water to cool their reactor and to keep the fuel pool stable. In California the consequences of the enormous amount of water needed in the reactors for once-through cooling were recognized. This led to concerns about dwindling water resources that resulted in statewide mandates to reduce the amount of sea water being used by all the energy plants. Water is a scarce commodity in many parts of the United States. Global warming continues to decrease the river and lake levels needed to cool reactors. (0030-21-6 [Carberry, Mike])

Comment: Then when later faced with a high-level nuclear permanent storage in the granites in western North Carolina and Raleigh area, I knew there were possibilities that this would be a major problem with ground water. Now with this issue taking place in the Northwest, we need to have some control for such a potentiality. (0079-1 [Pittillo, Dan])

Comment: In our area we face major water issues. The Draft GEIS does not address water safety issues as reactor site specific and does not include the necessary data collection needed to take a realistic look at our situation. Here are only a few examples: The Nuclear power stations, Catawba and McGuire give us 4 nuclear reactors located on drinking water reservoirs within 20 miles of downtown Charlotte. They are the largest water users on the Catawba River, a river that has been ranked the 4th most stressed river in the United States by the Union of Concerned Scientist and made the The Southern Environmental Law Center's list of the top ten most endangered places in the Southeast. Other reports are quoted: by 2040 there will not be enough water in The Catawba River to meet all of the water demands. Most individuals do not realize that more water is used to generate power for their home than is directly used in the household." The Oconee Nuclear station shut down on Oct 24 due to water issues. This plant faces serious damn issues and has had 14 high level violations since 2000. It took an NRC whistle-blower for Duke or the NRC to do anything about it! And the proposed WS LEE nuclear plant : Duke has had to build up massive ponds as a band-aid approach to resolve the serious lack of cooling water from the Broad River. The Broad is a small river that dries up in the summer so much you can just walk across the rocks. Yet Duke and the NRC think it is okay to build just 20 miles downstream of Cliffside Coal, the largest coal plant in the south, and upstream from the 3 reactors that will be at VC Summer near Jenkinsville. We want you to have the same logic as the court and keep the ban on licensing new power plants. For the sake of time for speaking...we all know the importance of water when it comes to fuel pool storage and radioactive waste. (0145-1 [Sorensen, Laura])

Comment: I am also very concerned about the amount of water that is being used to cool these nuclear reactors. We are in a period of heavy drought and they have had to shut down nuclear reactors because of too little water as well as too much water. It requires water. Guys, come on, let's be real about this. (0246-27-3 [Gerleman, Doug])

Comment: With evidence that uranium mining contaminates waterways and water tables, and with the fact that dry casks at several storage facilities around the world, including the United States, have been leaking into these water tables by trillions of tons of nuclear waste. (0326-45-3 [Baker, Crystal])

Comment: I have been reading through the GEIS book. Of course, it's 500 whatever pages. So, so far I haven't been able to find anything, in particular, dealing with the temperature of water. I think there should be a concern. I noticed at Dominion's North Anna site, they said that like the lake that they used to cool the reactors, the other day, it was at 50 degrees when it goes in and when it comes out. They said it's typically 14 degrees, but it was coming out at 76.1 degrees. So that was actually 26.1 degrees hotter and, obviously, dealing with climate change. I'm just wondering how or maybe I haven't gotten to it yet, but I haven't been able to find anything yet talking about the issues of water, in particular, cooling the reactors and as well as water usage, how, you know, how the impacts are from all the water that is used because, obviously, I guess, in the cooling process, a lot of it is turned to vapor. So the water issues -- and I haven't been able to find anything dealing with that. I realize that in parts, it was talking about, you know, in particular, with the spent fuel pools and the dangers of a drain-down or leak, but is it addressed? Maybe I haven't seen it, but what if we lose Lake North Anna and we lose the dam and we lose the water? I don't think we have water that is being piped in in the quantities that we need it if there was a diversion of the water. That is a manmade lake. So I have concerns with the water as well. I can't seem to find anything on the water issues other than the spent fuel pools themselves. So I don't know if there is something there or not. (0329-35-1 [Gray, Susan])

Comment: Off-site waste at other sites are projected to have significant adverse long-term impacts on the groundwater, which ultimately impacts other bodies of water (0377-3-2 [Cuthbert, Lewis])

Comment: The NRC apparently did not do a very exhaustive review, because the assertion that surface waters in the vicinity of nuclear power plants are usually [emphasis added] large and therefore ensures dilution to levels well below those considered safe is incorrect. The lesson that large amounts of water will not dilute contaminant streams has been demonstrated for decades. At Hanford it was shown long ago the migration of radionuclides and other toxic substances into the Columbia River were concentrated by biological uptake to concentrations far higher than river water. The ultimate fate of these contaminants is the important question, which is not addressed in this GEIS. Furthermore, climatic impacts have shown both in the US and France that reactors located on and dependent on inland rivers have been shut down due to drought limiting the supply of cooling water. Use of the word "usually" also implies conditions where the surface water supplies are not large-they would be even more vulnerable to effects of drought. In addition, the account above admits the uncertainties of rates of leakage from SNF pools, direction and rate of groundwater flow, and distance to offsite waters. We cannot predict future risks from the toxic and radioactive wastes in the environment with any confidence because we do not know all of nature's pathways. (0553-9 [Wilshire, Howard])

Comment: Despite the conclusion that the risk and/or magnitude of potential impacts would likely be small, minimized or avoided, DNR is concerned about the potential impact to natural resources in the event that a permanent repository is not approved, particularly contamination of surface and groundwater resources. Although the risk of serious contamination events may be low, the potential impact could be severe, difficult to mitigate, and of long duration. (0560-1 [Vejdani, Vivianne])

Comment: When considering groundwater quality and use, the DGEIS completely excludes the Plymouth-Carver Sole Source Aquifer (PCA) and the glacial moraine of Plymouth, Massachusetts (where Pilgrim is located). The Northeast region's PCA and glacial debris influences environmental characteristics, including water temperature, pH, salinity, soil type, and other important attributes of regional peculiarity that are likely to impact the storage of nuclear waste, as well as be vulnerable to contamination from that storage. (0622-2-12 [Vale, Karen])

Comment: It's also inaccurate for the NRC to assume "SMALL" impacts when the factors involved vary at each groundwater contamination incident. For example, the amount of contamination is never the same in each incident, soils and environmental factors differ, groundwater flows differently at each site, the chemical properties of materials potentially released can differ, etc. Site specific assessment would have to be done to determine the real potential impacts of contamination of groundwater use and quality. (0622-2-14 [Vale, Karen])

Comment: Section 4.8 also does not properly address impacts to drinking water quality. Many nuclear plants are located on drinking water aquifers, and many have negatively impacted drinking water sources. For instance, the fuel pool at Brookhaven National Labs (New York) had leaked tritium, undetected, into the drinking water aquifer for twelve years.¹⁸ [footnote 18 text: U.S. General Accounting Office. 1997. Information on the Tritium Leak and Contractor Dismissal at the Brookhaven National Laboratory] And Pilgrim's tritium leaks are occurring on the PCA, which supplies drinking water for individual residents and several southeastern Massachusetts towns. (0622-2-15 [Vale, Karen])

Comment: Section 3.6 claims that the provisions of the Clean Water Act (CWA) and issuance of "NPDES permit terms may not exceed 5 years" will regulate the discharge of pollutants into waters of the U.S. However, at Pilgrim, the NPDES permit is 17 years out-of date, and there are discharges that are not being regulated as set out in the CWA. The DGEIS does not even mention this failure or how the CWA regulations are applied throughout the country at other nuclear facilities. (0622-2-5 [Vale, Karen])

Comment: In Section 4.7, the DGEIS states that, for pool storage, most environmental impacts to surface-water resources will cease due to the end of reactor operations, and that there will be a 99% reduction in cooling-water demand. However, some water use would still occur and there doesn't appear to be adequate information available to make a "SMALL" impact determination. For example, even currently, the NPDES permit for Entergy's Pilgrim plant in Plymouth, Massachusetts is based on limited field data and outdated science. As stated above, Entergy's NPDES permit for Pilgrim expired in 1996. The NRC cannot assume "SMALL" impacts based on less water use, if the impacts are not clearly known for current full-operation water use. Even based on Pilgrim's site-specific license renewal EIS, impacts to the marine environment were considered "MODERATE" for some species and "SMALL TO MODERATE" for others. (0622-2-6 [Vale, Karen])

Comment: The DGEIS states that incidents of radioactive contamination of groundwater would have a "SMALL" impact on surface water; that the large volume of surface water available would dilute groundwater contaminants "well below limits considered safe." However, despite the ocean's capacity to dilute radiation, nuclear isotopes persist and move up the marine food chain -evident in the marine life near the Fukushima Daiichi accident; the full impacts on marine life - and human life - are still unclear.¹² [footnote 12 text: Grossman E. 2011. Radioactivity in the ocean: diluted, but far from harmless." Yale Environment 360.] (0622-2-7 [Vale, Karen])

Comment: Further, it is inaccurate for the NRC to assume "SMALL" impacts when the factors involved vary at each facility/location in the U.S. For example, the amount of contamination is never the same in each location since soils and environmental factors differ, groundwater levels and flows are different at each site, the chemical properties of materials potentially released can differ, and most importantly, the fate of those contaminants on local resources will vary greatly. A site specific assessment would have to be done to determine the real potential impacts of groundwater contamination on surface water. (0622-2-8 [Vale, Karen])

Comment: In addition, the cumulative impact assessment in the DGEIS is also legally and factually deficient because it does not include an assessment of the combined impacts of future spent fuel pool leaks and leaks of radioactive water from other plant systems that are likely to increase the levels of groundwater contamination at Indian Point, and potentially at other reactor sites around the country. In its description of Groundwater Quality and Use, the DGEIS references the numerous instances of groundwater contamination from operating reactors, stating as follows: There are 65 locations in the United States where commercial nuclear power plants are operating. Records indicate that, at some time during their operating history, 42 of these sites have had leaks or spills involving tritium concentrations in excess of the 20,000 pCi/L drinking water standard established in the Safe Drinking Water Act. Nineteen sites are currently reporting tritium concentrations, from a leak or spill, in excess of 20,000 pCi/L onsite.⁵⁵ [footnote 55 text: DGEIS, Section 3.7 at 3-19.] Remarkably, Section 6.4.8 of the DGEIS, which addresses Cumulative Impacts to Groundwater Quality and Use, fails to mention or integrate this information into its assessment, completely ignoring the obvious significance of such information to this part of the required NEPA analysis.⁵⁶ [footnote 56 text: *Id.* at 6-28, 6-29.] The failure to assess the cumulative impacts of spent fuel pool leaks and other facility leaks to

groundwater renders the DGEIS legally and factually flawed. (0710-22 [Brancato, Deborah] [Musegaas, Philip])

Comment: Further, even though the groundwater at Indian Point is not used for drinking water purposes, it is designated under state law as “GA fresh groundwaters”²⁰ [footnote 20 text: 6 N.Y.C.R.R. §§ 701.18, 701.15; See Entergy’s Detailed Responses to the New York State Department of Environmental Conservation’s Request for Information, dated May 13, 2009) at 8, *available at*, http://www.dec.ny.gov/docs/permits_ej_operations_pdf/elecbrdrdetresp.pdf.] which NYSDEC requires to be suitable “as a source of potable water supply.”²¹ [footnote 21 text: 6 N.Y.C.R.R. § 701.15; Potable water” is defined as “those fresh waters usable for drinking, culinary or food processing purposes.” 6 N.Y.C.R.R. § 700.1(a)(48).] Moreover, a NYSDEC narrative standard applicable to groundwater dictates that deleterious substances not “impair the waters for their best usages.”²² [footnote 22 text: 6 N.Y.C.R.R. § 703.2.] So, the groundwater beneath Indian Point must not be impaired for use as drinking, culinary, or food processing water, notwithstanding whether the groundwater is *actually* used for such purposes. (0710-5 [Brancato, Deborah] [Musegaas, Philip])

Comment: The NRC contemplates that these pools may remain in use for 60 years after reactor operation ceases, where they will remain vulnerable to fires and also to leakage of tritium and other radioactive materials to soil and groundwater. The Union of Concerned Scientists has documented that 100 reactors in the USA already have leaks that threaten or have already caused ground water contamination. See: http://www.ucsusa.org/nuclear_power/reactor-map/embedded-flash-map.html. While we appreciate the ground water disclosures in GEIS Section 3.7 (pages 3-16--3-20) there is no recognition in the that discussion of the long-term issues associated with locating 70,000 metric tonnes (and growing) of highly radioactive spent nuclear fuel on top of ground water for an unbounded period of time. Every site has ground water. It is a violation of the National Environmental Policy to fail to answer these basic questions both generically and at each specific site. Adopting a generic waste confidence rule could prohibit in specific licensing proceedings, the opportunity to address groundwater contamination questions due to irradiated fuel. This is even more egregious when the generic draft EIS fails to even consider them, which is the case with this one. (0711-21 [Olson, Mary])

Comment: Where is the analysis of the potential for groundwater impacts over time? (0711-35 [Olson, Mary])

Comment: Further, decisions about water intake and outflow of surface waters at nuclear plants is NOT under the jurisdiction of the NRC. It resides with the States under the NPDES permitting system. Illinois has historically experienced instances where the Illinois EPA has either curtailed reactor operations, or conversely, granted permit exemptions for thermal discharge into Illinois rivers during severe drought conditions (1988; 2005; 2006). These decisions will be made by the State, not the NRC; and as a result can impact river temperatures, chemical and biological activity, evaporation rates, recharge and other factors - many of which affect whether dilution as NRC envisions it would occur. We see no evidence in NRC’s DGEIS that this has been taken into account. (0716-13 [Kraft, Dave])

Comment: p. 4-21 to 4-24. Surface-Water Quality and Use. Consumptive use of surface water is dismissed as unimportant after license expiration and ending of plant operations, which absorb most of the surface water needs. “Surface water quality may be affected by groundwater contamination. The NRC has completed a review of its overall regulatory approach to groundwater protection (NRC 2011b). The NRC started this review in response to recent

incidents of radioactive contamination of groundwater and soils at nuclear power plants. Contaminated groundwater at some sites may discharge to nearby surface waters, resulting in indirect effects on surface-water quality. The concentrations of radionuclides in offsite surface waters would depend on the rate of release from the spent fuel pool, direction and rate of groundwater flow, the distance to nearby offsite surface waters toward which groundwater flows, the velocity or transport rates of radionuclides through the subsurface and radioactive decay rates. However, because surface waters in the vicinity of nuclear power plants are usually large to meet reactor cooling requirements, a large volume of surface water is usually available to dilute groundwater contaminants that flow into the surface waterbody. This dilution ensures that contaminants that may have been present above applicable groundwater-quality standards are diluted well below limits considered safe." Comment: The NRC apparently did not do a very exhaustive review, because the assertion that surface waters in the vicinity of nuclear power plants are usually [emphasis added] large and therefore ensures dilution to levels well below those considered safe is incorrect. The lesson that large amounts of water will not dilute contaminant streams has been demonstrated for decades. At Hanford it was shown long ago the migration of radionuclides and other toxic substances into the Columbia River were concentrated by biological uptake to concentrations far higher than river water. The ultimate fate of these contaminants is the important question, which is not addressed in this GEIS. Furthermore, climatic impacts have shown both in the US and France that reactors located on and dependent on inland rivers have been shut down due to drought limiting the supply of cooling water. Use of the word "usually" also implies conditions where the surface water supplies are not large--they would be even more vulnerable to effects of drought. In addition, the account above admits the uncertainties of rates of leakage from SNF pools, direction and rate of groundwater flow, and distance to offsite waters. We cannot predict future risks from the toxic and radioactive wastes in the environment with any confidence because we do not know all of nature's pathways. (0805-9 [Wilshire, Howard])

Comment: I will concentrate on Ohio's reactors with which I am most familiar, but these comments pertain to virtually every light water reactor in the United States. 1) "Sites should be avoided where ... known natural resources may negatively affect the ability of the disposal site to meet the performance objectives." All U.S. reactors which sit on potable or environmentally sensitive bodies of water were never intended as radioactive waste sites. Perry and Davis Besse were built on Lake Erie, part of the world's largest fresh water system, source of drinking water for millions of people. (0819-17 [Kline, Connie])

Comment: 2) "A prospective site must be well-drained and free of flooding or frequent ponding." Davis Besse was built in a marshy wetlands subject to frequent flooding, including a 1972 Lake Erie storm that broke 300 feet of dikes, submerging the entire plant site including the reactor building which, fortunately, was pre-operational. People had to be airlifted or rescued by boat; cars were unsalvageable. I have included aerial photos taken of the Davis Besse three days after the flood which show the site still submerged despite some recession of water. (0819-18 [Kline, Connie])

Comment: 3) "The disposal site should be located far enough above the water table to prevent groundwater intrusion." According to the 1983 Perry FSAR, "Observations made in the test borings at the site indicated groundwater levels usually ranging from three to five feet below the ground surface in the main plant area... In the vicinity of the Perry site, many residential users obtain their water supplies from shallow wells." Perry has an intricate drainage and sophisticated "sump pump" system due to the high groundwater table. As early as 1992, "Radiological Occurrence Report ROR-92-0023" revealed that a stream which borders Perry

and leads to Lake Erie, was radioactively contaminated due to accidental spills and leakage that went undetected for 3 years. (0819-19 [Kline, Connie])

Comment: The common concern has always been that the waste will not be removed from our reactor sites, all of which sit on or close to the banks of the Mississippi River. No river maintains a single course over hundreds of years. And any release, leak or failure to isolate wastes for any period of time, will have "disasterous" consequences. (0820-3 [Eide-Tollefson, Kristen])

Comment: To the general public the conclusion that permanently stranding waste at reactor sites across the country, on major waterbodies - has "small" environmental effects, is absurd. The conclusion of "small impacts" in the chart, is possible only because of the Analytic Assumptions (0820-9 [Eide-Tollefson, Kristen])

Comment: Leakage from some sites may reach and contaminate groundwater quicker due to unique vulnerabilities in the environment, such as very high water tables, proximity to streams and lakes, proximity to ground water, vulnerability to flooding, risks of tsunamis and high waves, and more. Such vulnerabilities that generate leaks or expand leaks will likely cause significant adverse impact upon environment and humanity; a good scientific analysis would attempt to quantify probability ranges for each type of significant impact with differing characteristics, including drinking water sources for humans and wildlife. (0823-32 [Michetti, Susan])

Comment: Scientific thinking recognizes that water molecules migrate in plumes, often in specific directions, depending on the factors of attraction and repulsion in operation at all levels of the physical world. Scientific thinking recognizes that it is merely a matter of time when migration off-site will occur. To dismiss migration off-site with insufficient consideration fails to apply measurements of plume migration of contaminated water on a timeline. Scientific analysis requires the information for each leaked isotope to be plotted into a future timeline based on all known factors that might impact that migration map. (0823-41 [Michetti, Susan])

Comment: GEIS Section 4.7.1.1: NRC has appropriately determined that "impacts on surface water consumptive use from the continued storage of spent fuel in spent fuel pools will not be detectable or be so minor that they would not be destabilizing." (GEIS 4-22). NRC's basis for this - that cooling water demand would be significantly reduced after reactor operations have ceased - is correct. As an example, data from the recently shut down Crystal River Unit 3 indicate that total raw water flow (circulating water plus service water) from the ultimate heat sink through the plant when it was operating was about 690,000 GPM. About 2,000 GPM (0.3%) of this water is used to cool spent fuel via the spent fuel pool heat exchangers. (0827-7-26 [Ginsberg, Ellen])

Comment: Clean Water Act National Pollutant Discharge Elimination System (NPDES):] Page 3-16, line 33 -Insert the following sentence after the sentence ending in "water quality-based limits." "The technology-based limits applicable to nuclear power generating plants are cited at 40 CFR Part 423." Page 3-16, line 34 -Insert the following parenthetical phrase after the "not to exceed 5 years": "(unless administratively continued)" Page 3-17, line 8 -Add the following sentence: "The intake of cooling water from waters of the US is regulated under Clean Water Act Section 316(b), and the thermal component of any effluent discharges from power generating plants may be regulated by either the applicable state water quality standard or by Clean Water Act Section 316(a)." (0915-12 [Bromm, Susan E.]

Comment: Re: NRC's statement, on Page 3-18, lines 33 and following, that "Where shallow aquifers are immediately underlain by thick, impermeable shale or massive, unjointed carbonate strata, there is likely little or no hydraulic connection with deeper, regional groundwater flow

systems."...this, of course, is entirely changed, in ways that are difficult to track, by the fracking free for all underway in many parts of the U.S. U.S. hydrogeology is being changed, in a major way, that is little understood, in many regions. NRC has not addressed the interplay between fracking and the new risks to irradiated nuclear fuel storage this represents. (0919-5-15 [Kamps, Kevin])

Comment: Re: Page 4-24, lines 21 to 25, NRC states "The NRC concludes that the potential consumptive use and surface-water quality impacts from continued ISFSI operations would be minimal. Consumptive use of surface water for ISFSI replacement and DTS construction, operation, and replacement would involve amounts of water that are a small fraction of water use during reactor operations. Therefore, the NRC concludes that the potential impacts on surface-water use and quality for the long-term storage timeframe would be SMALL." NRC seems to be attempting to justify future, and ongoing, impacts, by pointing to past impacts that are even larger in magnitude, essentially arguing that long-term and even indefinite impacts are SMALL by comparison. This is an unacceptable attempt to "normalize" radioactivity and other impacts. And the only way NRC can get away with this paper game is to assume that dry cask storage replacements will happen, and will go smoothly. Those are indefensible assumptions. Essentially, NRC is making the absurd argument that impacts - whether in the so-called "short," long, or even forever term - are essentially zero. Zero X forevermore = zero, NRC absurdly reasons. Of course, the impacts are greater than zero. And any value greater than zero X infinity = infinity, unfortunately. (0919-7-10 [Kamps, Kevin])

Comment: Re: Page 4-46's NRC's statements, re: NPDES, RCRA, and SDWA, lines 36 to 40, re: nonradiological contaminants, amount to rosy, overly optimistic assumptions. What could possibly go wrong? NRC seems to be saying. It is not a conservative, protective, precautionary approach to the risks. Casting further doubt on NRC's over optimism, the diesel spill at Braidwood, IL, eventually led to the discovery of the massive tritium spills there (which had been covered up for a decade, with the complicity of the IL EPA and NRC). Also, sodium fires and tritium spills have occurred at Fermi 1, as recently as 2008 - remarkably, 42 years post-meltdown, and 36 years post-shut down; in addition; decommissioning continues, after 41 years. (0919-7-13 [Kamps, Kevin])

Comment: At Page 4-22, lines 9-11, NRC states "consumptive water loss per 1,000 MW(e) for different cooling systems used at operating power plants ranges from 8,100 gpm for plants that use once-through cooling system to 14,000 gpm at plants with mechanical draft cooling towers (NRC 2013a)."--I'd have thought cooling towers would mean LESS consumption than once-through? Can NRC explain why this is? (0919-7-4 [Kamps, Kevin])

Comment: Re: NRC's statement on Page 4-23, starting at line 20, "As passive, air-cooled storage systems, ISFSIs do not consume water and they generate minimal liquid effluents that may be discharged to surface waterbodies during normal operation. For example, in its consideration of water-use impacts for the renewal of the Calvert Cliffs ISFSI, the NRC determined that both direct and indirect impacts would be SMALL (NRC 2012a)." (emphasis added) What about OFF normal conditions?! (0919-7-7 [Kamps, Kevin])

Comment: On Page 4-24, line 3, NRC states "During ISFSI demolition, a small amount of water could be sprayed from water trucks to minimize dust clouds."...What about the radioactivity in the dust, then entering into the runoff, flowing into the soil and groundwater and surface waters?! (0919-7-8 [Kamps, Kevin])

Comment: Similarly, at lines 16-17, NRC states "During [DTS] operations, water would be brought to the facility by tanker truck or temporary connection to public water supply for general purpose cleaning and canister decontamination." (highlight added)"Again, what about the radioactivity in the dust and runoff?!" (0919-7-9 [Kamps, Kevin])

Comment: Ground water and geology are inseparable since aquifers are geologic materials and should be examined together. Changes in geologic interpretations affect how a ground water flow system may be interpreted. In addition, research into contaminate transport combined with three dimensional computer modeling using modern geologic mapping completed since the 1980's provide a better understanding of the ground water flow at a facility than the geologic and ground water reports completed from before the facility was constructed. Based on information obtained during the ongoing tritium contaminated ground water cleanups at two of the New Jersey plants, the original geology and ground water reports for the plants, as well as early company consultant reports after the leaks were identified did not reflect actual ground water flow systems. In each case, it was stated that the clay layers would prevent the tritium from moving into the deeper aquifer, but in both cases these clays did not prevent the contamination from migrating down into a deeper aquifer. (0920-31 [Foster, Ruth])

Comment: p. 4-26-- Lines 32 to 34 indicate "Except for a few substances (e.g., diesel fuel), these hazardous spills are often localized, quickly detected, and relatively easy to remediate NRC 2002b)." Based on an extensive number of ground water cleanups which have been done in New Jersey and contrary to what is stated here, the hydrocarbon (diesel and gasoline) cleanups generally are easiest, whereas ground water cleanups of other contaminants have taken tens of years and are not yet complete. (0920-35 [Foster, Ruth])

Comment: p. 4-28 in part 4.8.1.--In lines 15 to 19, NRC concludes that the short-term storage of the spent fuel in the spent fuel pools and ISFSI's impact would be SMALL for water use and quality. Without utilizing any up-to-date data along with current geologic interpretations of the local geology and ground water evaluations, not the studies from 40 or more years earlier when the facility was being designed, it is impossible to accurately assess these impacts. For instance, for the Oyster Creek plant, between the time construction started until today the ground water use within the ten mile radius of the plant has increased from about 150,000 gallons per day to over 15 million gallons per day, not including any industrial or agricultural water pumpage. In New Jersey, ground water pumpages has changed the flow from being toward local streams and rivers to the streams and rivers recharging the aquifers and the ground water flow is toward the pumping centers. (0920-36 [Foster, Ruth])

Comment: Section 6.4.8, p. 6-30--Lines 33-35 indicate that NRC has determined that the incremental impacts on ground water from continued storage would be minor compared to trends such as climate change. The problem with these assessments is that they do not take into account the fact that the impact of each plant site on groundwater near the plant is site specific, yet they are generalizing. For plants such as Oyster Creek, the ground water pumpage from the water table to shallow semi-confined aquifer are orders of magnitude greater than at most other US nuclear power plants. When the plant shuts down to be decommissioned, and the large circulation pumps stop pumping, the local ground water to surface water flow system will change. With large pumping centers just outside the plant boundaries of Oyster Creek, the ground water flow can be away from the surface water body toward the pumping centers, not toward the surface water body as the NRC uses in scenarios. (0920-38 [Foster, Ruth])

Comment: This section stresses that for any leaks at a plant, the contaminated ground water will flow to the nearby body of surface water and any will not contaminate any offsite public wells. Without looking at the modern demographics around a plant and current ground water use, this mere conjecture, not science. Again, in New Jersey, Oyster Creek had a small population and little ground water use when the plant was built. Now the population and ground water use within 10 miles is significantly greater. At Oyster Creek and Salem the tritium has migrated downward into deeper aquifers, a scenario not taken into account in any of the discussions found in the document. (0920-47 [Foster, Ruth])

Comment: The potential for spent fuel pool leaks (and other leaks of radioactive liquids) to impact deeper aquifers, separated from the shallow unconfined aquifers by low-permeability confining layers, is overly minimized here. Recent experience at nuclear power plants in New Jersey has demonstrated that the probability that tritium contaminated water released into shallow unconfined aquifers will ultimately reach deeper confined aquifers is much greater than previously predicted. Construction activities typically associated with nuclear power plants, such as deep excavations for building foundations and other structures, and the installation of cofferdams to support dewatering operations, can significantly alter site hydrological conditions. An unintended consequence of these activities has been the creation of downward pathways through the confining layers into the deeper aquifers. Although these facts do not alter the ultimate conclusions of the GEIS with regard to impact determination, for the sake of completeness and credibility this aspect of site hydrological conditions should be discussed. (0920-6 [Foster, Ruth])

Comment: The EIS must address reactor need for water and the consequences related to that use. Nuclear reactors use large amounts of water to cool the reactor and to keep the fuel pools stable. In California, the consequences of the enormous amount of water needed in the reactors for once through cooling were recognized. This led to concerns about dwindling water resources that resulted in state-wide mandates to reduce the amount of sea water being used by all energy plants. Water is a scarce commodity in many parts of the US. Global warming continues to decrease the river and lake levels needed to cool reactors. (0938-8 [Sondheim, Steven])

Comment: The greatest danger from our current technology is contaminated groundwater. Once the harm is done, there is no recourse. And WATER is a critical daily need to support life--even more essential than electricity! (0977-1 [Maguire, Cynthia])

Comment: Leaching of any kind into our rivers, which provide our drinking water will prove to be disastrous. (0984-1 [Rossin, Linda])

Comment: We also must find ways to keep the Columbia River from contamination and clean up what contamination already exists in the Columbia River and all other rivers in the watershed of all nuclear sites! (0995-1 [Epple, Melissa])

28. Comments Concerning Ecology

Comment: The Impact Statement doesn't adequately address the real consequences and impacts on other organisms, in addition to humans. It is my understanding that you have looked at whether levels, legal release levels, which are based on the Nuclear Regulatory Commission's own -- the nuclear industry's needs. That is how they base 10 CFR 20 concentrations. That if you can make a model and a calculation that projects that doses to

people will be less than this amount, never verified, never proven, that this is okay for the entire environment and that that is dismissed. (0246-2-6 [D'Arrigo, Diane])

Comment: The upcoming 100 years throughout which the NRC claims spent fuel may merrily sit in spent fuel pools of repeatedly relicensed reactors is also a duration that, NRC jargon aside, is neither "short," nor certain. What is reasonably predictable is that these pools will leak and that the total burden of radiation being released into the environment will increase sizably. The evidence comes from an expansive library of studies and reports documenting these leaks. A few of these investigations are dutifully referenced in the GEIS "References" sections. However this GEIS suggests little tends to be learned from "Lessons Learned" reports. As these already past-their-prime spent fuel pools continue to age, they will continue to experience age-related deterioration, and leak more. This is the most plausible sequel scenario. Other radiation effluents which have been disgorged onto the reactor sites and the groundwater must also be taken into calculation. Environmental and biological systems do not abide by the artifice of separately evaluating the impacts of radiation as does the NRC. The problem - given the century of leakings which await us - is that the radiation will be chronically delivered into the environment. The combined and multiplicative effects of the continual delivery of short and long-lived radionuclides the past, present, and future bioaccumulation of long-lived radionuclides pose untenable risks to humans and other biological beings. Add to the calculus the uncertain, but very real, risk of large accidental releases, and the impacts of "Short-Term Storage" storage hardly merit the label: "SMALL." (0341-1-23 [Mermelstein, Richard])

Comment: The NRC evaluates the effect of fuel storage on aquatic organisms. Spent fuel pools continue to be cooled by external sources such as river, lake or ocean water using one-time pass through cooling systems or by recirculated pond water with atmospheric cooling towers. Aquatic organisms sometimes block the circulation and so are killed by the application of pesticides and chemicals. The organisms can also be affected by radioactive materials, such as tritium which contaminates the cooling circuit or simply by heating during transit through the reactor piping. One unintended consequence of this destruction of aquatic organisms is that many of them are essential to carbon fixation as part of the global carbon cycle. Aquatic organisms with carbonaceous skeletons are required to complete the cycle and permanently sequester carbon dioxide by precipitation to the sea floor. These organisms produce an enzyme called carbonic anhydrase, which catalyzes the conversion of dissolved carbon dioxide into carbonate anions. Dissolved carbonate in equilibrium with carbonic acid then combines with calcium cations in the water to produce calcium carbonate which is incorporated into the organism's skeleton, through biological mineralization, much like the process by which bones are formed in humans or shells in clams. When the organism dies it sinks to the sea floor where the skeleton becomes incorporated into great limestone sheets, which are eventually lifted by geological forces back to the surface to become new land masses and parts of continents. Thermal power plant cooling systems can contribute to global warming both by dumping waste heat into the environment and by killing the aquatic organisms which sequester the atmospheric carbon dioxide. Atmospheric carbon dioxide dissolves in both fresh and salt water. This solution process is reversible and depends on the temperature and pH of the water. At higher water temperatures and lower pH less carbon dioxide can remain dissolved unless it is converted to calcium carbonate and precipitated. The reversible solution of carbon dioxide in water creates a global buffering system which regulates the atmosphere concentration of carbon dioxide. The set-point for this buffering system is the equilibrium constant of the carbonic anhydrase enzyme in these aquatic organisms. (0410-18 [Nelson, Dennis])

Comment: Each reactor differs in its proximity to special species & habitats and most significantly to compliance with environmental regulations. For example, Pilgrim's NUREG-1437,

Sup 3 lists: [TABLE 2-4 OF THE PILGRIM LR (NUREG-1437 Sup 3 GOES HERE) [Table Submitted with Correspondence ML13354A021]. Of particular concern at Pilgrim is the North Atlantic right whale, one of the rarest large whales in the world with a little more than 500 individuals remaining. Most of the Bay is critical habitat for right whales. In January 2013, there was an unusual sighting of a mother-calf right whale pair within Pilgrim's 500-yard safety exclusion zone. Reactors vary not only in proximity to aquatic resources and special status species and habitats but in their compliance to applicable regulations so that a generic approach is inappropriate. For example, Entergy's non-compliance with these regulations includes: • No state CWIS permit, as required by 2006 regulations. • Discharge violations: Since at least 1995, discharging toxic corrosion inhibitors without a state or federal permit; chlorine discharge limit violations in 5 of last 12 quarters. • The joint EPA-DEP Clean Water Act "NPDES" permit expired 16 years ago; and although it has been "administratively extended" for 16 years, Entergy has violated its terms since 2000. • The Massachusetts "Section 401 certification" of the NPDES permit is outdated and invalid, given unpermitted discharges of various pollutants and other violations. • Since about 2000, no approved "marine monitoring plan" as required by NPDES permit. • Since 2000, Entergy has refused to cooperate with the required technical advisory committee, which was set up as an "integral part" of the NPDES permit. Entergy is not meeting its obligations: without compliance with this critical provision, the permit is meaningless. • Radioactive tritium is leaking into the groundwater which flows into Cape Cod Bay. • State 2006 coastal zone management "federal consistency certification" is invalid. NRC has taken no action to assure that these permits are updated with requirements followed despite its being brought forward in contentions during license renewal. The environmental impact, post-shutdown may well be entirely different at reactors in states that enforce regulations and at reactors that comply with regulations. (0556-1-20 [Lampert, Mary])

Comment: Environmental Impacts. The Draft GEIS considers only human health impacts and not environmental impacts in general. To begin with, it does not address impacts to the non-human environment. Contamination that is too low to cause disease in humans may affect plants and animals, and even small leaks may grow. In the past, the casual acceptance of leakage has undermined public trust in the NRC. (0556-3-1 [Lampert, Mary])

Comment: Staff also states that it "assumes" the site selection of an away-from-reactor storage facility would be "adjusted to minimize impacts on local resources, including ... special status species and habitats" but NRC also acknowledges "that in some cases avoiding impacts may not be possible."¹⁵ [footnote 15 text: Draft GEIS at 5-3.] If staff recognize that it is unknown whether impacts may be avoided, then staff cannot make any generic findings regarding impacts to local resources. If staff recognize that it is unknown whether impacts may be avoided, then staff cannot make any generic findings regarding impacts to local resources. (0579-11 [Smith, Amanda])

Comment: The Draft GEIS states "[i]t is likely than an away-from-reactor storage facility [like PFS] would also be located in an area away from sensitive perennial and wetland habitats to satisfy laws such as the Endangered Species Act (ESA) and the Clean Water Act (for wetlands);" but that "in some locations sensitive terrestrial features may be unavoidably affected."²⁶ [footnote 26 text: Draft GEIS at 5-26, 27.] The Draft GEIS fails to acknowledge that the intermodal storage facility for PFS was proposed to be located within two miles of the 1440-acre Timpie Springs Wildlife Management Area and the Great Salt Lake where thousands of birds migrate each year.²⁷ [footnote 27 text: See <http://publiclands.org/explore/site.php?id=1401>.] Although vacated, the U.S. Bureau of Land Management denied the PFS request for a right-of-way near the Timpie Springs Wildlife Management Area.²⁸ [footnote 28 text: U.S. Bureau of Land Management, Record of Decision Addressing Right-of-Way Applications U

76985 and U 76986 To Transport Spent Nuclear Fuel to the Reservation of the Skull Valley Band of Goshute Indians (September 7, 2006).] (0579-14 [Smith, Amanda])

Comment: Staff then mention the impacts to terrestrial resources at the PFS facility were determined to be small.²⁹ [footnote 29 text: Draft GEIS at 5-27.] Then staff concluded that the impacts at a storage site would be also small to moderate, "based primarily on the potential impacts of construction activities."³⁰ [footnote 30 text: Id.] It is mere speculation that an away-from-reactor storage facility would be located in an environment similar to the PFS facility - arid desert but with facilities near a wildlife management area and wetlands. NRC cannot support any generic conclusion for terrestrial impacts. (0579-15 [Smith, Amanda])

Comment: Section 4.9 of the DGEIS states that impacts of continued spent fuel storage in fuel pools and ISFSIs (including construction, repacking, and replacement activities) on terrestrial resources would be "SMALL". Again, it seems impossible for a generic EIS to accurately assess the impacts on terrestrial resources at every site, given that the resources (imperiled species, habitat types, etc.) vary extensively at site locations. For example, at the Pilgrim plant, there is both priority and estimated habitat for the spotted turtle (*Clemmys guttata*), which is a Massachusetts state species of special concern, and other sensitive species (although the MA Natural Heritage and Endangered Species Program will not reveal the sensitive species found or potentially found in the area). There is also an area designated as critical habitat for the northern red-bellied cooter (*Pseudemys rubriventris*) on the site. The NRC should use site-specific assessments to determine the impacts of long term storage (pools and ISFSIs) on terrestrial resources. The NRC should also fully assess the impacts of postulated accidents on site-specific terrestrial resources. (0622-3-1 [Vale, Karen])

Comment: The DGEIS (Section 4.10) states that the impacts on aquatic ecology associated with the operation of spent fuel pools would be "SMALL" due to lower withdrawal rates, lower discharge rates, and smaller thermal plumes. However, the impacts from water use of operating plants (Pilgrim for example) have not even been properly assessed, so there is no proper baseline to base this assumption on. To touch upon this point, even currently, the NPDES permit for Entergy's Pilgrim plant is based on limited field data and outdated science, and Entergy's NPDES permit expired in 1996. The NRC cannot assume "SMALL" impacts based on less water usage, if the impacts are not clearly known for current full-operation water use. (0622-3-2 [Vale, Karen])

Comment: To better understand the impacts of continued spent fuel storage (specifically in pools) on aquatic resources, the NRC should carry out site-specific assessments since aquatic resources differ greatly between reactor sites. The Pilgrim plant is located on Cape Cod Bay, which is an ecologically rich ecosystem composed of a diversity of habitats, provides a variety of estuarine and marine species and communities, including fish, shellfish, turtles, marine mammals, plants, and birds.²⁰ [footnote 20 text: Executive Office of Energy and Environmental Affairs (EOEEA). 2008. Ocean planning - draft report of the habitat work group. 75 pp.; Massachusetts Water Resources Authority (MWRA). How healthy is the marine ecosystem of the bays? Factsheet. <http://www.mwra.state.ma.us/harbor/pdf/fqa4.pdf> Accessed 10/10/2012.] Along the coast, Cape Cod Bay is lined with estuarine habitats, primarily salt marsh and tidal flats. Estuaries are among the most productive ecosystems in the world and are vital to the economy and the environment. They provide nesting and feeding areas for aquatic species of plants and animals, including fish and shellfish many of which are commercially important species. The importance of estuaries as "nurseries" for juvenile fish and shellfish has long been recognized. Estuaries are also important filters for pollutants and sediments flowing from rivers and streams in to the sea.²¹ [footnote 21 text: Beck et al. 2003. The Role of Nearshore

Ecosystems as Fish and Shellfish Nurseries. Issues in Ecology No. 11, Ecological Society of America. 12 pp.] (0622-3-3 [Vale, Karen])

Comment: Cape Cod Bay has long been recognized as a valuable and unique resource for the state of Massachusetts. In the early 1970s, the Massachusetts Oceans Sanctuaries Act recognized it as a state ocean sanctuary.²² [footnote 22 text: MA G.L. c. 132A, §§12A-16E&18 - Massachusetts Ocean Sanctuaries Act] Furthermore, in 1985, an eastern portion of the bay was designated by the Massachusetts's Secretary of Environmental Affairs as an Area of Critical Environmental Concern because of the extraordinary natural resources found in the area. A generic EIS cannot accurately determine the impacts of continued spent fuel storage on this unique and important resource. (0622-3-4 [Vale, Karen])

Comment: In Section 6.4.10 the DGEIS states, "LARGE impacts are not as likely but could occur under exceptional circumstances such as if other Federal or non-Federal actions, such as intense fishing pressure or changes in aquatic habitats from climate change, had overlapping impacts with the continued storage of waste that destabilized aquatic resources." As we have stated often in our comments, we are concerned that the NRC has a poor grip on the likely influence of climate change in all its forms on the Pilgrim facility. Warming waters, sea level rise, inundation from storms and increases in groundwater, leaking contamination into groundwater and Cape Cod Bay, unregulated discharges due to an expired NPDES permit, lack of regulatory oversight concerning wastewater and storm water discharges, ongoing impingement and entrainment of marine species, changes to ocean pH -coupled with changes in species composition over time and failure of proper consultation with NMFS and FWS -means that the impacts from long-term storage of spent fuel will have an UNACCEPTABLE LARGE impact upon the fragile aquatic resources of Cape Cod Bay. (0622-3-5 [Vale, Karen])

Comment: The DGEIS (Section 4.11) states that the NRC would be required to reinitiate consultation with the U.S. Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NMFS) if the cooling system parameters change, or if a "take" occurs for a species not included in an incidental take permit, or if a new species is listed under the ESA. However, to assume compliance with this requirement is flawed. For example, NOAA Fisheries (NMFS) concluded informal consultation with the NRC regarding the relicensing of Pilgrim with a "not likely to adversely affect" finding for all species under NMFS jurisdiction, including north Atlantic right whales (*Eubalaena glacialis*). But at that time, the federal agencies only considered Pilgrim's effects on individual, adult whales. However, in January 2012, new information emerged -a right whale mother-calf pair was seen swimming very close to Pilgrim (within the 500 yard exclusion zone). This was the first mother and calf right whale sighting in Cape Cod Bay in January in 27 years, and the only mother-calf pair ever documented occurring near Pilgrim. This new information should have required the NRC and NMFS to reinitiate ESA Section 7 consultation to reassess whether Pilgrim's operations could have negative impacts on a nursing mother and newborn calf. The reinitiation never happened. (0622-3-8 [Vale, Karen])

Comment: There are more than 80 state-and federally-listed species occurring in Plymouth County, where Pilgrim is located.²³ [footnote 23 text: Entergy Nuclear Generation Company. 2006. Appendix E. Pilgrim Nuclear Power Station, Applicant's Environmental Report, Operating License Renewal Stage. 261 pp.] Four endangered whale species (sei, right, finback, and humpback) and five endangered sea turtle species (loggerhead, leatherback, hawksbill, green, and Kemp's ridley) have the potential of occurring near Pilgrim in Cape Cod Bay. There is also critical habitat and priority habitat areas (for the north Atlantic right whale, northern red-bellied cooter, and spotted turtle) occurring near Pilgrim. The potential site-specific impacts of continued spent fuel storage should be fully assessed for these protected species and their

habitats. The impact of postulated accidents on all site-specific special status species and habitats should be assessed by the NRC (those mentioned above as well as others found in the area, such as the bald eagle, piping plover, roseate tern, Atlantic sturgeon, and all non-listed marine mammals that are protected under the Marine Mammal Protection Act). (0622-3-9 [Vale, Karen])

Comment: 3. *Significance of the Surrounding Ecology*[.] Indian Point is located in an area of high ecological significance. The plant is situated on the eastern banks of the Hudson River estuary, which is home to “an extraordinarily rich variety of fish species,” “one of the major spawning grounds for several commercially significant Atlantic species,” and “many important wildlife habitats.”¹⁵ [footnote 15 text: NOAA, Office of Coastal Zone Management, *New York State Coastal Management Program and Final Environmental Impact Statement*, available at, <http://www.dos.ny.gov/communitieswaterfronts/pdfs/NY%20CMP%20.pdf> at § II-2, 6-7.] Indian Point sits directly in front of and adjacent to designated Significant Coastal Fish and Wildlife Habitat (i.e., the “Hudson Highlands” habitat), as well as slightly upstream of Haverstraw Bay, which is also a designated Significant Coastal Fish and Wildlife Habitat (“SCFWH”).¹⁶ [footnote 16 text: See Coastal Fish and Wildlife Rating Form, Hudson Highlands (Revised Aug. 15, 2012), available at, http://www.dos.ny.gov/communitieswaterfronts/consistency/Habitats/HudsonRiver/Hudson_Highlands_FINAL.pdf (last visited Oct. 27, 2013) (hereinafter “Hudson Highlands SCFWH Rating Form”); Coastal Fish and Wildlife Rating Form, Haverstraw Bay (Revised Aug. 15, 2012), available at, http://www.dos.ny.gov/communitieswaterfronts/consistency/Habitats/HudsonRiver/Haverstraw_Bay_FINAL.pdf (last visited Oct. 27, 2013) (hereinafter “Haverstraw Bay SCFWH Rating Form”).] The Hudson Highlands SCFWH, *inter alia*, “provides highly favorable conditions for reproduction by coastal migratory fishes, especially striped bass,” is used as a migrational route for endangered shortnose and Atlantic sturgeon species, and provides an important nursery and summering area for endangered Atlantic sturgeon.¹⁷ [footnote 17 text: See *generally* Hudson Highlands SCFWH Rating Form.] The Haverstraw Bay SCFWH, *inter alia*, “regularly comprises a substantial part of the nursery area for striped bass ... American shad ... white perch ... Atlantic tomcod ... and Atlantic sturgeon,” provides habitat for numerous fish species, is a major nursery and feeding area for bay anchovy, Atlantic menhaden, and Atlantic blue crab, and provides spawning and wintering grounds for endangered shortnose and Atlantic sturgeon.¹⁸ [footnote 18 text: See *generally* Haverstraw Bay SCFWH Rating Form.] Importantly, the State of New York Department of Environmental Conservation (“NYSDEC”) has a number of regulations and standards which provide for the protection of surface waters as well as groundwaters in the State, including the Hudson River and groundwater beneath Indian Point. In particular, NYSDEC has designated the waters of the Hudson River in the vicinity of Indian Point to be suitable as aquatic habitat as well as for primary and secondary contact recreational activities, i.e., swimming, fishing, boating, etc.¹⁹ [footnote 19 text: The varying classifications of the Hudson River, all designate fishing as a “best usage.” See 6 N.Y.C.R.R. §§ 701.5, 701.6, 701.7, 701.8, 701.11, 701.13; See 6 N.Y.C.R.R. § 864.6 (classifying the portion of the Hudson River from the New York State Bronx County line to Bear Mountain Bridge as “Class SB saline surface waters”); 6 N.Y.C.R.R. § 701.11 (“The best usages of Class SB waters are primary and secondary contact recreation and fishing. These waters shall be suitable for fish, shellfish, and wildlife propagation and survival.”).] (0710-4 [Brancato, Deborah] [Musegaas, Philip])

Comment: You could examine each of the resource areas described above and find similar or greater discrepancies. In regard to “aquatic ecology,” fish in the Hudson River have been found to contain traces of strontium-90. The radioactive isotope was discovered leaking at the Indian

Point nuclear power plant; and tests on the fish found detectable amounts, as reported by the Westchester Journal News. (0762-4 [Skopic, Catherine])

Comment: The distinction made between the short term storage impact of ISFSIs and Spent Fuel Pools on Special Status Species and Habitats should be clarified. Table 1 "Environmental Impacts of At-Reactor Continued Storage of Spent Nuclear Fuel,"⁹⁴ [footnote 94 text: 8 Fed. Reg. 56779, 56785-86.] states that "ISFSI operations are not likely to adversely affect special status species and habitats," while indicating that "impacts from the spent fuel pool would be determined as part of Endangered Species Act Section 7 consultation." It is not immediately clear why short term storage in the pools would require consultation while ISFSI storage would not. NRC does explain in GEIS section 4.11.1 that the consultation in the pool case would be to consider the "parameters associated with the spent fuel cooling system," while also observing that the operation of only the spent fuel cooling system after plant shutdown would result in a "decrease in water withdrawal and discharge rates" from what had already been considered in the operating plant's Biological Opinion, and that impacts would "likely decrease." Therefore, the same statement that is made for ISFSI operations is actually also true for pool operations in that there would be no new "adverse" impacts due to short term storage. Table 1 should be revised to make the "not likely to adversely affect" statement equally applicable to pool and ISFSI storage. NRC could caveat the conclusion for pools by clarifying that the agency assumed that the continued operation of the spent fuel pool cooling system did not result in a "take" of a biological species not already covered in the operating reactor's Biological Opinion. Industry does, however, in general agree that the use of consultations would avoid and mitigate protected species impacts. (0827-4-3 [Ginsberg, Ellen])

Comment: GEIS Section 4.10: The discussion of operating plant experience with impingement and entrainment appears to contain information that is not relevant (GEIS 4-36). We recommend that this discussion address only that information which is relevant to support the statement that these impacts are "bounded" by operating plants and "minor" as concluded on page 4-38 of the GEIS (e.g. the comparison of water requirements for a spent fuel pool vs. those for an operating reactor). (0827-7-24 [Ginsberg, Ellen])

Comment: NRC's narrow framework for assessing SFP leak impacts has resulted in an "analysis" which fails to adequately consider other relevant environmental impacts as well. Particularly, NRC's consideration of the impacts posed by SFP leaks on surface water resources is severely wanting and inadequate under NEPA as well as the court's decision. NRC acknowledges that SFP leaks can discharge to offsite surface waters, but then indicates that "dilution ensures that radionuclides" would be "diluted well below EPA safe drinking-water limits." DGEIS at E-17. This limited focus on drinking water-related impacts boils down to a consideration from a public health aspect, and ignores other relevant potential environmental impacts to surface waters, namely impacts to aquatic ecology. Importantly, NRC's restricted consideration of impacts to surface waters is precisely what was deemed by the Circuit Court as insufficient. 681 F.3d at 481. Yet, the DGEIS contains no meaningful analysis of how SFP leaks may impact nearby aquatic habitats and organisms.¹³ [footnote 13 text: In fact, despite the fact that one of the purported focuses of the DGEIS is SFP leaks, the NRC's only consideration of impacts to aquatic ecology focuses on cooling water intake structure impacts, with no meaningful discussion of impacts of radioactive waste storage on such resources. See DGEIS at § 4.10, at pages 4-35-4-41.] NRC must fully analyze the extent to which SFP leaks may contaminate surface waters and the foreseeable impact of such contamination on the aquatic ecology of such waters. Such an assessment cannot be limited to NRC dose calculation methodology, but rather must focus more broadly on impacts to aquatic organisms, with regard for other Federal, State, and/or local standards and requirements. The

DGEIS must consider the length of time surface waters will be contaminated by, and thus, aquatic ecology exposed to, radiological contamination (with due consideration for the fact that SFP leaks may admittedly occur for long periods of time undetected) and the various ways in which different radionuclides have the potential to bioaccumulate in the environment, e.g. in river sediments, sub-aquatic vegetation, shellfish, and finfish. NRC must determine the extent to which aquatic organisms may be impacted over long- periods of time. An evaluation of the impacts of bioaccumulation and long-term exposure to low levels of radioactivity should be conducted by the NRC. NRC should focus attention on long- term exposure impacts to varying fish populations, as well as impacts to individuals within populations. NRC should not assume that a lack of impacts to date (at plants where SFP leaks have already contaminated surface waters) means that no future impacts will occur. See *New York v. NRC*, 681 F.3d at 481. Rather, NRC must fully evaluate the foreseeable future impacts to aquatic organisms that may occur as a result of SFP leaks. (0897-5-15 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: What risks to wildlife survival, and even genetic damage, could result from such exposures to the radioactive waste facilities, over time? (0919-5-17 [Kamps, Kevin])

Comment: At Page 3-27, re: Section 3.9.2.5, beginning at line 18, NRC states: "Other important aquatic species include cephalopods (e.g., squid and octopus), marine mammals (e.g., seals and whales), sea turtles, and reptiles. These species may be present near at-reactor storage facilities; however, because of the significantly reduced water demands for spent fuel pool cooling during continued storage, these larger organisms are more likely to avoid being impinged or entrained by the cooling system, and are therefore not discussed in Chapter 4 of this draft GEIS." But besides risks of impingement or entrainment, what about the ongoing risks from exposure to the radioactive wastes that these species will be subjected to over time, given the coastal locations of nuclear power plants and their radioactive waste storage facilities? (0919-5-18 [Kamps, Kevin])

Comment: Re: Page 4-28, line 32, NRC's statement "The significance of potential impacts on plants and animals and their habitats depends on the importance or role of the plant or animal within the ecological community that is affected."--There are no insignificant species. (Except perhaps humans. Most other species could get by just fine without us.) But we cannot get by without them, we will find out the hard way. NRC's attitude is anachronistic, belonging (never belonging) to a much earlier phase of the "industrial extinction event" humankind has unleashed on the planet. Whether from a Native American spiritual perspective (which NRC should give serious consideration to in this EIS, as an element of EJ), to a Western scientific ecosystem perspective, no species can be regarded as insignificant. Alanis Obomsawin, an Abenaki from the Odanak reserve, seventy odd miles northeast of Montreal, has put it well: "...When the last tree is cut, the last fish is caught, and the last river is polluted; when to breathe the air is sickening, you will realize, too late, that wealth is not in bank accounts and that you can't eat money." (0919-7-14 [Kamps, Kevin])

Comment: On Page 4-32, NRC has stated, beginning at line 16, that "licensees are required to adhere to the protection of eagles and migratory birds under the Federal Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act. In addition, coordination with State natural resource agencies may further ensure that power plant operators take appropriate steps to avoid or mitigate impacts on State species of special concern that may not be protected under other Federal statutes."--Has NRC considered the risk of eagles or other species (osprey, birds that nest on human structures) nesting on/near dry casks, given the lure of the warmth?! Loss of institutional control - no humans around - could worsen this risk. NRC has reported that dry cask storage will increase the ambient air temperature several degrees downwind, out to a distance

of 0.6 miles. What is to prevent this warmth "island" from attracting wildlife, including endangered migratory birds, especially if their prey species are attracted to the warmth? What would be the impact of such species interacting at such close proximity to the radioactive waste storage. After all, mutagenic gamma radiation is allowed to emanate from dry casks at a rate of 10 mRem/hour at distances 6 feet away - and at a rate 20 times higher at the casks' surface. (0919-7-21 [Kamps, Kevin])

29. Comments Concerning Historic and Cultural Resources

Comment: The NRC should be careful and continue to monitor the potential LARGE impact on cultural and historical resources. It would be a horrible tragedy to lose resources that are irreplaceable and unable to regenerate independently. This is my main concern with this project, that under the bureaucratic mess, precious resources could be changed forever. (0007-2 [Anonymous, Anonymous])

Comment: 28 ES.13.1.3 Environmental Justice and ES.13.2.12 Historic and Cultural Resources: When "impacts could be SMALL, MODERATE, or LARGE", in other words, there is no GENERIC way in which these impacts can be addressed by these rules. These impacts must be addressed in each Site Specific EIS. This should be made clear in this document, so that EIS development for each site cannot simply include the Generic EIS and fail to do a Site Specific Analysis for these impacts. (0093-4 [Dennis, Harold E.B.])

Comment: Page 7-7, lines 21-23 and page 7-10 lines 8-11. "The value of reviewing continued storage in site-specific NEPA analyses is difficult to quantify; however, a site-specific analysis of the environmental impacts of continued storage would likely not reveal any new information that cannot be addressed in a generic analysis." The determinations that impacts could be SMALL, MEDIUM, or LARGE for certain impacts in certain scenarios (for example: ES.13.1.3 Environmental Justice and ES.13.2.12 Historic and Cultural Resources) shows that there is information that cannot be addressed in a generic analysis. Therefore, the above statement is false. (0093-7 [Dennis, Harold E.B.])

Comment: We, as Native people, have not granted the permission for this facility, nor the storage of this waste material. The treaties of Guadalupe Hidalgo were never ratified by the United States Government. The plant sits on land that we still own and land is ours. And we're not giving the Waste Confidence Commission permission to move forward with this project, or with, even, the EIS. (0326-2-2 [Collins, Fred])

Comment: Okay, on Roman numeral 41 it says long-term storage and indefinite storage impact could be small, moderate, or large. What? They don't know? (0326-56-3 [Homick, Nick])

Comment: The Draft Generic Environmental Impact Statement has many flaws. It seeks to analyze severe consequences and potential environmental and health impacts generically for all facilities. This makes no sense. We're not aware of another tribal nation whose entire reservation homeland could be rendered uninhabitable by a spent fuel accident. The NRC must conduct a site-specific analysis of environmental impacts. (0328-1-10 [Johnson, Ron])

Comment: The same considerations ought to apply to the ongoing - indeed, potentially indefinite - storage of spent nuclear fuel on Prairie Island. The DGEIS is insufficient because it fails to adequately consider and weigh the long-term viability of the Prairie Island Reservation as a homeland for the Tribe (and the implications for preservation of Tribal life and culture) against the risks of continued, indefinite storage of an ever-increasing amount of spent nuclear fuel. A

spent fuel accident or act of sabotage (even if unsuccessful) would have a devastating socioeconomic impact on the Tribe, and perhaps render the Tribe's reservation homeland uninhabitable. The Tribe cannot simply go out and buy new land and relocate its reservation.⁴⁷ [footnote 47 text: The Indian Reorganization Act (IRA), enacted in 1934, authorizes the Secretary of the Interior to acquire land and hold it in trust "for the purpose of providing land for Indians." 25 U.S.C. § 465; see also 25 C.F.R. Part 151.] It is a long, cumbersome and uncertain process pursuant to which the Tribe must apply to have land placed into trust by the United States for the benefit of the Tribe, and there is no guarantee that its fee-to-trust application would be approved. (0473-16-6 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The Santa Ynez Band of Chumash Indians ("Tribe" or "Chumash") hereby provides the following comments to NRC-2012-0246. (1) SANTA YNEZ BAND OF CHUMASH INDIANS; Located on the Santa Ynez Reservation in Santa Barbara County, California, the Santa Ynez Band of Chumash Indians ("Chumash" or "Tribe") was federally recognized in 1901 and remains the only federally-recognized Chumash tribe in the nation.

<http://www.loc.gov/catdir/cpsoc/biaind.pdf>. The Chumash original territory lies along the coast of California, between Malibu and Paso Robles, as well as on the Northern Channel Islands. The area was first settled about 13,000 years ago and at one time, the Chumash had a total population of about 18,000 people. The Santa Ynez Band of Chumash Indians was eventually relegated to 99-acres which lays entirely in a flood plain, 40 percent of which is within a flood zone near the unincorporated city of Santa Ynez, County of Santa Barbara, California. For many years, few tribal members lived on the Reservation since running water and electricity was not made available to Tribal residents. The establishment of indoor plumbing didn't happen on the Reservation until the 1960s. In late 1970s, the first of the Housing and Urban Development (HUD) homes were built and more tribal members were able to move on to the Reservation. Pursuant to its Articles of Organization, the day-to-day business of the Tribe is governed by an elected Business Committee. The Business Committee has an elected Chairman and selects from within the remaining Business Committee Members a Vice Chairman, Secretary and Treasurer. www.santaynezchumash.org. The Santa Ynez Indian Reservation is located 75 miles south of the Diablo Canyon Nuclear Power Plant near Avila Beach, California and 196 miles north of the San Onofre Nuclear Power Plant between Los Angeles and San Diego, California. In addition the Chumash are less than 100 miles northeast from the Santa Susana Sodium Reactor Experimental (SRE) which was a small sodium-cooled experimental reactor built by Southern California Edison and Atomics International at the Santa Susana Field Laboratory, near Moorpark in Ventura County. SRE has since been dismantled after a reactor incident and the entire Santa Susana Field Laboratory has been declared excess federal property by the General Services Administration. (2) THE NATIONAL HISTORIC PRESERVATION ACT (NHPA); The NHPA requires Federal agencies to consult with any Indian tribe that attaches religious and cultural significance to historic properties that may be affected by a federal undertaking and take those potential effects into account in their decision making. This consultation should occur at the earliest steps in general land management or project planning and may include consultation with Tribes concerning inventory methods, management prescriptions, proposed land uses, and impacts from both human and natural effects. Under the NHPA, prior to approving federal action, agencies must take into account and enter consultation concerning the effects of the action on properties eligible for inclusion in the National Register for Historic Preservation. Under the NHPA amendments of 1992, historic properties of religious and cultural importance to a Native American Tribe may be determined eligible for inclusion on the National Register of Historic Places (National Register or NRHP) and therefore subject to NHPA consultation requirements. The 1992 amendments significantly expanded the provisions

of the NHPA to ensure that Tribal interests are considered in determinations of significance and effect. (0500-1 [Cohen, Sam])

Comment: (3) EXECUTIVE ORDER 13007 "INDIAN SACRED SITES;" President Clinton's E.O. 13007 (1996) on Indian sacred sites directs Federal agencies "to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions, (1) [to] accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and (2) avoid adversely affecting the physical integrity of such sacred sites." A key feature of this definition is that it is Tribes and appropriate representatives of AI/AN religions who identify which sites are sacred to them, not the Federal Government. (4) EXECUTIVE ORDER 13175 "CONSULTATION AND COORDINATION WITH INDIAN TRIBAL GOVERNMENTS;" On November 5, 2009, President Obama issued a Presidential Memorandum on Tribal Coordination. That memorandum reaffirmed Executive Order 13175, "Consultation and Coordination with Indian Tribal Governments," and emphasized the importance of strengthening government-to-government relationships with Native American tribes. In response to the Presidential Memorandum, NRC staff reviewed the agency's various interactions with Native American tribes, and developed a Commission Paper (SECY-09-0180), entitled "U.S. Nuclear Regulatory Commission Interaction with Native American tribes," dated December 11, 2009. In that paper, the staff noted that the NRC's previous interactions had been limited to a small number of activities under the agency's regulatory authority. The NRC concluded that because a "case-by-case" approach had proven effective in these interactions with Native American tribes by allowing for custom-tailored approaches that met Commission and tribal needs, that no formal policy was needed at that time. (5) TRIBAL TRUST RESPONSIBILITY; The Tribal trust responsibility requires the Federal Government to maintain a fiduciary relationship towards all federally recognized Tribes. The trustee beneficiary relationship between the Federal Government and Indian Tribes has been described as resembling a "guardian-ward" relationship. The trust relationship was first recognized by the Supreme Court in its early decisions interpreting Indian treaties, and the Court's interpretation of the trust responsibility has evolved over the years. (6) UNDRIP; In December 2010, the United States announced support for the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). In announcing this support, President Obama stated: "The aspirations it affirms--including the respect for the institutions and rich cultures of Native peoples--are one we must always seek to fulfill...[W]hat matters far more than any resolution or declaration - are actions to match those words." The UNDRIP addresses indigenous peoples' rights to maintain culture and traditions (Article 11); and religious traditions, customs, and ceremonies (Article 12); to participate in decision making in matters which would affect their rights (Article 18); and to maintain spiritual connections to traditionally owned lands (Article 25). (7) ADVISORY COUNCIL ON HISTORIC PRESERVATION (ACHP); As of June 2013 and as updated November 2013, the federal Advisory Council on Historic Preservation (ACHP) approved the UN Declaration on the Rights of Indigenous Peoples. <http://indiancountrytodaymedianetwork.com/2013/06/03/federal-agency-supports-undrip-new-era-tribalfederal-relations-149676>. ACHP will now incorporate the UN Declaration on the Rights of Indigenous Peoples in the National Historic Preservation Act (NHPA) Section 106 review process. (0500-2 [Cohen, Sam])

Comment: Resource Areas in Which Impacts May Be Small, Moderate or Large The GEIS finds that the effects on several resource areas may be small, moderate or large (in short-term, long-term or indefinite storage) depending on site-specific conditions.³ [footnote 3 text: Examples include historic and cultural resources, and environmental justice.] We assume that, in these resource areas, the general GEIS presumption that the effects will be small does not

apply, and that effects will be addressed site-by-site in licensing for short-term, long-term or indefinite storage. (0505-5 [Williams, Jim])

Comment: Reactors Vary in Proximity to Historic and Cultural Resources: Pilgrim for example is in "America's Hometown" and 37 miles from Boston and its rich cultural, historic and educational institutions. The impact on these resources would be far greater than for a reactor located in a remote rural location. (0556-1-21 [Lampert, Mary])

Comment: Staff also states that it "assumes" the site selection of an away-from-reactor storage facility would be "adjusted to minimize impacts on local resources, including historic and cultural resources...but NRC also acknowledges "that in some cases avoiding impacts may not be possible."¹⁵ [footnote 15 text: Draft GEIS at 5-3.] If staff recognize that it is unknown whether impacts may be avoided, then staff cannot make any generic findings regarding impacts to local resources. (0579-10 [Smith, Amanda])

Comment: Historic and Cultural Resources: The draft GEIS assumes replacement of the ISFSI and construction of the DTS during the long-term. Section 4.12 discusses the potential impacts on historic and cultural resources during these events. We do not believe that impacts to historic and cultural resources have been adequately evaluated in the draft Waste Confidence GEIS. As discussed in the draft GEIS, there are two possible license types for ISFSIs: a general license, which is granted by Subpart K of 10 CFR 72 (restricted to operating plants), or a site-specific license, issued under Subparts A through I of 10 CFR 72. According to NUREG-1572, Information Handbook on Independent Spent Fuel Storage Installation, the major advantages of a General License ISFSI are that no additional environmental documents are required (i.e., the applicants Environmental Report (ER) or the NRC's EA). Compliance with NEPA, for General License sites, is via the Certificate of Compliance (CoC) EA for the cask design, not the construction of the ISFSI. The draft GEIS reiterates this by stating that there is no Section 106 (of the national Historic Preservation Act) review. In other words, once a utility has a General License no additional environmental analysis seems to be required. For a Site-Specific license, like the Prairie Island ISFSI, an ER was submitted in 1991 for the original license and more recently by NSPM for the renewal. The NRC issued the original EA in 1992 and has just issued a draft EA for the renewal. Throughout much of the draft GEIS there are many statements alluding to extensive prior land disturbance during the construction of the power plant. There seems to some thought that prior construction all but removed any potential for historic or cultural resources to be present. This seems to be at odds with the statement that "for sites that had conducted field investigations, on average, the number of historic and cultural resources present were 35 per site" (page 4-4 7 of draft GEIS). (0619-1-18 [Mahowald, Philip R.])

Comment: In our own experience with the PINGP Units 1 and 2 and PINGP ISFSI license renewals, reliance on original licensing documents (for either the reactor or the ISFSI) is no guarantee that all historic and cultural resources are either documented or no longer present. That is, license applications for both the PINGP reactor and ISFSI renewals indicated that no archaeological resources were present in the vicinity of the projects. The ASLB disagreed and we subsequently learned, that in spite of extensive ground disturbing activities during the construction of the PINGP Units 1 and 2, there was still the possibility of deep prehistoric archaeological sites across most of the PINGP and that prehistoric archaeological sites could be buried under parking lots, modular buildings or other structures or features within the plant. Past construction activities is no guarantee that historic and cultural resources are no longer present. Currently, there are 68 total ISFSI licenses; of these only 14 are site-specific.⁶ [footnote 6 text: US NRC, 2013-2014 Information Digest, NUREG-1350, Volume 25, August 2013.] While some General License ISFSIs are clearly within the original footprint of power plant construction,

many are not (e.g., the Point Beach General License ISFSI, on the shore of Lake Michigan, is about .5 mile from plant, surrounded by trees and vacant fields). NUREG-1571 also states that because General License ISFSIs are restricted to plants still operating under 10 CFR 50, a utility must apply for a Site-Specific license when the plant is decommissioned. The draft GEIS states that the replacement of the at-reactor ISFSI and initial and replacement DTS would require a site specific review and compliance with the NHP A before a decision is made. Our concern is that once these General License ISFSI goes through the more rigorous site specific licensing process, it will be too late -any potential historic or cultural resources would already have been destroyed by the construction of the General License ISFSI. The final GEIS should discuss how the environmental impacts of General License ISFSI' s would be evaluated before the reactors are decommissioned. (0619-1-19 [Mahowald, Philip R.]

Comment: As we stated earlier, it is not clear how DTS facilities will be evaluated, relative to NEPA. Will DTS be evaluated using NUREG-1748 (Environmental Review Guidance for Licensing Actions Associated with NMSS Programs) or some other guidance? (0619-1-20 [Mahowald, Philip R.]

Comment: [T]he environmental impacts for historic and cultural resources would be SMALL, MODERATE, or LARGE for long-term and indefinite storage timeframes. The magnitude of adverse effect on historic properties and impact on historic and cultural resources largely depends on what resources are present, the extent of proposed land disturbance, whether the area has been previously surveyed to identify historic and cultural resources, and whether the licensee has management plans and procedures that are protective of historic and cultural resources.⁹³ [footnote 93 text: *Id.* at 4-50.] [TVA believes that the impacts would be SMALL.] (0694-3-1 [Shea, Joseph])

Comment: DGEIS Section 4.12 assumes that the environmental impacts for historic and cultural resources could be SMALL, MODERATE, or LARGE for long-term and indefinite storage timeframes. TVA agrees with NEI's comment that this impact should be SMALL for all continued storage scenarios.⁹⁷ [footnote 97 text: NEI comments.] (0694-3-5 [Shea, Joseph])

Comment: [E]nvironmental impacts for historic and cultural resources would be SMALL, MODERATE, or LARGE for long-term and indefinite storage timeframes. The magnitude of adverse effect on historic properties and impact on historic and cultural resources largely depends on what resources are present, the extent of proposed land disturbance, whether the area has been previously surveyed to identify historic and cultural resources, and whether the licensee has management plans and procedures that are protective of historic and cultural resources.⁷⁶ [footnote 76 text: *Id.* at 4-50.] [TVA believes that the impacts would be SMALL.] (0697-2-10 [Bessette, Paul] [Kuyler, Raphael])

Comment: DGEIS Section 4.12 assumes that the environmental impacts for historic and cultural resources could be SMALL, MODERATE, or LARGE for long-term and indefinite storage timeframes. Entergy agrees with NEI's comment that this impact should be SMALL for all continued storage scenarios.⁷⁹ [footnote 79 text: NEI Comments.] (0697-2-14 [Bessette, Paul] [Kuyler, Raphael])

Comment: Specifically, Entergy already has a large area of previously disturbed land at its sites that could be used for the construction of any expanded storage facilities. Entergy would also mitigate any adverse effects on historic resources. Entergy has appropriate management plans and procedures that are protective of historic and cultural resources, and these activities

would be subject to further consideration of historic and cultural impacts during future regulatory activities. (0697-2-15 [Bessette, Paul] [Kuyler, Raphael])

Comment: NEI disagrees with NRC's determination that impacts to historic and cultural resources in the long term and indefinite scenarios could be moderate or large. To the contrary, historic and cultural resources impacts can, and likely will, be avoided for all continued storage scenarios. During facility-specific licensing actions all requirements of the National Historic Preservation Act (NHPA), NEPA, and NRC regulations must be met, which provides further assurance that unavoidable impacts will be mitigated. The conclusion for all continued storage scenarios should be that cultural and historic impacts will be small. (0827-4-4 [Ginsberg, Ellen])

Comment: Historic and Cultural Resources Sections (At-Reactor Continued Storage): In the discussion of historic and cultural resources impacts for at-reactor, long-term⁹⁷ [footnote 97 text: *Id.* at Section 4.12.2, pp. 4-49 and 4-50.] and indefinite storage⁹⁸ [footnote 98 text: *Id.* at Section 4.12.3, pp. 4-50.] there is an inappropriate conclusion that moderate or large impacts to historic and cultural resources could result. It should be recognized that for long-term or indefinite storage at decommissioned reactor sites, there will be a large area of previously disturbed land that could be used for the construction of storage facilities and a DTS (if necessary). Therefore, an ISFSI or DTS can be sited to avoid significant historic and cultural resources. This assumption is similar to the assumptions made in other sections of the GEIS for special status species and habitat. (0827-4-6 [Ginsberg, Ellen])

Comment: The conclusion that ISFSIs and DTS facilities can, and likely will, be sited in a manner that avoids moderate or large impacts on cultural resources is supported by the discussion in several sections of the GEIS, including: • Section 4.12, page 4-48, lines 6-8, which states: "If adverse effects on historic properties are identified, appropriate mitigation can be developed through consultation with the State Historic Preservation Officer, tribal representatives, and other interested parties." • Section 4.12.1, page 48, lines 31-33, which states: "[I]mpacts could be mitigated if the licensee has previously identified historic and cultural resources and has management plans and protective procedures in place." • Section 4.12.2, page 4-49, lines 25 and 26, which states: "The replacement of the at-reactor ISFSI and initial and replacement DTS would require a site-specific environmental review and compliance with NHPA requirements before making a decision on the licensing action." These statements support a reasonable assumption that licensees would avoid or mitigate any large or moderate impacts on cultural and historic resources resulting from construction of storage or DTS facilities. The NRC recognizes the inherent reasonableness of this assumption on pages 4-49 and 4-50 of the GEIS, which state: Given the minimal size of the replacement ISFSI and initial and replacement DTS, and the large land areas at nuclear power plant sites, licensees should be able to locate these facilities away from historic and cultural resources. Potential adverse effects on historic properties or impacts on historic and cultural resources could also be minimized through development of agreements, license conditions, and implementation of the licensee's historic and cultural resource management plans and procedures to protect known historic and cultural resources and address inadvertent discoveries during construction of the replacement at-reactor ISFSI and initial and replacement DTS. * * * * * If replacement activities occur in previously disturbed areas (i.e., in areas that have previously experienced construction impacts) then impacts on historic and cultural resources would be SMALL. Therefore, historic properties would not be adversely affected. It is reasonable to assume that any new construction at a decommissioned nuclear power plant site would be on the large area of previously disturbed land. Thus, the NRC should conclude that the ISFSI and DTS (if there is one) can be sited to avoid significant historic and cultural resources, much like the appropriate assumption made for special status species and habitat made in other sections of the GEIS. In

sum, the conclusion for at-reactor continued storage should be that cultural and historic impacts will be small for all timeframes. (0827-4-7 [Ginsberg, Ellen])

Comment: Historic and Cultural Resources Sections (Away-From-Reactor Continued Storage): Like at-reactor continued storage, NEI believes that the impacts on cultural and historic resources for away-from reactor continued storage are properly characterized as small for all timeframes. This conclusion is supported by the discussion already provided in several sections of the GEIS, including: • Section 5.12.1 (pages 5-34 and 5-35) provides a rationale explaining why any historic and cultural resources impacts would be minimal. Lines 18 and 19, p. 5-34 discuss how any ISFSI or DTS license would require NRC NEPA review and meet NHPA requirements. Lines 26 and 27 on p. 5-34 state, "Resolution of adverse effects, if any, should be concluded prior to the closure of the Section 106 process." Lines 12-26 on p. 5-35 list ". . . several factors [that] could avoid, minimize, or mitigate impacts." • Section 5.12.2, Long-Term Storage (pages 5-36 and 5-37) makes much the same arguments for the avoidance or mitigation of impacts. Further, page 5-37 states: Given the large land area available around the ISFSI restricted area, the licensee should be able to locate the replacement facilities away from historic and cultural resources. Potential adverse effects on historic properties or impacts on historic and cultural resources could also be minimized through the development of agreements, license conditions, and implementation of the licensee's historic and cultural resource management plans and procedures to protect known historic and cultural resources and address inadvertent discoveries during construction of the replacement ISFSI and initial and replacement DTS. • Section 5.12.3, which addresses indefinite storage, merely points to the discussion regarding long-term storage. These passages reveal that the rationale for characterizing the impacts of away-from-reactor storage on historic and cultural resources as small for all timeframes is already provided in the GEIS. ISFSIs and DTS (if any are necessary) can be sited (or replaced) to avoid significant historic and cultural resources. This conclusion is analogous to the conclusions reached for special status species and habitat that are included in other sections of the GEIS. In sum, the conclusion for away-from-reactor continued storage should be that impacts on cultural and historic resources will be small for all timeframes. (0827-4-9 [Ginsberg, Ellen])

Comment: On Page 3-31, lines 10-11, NRC states "the NRC reviewed historic and cultural resource reviews that were performed for 40 license renewals." The Don't Waste MI/NIRS intervention against the 20-year license extension, from 2005 to 2007, featured a Historic and Cultural Resources proposed contention, as well as extensive public comment on the EIS component of the proceeding. Although the ASLB panel refused to grant a hearing on the merits of the contention, NRC staff was pressured to bring in additional expertise to address our allegations of significant cultural resources on-site put at risk for the license extension. NRC claimed to have reached a strict agreement with the nuclear utility to assure protection of the Native American cultural resources already identified, and those that have not yet been, located on the Palisades site. The environmental intervention and comment made a significant difference for the better in that proceeding. (0919-5-20 [Kamps, Kevin])

Comment: At Page 3-31, line 20, where NRC states "It is unlikely that historic and cultural resources are present within heavily disturbed areas," they failed to clarify that this is because the damage is already done. Any resources formerly located there have long since been destroyed. (0919-5-21 [Kamps, Kevin])

Comment: Upon review of the NRC's Draft GEIS, the HPO [New Jersey State Historic Preservation Office] broadly concurs with the report's findings regarding at-reactor and away-from-reactor ISFSIs at it relates to impacts on historic and cultural resources (historic properties)

subject to Section 106 of the Natural Historic Preservation Act. However, the HPO does not agree that an entire power block is "extremely disturbed" with no possibility for any surviving pockets of archeological sensitivity unless there is supporting documentation from the original station construction to support such an assumption within any particular area of potential effects (APE). (0920-51 [Foster, Ruth])

Comment: In the discussion of historic and cultural resources impacts for at-reactor long-term storage, Exelon believes there is an inappropriate conclusion that the possibility of moderate or large impacts to historic and cultural resources could exist. It should be recognized that for long-term or indefinite storage at decommissioned reactor sites, there will be a large area of previously disturbed land that could be used for the storage facilities and a possible Dry Transfer System (DTS). A more reasonable assumption would be that the Independent Spent Fuel Storage Installation (ISFSI) can be sited to avoid significant historic and cultural resources much like the appropriate assumption made for special status species and habitat made in other sections of the GEIS. Therefore, historic properties would not be adversely affected. It is reasonable to assume that, at a decommissioned nuclear power plant site, any new construction would be on the large area previously disturbed in an effort to avoid any undisturbed areas. The GEIS seems to reach an unreasonable conclusion regarding the possibility of large historic and cultural impacts. The rationale is already included in the discussion to conclude that impacts will likely be small. Exelon believes that the conclusion for at-reactor continued storage should be that cultural and historic impacts will be small for all phases. (0942-5 [Helker, David P.])

30. Comments Concerning Noise

Comment: Page 3-32, re: noise that is "otherwise annoying" or irritating "will live gunfire exercises, for security personnel training, continue forevermore into the future at irradiated nuclear fuel storage sites, as they do currently at nuclear power plant sites? (0919-6-1 [Kamps, Kevin])

31. Comments Concerning Aesthetics

Comment: The Draft GEIS notes that the PFS FEIS determined the aesthetic impacts to be small to moderate and similarly concludes that the impacts at an away-from-reactor ISFSI would also be small to moderate.³¹ [footnote 31 text: Draft GEIS at 5-41.] Again, whether aesthetic impacts are small or large is site dependent. For example, local researchers raised substantial concerns that light pollution from the PFS facility would destroy their research, having a substantial aesthetic impact. (0579-16 [Smith, Amanda])

32. Comments Concerning Waste Management

Comment: Waste, of any kind, is always an issue that should be considered for the health and safety of communities. Ordinances at the local level and bills at both the state and federal level exist to direct the handling of solid waste and hazardous waste, to protect the air and our waters so they are clean and nourishing. One type of hazardous waste has gotten little attention: radioactive waste, because it's relatively new. We need our elected and appointed officials to diligently seek out solutions to storing these wastes and to do so carefully and thoughtfully. (0085-1 [Davison, Heidi])

Comment: And one thing I read in the first few pages, in fact, why aren't the pages numbered here? They're all in Roman -- so on page Roman III.1.19 section, it says it's not going to consider at all anything to do with Class C radioactive waste or greater. That's the most dangerous, that's the most highly contaminated stuff. All of that stuff, all that rubble is going to go to Andrews, Texas. How are you going to get it there? It's going to go through four or five states, hundreds of towns, and this is not dangerous? So, all that rubble that you blow up and destroy, and all those pipes and valves and everything else that's radioactive is -- what about that? It's not really addressed in here. What about Class A and B low-level waste? Low-level waste is not dangerous according to the NRC for the adult male, but it is dangerous to babies and children, and the human fetus, so I'd like to see more about that. (0325-31-4 [Johnson, Roger])

Comment: I'm liking the words that the NRC are throwing around. Confidence. I feel better, don't you? This new green program. Decontamination, recycling, which is real special. Harmonize, water down. A few things stick out in my mind. One of this recycling things, it says in 2012, along bicycle baskets, tissue holders, pet food bowls that were constructed unknowingly with radioactive metals were pulled from the U.S. global markets. Isn't that nice? It was unknowing. So it's floating around, and nobody knows where the hell it's going. But, whatever, that's cool. So they're going to handle all the decontamination of large nuclear equipment, millions of pounds of metal can be reused. And it's already secured two large contracts, this new green, and has plans for future development. So there's jobs there. (0327-22-1 [Muser, Mary Jo])

Comment: ...and the proposal to recycle radioactive waste into the commercial metal stream - into our pots and pans, zippers, bedsprings, toys, and virtually everything we live with and come into contact with. (0381-12 [Fasten, Susan])

Comment: Considering that materials classified as LLRW can contain long-lived species, information should be provided on the types and concentrations of radionuclides present in cask wastes for all types of casks, storage mode, and ISFSI location factors. LLRW disposal sites across the nation have all leaked presenting, depending on the leaked constituents, environmental risks that must be analyzed. (0553-11 [Wilshire, Howard])

Comment: The DGEIS section on Low-level Radioactive Waste Management (3.14.1) treats LLRW impact generically but some reactors, such as Pilgrim, are in states that are not part of any compact. Non-compact states will have onsite LLRW generated during operations, post operations and in decommissioning activities. LLRW will present environmental concerns different from reactors having access to disposal facilities. Also all reactor types are not the same. BWR's generate approximately twice the LLRW of PWRs. (0556-1-27 [Lampert, Mary])

Comment: [T]he environmental impacts for waste management of nonradioactive waste would be SMALL to MODERATE for indefinite storage, because it is difficult to accurately estimate the amount that would be generated over an indefinite timeframe.⁹⁴ [footnote 94 text: *Id.* at 4-61.] TVA believes that the impacts would be SMALL. (0694-3-2 [Shea, Joseph])

Comment: [T]he environmental impacts for waste management of nonradioactive waste would be SMALL to MODERATE for indefinite storage, because it is difficult to accurately estimate the amount that would be generated over an indefinite timeframe.⁷⁷ [footnote 77 text: *Id.* at 4-61.] These general conclusions regarding environmental impacts apply to Entergy's plants, although Entergy believes that all impacts would be SMALL. (0697-2-11 [Bessette, Paul] [Kuyler, Raphael])

Comment: So-Called "Low-Level" Waste[:] NRC makes unrealistic, inadequate and highly speculative assumptions to dismiss potential environmental and health impacts from the so-called "low-level" radioactive generated along with and a result of the generation, storage, treatment and disposal of irradiated/spent fuel and high level radioactive waste. It can contain all the same long lasting radionuclides as irradiated fuel and high level waste, sometimes even in higher concentrations, but NRC assumes without calculations or analysis that impacts will be "SMALL" under all three scenarios--short term, long term and indefinite storage. On page xxix of the GEIS, NUREG 2157, NRC describes "low-level" radioactive waste as "a wide range of items that have become contaminated with radioactive material or have become radioactive through exposure to neutron radiation. The radioactivity in these wastes can range from just above natural background levels to much higher levels, such as seen in parts from inside the reactor vessel in a nuclear power reactor" The U.S. General Accounting Office on pages 49-52 of GAO RCED-98-40R (B-278691 , May 1998) confirmed that •"low-level" radioactive waste includes virtually everything from a nuclear reactor except the spent fuel •"low-level" radioactive waste can contain every radionuclide found in "high-level" waste •when plutonium, cesium-137, strontium-90 and similar materials are inside the fuel, they are high-level; and that when they leak out of the fuel, as happens during reactor operations, and are collected in filters and ion-exchange resins, these same materials are considered "low-level" •at a maximum Class C ("low level") waste limit of 4,600 curies, unshielded cesium-137 would yield a lethal dose to 50 percent of a hypothetically exposed population at a 1-meter distance in approximately 20 minutes... The point is that "low-level" radioactive waste is not low risk and its impact should not be considered SMALL. (0711-11 [Olson, Mary])

Comment: NRC unjustifiably concludes that the amount of "low-level" radioactive waste generated in the short and long term scenarios is less than the amount already being generated by reactor operations and decommissioning thus its impact is SMALL, not significant. NRC is irresponsibly saying that because there is already some amount of waste, additional waste can be added to it without consequence. This ignores that (1) the vast majority of the radioactivity is from the irradiated fuel in the first place and (2) there very likely could be no disposal site for it. It further ignores the failed history of "low-level" radioactive waste disposal sites in the US, most if not all of which have leaked or are leaking. There is no data provided in the GEIS to conclude that sufficient capacity will be available when needed—at least if we still live in a democracy at that time. (0711-12 [Olson, Mary])

Comment: One of the irresponsible consequences of not being able to permanently isolate so called "low-level" radioactive waste is the pressure by generators and government agencies to release the less concentrated portions from radioactive controls in essence dispersing the radioactivity into the marketplace, populace and biosphere. These consequences are potentially very significant to those exposed but are completely ignored in the GEIS. (0711-13 [Olson, Mary])

Comment: How much so-called "Low-Level" radioactive waste is generated during changing dry casks over time? If dry casks + recontainerization are used for the entire period that this waste will be a hazard, how long is that? (0711-37 [Olson, Mary])

Comment: NRC fails to adequately consider all the waste generated producing the fuel that has become this waste. We also believe that NRC has underestimated the waste that is generated in waste management and storage. NRC also assumes that all the highly radioactive spent nuclear fuel is homogeneous. (0711-8 [Olson, Mary])

Comment: Under section ES13.1.15, pages xli and xlii, lines 21-34, and 1-11, respectively, lower level waste management or disposal of the same is assumed to be available. However, as

described in more detail below, this presumption may prove to be false since currently there are very limited options for the disposal of low level waste. With the continued radioactivity in these wastes, there is a possibility that there may not be a private facility open or one that would accept certain levels of waste unless this was supported by the Federal Government. This analysis must be supplemented and described in more detail. (0783-1-17 [Harlan, Thomas])

Comment: On page 1-17, lines 16-20, there is assumption that sufficient low-level waste will be disposed of properly. This assumption is false. The industry today is facing difficulty in disposing of low-level waste and it is anticipated that low-level waste will be stored at the facility until such time that it is disposed of properly. Because of this storage alongside of spent fuel, the assumption must be removed and properly analyzed within the scope of the Draft GEIS. (0783-2-13 [Harlan, Thomas])

Comment: Under section 6.4.14, starting on page 6-45 and running to 6-50, the Draft GEIS analyzes the cumulative impacts of waste management. Its analysis must be modified to include, or at least account for, the fact that there may not be a facility available at any time in the near future to handle the waste generated by continued storage. The alternative, of course, is that even after removal of the spent fuel the low-level radioactive waste will continue to need to be stored and paid for by the generator. (0783-3-14 [Harlan, Thomas])

Comment: Under section 4.15.2.1, starting on page 4-58 and carrying over to page 4-59, the Draft GEIS discusses low-level radioactive waste that is going to be created as a result of continued storage. The underlying presumption, again, is that this low-level waste is going to be properly disposed of by the industry. This assumption, as stated before, may not be accurate. Currently, there are some facilities for the storage of low-level waste until a permanent depository can be created. However, this is not available for all generators and therefore must be stored until a facility is made available. (0783-3-5 [Harlan, Thomas])

Comment: p. 4-55 to 4-61. Waste Management. "This section describes potential environmental impacts from low-level radioactive waste (LLW), mixed waste, and nonradioactive waste management and disposal caused by the continued storage of spent fuel in spent fuel pools and at-reactor ISFSIs." Low-Level Radioactive Waste. For the Long-Term and Indefinite time frames in which casks would be replaced, disposal of cask materials that have been contaminated by contact with SNF rods will be disposed as Low-Level Radioactive Waste (LLRW). **Comment:** Considering that materials classified as LLRW can contain long-lived species, information should be provided on the types and concentrations of radionuclides present in cask wastes for all types of casks, storage mode, and ISFSI location factors. LLRW disposal sites across the nation have all leaked presenting, depending on the leaked constituents, environmental risks that must be analyzed. (0805-11 [Wilshire, Howard])

Comment: *Sufficient low-level waste (LLW) disposal capacity will be made available when needed. Historically, the demand for LLW disposal capacity has been met by private industry. NRC expects that this trend will continue in the future. For example, in response to demand for LLW disposal capacity, Waste Control Specialists, LLC, opened a LLW disposal facility in Andrews County, Texas on April 27, 2012.* This assumption may be unrealistic and fails to address the increasing costs of LLW storage. For example, as liability and costs concerns rise, it may not be a desirable business model to be in waste disposal in the future. (0867-2-19 [Griffin, William])

Comment: The DGEIS assumes that LLW storage for all of the materials will be available in a timely and cost-effective manner. The NRC produces a periodic report on the problem

(NUREG1307 Rev 15). The report indicates that some facilities do not have a LLW disposal facility available. The report must assume costs for these facilities because of the lack of low level waste storage. Additionally, the year-to-year price increase from 2010-2012 was 12%. The increase in fees is due to the changes in the fees charged by the commercial operators. Such inflationary pressures are not addressed in the DGEIS. This problem is assumed away in NUREG-1307]. These two considerations make the DGEIS assumptions that there will always be LLW storage and that its costs will be addressed in current levels of funding unrealistic. (0867-3-9 [Griffin, William])

Comment: During the Long-Term and Indefinite periods, Low Level Radioactive Waste (LLRW) will be generated on site during the repackaging of SNF, including the SNF canisters. Several references are made that waste would be processed by compaction, again including the replaced storage canisters. Temporary on-site storage of the waste is not addressed, nor is there any discussion of the waste compaction activities that will be performed, by either site personnel or contractors. The GEIS assumes "Sufficient LLW disposal capacity will be made available when needed." However, given the failures of some of the proposed compacts, and the time it takes to develop and license a new disposal site, the required LLRW capacity may not be as "available when needed" as stated and the waste would have to be stored on-site, which is less than satisfactory, and will continue to be an added burden to State and local governments. Additional details describing the on-site LLRW program must be included in the GEIS. The description must address temporary on-site LLRW storage, on-site compaction of LLRW including the SNF canisters, and the mandatory alternative actions that will be taken in the event permanent LLRW disposal facilities are not available when needed. Public and Occupational Health impact must also be reassessed in connection with an expanded description of the LLRW on-site activities[.] (0913-11 [Bevill, Bernard])

Comment: On Page 1-17, lines 16-20, NRC makes the flippant assumption that: "Sufficient low-level waste (LLW) disposal capacity will be made available when needed. Historically, the demand for LLW disposal capacity has been met by private industry. NRC expects that this trend will continue in the future. For example, in response to demand for LLW disposal capacity, Waste Control Specialists, LLC, opened a LLW disposal facility in Andrews County, Texas on April 27, 2012." NRC neglected to mention that several career Texas state environmental protection agency officials resigned their jobs, and careers, in protest over the decision to open WCS, nor that WCS now threatens the Ogallala Aquifer - essential to numerous Great Plains States for drinking and irrigation water - with radiological contamination. (0919-3-6 [Kamps, Kevin])

Comment: Re: Page 3-36, Section 3.14.4, Nonradioactive, Nonhazardous Waste, at Big Rock Point in MI, radioactive waste was simply treated as if it weren't, and was dumped in the Waters Twp., MI household trash landfill. Such "clearance level" or "below regulatory concern" exemptions permitted by NRC are unacceptable. (0919-6-2 [Kamps, Kevin])

Comment: Re: line 31, "Waste minimization techniques employed by the licensees may include source reduction and recycling of materials either onsite or offsite"...This is quite Orwellian - "recycling" hazardous wastes? Into WHAT?! What are the risks to people and the environment of doing that? What is the motivation? To save industry money on disposal costs for toxic waste? (0919-6-3 [Kamps, Kevin])

33. Comments Concerning Transportation

Comment: Trucking (or transport) of radioactive waste to the disposal site must be made in lead-lined containers, on routes which do not cross ANY populated areas or important farm/crop land. We have seen too often the horrific accidents creating hazardous waste spills from accidents to rail and truck transport in populated areas. We cannot afford to further put our land and citizens at risk. Short of this, there is no waste confidence in the disposal of nuclear fuel. (0006-2 [Van Wicklen, Betty J.]

Comment: Nuclear waste should not be transported anywhere else for "disposal", it should be stored at the reactor site where it originated. (0012-2 [Swanson, Mark])

Comment: Transporting nuclear waste to temporary waste dumps is irresponsible and dangerous. (0023-4 [Bridges, Martha])

Comment: Local conditions about our railroads and bridges, we got a hairpin curve right on the art museum a couple of blocks from midtown. And I'll tell you, I hope somebody walks those tracks before a trainload of nuclear waste goes through. (0030-14-3 [Lewis, Marvin])

Comment: The radiological impacts from spent fuel transportation conducted in compliance with the NRC Regulations are low. The NRC also concluded that regulations for transportation of radioactive material were adequate to protect public against unreasonable risk. NRC concludes that radiological impacts were incidents free and accident transportation of spent fuel from a single at-reactor storage facility to repository would be small. The same conclusion is reached with respect to a system-wide inventory. I want to list the assumptions that go into this, which I think are invalid, which I hope the Commission will address in its final report, if a Supplemental Impact Statement is compiled. The radiological doses seem to be based on an assumption that there will be only external exposures to radioactive materials, and that there will be no contaminations, say, on the outside of a shipping container. (0045-3-1 [Haggerty, Bernard])

Comment: There's also a peculiar, the Draft Environmental Impact Statement pieces together, I don't know what the technical term for this, but it pieces together a large number of transportation studies of various kinds, including two of them from 1972 and 1975, which really need to be updated. Since those dates, the Interstate Commerce Commission has been eliminated and replaced with the Service Transportation Board. And I think my basic comment here, is that the assumption of institutional controls, and the express assumption that transportation regulation is adequate is just false, and needs to be re-examined. Here's what I've learned, and this is the purpose of my visual aid, is an example of what I take to be an obvious violation of the transportation safety regulation. The safety regulations require the commercial vehicles transporting hazardous materials to use extreme caution. And when the weather is bad, basically, they're required to pull over. This is a, I don't know if you can see it from where you are, but this is a truck carrying radioactive materials. I suspect it's from Tennessee on its way to Idaho National Engineering Laboratory. On this particular day, Interstate 80 is covered in a polished ice coating. And this truck, pretty clearly, was in violation of the transportation safety regulations. If you want to hold it for a second, that's fine, or you can set it down. It's has illustrated my point. So I correspond, and I've done this several times, with the Federal Motor Carrier Safety Administration, which presumably regulates and monitors violations of transportation safety regulations. And their response in written form to the Congressman, who helped me get this response, was "the Federal Motor Carrier Safety Administration believes that the judgment about weather conditions should be left to professional truck drivers, the police, State, and local officials." In other words, the Federal

Motor Carrier Safety Administration does not monitor or enforce the transportation safety regulations that apply to shipments of radioactive materials. And I think this is in direct contradiction to the assumption stated in the Section I quoted. And so some digging needs to be done before a final Impact Statement is made. (0045-3-2 [Haggerty, Bernard])

Comment: Let me quote to you, from a description of an incident that wasn't just a weather-related violation of the transportation regulations. November of 1996, a tractor trailer overturned on an icy road in Northern Nebraska, while carrying two nuclear warheads to a decommissioning facility in Texas. And this is from an article in the Bulletin of the Atomic Scientist by Robert Alvarez. Nebraska officials criticized the Department of Energy for failing to follow protocols that required advanced notice about such shipments. They also raised concerns about their transportation of route, which required the trucks travel in an area hours away from the nearest equipment capable of salvaging the truck from the ditch. (0045-3-3 [Haggerty, Bernard])

Comment: Later, a former DOE official disclosed that the radiation monitoring equipment on the truck had been removed, by order of the Department of Energy. Apparently, in September of 1996, one of the drivers had claimed that his daughter died from a rare brain tumor, because of his exposure to radiation at work. And in response, the Department of Energy ordered the monitors removed. So two months later when the truck carrying the warheads crashed the Department of Transportation had no way of knowing whether that had been a radiation leak. To me, these are examples of the absence of effective institutional controls in the Continental Scale Transportation Project that will accompany any, either interim storage, or off-site permanent repository. (0045-3-4 [Haggerty, Bernard])

Comment: I'm opposed to the option of off-site storage, in any form, and I think that the Nuclear Regulatory Commission should not express any confidence in any plan that requires transportation off the site where radioactive materials are produced. (0045-3-5 [Haggerty, Bernard])

Comment: A national waste repository would create new and complex safety problems for our nation. If a national waste repository opened it would result in tens of thousands of shipments of high-level radioactive spent fuel and other nuclear waste across the United States, raising the spectre of weather- or transport-related accidents or terrorism in the states through which the spent fuel travels. If 10-mile emergency evacuation plans for areas surrounding all nuclear plants are required, shouldn't there be a similar requirement for areas surrounding the corridor across which the spent fuel would travel? Is this increased threat to national security worth the cost or risk to public safety? (0064-5 [Skud, Bruce])

Comment: This country should not transport nuclear waste nor should we store it in containers that do not protect us and the environment. (0076-2 [Jensen, Phyllis])

Comment: This spent fuel must never be transported via road/highway for long distances (over 50 km) and when transported via road/highway, every precaution must be taken to prevent vehicles operated by those unrelated to said movement from possibly causing an undesirable incident. Transport over distances greater than 50 km. should be discouraged, but when absolutely necessary, accomplished via rail, and measures to maintain security and the safety of the public must be implemented. This would include routing around densely populated areas and away from potable water supplies. (0080-1 [Emerson, Willis])

Comment: Even the casks approved by the NRC for on site storage are not safe enough for transport and so will not be sufficient to safely deal with environmental conditions (sea level or river rise, severe flooding, etc) that require removing casks stored on site to some more secure location. (0086-3 [Lewis, Carol])

Comment: [S]outhern indiana164 bypass around evansville just out of evansville, indiana.on my way to work one morning a small truck was rolled over on the highway. i slowed down to see if someone needed help. a head of me on a hill was the fire department, i stop to ask what was going on with the truck down the hill. in ones hand was a picture book of difference truck signs. it show the truck to be carrying radioactive waste from a mfg. plant in Tennessee. they ask if there was anything inching out of the truck. they told me they can not do anything until someone shows from up from the highway dept. and the nuclear dept. to tell them what to do with the truck. 8 hour later i drove bye to leaner they had just finish up with the truck and there be no info on the news that night. no one was to know about the waste moving there indiana. (0094-1 [Edwards, Greg])

Comment: In the remote possibility that a national repository actually opens it would result in tens of thousands of shipments of spent fuel across the nation, raising the specter of catastrophic accidents or terrorism. If nuclear plants are required to have evacuation zones, shouldn't there be a similar requirement for these spent fuel transportation corridors? At the end of the day is this new serious threat to national security really worth the environment and public safety risk? (0112-10-4 [Skud, Bruce])

Comment: Nuclear waste should not be transported and stockpiled in "interim" sites around the country, as the cost to taxpayers and risk to communities of moving this deadly cargo are too great. (0143-6 [Arauz, Jorge])

Comment: The sheer volume of nuclear waste will require thousands of shipments on our roads, rails, and waterways. Due to the risk involved in mass nuclear waste transportation, it should only be undertaken once--and when we know there is a viable solution. (0147-5 [Fallon, Gloria])

Comment: I don't want nuclear waste traveling through my city enroute to a storage facility. (0158-3 [Payne, Joanne])

Comment: Regarding storage of nuclear waste both here and across the country, I firmly believe that the risks of transportation are greater than the risk of storage onsite. Transporting highly radioactive fuel over the highway is a specter of many possible errors and accidents, collisions, mechanical breakdowns, spills, and inexperienced Hazmat personnel in areas far from any nuclear facility. (0163-20-7 [Gellert, Sally Jane])

Comment: Consider the attached article, "Burning truck hauling nuclear load flies under radar," 10/31/13 Toronto Star. (0174-13 [Thomas, Ellen] [Thomas, Ruth])

Comment: Secondly, we must not transport the waste ...anywhere...keep it where it is. (0177-3 [Craig, Anne])

Comment: As a Commissioner, I had the opportunity to participate in a 100+ mile used fuel train shipment between Duke's Brunswick and Shearon Harris plants in eastern North Carolina. The utility demonstrated extraordinary care and skill in conducting this shipment and their coordination with state and local law enforcement authorities was exceptional. (0180-4 [Merrifield, Jeffrey])

Comment: I appreciate the opportunity to offer my testimony to the Commission, regarding transportation of highly radioactive waste to "temporary" storage sites. Would not the proposed transportation of radioactive waste establish "consolidated interim storage" sites for high-level radioactive waste, initiating transport of tens of thousands of casks of lethal radioactive waste on our roads and railways for the primary benefit of the nuclear power industry, while endangering the health and safety of millions of Americans? (0189-1 [Patrie, MD, MPH, Lewis E.])

Comment: With the real potential for serious transportation mishaps and disasters on our highways and railways, I do NOT want to see any more high-level radwaste coming to (or going through) "NUCLEAR ILLINOIS: THE LAND OF LINCOLN." Illinois should NOT store an additional 9,000 tons of irradiated nuclear reactor fuel rods from our nation's closed reactors, that would come to a proposed "CENTRALIZED INTERIM STORAGE" radwaste facility here. (0196-5 [Nelson, Dennis R])

Comment: Nor should we transport this waste, endangering everyone on the route. (0226-1 [Garden, Claire])

Comment: My letter is for road safety. Although my state may not be a state within routes holding shipments of radioactive waste it is my concern because it would only be fair to the people who may find themselves without knowledge of your operations planning. Not all people have the knowledge of nuclear operations as I do and some do not even know anything regarding protest and activist activities that bring awareness to operations that cause harm to the environment. I am not here to ask you anything but to consider reviewing the options of your storing and transporting. Since you have obligations it would only be fair that you have that opportunity to continue but to transport in any unsafe or risk taking that puts people in harms way should be a discussion with state and federal officials that they assist you with funding of a route that will not be shared. In the event there is an accident that would be covered and followed through a set of regulations that you may be capable of handling and avoiding a threat to the public. (0228-1 [Wilson, Lavern])

Comment: Second thing is limit spent fuel transportation. Onsite storage also would save unnecessary transportation costs and reduce radiation exposure risk to the general population during highway road and barge transit. These risks could be significant because even undamaged transport casks do not have enough shielding to prevent gamma and X-ray radiation from escaping through the vault. (0245-29-3 [Shineflug, Marilyn])

Comment: Mass transportation of nuclear waste is insane. The sheer volume of nuclear waste will require thousands of shipments on our roads, rails, and waterways. (0245-37-2 [Bilenko, Stephanie])

Comment: Centralized or consolidated storage in temporary sites would involve significant waste handling and thousands of trips moving waste and just inherently increasing the likelihood of the various kinds of accidents. In Maryland, we are particularly concerned about environmental impacts, including water contamination in the Susquehanna River or our treasured Chesapeake Bay from the reactors at Calvert Cliffs, Peach Bottom, and the other reactors throughout the watershed. (0246-13-2 [O'Leary, David])

Comment: Again going back to the transport issue, we have concerns. Calvert Cliffs, in its location -- and this is true of other reactors around the country, but using Calvert Cliffs as an example -- transporting that waste would bring it past major metropolitan areas like Washington, D.C. and there really are no other obvious ways to move that waste around. (0246-13-3 [O'Leary, David])

Comment: And we shouldn't be having high-level nuclear waste being transported through states to go to into permanent places that are not -- have no safety or any more safety than where they are at. We need to keep everything on the site where it is right now in order to not create other accidents. (0246-16-6 [Michetti, Susan])

Comment: I keep hearing that we will be transporting our waste to a permanent site. Of course you all know that no such site has been identified. We all know that Yucca Mountain has been closed. So what is the idea of transporting masses of waste on our roads, leading through communities, having the risk of accidents? It is undoable. This is not a solution. (0246-30-1 [Fabiin, Dagmar])

Comment: And so, I have to repeat the storage in-house study in transition, although best from those that are offered. They cannot be transported because most of them are not even licensed for transport. So, everything has to be staying where they are now. And consequently, forget about transport. That is just insane. (0246-30-3 [Fabiin, Dagmar])

Comment: Now, notice that nothing is mentioned here about transporting this high burn-up fuel, just storing it. So, we are left to wonder how they are going to get the fuel to a site other than the reactor complex itself. That is not mentioned. (0246-5-2 [Leichtling, Don])

Comment: Additionally, highly protected methods of transportation, through non-populated areas must also be identified and employed. While the issues are certainly complex, it is time to move forward and resolve these problems for the long term. (0247-2 [Rogina, Raymond])

Comment: Pennsylvania's degraded roads, rails, and bridges make accidents inevitable. Extraordinary health, environmental, and financial risks on-site and along transportation routes are enormous and pose unacceptable risks in this densely populated region. (0249-11 [Dugdale, Jane])

Comment: No, it would not license such a facility, but the Generic Environmental Impact Statement would apply to a temporary storage site, if one were to be located in South Carolina at the Savannah River site, perhaps one of the leading contenders for such a site. That would mean high-level nuclear waste trucked all over the United States through Highway 77, on Highway 85, bound for the Savannah River site, and exposing people all along the way. (0250-1-6 [Zeller, Lou])

Comment: Finally, stop the secretly moving nuclear waste from here to there. Don't use our highways, rails, and waterways for such dangerous and unnecessary projects. (0250-11-5 [Kerr, Julius])

Comment: Would not the proposed transportation of radioactive waste establish consolidated interim sites for high-level radioactive waste, initiating transport of tens of thousands of casks of lethal radioactive waste on our roads and railways for the primary benefit of the nuclear power industry, while endangering the health and safety of millions of Americans? (0250-30-1 [Patrie, Lewis E.])

Comment: How can we even consider moving such waste, risking devastating consequences to people and the environment by radiation poisoning; the poisoning of our land and water cannot be reclaimed. We can't take it back. Let's not make any more mistakes about this. Let's not move any waste[.] (0250-39-5 [Richards, Kitty Katherine])

Comment: And, for some irony here, the security about transporting nuclear waste mentions crashing into high-speed concrete barriers, water immersion, 30-foot drop, severe impact, extreme heat. (0250-46-5 [Stein, Ed])

Comment: The prospect of transporting this waste across our country by rail, boats, and trucks is frightening. The American Transportation Research Institute, headquartered in Arlington, Virginia, is part of the American Trucking Association's federation and a 501(c)(3) not-for-profit research organization. They published a report May 2013, which stated for the year 2010 there were 35,000 large trucks involved in crashes in the United States. If .001 percent of the accidents are trucks transporting high-level nuclear waste, that would be 35 a year. The potential damage caused by just one truck transporting high-level nuclear waste involved in a worst case scenario accident with the container cracking and possible fire and the waste spilling and contaminating our land, our streams, innocent people and animals in the area, and those sitting in the traffic caused by the accident could be deadly and render the area uninhabitable for decades. (0250-49-4 [Gantt, Carol])

Comment: And storing it onsite in the dry cask is not safe, but it's a lot less dangerous than transporting it on our roads to go store it somewhere else. In Tennessee, they have these electronic signs over the highway that show many roadway fatalities we have had, and it's over 800 this year. So there's no reason to think it's safe to be transporting this stuff. There will be accidents inevitably. And, even without accidents, you know, the radioactive elements are getting through the containment structures that they're transporting it in. Some of these elements are created for nuclear efficiency get through steel and concrete. (0250-50-3 [Blevins, Eric])

Comment: And, if this permanent storage place does come to us from out of the ether, the problem of transporting ever increasing numbers of radio-active spent fuel cells will plague our society. (0252-5 [Golden, Leon] [Goldin, Martha])

Comment: If and when a repository is found and accepted by the community where it is located, the transport of high-level radioactive waste across this country will be on terrorist's "to do list". (0290-2 [Brown, Marty])

Comment: The NRC's plan to hide the waste problem by transporting spent fuel away from nuclear reactors to 'temporary' storage sites around the country is unsatisfactory because thousands of communities would be at risk from radioactive waste during transportation and storage, more nuclear sites would have to be safeguarded, and reactor owners could continue making waste without responsibility for managing it. The great volume of nuclear waste will require thousands of shipments on our roads, rails, and waterways. Due to the risk involved in mass nuclear waste transportation, it should be undertaken only once to a proven-safe permanent storage site. (0319-6 [Nichols, John])

Comment: Over 3,000 spent fuel shipments covering more than 1.7 million miles have been safely completed in the U.S. (0325-18-2 [Lemmon, Tom])

Comment: "If and when a repository is found, and accepted by the community where it is located, the transport of high-level radioactive waste across this country will be on a terrorist to-do list." (0326-14-2 [Brown, Marti])

Comment: The mass transportation of nuclear waste is a threat to the public. You cannot transport nuclear waste without accidents or spills. You cannot guarantee the public's safety while doing so, with this protecting people and the environment mission statement that you have. (0327-21-3 [Miskena, Jessice])

Comment: Finally, I would say that, on transportation, if you listen to the news reports every morning, you will find that there are 18-wheeler truck accidents occurring at rush hour, morning and evening, in virtually every major city since we have Interstate 75, Interstate 40, Interstate 65, and Interstate 24. And every few days, there is some kind of a collision or one of these 18-wheelers goes off a curve or goes off an on- or off-ramp. And the idea that you can transport huge volumes of nuclear waste over years without having deadly accidents and accidents for which our emergency management and hazardous waste managers are not prepared. (0329-12-11 [Paddock, Brian])

Comment: [P]utting it [nuclear waste] into geological repositories which would encourage mobile Chernobyls in transporting waste on the roads and our highways. It puts everyone at risk. Every car traveling past an entourage of waste that's being moved is endangered, not to mention if there was an accident from anything that can happen on the road or a terrorist knowing that there was a route of this waste being transported. A terrorist knowing that puts the entire country at risk, so this is just sheer madness, the issue of putting it on the highway. I resent that. I believe most everyone on the call, save for a few that are anesthetized by nuclear propaganda, would agree. (0329-15-3 [Star, Priscilla])

Comment: We're going to transport it there. Good luck with that. Those roads, he's not joking about that. And there will be protests all along the way because we need to protect our Earth. (0329-19-5 [Vandel, Niki])

Comment: And I would wholly recommend that the NRC in its sense of feeling obligated now to be more transparent takes this more to the level in the street and asking people how do they feel if there were trucks moving through their town moving radioactive waste and what will those trucks be made of and how can we feel safe when, say, we're taking our children home from school or we're going home from work or we're traveling these highways where these situations are going to occur. You know, the situation, as they say, you have blood on your hands. Is it not the same if there was an accident and the NRC had made that decision without fully canvassing whether or not these trucks should be on the road? This is just insanity. I don't think anyone would agree that it's smart. But I felt compelled to come back on and talk about that because I feel very strongly threatened, threatened by the concept that that may ever happen. The fact that that is being discussed and how to move waste from point A to point B, of course, we have to transport, right? That's what we're talking about. But that to me is insanity. You can't just take it from A to B without bringing on the worst risks known. (0329-21-2 [Star, Priscilla])

Comment: I wouldn't recommend anybody transporting nuclear waste an inch further than what they have to, such as like on the West Coast, just to move the spent fuel away from the San Andreas Fault up into the mountains, you know, just a few miles away from San Diego or wherever else they're at, to some safe underground place or sand pit or something where they could be stored away from people a little bit and away from an active possible tsunami or earthquake zone. I just wanted to throw that in there, that I just really don't want to have anybody transferring spent fuel rods, you know, 1,000 miles or 2,000 miles across the country. (0329-24-3 [Wilson, Greg])

Comment: And my final point is that one of the issues in TVA is that the transportation of radioactive waste could be considered to be done, instead of by truck, on the rivers. TVA controls the navigable waters within its area. And it has previously let highly toxic and dangerous cargos use our rivers. And that's a problem. And we think that the problem and a prohibition on river transport of radioactive waste is in order. (0329-25-5 [Paddock, Brian])

Comment: Simply stated, transport is too dangerous to become a viable solution in our analysis. On a personal note, we are continuously uncomfortable living very close to Limerick Nuclear Plant's nuclear waste, and evidence suggests that attempting to transport it would even be worse. (0329-3-4 [Cuthbert, Lewis])

Comment: It's pretty clear that the NRC nor anyone else can't guarantee safe transport of nuclear waste, and, based on the inability to provide that kind of surety, we suggest that it makes much better sense not to transport high-level radioactive waste on our nation's highways and railroads. The history of nuclear waste transport incidents and accidents would tend to refute both NRC and nuclear industry claims that transport is safe. There have been numerous incidents and accidents since the 1950s through literally last week where there have been problems. One of them occurred in Pennsylvania in 1981. (0329-3-5 [Cuthbert, Lewis])

Comment: And a number of things in the state of Pennsylvania would suggest this is a very bad idea. We have a severely deteriorating infrastructure problem in Pennsylvania that would mitigate against attempting to transport these wastes. Pennsylvania's current governor, Tom Corbett, is on record saying that the roads and bridges in Pennsylvania are crumbling, and it's also been reported that two of every five Pennsylvania bridges are structurally deficient or functionally obsolete. So the safety of transport is a very large hurdle to try to clear. (0329-3-6 [Cuthbert, Lewis])

Comment: An additional factor to consider for the NRC would be increasing extreme weather conditions and patterns and what the impact would be on transport plans. Pennsylvania, in 2011, broke all existing records for snow, ice, heat, and rain problems in terms of weather conditions. (0329-3-7 [Cuthbert, Lewis])

Comment: Final thought in terms of a separate topic is financial injustice. Our analysis suggests and our research would show and support the fact that a number of potentially negative financial impacts would occur from transportation of high-level radioactive waste. Property values have been documented to decline along nuclear waste transportation routes in several states already. Insurance does not cover radiological incidents or accidents in virtually every case, and there's a very large open question in terms of who would reimburse victims of a nuclear waste transport accident. That is not clear. And there's been an attempt in Pennsylvania and I'm going to presume in other states as well that local rights are under attack in terms of the ability to oppose nuclear waste transport through communities. (0329-3-8 [Cuthbert, Lewis])

Comment: I have also lived in Santa Fe, New Mexico and have been on the bypass and had one of the waste trucks overtake me in the middle of the night in an unsafe manner, scared the bejeezus out of me, not really comfortable with that whole process either[.] (0329-34-2 [Myers, Susan])

Comment: And I want to thank the doctor [Dr. Lewis Cuthbert]. He really brought in one side of the argument quite well. And I guess I completely -- two things. The transport thing, completely agree with that. Do not transport nuclear waste until we have a team that can provide immediate response. (0329-6-1 [Vandel, Niki])

Comment: Were there to be a repository available, the transportation of waste to it would be vulnerable to accidents and to terrorism. One only has to cite the many truck, train and ocean vessel accidents associated with the transportation of chemicals and fossil fuels to understand comparable risks. (0348-2 [Agnew, David] [Roscoe, Lee])

Comment: Were there to be a repository available, the transportation of waste to it would be vulnerable to accidents and to terrorism. One only has to cite the many truck, train and ocean vessel accidents associated with the transportation of chemicals and fossil fuels to understand comparable risks. (0352-2 [Roscoe, Lee])

Comment: Accidents can occur during transportation of waste. (0368-4 [Mattox, Judy])

Comment: Were there to be a repository available, the transportation of waste to it would be vulnerable to accidents and to terrorism. One only has to cite the many truck, train and ocean vessel accidents associated with the transportation of chemicals and fossil fuels to understand comparable risks. (0373-2 [O'Malley, Brian])

Comment: 3. Stop the extremely dangerous transport and interim storage scheme that: 4. Would drastically increase risks for a catastrophic transport disaster (0377-1-13 [Cuthbert, Lewis])

Comment: We also provided NRC with a body of evidence showing why transport of high-level radioactive waste from Limerick is even worse than on-site storage. It would present the public with even greater risks to more residents. (0377-1-4 [Cuthbert, Lewis])

Comment: ACE COMPILED A BODY OF EVIDENCE FOR THESE COMMENTS, SHOWING WHY NUCLEAR WASTE TRANSPORT IS TOO DANGEROUS! Nuclear Wastes, Some of the Most Deadly Materials on Earth, Should NOT be Transported On Our Nation's Highways and Railroads. -Transport creates extraordinary, unnecessary, and unacceptable health and financial risks for the public. -Our nation's seriously degrading roads, bridges, and train tracks add to the inherent risks from natural disasters. -Transport sets up vast numbers of inviting targets for terrorists, for which guarantee of safety is not realistic. Security will not be adequate, available, or affordable. Thousands of radioactive waste shipments in trucks and trains would be vulnerable to radioactive disasters throughout our nation due to: ACCIDENTS -There is serious cause for concern: (1) DOE acknowledges that accidents will happen; (2) Even low speed accidents can crack brittle metal tubing and unseat or damage a valve or seal, releasing radioactive particulates to the environment; (3) Fires from truck or rail accidents increase probability of devastating radioactive releases; (4) Terrorist attacks with planes, missiles, or bombs can ignite transport vehicles, causing fires that release radiation; (5) Lax security has already been documented - "Security Breach on Nuclear Waste Train." (4-30-02) Each fuel assembly contains 10 times the long-lived radioactivity released by the Hiroshima bomb. - Trucks contain 1 to 4 fuel assemblies -Trains contain up to 24 fuel assemblies - Nuclear waste casks could emit significant radiation just in transport. Thermal images of traveling nuke wastes suggest just getting stuck near a shipment is dangerous. (0377-2-1 [Cuthbert, Lewis])

Comment: FINANCIAL INJUSTICE: Property Values Decline Along Nuclear Waste Transportation Routes - Experience Shows Courts in New Mexico, Colorado, Tennessee, Washington, and Ohio already awarded property damages for reduced values; Disclosure Laws in Most States Require That Buyers Be Told If Property Is On A Transportation Route; Residents could be "stuck" with property they can't sell along a nuclear waste transportation route. This is an unacceptable and unnecessary injustice. Many PA communities would be

exposed to frequent shipments of large amounts of nuclear wastes transported to interim storage facilities, likely for far longer than 25 years (0377-2-10 [Cuthbert, Lewis])

Comment: Public Health and Safety Impact From Radioactive Waste Transportation (DOE Estimates. 50 Miles (80 kilometers) for Accident Conditions; .5 mile (800 meters) on either side of the transportation right of way for non-accident conditions; Consequences could be devastating to the economy and public health from a severe radioactive waste transport accident in an urban setting. Even a small radiation release in a rural setting would contaminate 42 square miles for over 1 year (0377-2-11 [Cuthbert, Lewis])

Comment: Insurance Does NOT Cover Radiological Incidents or Accidents: Homeowners insurance will not cover loss of real estate use or personal property caused by radiological accidents or terrorist attacks; Health insurance may not cover some illnesses related to long-term or permanent radiological damage or other long-term serious illnesses caused by a radioactive waste transport accident. Who will reimburse victims of a nuclear waste transport accident or terrorist attack? Vast numbers of people could lose everything from radioactive contamination; -Size of region impacted for public health and safety along transportation routes is 50 miles according to a DOE report; -A severe accident involving 1 radioactive waste cask, releasing a small amount of radiation would contaminate about 42 square miles for well over 1 year, with devastating economic consequences in an urban setting (DOE Report); -Economic consequences estimated at \$2 Billion (1980 NRC study); Many people could lose their homes, businesses, possessions, and health from just one radioactive waste transportation accident that turns into a radioactive fire; Neither the nuclear industry, nor state or federal governments are obligated to compensate the vast numbers of victims who could lose everything due to nuclear waste transport accidents or terrorist attacks. The Nuclear Industry Won't Pay A Dime: The nuclear industry is no longer responsible for any costs associated with nuclear waste after it leaves the site, including any costs associated with nuclear waste transportation accidents. Cash-Strapped States Can't Pay: States do not have adequate budgets to cover astronomical long-term relocation costs or for widespread radiation clean-up costs, required after a serious radioactive waste transport accident. The federal Price Anderson Act does not cover nuclear waste transportation accidents: The current Republican Congress is unlikely to provide relocation or clean-up costs; It is more likely they will deny risks. You can't see, smell, or feel radiation contamination. Many Congressmen were reluctant and very slow to help other Americans in major emergencies. Vast numbers of Sandy victims are still homeless, and the devastation from that hurricane was easy to see. (0377-2-12 [Cuthbert, Lewis])

Comment: Local Rights Are Being Steamrolled To Allow Dangerous Nuclear Waste Transport: Many jurisdictions already officially opposed nuclear waste transportation through their communities to protect the health and financial interests of their citizens, including Philadelphia, Bucks County, and Falls Township in PA (0377-2-13 [Cuthbert, Lewis])

Comment: PA State Senate Republicans are attempting to take away the rights of local municipalities to say NO to nuclear waste transport on behalf of nuclear industry interests. Local officials should have the right to say no to transporting deadly radioactive wastes through their communities to protect public safety, health, and financial interests. At stake for victims of high-level radioactive waste transport accidents or terrorist attacks - health and potential total loss of property, homes, businesses, and all possessions for generations. (0377-2-15 [Cuthbert, Lewis])

Comment: DOE Knows Accidents Will Happen; -DOE estimates at least 50 accidents could occur during shipments of the nation's radioactive wastes; -DOE's own data estimated that transporting several thousand shipments of the nation's nuclear waste off nuclear sites would

result in between: 70 to 310 accidents - over 1000 incidents - would occur during truck shipments 50 to 260 accidents - over 250 incidents - would occur by train shipments; - The American Petroleum Institute says at least 15 accidents are expected each year with thousands of truck shipments; -Facts refute deceptive NRC studies claiming nuclear waste transport is totally safe; -Independent studies show the kind of damage that can be done by transporting nuclear fuel; -Even a low speed accident could unseat a valve or damage a seal, releasing radioactive particulates to the environment; -An accident could crack brittle metal tubing around the fuel; -The more severe the accident, the more radiation would be released to the environment. Consequences of Nuclear Waste Transport Accidents or Terrorists Attacks - Size of region impacted for public health and safety along transportation routes (DOE Report); 50 Miles (80 kilometers) for Accident Conditions .5 mile (800 meters) on either side of the transportation right of way (non-accident conditions); - A severe accident involving one radioactive waste cask, releasing a small amount of radiation would: Contaminate about 42 square miles for well over a year, with devastating economic consequences in an urban setting (DOE Report); Take over a year to attempt to clean up radioactive residue (DOE Report); Economic consequences estimated at \$2 Billion (1980 NRC study); - Radiation doses from an accident or terrorist attack breaching transport containers (1 yard away) could result in devastating impacts: Lethal radiation doses from high-level radioactive waste transport (500 rem) could result when exposed for less than 3 minutes; Cancer or genetic damage risk increases after just 30 seconds (100 rem); - NRC's pamphlet says 10 years after waste is removed from reactors, an unshielded radiation dose could exceed 20,000 rems per hour; - 5,000 rems can cause incapacitation and death within a week. (0377-2-2 [Cuthbert, Lewis])

Comment: Regulations For Radioactive Transportation Accidents Are UNprotective: -8-22-13 - A burning truck carrying radioactive material was not reported until; 10-31-13. It took over two months for this dangerous incident to be disclosed to the public. -This refutes industry and NRC claims that nuclear materials transportation is absolutely secure; -In fact it suggests many nuclear transport accidents / incidents can be going unreported to NRC or the public; -It confirms major GAPS in nuclear reporting systems; -Despite the fiery emergency, NRC was not informed. There was no requirement for this major truck fire to be reported. Fires, even on nuclear materials trucks, are not required to be reported to NRC; -Many radioactive transport accidents and incidents can be going unreported; -Truck drivers are programmed, basically taught, to do everything they can to avoid the media, that the media is like terrorism. (0377-2-3 [Cuthbert, Lewis])

Comment: Deteriorating Infrastructure Makes Transport Far Too Risky: -It is not safe to transport deadly radioactive wastes on our nation's deteriorating roads and bridges. - Example: PA's Crumbling Roads and Bridges. In 2013, PA's governor admitted roads and bridges are "crumbling;" In 2011, PA bridges were among the worst in the nation (Philadelphia Inquirer), with two of every five PA bridges structurally deficient or functionally obsolete. The safety factor suggests NO radioactive wastes should be transported across PA bridges; PA leads the country in the number and percent of spans of roads and bridges deemed structurally deficient More than 1/2 of PA's major urban roads are in "poor" or mediocre condition (American Society for Civil Engineers report); - Radioactive Waste Transport in PA Unacceptable; The PA Department of Transportation does not have funding for adequate maintenance of the vast portions of badly deteriorated roads and dangerous bridges; PA is 2nd in the nation for the number of nuclear reactors, and therefore 2nd for the highest amount of high-level radioactive wastes that would be transported -In other states bridges have already collapsed and roads have already crumbled. What if radioactive waste transportation vehicles were involved? - Many states, like PA, are facing funding crises, making it unlikely all structurally deficient roads and bridges will be made safe enough to safely transport deadly radioactive wastes (0377-2-4 [Cuthbert, Lewis])

Comment: Terrorist Attacks - Deadly radioactive wastes cannot, and will not, be guarded as well along transport routes as at a nuclear plant site. The largest casks carry the equivalent of some 200 Hiroshima bombs in a long-lived radiological equivalent; Some call radioactive waste transport a potential "Mobile Chernobyl, vulnerable to terrorist attacks with planes or missiles (even from afar). Bombs ignited on transport vehicles could cause catastrophic radioactive fires, releasing massive radiation, contaminating and making uninhabitable very large areas of the transport route. Army testing proves transport casks can be penetrated with a missile; Jet plane fuel from a deliberate crash into a transport vehicle could cause a devastating fire, even with a small plane. Lax Security Documented: It is absurd for the nuclear industry to claim their wastes are self-protecting due to risk of radiation exposure. This ignores reality, including the real potential for airplane and missile attacks. Evidence confirms that "Waste Trains" are not adequately protected from terrorists, "Security Breach on Nuclear Waste Train." 4-30-02 Durham, N.C.; -Inmates Jump Wrong Train, Revealing Vulnerability. If these people intended to cause serious harm, they were in perfect position. Terrorists would not have boarded the train unarmed. -Defenders did not deny access. If those who boarded the train had been attackers carrying explosives who were willing to sacrifice their lives, there would have been a serious problem. (0377-2-5 [Cuthbert, Lewis])

Comment: Fire And Nuclear Waste Transport: Fires due to truck or rail accidents increase probability of disastrous radioactive releases.; Accidents or terrorist attacks could trigger fires during truck or train transport.; There is significant potential for a fire resulting from a transportation accident involving high-level radioactive wastes. This could have similar consequences as radiological weapons.; If a truck or train accident resulted in a fire, spent fuel rods could heat up, self-ignite and burn in an unstoppable fire. Numerous scientific experts warn that burning fire on zirconium cladding of nuclear waste can trigger an exothermic reaction. It's important to extinguish fires within 1/2 hour. Yet confusion, a lack of understanding radiation risks, and deciding who is responsible for cleanup and public health in a radioactive emergency elevate risks. Shipping containers are only designed to withstand a 1/2 hour fire at a temperature of 1475 degrees. NEI's inadequate testing was only 90 minutes at 2000 degrees. Rail fires could burn for hours, sometimes days, at temperatures considerably higher -Heat could vaporize some of the radioactive materials and sweep them up into the air - Persons downwind can inhale radioactive particles, later developing cancer or genetic defects. Burning Truck Hauling Nuclear Load Flies Under The Radar: -A burning truck hauling a nuclear load flew under the radar in Ohio 8-22-13. (Not reported until October 31, 2013) Despite the fiery emergency, there was no requirement to immediately inform NRC to independently determine if radiation was released. This incident did not turn into a disaster, but it could have. It refutes claims that nuclear materials transportation is absolutely safe. (0377-2-6 [Cuthbert, Lewis])

Comment: Extreme Weather Conditions Increase Risk Of Transport Disasters: Earthquakes, tornadoes, and hurricanes are getting far stronger and much more frequent, drastically increasing risk of transport accidents. In 2011, all PA weather records were broken for snow, ice, heat, and rain, clearly increasing risks for transportation accidents which could be disastrous if they involve nuclear waste. Since PA is 2nd in numbers of nuclear reactors, more wastes would be transported than in other states, increasing the odds of disaster. (0377-2-7 [Cuthbert, Lewis])

Comment: Earthquake Faults and Fracking: Nuclear waste on Limerick's site faces serious threats from loss of water and power from an earthquake. Limerick was built directly over an earthquake fault with 4 others within 17 miles. Transport of large volumes of this waste off-site during an earthquake could also create a catastrophic disaster. Fracking is known to trigger

earthquakes. To date, over 4200 wells have been approved for fracking in PA. PA would be transporting large volumes of waste since it has the 2nd highest number of nuclear plants. (0377-2-8 [Cuthbert, Lewis])

Comment: A truck or railway accident or terrorist attack involving transported nuclear waste could render entire cities and surrounding areas uninhabitable. Transporting radioactive materials across the nation on major interstates, highways, and railways will expose countless communities across the country to hazardous radiation. A recent DOE study estimated over 800 adults would die from cancer due to radiation emitted from the trucks in the Northwest region alone. (0377-3-1 [Cuthbert, Lewis])

Comment: Transport Is An Immoral, Unethical, Unnecessary Risk: Evidence above reveals the insanity of transporting tens of thousands of casks of lethal high-level nuclear wastes across the nation on our nation's degrading highways and railroads, potentially affecting the health, safety, and financial well-being of 100 million Americans who live within a mile or two of likely transport routes. Given the potential for a radioactive waste transport accident on our highly degraded infrastructure and the ever-growing threat of terrorism, it is insane to risk loss of health, homes, and businesses for so many people through radioactive waste transport. We urge NRC to consider inherent risks for a Mobile Chernobyl. Times 2. STOP NUCLEAR WASTE TRANSPORT TO INTERIM STORAGE SITES. (0377-3-3 [Cuthbert, Lewis])

Comment: NRC ignores dangerous, deadly, and costly transportation risks including: -Loading and Unloading; -Extraordinary health, environmental, and financial risks on-site and along the route; -Train and truck accidents are of major concern, especially for fire from fuel. (0377-6-5 [Cuthbert, Lewis])

Comment: *Criticality Risks during Transportation of Spent Fuel Pool - Revision 1.* EPRI, Palo Alto, CA: 2008. 1016635.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001016635>; This report presents a best-estimate probabilistic risk assessment (PRA) to quantify the frequency of criticality accidents during railroad transportation of spent nuclear fuel casks. The assessment is of sufficient detail to enable full scrutiny of the model logic and the basis for each quantitative parameter contributing to criticality accident scenario frequencies. The report takes into account the results of a 2007 peer review of the initial version of this probabilistic risk assessment, which was published as EPRI Technical Report 1013449 in December 2006. *Fuel Relocation Effects for Transportation Packages.* EPRI, Palo Alto, CA: 2007. 1015050.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001015050>; Spent nuclear fuel transported in large casks must remain subcritical in all credible configurations for normal operation and hypothetical accident conditions. The effects of "worst case" accident scenarios were considered in "Effects of Fuel Failure on Criticality Safety and Radiation Dose for Spent Fuel Casks" (NUREG/CR-6835, September 2003). These scenarios were postulated to provide theoretical upper limits for reactivity effects, although they were described as going "beyond credible conditions." This report shows that the effects of fuel relocation are not as significant as might otherwise be expected from the results published in NUREG/CR-6835, and are more likely to result either in small reactivity increases in some cases or in reactivity decreases in others. *Spent-fuel Transportation Applications - Normal Conditions of Transport.* EPRI, Palo Alto, CA: 2007. 1015049.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001015049>; The report describes the response of a high-burnup fuel assembly to dynamic forces that result from a one-foot drop onto a rigid surface in the most damaging orientation. This condition corresponds to a surrogate loading configuration for normal conditions of transport of spent

nuclear fuel, as prescribed in Part 71 of the Code of Federal Regulations, Title 10. (0379-10 [Kessler, John])

Comment: EPRI is pleased to provide the attached bibliography of EPRI publications that provide information and analysis related to NRC's Waste Confidence GEIS. EPRI requests that the relevant NRC Waste Confidence staff review the EPRI publications for potential use in preparing the final Waste Confidence GEIS. *Spent Fuel Transportation Applications—Assessment of Cladding Performance*. EPRI, Palo Alto, CA: 2007. 1015048; <http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001015048>; This report summarizes the results of EPRI's multi-year research effort to assess cladding performance under normal and hypothetical accident conditions of spent nuclear fuel transportation. *Assessment of Accident Risk for Transport of Spent Nuclear Fuel to Yucca Mountain Using RADTRAN 5.5*. EPRI, Palo Alto, CA: 2006. 1013450. <http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001013450>; This report evaluates the radiological impacts during postulated accidents associated with the transportation of spent nuclear fuel to the proposed Yucca Mountain repository, using the RADTRAN 5.5 computer code developed by Sandia National Laboratories. RADTRAN 5.5 can be applied to estimate the risks associated both with incident-free transportation of radioactive materials as well as with accidents that may be assumed to occur during transportation. Incident-free transportation risks for transport of spent nuclear fuel to Yucca Mountain were evaluated in EPRI report 1011821 using RADTRAN 5.5, September 2005. (0379-11 [Kessler, John])

Comment: *Summary of the NAS Report, "Going the Distance? The Safe Transport of Spent Nuclear Fuel and High-Level Radioactive Waste in the United States" and EPRI's Comments*. EPRI, Palo Alto, CA: 2006. 1010075. <http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001010075> In May 2003, The National Academy of Sciences (NAS) formed a Committee on Transportation of Radioactive Waste (NAS Committee) to examine the transportation of spent nuclear fuel (SNF) and high-level radioactive waste (HLW) in the United States. The focus of this study was on the transportation of SNF in the United States. The results of the culminated in a report that was issued in February 2006 entitled, "Going the Distance? The Safe Transport of Spent Nuclear Fuel and High-Level Radioactive Waste in the United States." EPRI was one of the principal sponsors of the study along with the U.S. Department of Energy (DOE), U.S. Nuclear Regulatory Commission (NRC), U.S. Department of Transportation (DOT), and the National Cooperative Highway Research Program. This EPRI report summarizes the principal findings and recommendations made by the NAS committee in its "Going the Distance?" report. This EPRI report concludes with some observations by EPRI on the NAS findings and recommendations. *Spent Nuclear Fuel Transportation—An Overview*. EPRI, Palo Alto, CA: 2004. 1009226. <http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001009226> Spent nuclear fuel comprises a fraction of the hazardous materials packages shipped annually in the United States. In fact, at the present time, fewer than 100 packages of spent nuclear fuel are shipped annually. At the onset of spent fuel shipments to the proposed Yucca Mountain, Nevada, repository, the U.S. Department of Energy (DOE) expected to ship 400 - 500 spent fuel transport casks per year over the life of the facility. This study summarizes work on transportation cask design and testing, regulatory requirements, jurisdictional requirements, operational procedures and experience, and transportation risk assessments. (0379-12 [Kessler, John])

Comment: EPRI is pleased to provide the attached bibliography of EPRI publications that provide information and analysis related to NRC's Waste Confidence GEIS. EPRI requests that the relevant NRC Waste Confidence staff review the EPRI publications for potential use in preparing the final Waste Confidence GEIS. Transportation of Used Fuel; *Transportation of Commercial Spent Nuclear Fuel: Regulatory Issues Resolution*. EPRI, Palo Alto, CA: 2010. 1016637.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001016637>; The U.S. industry's limited efforts at licensing transportation packages characterized as "high-capacity," or containing "high-burnup" (>45 GWd/MTU) commercial spent nuclear fuel (CSNF), or both, have not been successful considering existing spent-fuel inventories that will have to be eventually transported. A holistic framework is proposed for resolving several CSNF transportation issues. The framework considers transportation risks, spent-fuel and cask-design features, and defense-in-depth in context of present regulations as well as in context of future potential revisions of regulations that would reflect a risk-informed, technically state-of-the-art approach. Within the boundary limits of cases analyzed, the EPRI-sponsored work shows that there are no credible combinations of accident events, accident locations, and fuel misloading or reconfiguration that would result in a critical configuration during the transportation of spent nuclear fuel. The non-mechanistic criticality evaluation performed in the as-loaded or as-designed configuration can be considered the bounding case for all conditions of transportation because this hypothetical reactivity case bounds all those normal and hypothetical accident cases that can credibly exist for spent-fuel transportation packages. Criticality during hypothetical transportation accidents should be a regulatory non-issue, given that misallocation of regulatory requirements can lead to greater overall risks, specifically by increasing the number of shipments when overly restricting spent-fuel transportation payloads. (0379-9 [Kessler, John])

Comment: I attended this meeting because I was very worried about the proposal to transport radioactive waste to interim sites across the country on railroads, trucks, boats, through towns, cities, backyards, highways, fishing beds... (0381-11 [Fasten, Susan])

Comment: When a safe permanent storage area is found, transporting the waste must be done with care and security to eliminate the risk of transport accidents and incidents, contamination of the surrounding areas during transport, and inviting attack and vandalism. Not as it was done some years ago when I found myself in Connecticut on a high speed highway in a densely populated area at rush hour behind a flatbed truck carrying a huge cement cask with radioactive signs on it - no protection, no security, no escort. Not as it was done in Lexington, MA when a truck carrying radioactive material sprang a leak as it was gassing up at a service station on a busy highway - no escort, no security, no protection. Not as the Rowe nuclear plant was carelessly and rapidly dismantled and transported giving off radioactivity in all directions along the way as measured by citizens with geiger counters. Not as a Mexican truck driver transporting radioactive material last week stopped to take a nap and was hijacked - no escort, no security, no protection. The list goes on and on. (0381-8 [Fasten, Susan])

Comment: Since no one wants a high-level nuclear dump in their backyard, or the transport of high-level nuclear waste through their neighborhood, the acceptance of a "Yucca Mountain" in the backyard scenario is unlikely to happen anywhere in America. Also the very concept of away-from-reactor consolidated interim storage does not meet with the strictures of ALARA, since transporting the waste twice or more in its lifetime greatly increases the risk of accidents and exposure to bystanders. It also unnecessarily contaminates virgin land not currently radioactive. The transport of nuclear waste is also not well controlled. For example, I personally measured radiation emanating from a transport truck on Interstate-40 near Amarillo, TX of

several hundred CPM (50 times background) in just the few seconds it took to pass the truck. One can only imagine the exposure level to the driver and anyone parked next to the truck at a cafe, fueling stop, rest area or motel. The transport also exposes the fuel to the possibility of theft or traffic accidents which is clearly not a trivial risk. For the above reasons I believe that the entire Section 5 of the Generic Waste Confidence draft should be discarded as both imprudent and impractical. There may, however, be some situations where continued dry storage at the original reactor site is so dangerous that moving the spent fuel to an alternate, safer site is possibly justified, but risk versus benefit must be evaluated for each individual situation. Moving the fuel should never be merely for the convenience of the operators. (0410-24 [Nelson, Dennis])

Comment: Even transporting waste would be dangerous and vulnerable. (0450-4 [Bast, Nancy])

Comment: And even if this becomes a possibility in the near future, safe movement of the massive quantity of waste fuel already generated will still remain an extremely risky operation. (0454-9 [Waldstein, Joe])

Comment: Eureka County offers the following comments on the NRC Draft Generic EIS and draft rule on Waste Confidence. Eureka County is an affected unit of local government under Section 116 of the Nuclear Waste Policy Act. In our experience with nuclear waste planning and management as an Affected Unit of Local Government, transportation issues have been ignored or postponed. We believe that the integrity of the spent nuclear fuel (SNF), fuel rod cladding and the components of the fuel assemblies is essential to the safe transportation of SNF. As an affected unit of local government who will be primarily affected by transportation of SNF through our County, we must have assurance that the SNF can be transported safely in both normal transportation and during transportation incidents. (0459-1 [Johnson, Abigail])

Comment: This high priority information identified by the staff is essential to the determination that after long term storage, SNF can be transported safely. Unfortunately, the draft GEIS does not address this concern. It is difficult to understand how one can conclude that the waste can be stored safely for extended periods of time without addressing these critical information needs raised by the NRC staff. In our scoping comments, we also noted that it is essential that this EIS integrate the systems components of the nuclear power industry, including its nuclear wastes and components of the SNF transportation system, in order to produce a useful and meaningful analysis. By conducting a generic EIS, the EIS fails to address this concern. (0459-3 [Johnson, Abigail])

Comment: The EIS does not adequately assess the impacts associated with transportation of SNF after long term storage. The assessment of transportation impacts is limited primarily to the inconsequential transportation impacts associated with the construction of DTSs and replacement ISFSIs in a generic manner. The EIS deals with the risk, and hence impact of SNF transportation by relying on previous studies conducted and the risk of transportation of SNF. Many of these studies are dated (e.g. an AEC analysis dated 1972; an NRC FEIS dated 1977, etc.). Those studies that have been conducted recently have not considered the issues associated with possible SNF degradation such as stress corrosion cracking, embrittlement, and swelling of fuel pellets as identified as issues in the NRC staff report on information needed for long term storage assessment. (0459-6 [Johnson, Abigail])

Comment: Transporting nuclear waste across our country is asking for a disaster. (0492-2 [Maghakian, Carol])

Comment: The GEIS finds that the effects on transportation are "small to moderate." However, it reaches this conclusion only because it considers transportation only within the vicinity of reactor or interim storage sites--commuting of site workers, deliveries of supplies and replacement equipment, etc. Even within the site vicinity, the effects of overweight truck shipment and/or large-load rail shipment, often on sub-par infrastructure, are not addressed. Short-term and long-term storage presume eventual large-scale transport of SNF, possibly cross-country and affecting hundreds of corridor as well as origin and destination communities. The GEIS appears to assume that such transport is not an effect of its site-specific licensing decisions, or that cross-country transport resulting from short or long-term storage is no different than that which would occur during licensed operations--i.e. that cross-country transport is an effect of licensed operations, not of continued storage after licensed operations, even if it occurs during "continued storage". Cross-country transport is a major impact of SNF generation at 100 reactors on 75 sites. The formulation of the GEIS does not warrant ignoring this impact. The GEIS should recognize that SNF transport on this scale has not been demonstrated in the U.S., and that it results from its many site-by-site licensing decisions, except in the (undesirable) indefinite storage case. (0505-3 [Williams, Jim])

Comment: More nuclear waste means more transportation of the waste, on our highways, rails and waterways. The risk involved in nuclear waste transportation is growing exponentially as storage ponds are filling up. (0531-2-15 [Morgan, Sally])

Comment: There is no way nuclear waste can be made safe to truck around on public roads. (0539-1 [Luttinger, Lionel])

Comment: It cannot be trucked around on public roads. That is far too dangerous. We do not need deadly mobile radiation on our roads. (0539-3 [Luttinger, Lionel])

Comment: The sheer volume of nuclear waste will require thousands of shipments on our roads, rails, and waterways. Due to the risk involved in mass nuclear waste transportation, it should only be undertaken once--and when we know there is a viable solution. (0552-1-11 [Macks, Vic])

Comment: (It should be noted that the used fuel is actually much easier to transport if its temperature is above about 800 degrees Fahrenheit, because the zirconium cladding is much more ductile above that temperature. However, when the fuel is naturally that hot thermally, the damage if an accident were to occur would be much greater, because the fuel is also radioactively much "hotter" a few months after discharge than it is, say, 20 years or 50 years afterwards.) (0562-8 [Hoffman, Ace])

Comment: In discussion with our science personnel one of the big topics was transporting spent nuclear fuel to Yucca Mountain, and the mathematical certainty of train accidents irradiating large densely populated areas of the U.S. Regardless of the viability of Yucca Mountain, the material itself is much too dangerous to transport across the country. (0573-1 [Gerhart, Dan])

Comment: And transporting nuclear waste across the nation by truck and rail significantly increases Homeland security risks. (0611-32 [Shapiro, Susan])

Comment: Transportation: Chapter 6 generally discusses cumulative impacts (other past present, and reasonably foreseeable actions) and Section 6.3 .2.4 briefly discusses the transportation of spent fuel to a repository for disposal. The draft GEIS assume that this will

happen. Since no dry cask is currently licensed to transport high burn-up fuel, the final GEIS must discuss any potential licensing challenges (for high burn-up fuel) and the possibility that this particular fuel might never leave its storage location. Its not enough to assume that it will happen. (0619-2-3 [Mahowald, Philip R.]

Comment: The problem with transport to Yucca Mountain in the unlikely event that work will be restarted there and the repository will be finished is that transport of radioactive waste via truck or the nation's rail lines is inherently dangerous to the public, due to unavoidable release of radioactivity during the transportation process. (0628-2 [Perkins, V.E.]

Comment: I am a citizen concerned about transport of nuclear waste via roads or railways, putting public safety, health and first response at risk. (0636-1 [Bluestein, Bonnie])

Comment: Nor do I share your confidence about the safety and soundness of irradiated nuclear fuel transport, which would be required to go from on-site/at-reactor storage to away-from-reactor/centralized interim storage (what we prefer to call de facto permanent parking lot dumps) or final repositories. (0698-2 [Kamps, Kevin])

Comment: The probability of a transportation accident resulting in a major release of radioactive material is a major concern. (0701-3 [Wilson, Greg])

Comment: Even burying it deep in the earth or at the bottom of the sea requires getting it to its storage place -- and no one knows how to do that safely. (0719-5 [Hibbard, Angela])

Comment: No transport of the waste! (0744-6 [Bonniwell, Colleen])

Comment: Under section ES13.2.16, page lvii, lines 5-29, in that portion of the executive summary which addresses away from reactor storage sites, the analysis on transportation misses the mark. There needs to be an analysis on the risks associated with that process including but not limited to a discussion of the various canisters that are to be used for such transportation, the transfer into those casks and the risks of the transport. (0783-1-18 [Harlan, Thomas])

Comment: Under section 2.1.2.2, page 2-14, lines 1-9, the Draft GEIS should clarify, at the outset, that it has not designated any casks for transportation. Accordingly, prior to transportation, all spent fuel should be required to be transferred to transportation casks. (0783-2-15 [Harlan, Thomas])

Comment: The process of moving this fuel to a final storage solution should be treated with the same care as moving the rockets that launch items into space. This includes a military escort to secure these materials. (0786-2 [Dew, Jane])

Comment: As I mentioned in my oral comments, at least 85% of all long distance semi-truck traffic passes through Tennessee because we are the intersection of several major North-South and East-West Interstates. We have daily truck accidents and cargo spills in our cities as well as on the open road. TVA may desire to transport irradiated fuel on the Tennessee River connection between its reactors. This presents new and different issues and risks to be analyzed and avoided. No transport of irradiated fuel should occur without adequate analysis including a separate EIS and an opportunity for public comment. (0821-3 [Paddock, Brian])

Comment: GEIS Section 5: NRC's evaluation of transportation impacts is sound and well supported by referenced reports and prior environmental studies all of which have been finalized after appropriate consideration of public comment. (0827-7-27 [Ginsberg, Ellen])

Comment: GEIS Section 3.15. With respect to the transportation environment (GEIS 3-37), the GEIS provides a reasonable description of the transportation region of influence. The GEIS concludes that non-radiation impacts from transportation for all scenarios are small to moderate with moderate impacts related to traffic and characteristics at a particular site. For radiological impacts (only the away from reactor scenarios and transport to a repository in the cumulative impacts section), the GEIS defers to generic findings in 10 CFR 51.52, Table S-4; several NRC analyses subsequent to Table S-4; and analysis done for Private Fuel Storage Facility. The conclusion in all cases is that radiological impacts would be small. NRC's treatment of this topic in the GEIS is appropriate and there is no basis to reconsider the determinations documented in Table S-4. (0827-7-28 [Ginsberg, Ellen])

Comment: As for transportation, high-level radioactive waste will be regularly trucked over our nation's highways, subject to any number of catastrophic accidents daily, one of which could render a large portion of a state (or states) uninhabitable for the foreseeable future. (0834-5 [Thabit, Nick])

Comment: Section 3, in its entirety, you also do not sufficiently mention issues that need to be addressed on a case-by-case basis. For example, in Section 3.15, Transportation, you say "Local and regional transportation networks in the vicinity of nuclear power plant sites may vary considerably depending on the regional population density, location, and size of local communities, nature of economic development patterns, location of the region relative to interregional transportation corridors, and land surface features, such as mountains, rivers, and lakes." This is certainly an example of an impact where generic treatment is insufficient. (0836-50 [Davis, Anonymous])

Comment: In closing, discussing "waste confidence" is almost absurd. The waste being created (adding to the 80,000 tons of spent nuclear fuel that will remain toxic for 240,000 years or even longer) is a pending disaster. To consider moving this quantity of dangerous waste would be irresponsible even if we had someplace to put it. (0864-14 [Gellert, Sally Jane])

Comment: Regarding storage of nuclear waste both here and across the country, I firmly believe that the risks of transportation are greater than the risks of storage on site. Transporting highly radioactive fuel over the highways raises the specter of many possible errors and accidents: from collisions, to mechanical breakdowns, to spills in areas far from any nuclear facility, which of necessity would have to be handled by hazardous-material personnel who, despite being professionals, are unlikely to have experience or training in handling highly radioactive nuclear waste. In fact, even here, with Indian Point right here, when a worker at Indian Point was exposed to radiation and transferred to the local hospital emergency room, the incident required evacuation of the emergency room for a number of hours; if there had been a much bigger incident, the region would have been without a working facility for a much longer time. (0864-6 [Gellert, Sally Jane])

Comment: Generic analysis of a NPP would miss the transportation related issues associated with a real world facility. For example, if the NPP site did not have rail access, movement of the SNF to another site or even within the site may be hindered. Additionally access limitations like geographic barriers to and from the plant may limit the use of heavy haul trucks and thus increase the numbers of transportation links necessary to move the SNF from the facility, to

storage and/or to an intermodal transfer stations, that could then load the canisters onto a train, barge or other transport means. These types of site specific transportation related barriers would need to be analyzed in reality, not in the abstract. They require specific planning and articulation as to their impacts on the environment, social structures, political impacts and economic costs. Risks for such shipments rise as the number of transfers increase and as the failure to recognize such site specific realities is a critical mistake in the use of a generic analytical approach (Ballard 2002a, Ballard 2002b, Ballard 2003, Ballard 2008). (0867-3-15 [Griffin, William])

Comment: Underwater submersion could lead to inadvertent nuclear chain reactions in the fissile materials still present in the wastes; burial under sand could cause the wastes to dangerously overheat. Although written as a warning about the risks of shipping high-level radioactive waste by barge on Lake Michigan, a backgrounder I wrote a decade ago provides specific, relevant information on how an inadvertent nuclear chain reaction, or accidental criticality, could be sparked by the underwater submersion of a Palisades dry cask (whether that were to occur by a barge shipment sinking, or Palisades' dry cask storage being plunged underwater by an earthquake): "As part of its plan to transport high-level radioactive waste to Western Shoshone Indian land at Yucca Mountain, Nevada, the U.S. Department of Energy (DOE) proposes up to 453 barges carrying giant high-level radioactive waste containers onto the waters of Lake Michigan. See the second page of this fact sheet for a map of the proposed routes and a breakdown of shipment numbers by port. Accidents happen. But what if high-level radioactive waste is involved? U.S. Nuclear Regulatory Commission (NRC) design criteria for atomic waste transport containers are woefully inadequate. Rather than full-scale physical safety testing, scale model tests and computer simulations are all that is required. The underwater immersion design criteria are meant to "test" (on paper, at least) the integrity of a slightly damaged container submerged under 3 feet of water for 8 hours. An undamaged cask is "tested" (on computers, at least) for a 1 hour submersion under 656 feet of water. But if a cask were accidentally immersed under water, or sunk by terrorists, is it reasonable for NRC to assume that the cask would only be slightly damaged, or not damaged at all? Given that barge casks could weigh well over 100 tons (even up to 140 tons), how can NRC assume that they could be recovered from underwater within 1 hour, or even within 8 hours? Special cranes capable of lifting such heavy loads would have to be located, brought in, and set up. And what about the fact that Lake Michigan is deeper than 656 feet at locations not far from DOE's proposed barge shipment routes? The dangers of nuclear waste cask submersion underwater are two fold. First, radioactivity could leak from the cask into the water. Each container would hold 200 times the long lasting radioactivity released by the Hiroshima atomic bomb. Given high-level atomic waste's deadliness, leakage of even a fraction of a cask's contents could spell unprecedented catastrophe in the source of drinking water for tens of millions of people - Lake Michigan. Second, enough fissile uranium-235 and plutonium is present in high-level atomic waste that water, with its neutron moderating properties, could actually cause a nuclear chain reaction to take place within the cask. Such an inadvertent criticality event in Sept. 1999 at a nuclear fuel factory in Japan led to the deaths of two workers; many hundreds of nearby residents, including children, received radiation doses well above safety standards." (0919-1-15 [Kamps, Kevin])

Comment: Nor do I share your confidence about the safety and soundness of irradiated nuclear fuel transport, which would be required to go from on-site/at-reactor storage to away-from-reactor/centralized interim storage (what we prefer to call de facto permanent parking lot dumps). (0929-3 [Kamps, Kevin])

Comment: Section 3, in its entirety, you also do not sufficiently mention issues that need to be addressed on a case-by-case basis. For example, in Section 3.15, Transportation, you say "Local and regional transportation networks in the vicinity of nuclear power plant sites may vary considerably depending on the regional population density, location, and size of local communities, nature of economic development patterns, location of the region relative to interregional transportation corridors, and land surface features, such as mountains, rivers, and lakes." This is certainly an example of an impact where generic treatment is insufficient. (0930-3-2 [Lutz, Ray])

Comment: Furthermore, there is no safe way to transport the stuff. (0936-6 [Laney, Nan S.])

Comment: I oppose transportation of nuclear waste to temporary storage sites because it is dangerous and puts citizens at risk for radiation exposure. (0946-3 [Commenters, Multiple])

Comment: The thought of transporting these dangerous materials to distant storage sites seems short sighted and foolhardy. We now know the unthinkable can happen. (0963-2 [Jacopetti, Anna])

Comment: I am also concerned about nuclear waste that is transferred by truck and rail across country. The potential for accidents that result in radioactive waste being released into the air is frightening and needs to be curtailed. (0968-1 [Morris, Beverly])

Comment: We especially do not want to see nuclear waste transported around the country, via truck or other means, to be stored at a site location other than that of the power plant itself. Transporting and storing of these wastes poses and extreme threat to the health of communities nearby storage sites, and all those through which the waste must travel. (0970-1 [Wilde, Paul])

Comment: While we're about it, in considering the feasibility of any nuclear waste storage and disposal plan, we need to consider the dangers posed by the possible need to transport this material through the country and across state lines. Any safety plan or rules to regulate nuclear power and its waste byproducts needs ton consider safeguards for any necessary transport of this material. Not only are leaks an issue to consider, but also the possibility of this material falling into the wrong hands, such as that of terrorists. (0971-1 [Schneider, Linda])

Comment: Resistance to terror strike is a high priority. Transport to another location is an invitation to terrorists. (0988-1 [Wagner, Deborah])

Comment: NO transport of such waste should be made by rail or highway. (1000-2 [VanWicklen, Betty J.])

34. Comments Concerning Public and Occupational Health

Comment: Have we already released enough radioactivity into the biosphere that over the centuries we may stop evolution? I'd like to see that question answered. And I think every part of the nuclear fuel cycle should answer for the cumulative radioactive load on the human genome. (0030-14-6 [Lewis, Marvin])

Comment: The NRC was part of the Environmental Protection Agency protective action guides that have just -- the controversial protection action guides, which look at the consequences of large nuclear disasters at nuclear reactors, and this would include nuclear waste. And under the protective action guides, because the scenario could be so bad, because the risks to the

public could be so high, as high as one in seven cancers from the exposures from the long-term -- the intermediate and long-term allowable contamination, our regular allowable risks that the EPA has of one in a million to one in 100,000, one in 10,000, these are being jettisoned to allow for higher risks to the public because of the real potential dangers from nuclear power and nuclear waste from nuclear power. (0030-8-6 [D'Arrigo, Diane])

Comment: How many children with leukemia and other cancers which are caused by radiation will be acceptable? Are you willing to sacrifice the health of your grandchildren and their children? (0035-6 [Fulton, Doris])

Comment: As Mr. Jaczko also said, The Fukushima Daichi accident lasted nine months. The consequences of the accident, the incident itself, will go on for decades. If the National Academy of Sciences BEIR VII report is correct, and it is the best science we have on this question, there is no threshold below which exposure to ionizing radiation has no effect on the living cell. Therefore, given the half lives of all the radioactive isotopes ejected from the SPF, leaked into groundwater, and spread around the region via atmospheric deposition and ocean currents, the genetic legacy of this horrifying impact to marine and human life in Japan will go on as long as life exists in this place. It is simply unbelievable that NRC would probabilistically weight these very real consequences out of existence for the purpose of this GEIS. It is my opinion that the requirements of NEPA are not met due to this glaring omission. (0089-18 [Shaw, Sally])

Comment: Don't allow radioactive waste to hurt us. This waste can pollute the water we drink. If we drink it, we can get seriously sick. This can lead us to dying. The fish in that water could get sick or even die from breathing that water. They need clean water; not polluted water. This waste can kill the plants in the water and the ground. We can get sick and die from eating those plants too; or animals who get sick from eating those polluted plants or drinking the polluted water I mentioned. (0160-1 [Rosin, Lawrence])

Comment: I've been looking at pictures of birth defects from the kids that are being born now in Iraq from the depleted uranium that their parents are being exposed to all the time and it's radiation poisoning. And what it does is -- it's heinous, you know, I can't -- I can't describe the photographs. But it's too hideous and I'm just thinking about grandkids and stuff like that, and radiation, no matter what, is incredibly dangerous and it can't be stored safely. It's always leaking. There's always problems with it and it's going to cost -- it's going to cost lives. It's going to cost heartbreak, lives and all that kind of stuff. (0163-10-1 [Kimmich, Erl])

Comment: Europe accepts that "There is no safe lower limit" of radiation exposure. That means that low-level exposure, even close to background levels, cause the death rate to spike. We don't hear about no safe lower limit from the NRC, though you know the laws of physics are the same on both sides of the Atlantic. (0163-28-2 [Cypser, Betty])

Comment: We pay with our health and our lives. Oh, fission and leaks have caused millions of deaths. It's the cost of that cheap energy. (0163-28-6 [Cypser, Betty])

Comment: I also went over some of the summary of the EI -- what is that? GEIS and it still strikes me that it's going under the safe dose myth of radiation exposure, and I want to ask all of you that, okay, there's -- to set up the standard for a safe dose of radiation, there's this model. Okay, this model is created around reference man. That's a man. It's usually a white male in their 20's and 30's who is living based on Western diet. Raise your hand if you fall into that category? (0163-31-2 [Tonohira, Yuko])

Comment: While the Department of Energy and energy corporations have stressed a track record of decades long history of safe nuclear power, isn't there much evidence that such claims cannot be substantiated? Isn't there evidence that the entire nuclear energy cycle constantly emits low levels of radioactive nuclides which results in human exposure to these materials? (0189-3 [Patrie, MD, MPH, Lewis E.])

Comment: Have nuclear energy proponents ignored the evidence provided by many reputable scientists who believe, based on their research, that there is no threshold for radiation damage to humans, no dose which is harmless? Many scientists, including Dr. Steve Wing have discovered evidence that there isn't any safe level of radiation exposure. Also that "An important feature of alpha irradiation is that, no matter how low the total dose to the whole body, a substantial dose of radiation (approx .5 Gy) is delivered to an individual cell if it is traversed by a single alpha particle.", from Proc Natl Acad Sci USA. 1998 May 12;95(10):5730-3. Chromosomal instability in the descendants of unirradiated surviving cells after alpha-particle infiltration. Such findings exist among many reports that even very low doses of radiation can induce cellular damage that can result in increased incidences of cancer and genetic defects. Risks from incidents involving increased transportation of these very highly dangerous nuclear materials could expose populations to unacceptable dangers. (0189-4 [Patrie, MD, MPH, Lewis E.])

Comment: When it comes to nuclear waste, as stated before, its potential harmful effects on humans is very dangerous. This means that the community has every right to know about any nuclear waste that could cause problems. (0192-3 [Einhorn, Jeremy])

Comment: [T]he NRC is responsible for anything nuclear power related, and that includes and ill effects nuclear power may cause. The health effects of nuclear waste on humans can be very harmful, and fatal if exposure is high enough. (0192-5 [Einhorn, Jeremy])

Comment: And then, another point would be that there is -- they haven't addressed any human health -- there's not an actual section of public health, sort of what measures of the waste created by these. Like, what types of waste would be stored, what is the life, you know, the half-life or basically the decay time for these substances. Specifically, just because we all know that nuclear substances, they remain active and radioactive and noxious for, you know, centuries. So if the report was based on assessing, you know, the time that it would be safe to store them, how were we measuring that if it would take centuries to really, you know, really have a confidence in how long we're storing it? (0244-15-2 [Zuccarini, Ana])

Comment: And, you know, again with the word "small" in capital letters. What does that mean? In this case, when it comes to noxious substances and possible, you know, deaths of population in close proximity to these facilities, size matters, guys. The length of exposure, the amount of contact and just basically, you know, how long you're in contact with the poison, you know, even hours and it can kill you over, you know, a couple weeks or whatnot. However, we don't know if these are -- you know, we don't know the substances, we don't know the time, we don't know the times of exposures, so we can't really -- well, me, as I am reading this, I can't assess if this is small or not. (0244-15-9 [Zuccarini, Ana])

Comment: Who here is a nuclear neighbor? If you live in Illinois, you're a nuclear neighbor. If you live in the United States, you're a nuclear neighbor. It is insane to me, the previous gentleman that was up here talking about Mr. Hansen. I've seen him speak before. I have some respect for him. He doesn't live in a nuclear neighborhood, never has, doubt that he ever would, considering Dresden. He has leaks out there and water still hasn't been fixed for the people that have the leaks. The moms can't explain why their kids are leaking from their eyes, and the

parents are paying really high medical bills for dentistry to have their jaws wired shut for kids in the 4th and 5th Grade because their teeth are separating due to radiation exposure. Not to mention all the kids that keep showing up at the Mayo Clinic that have radiation overdoses and nobody knows anything about it. (0245-17-1 [Thompson, Tammy])

Comment: I'd like to start with a basic question about the fact that there has been some anecdote testimony here about the effects of living near nuclear power plants, and the people who come to represent the industry have nothing to say about the anecdotal evidence, the stories about what happens to families and children who are living near these plants and the possibility of birth defects that are almost unbelievable. So, I'm asking this question really because there was an earlier comment about this. Residents around reactor sites may not have signed up to store radioactive waste indefinitely, but they also did not sign up for 20-year extensions of operating licenses. Yet the NRC imposes that on communities without pause and without exception. So, I'm very moved by the anecdotal evidence because the anecdotal evidence from Chernobyl was cut off and the difficulties of tracing the effects of the exposure at Chernobyl were massive and eventually the strong scientific minds says, well, gee, you're just giving us anecdotal evidence, when it was all the evidence that they had. (0245-21-1 [Boudart, Jan])

Comment: I just want to clarify a few things that came up about safety concerns and the facts. Well, one of the facts that are to safety concerns is Three Mile Island. And I have a very conservative accountant who in every way is very conservative. But when it comes to Three Mile Island, he shakes his head and he hates nuclear. Why? Because his relatives are there and they're dying. That is a fact. That is not safety concern, that's fact. Please say it as it is. My next-door neighbor, who gets sick constantly, a beautiful young man and at most he's in his early 30's, he was a victim of Chernobyl. He lived in Poland. He constantly gets ill. He does not know how to solve it. That is not a safety feature. That's a fact, and that's a fact we have to look at and we have to look now. (0245-38-1 [Good, Joyce])

Comment: While the Department of Energy and energy corporations have stressed a long track record of decades of safe nuclear power, isn't there much evidence that such claims cannot be substantiated? Isn't there evidence that the entire nuclear energy cycle consistently emits low levels of radioactive nuclides which results in human exposure to these materials? Have nuclear energy proponents ignored the evidence provided by many reputable scientists who believe based on their research that there is no threshold for radiation damage to humans, no dose which is harmless? And I cite Dr. Steve Wing's study and others. Such findings exist among many reports that even very low doses of radiation can induce cellular damage that can result in increased incidences of cancer and genetic defects; risks from incidents involving increased transportation of these very highly dangerous nuclear materials could expose populations to unacceptable dangers. (0250-30-3 [Patrie, Lewis E.])

Comment: One of them is that ionizing radiation can cause cancers. We know that from Hiroshima and Nagasaki. We know that from Chernobyl and we know that from Japan, but there is whitewashing going on. There are studies coming out from the UN, and when you go to the NRC you see that what they say in their website is that we're pleased that no ill effects of radiation have occurred. They do add more time is needed. There is evidence already of thyroid cancers in children, and there's -- Chernobyl, I mean, the Japanese tragedy is not over yet. They're still actively being exposed to radiation. (0250-31-3 [Clark, Terry])

Comment: Also, I just wanted to bring up the fact that, according to the National Academy of Sciences data, a female body of people and children are more impacted by doses of radiation than other folks are. So perhaps they should have more of a say in what is being done with this stuff. (0250-50-6 [Blevins, Eric])

Comment: You must regulate nuclear waste's dumping. If it's dumped in the water, then the fish can get poisoned. It can also kill the fish. Even fish that don't get directly affected, can still get indirectly affected, if they eat enough fish affected by the nuclear waste. Also humans who eat the intoxicated fish can get sick. Also the nuclear waste can make the water dangerous to swim. We can can accidentally swallow the water. (0258-1 [Rosin, Lawrence])

Comment: Highlights from expert presentations on "high burn" and related topics: Donald Mosier, Professor of Immunology & Microbial Science at the Scripps Research Institute, asked if any dose of radiation is safe and answered, "No -Any level can be dangerous. We now know why very low doses can cause cancer. Many sites in the body are hypersensitive DNA regions highly vulnerable to cancer factors. These are areas of rapid change, which provide openings for cancerous mutation." Dr. Mosier noted that "exposure to 10,000 milli-sieverts is deadly. 1,000 brings sickness and is cancerous. The rate during the Fukushima crisis was 400 per hour. A CAT scan is 20 to 60. Amammogram is .4. A dental x-ray is .005-and requires you to wear a lead apron." He cited a 15-country study that found the risk was double the norm for nuclear industry workers, and added, "There is no reliable survey data on the health of San Onofre workers because the amount of radiation releases is not monitored at any point near the site." Dr. Mosier concluded, "The effects of exposure to cancer factors are cummulative. This is why repeated exposure matters. Why add one more insult to the mix?" (0283-4 [Pascall, Glenn] [Watland, George])

Comment: I am a 33 year local resident that lives within a 5 mile radius of the plant. The low levels of radiation are killing us! I have ad 9 miscarriages and one still born. Many good friends are not here to share their stories --- meeting untimely deaths. One died at 47 of adrenal gland cancer, one at 50 died of blood cancer, 2 died at under 50 from brain tumor. Others are still fighting cancer at ages 49, 30, 55 and 49 years old. The are just my personal friends. Coincidence?? (0292-2 [Comer, Gail])

Comment: We live just outside the 12 mile "radius" and believed that a power plant, including it's continued on-site storage of spent nuclear fuel repository would pose no threat to our families living within this community. Why, then, do we have an excessively high number of individuals living within this community that have or have had cancer? Just within our immediate neighborhood alone we have had over a dozen neighbors within the last few years with various types of cancers, most prominently breast and thyroid cancers. Have any actual studies been done on the health of people living with a certain geographic area to see if their might be a relationship to the nuclear fuel and human health? How in the world can you possibly determine the safety of an unsafe material when you haven't even verified the potential hazards to those living near it? We in this community do not consider the power plant safe, nor do we consider the continued storage of nuclear waste safe. The lives of people must be considered before the livelihood of a business! (0323-1 [Murdock, J.]

Comment: I'd like to address one thing that we might not know. In Japan, there is an ongoing triple nuclear meltdown, and they have standards for the contamination in their food. It is the lowest and strictest in the world, being 100 becquerels per kilogram. This is for food that we eat, 100 becquerels per kilogram. It's a standard of tangible waste. I'm going to finish really, really quickly. In the United States, we allow -- the FDA made the standard of 1,200 becquerels per

kilogram. Where do we think this radioactive waste, cesium-134, cesium-137, strontium-90 is allowed in our food system. This is all coming from leaking waste. I have no confidence in our waste management system at all. We need to understand that internal contamination affects the weakest in our society, the babies. We feed our children the food that is -- have you heard of tritium in the water? These are some issues that we really, really need to think about. So, go to the FDA website and you will notice when these limits were set, and it's all about the leaking radioactivity in our environment. It's showing up in our food. This is something that we need to pay attention to[.] (0325-21-2 [Iwane, Cathy])

Comment: The low-level waste problem is not really dealt with. It's whitewashed, also. If you -- the NRC website says -- adopts the linear no threshold idea that there is no such thing as a safe level of radiation. This also comes from the BEIR 7 reports of the biological effects of ionizing radiation, and the BEIR 7 report says that all radiation is potentially dangerous, and there's no such thing as a safe threshold. So, low-level doesn't mean it's safe. (0325-31-3 [Johnson, Roger])

Comment: One thing that I would like to see is radioactive monitoring. There is no real-time radioactive monitoring available to the public, so when you have a dirty day and you blow up something and a contaminant gets into the ocean and into the air, I think people who live in San Clemente or inland ought to know about it. I'd like to propose that you build real-time publicly available radioactive monitors in every town and city within 20 miles. (0325-31-5 [Johnson, Roger])

Comment: We have to look at this Waste Confidence issue from a very small level, molecular level, where it affects the area. It affects us here where we sit today. I mean, we are being bombarded by the waste that is being stored out there at Diablo and here in this room. You know, nuclear energy passes through, at a molecular level, tremendous distances. The effect that the storage of waste at the nuclear plant has on the environment and the cultural landscape of my ancestors and the occurrent families of Chumash people that live here is unacceptable. (0326-2-1 [Collins, Fred])

Comment: We believe that it is being done without the whole picture and for us, it is a highly volatile and a very harmful storage, and the continued buildup of this waste material in this very small part of our coastline is extremely dangerous. It's extremely dangerous to the future, the seven generations that are to come, so we do not give the NRC permission to re-license this plant, nor do we give the Waste Confidence Commission permission to move forward with this Generic EIS. (0326-2-3 [Collins, Fred])

Comment: Clearly, the truth about Fukushima has not been told. Nuclear efforts say there's nothing in the books on what we can do. They are making it up as they go. Helen Caldecott warns that the ace in the hole for the nuclear energy industry is the incubation period of radiation exposure. Its damage does not show up for a long time. You cannot prove that it was caused by the nuclear power plant. It's two to five years for lung cancer to show up; 15 to 17 years for solid cancers. (0326-23-2 [Malboeuf, Simone])

Comment: Okay, public and occupational health, Roman numeral 43; it says that it's small, that there is no public or occupational health. That is also a lie. (0326-56-4 [Homick, Nick])

Comment: It appears that the danger of radiation from nuclear waste depends on your clothing. With NRC's representatives and representatives from industry in suits and ties, the waste is evidently quite safe, but people in lab coats know even the tiniest exposure is dangerous. Every U.S. agency that monitors radiation says this. The National Council on

Radiation Protection says, "Every increment of radiation exposure produces an incremental increase in the risk of cancer." The National EPA says, "There is no firm basis for setting a safe level of exposure above background. Based on current scientific evidence, any exposure to radiation can be harmful or can increase the risk of cancer. No radiation exposure is completely risk-free. There is no level below which we can say an exposure poses no risk. Radiation is a carcinogen. It may also cause other adverse health effects, including genetic defects in children of exposed parents, or mental retardation in the children of mothers exposed during pregnancy." The National Academy of Sciences in Bier 7 says, "There is a relationship between exposure to ionizing radiation and the development of radiation-induced solid cancers in humans. Current evidence suggests that any exposure to radiation poses some risk; that is, there is no level below which we can say exposure poses no risk." The United States Department of Energy says, "U.S. Government regulations assume that the effects of all radiation exposures are cumulative and should be limited as much as reasonably possible." Even our own Nuclear Regulatory Commission says, "Any amount of radiation may pose some risk for causing cancer and hereditary effect, and that the risk is higher for higher radiation exposures. Any increase in dose no matter how small results in an incremental increase in risk." (0328-9-1 [LaForge, John])

Comment: [I] have seen the effects of long-term radiation, slow radiation poisoning on veterans, worked at the VA for a long time. So I have a lot of concerns about transporting waste, storing waste safely, and the long-term effects on humans. (0329-34-3 [Myers, Susan])

Comment: In concluding, one elephant in the room stands: the NRC's failure to understand the very real, well documented, science of radioactive substances which waste produces. A fingernail of plutonium could kill off, conservatively a large city. Cesium, strontium, and other radionuclides contained in waste, are some of the most toxic substances on earth, creating slow and long term illness and well as mutating genes. The NRC has a duty to protect children and grandchildren for generations to come from substances which contaminate human beings, the biosphere and the environment and which can create lasting, adverse, multi-generational changes in the genome. We believe the DWC GEIS shows that the NRC does not take that duty seriously. (0348-14 [Agnew, David] [Roscoe, Lee])

Comment: In concluding, one elephant in the room stands: the NRC's failure to understand the very real, well documented, science of radioactive substances which waste produces. A fingernail of plutonium could kill off, conservatively a large city. Cesium, strontium, and other radionuclides contained in waste, are some of the most toxic substances on earth, creating slow and long term illness and well as mutating genes. The NRC has a duty to protect children and grandchildren for generations to come from substances which contaminate human beings, the biosphere and the environment and which can create lasting, adverse, multi-generational changes in the genome. We believe the DWC GEIS shows that the NRC does not take that duty seriously. (0352-14 [Roscoe, Lee])

Comment: Spent nuclear fuel remains highly dangerous, virtually forever. It contains long-lived radioactive materials that can seriously contaminate the environment and harm public health if released. Plutonium-239 can be used to make nuclear weapons if separated from the other materials in the fuel. Plutonium-239 has a half-life of over 24,000 years. (0377-5-19 [Cuthbert, Lewis])

Comment: Tritium is a strong biological toxin because it is readily incorporated into biological tissues. It doesn't even require a chemical reaction since an organic molecule can incorporate tritium through an exchange mechanism between tritiated water and the hydrogen atoms of organic compounds by simple incubation in aqueous solution. Thus tritium can be absorbed

from the environment by both ingestion and inspiration. Once incorporated into the body, tritium is particularly dangerous because hydrogen is ubiquitous in biological tissue. Tritium decays at a high activity rate but emits a low energy electron. Low energy electrons have a high linear energy transfer to their surroundings and therefore cause maximum biological damage in a small volume of tissue. This energy deposition in a very small area of an organ results in a very high micro-dose to specific cellular and tissue components, which can lead to cancer or mutation if a cell is transformed and not cleared by the immune system. Therefore, micro-dose calculation is important for assessing the carcinogenic potential of tritium decay, in situ, and this micro-dose is much larger than what would be expected if the dose were to be distributed uniformly throughout the organ. (0410-14 [Nelson, Dennis])

Comment: Other radionuclides present in spent fuel are also selectively incorporated into certain biological tissue because they mimic some essential biological elements. For example: radioactive cesium and rubidium mimic potassium and so are concentrated in the muscles where they can cause wasting disease such as polymyocytis, or contribute to autoimmune disorders like multiple sclerosis or even heart disease. Plutonium and strontium mimic calcium and so concentrate in the bones near the bone marrow which can cause leukemia and disorders of the blood forming units. Some alpha emitters in the circulatory system damage the vascular lining causing inflammation resulting in calcified arterial plaques which can cause infarcts and heart disease. Radioactive noble gases dissolve in fatty tissues and so concentrate in tissues like the brain, breast and bone marrow, causing cancers in these organs. A variety of radionuclides mimic iron and so are transported and stored in the body by transferrin and ferritin. Radio-iodine concentrates in the thyroid, but can also be incorporated into radioactive thyroxin which can damage the thyroxin receptors in the tissues. (Dioxin is so chemically toxic precisely because it disrupts this thyroxin/receptor binding site). It is not enough to say that these atoms are simply radioactive but one must also know where in the body they are concentrated and how their decay affects the adjacent tissue and its biochemistry. These pathways are so complex that it is virtually useless to attempt to predict biological risk based on the decay properties of radioisotopes themselves outside the body. Most of the NRC risk analyses are clearly done by physicists with limited knowledge of biology or biochemistry and so lack the insight of the biological disciplines. Physicists concentrate on the external radiation component of dose, in most cases, while ignoring the subtleties of the tissue doses at the molecular level. Radiation has also been shown to have other demonstrated statistical effects besides increasing cancer rates, such as depression of the normal bodily immune response mechanisms against pathogens and a non-specific life shortening in irradiated populations. (0410-15 [Nelson, Dennis])

Comment: The NRC has used an artificially inflated number of 350 mR per year for natural background radiation (NBR). The tacit assumption here is that this "natural" level of radiation exposure results in no deleterious health effects. In the GEIS draft report the NRC constantly compares the "permissible" dose/exposure level for members of the general public (up to 500 mR/yr) to this "natural" level. They assume that if this natural level is "safe" then it must follow that exposure to man-made radiation in this same range must also be "safe." No account seems to be taken of the fact that the natural and man-made doses are additive. There is no threshold safe dose of radiation so any additional level of exposure can be expected to cause additional damage to health. Problems with this analysis also arise when one recognizes that the actual natural level of background radiation is about 81 mR/yr at sea-level with an average terrestrial radiation component (about one quarter the NRC's estimated value). Most other NRC analyses of "dose" are based on external radiation sources and the effect of penetrating radiation on biological systems. It is therefore curious that the NRC has chosen to add an internal radon dose to their estimate of NBR. This "radon" dose cannot even be generalized since it depends

on so many factors such as smoking habits, house ventilation/air exchange systems and the composition of the underlying bedrock and soils. The NRC uses this approach when it suits their purpose of inflating the background dose for comparison purposes against NRC allowed exposure limits; but they ignore internal doses when they go against their otherwise optimistic risk projections. It is also curious that they add a significant dose due to medical procedures which are clearly not "natural" at all. (0410-16 [Nelson, Dennis])

Comment: Since the earth's life forms are carbon based, carbon-14 is a particularly noxious toxicant. Carbon-14-carbon dioxide has a long half-life and is also readily incorporated into the biome by photosynthesis, where it can be assimilated into bio-molecules such as DNA which are vital to life. Carbon-14 decays by beta emission and can cause disruption and mutation of bio-molecules in three different ways: (1) the emitted beta particle can ionize and disrupt adjacent bonds in the molecule; (2) the beta decay can cause the source nucleus to recoil and be expelled from its position in the bio-molecule causing bond recombination in deleterious ways; and (3) the decaying carbon nucleus can transform itself into a different element with different chemical properties and thus compromise the chemical integrity of the bio-molecule. The NRC does not state how much carbon-14 would be produced and released into the atmosphere by the air cooling of dry casks over decades or centuries or how this would affect future generations. This is not a question of a dose distributed uniformly over the planet affecting everyone equally; but rather the effect of a widespread random distribution of discrete biological disrupters into the biosphere, (the biochemical equivalent of "land mines" or "time bombs" in the macroscopic world) each with the potential to cause random disease, mutation or premature death. During the atmospheric nuclear test era the concentration of carbon-14 in the biosphere more than doubled. This is one likely explanation for the large increase in the cancer rate during that same time frame. (0410-26 [Nelson, Dennis])

Comment: Some genetic variations, the so-called inborn errors of metabolism, also confer increased sensitivity to radiation damage on certain susceptible individuals, rendering them much more vulnerable to environmental radiation than others. This means that the same amount of radiation which might be tolerated by one person might cause harm in another. One example is hemochromatosis, a genetic defect in iron metabolism associated with a greatly increased susceptibility to radiation damage. It has also been suggested that the more common heterozygous persons with this trait may also be at increased risk. Many other genetic variations including ataxia telangiectasia also increase the radiation risk in susceptible individuals. It is well known that pregnant women and children are also more sensitive to radiation damage than are adults. In the end, the number one priority of the NRC should always be the preservation of the health of nuclear workers and the general public. The report mentions nothing in its risk assessment about susceptible genetic variants in the population or the need for increased levels of protection for pregnant women and children. This omission shows a total lack of consideration for the most vulnerable members of society, and a lack of caution in this regard could have devastating effects on the future of our nation since pregnant women and children represent our future. The NRC GEIS Draft Report is, therefore, not a true analysis of radiation health risk and is not based on the entirety of the scientific knowledge. (0410-32 [Nelson, Dennis])

Comment: Almost every facility in the nuclear complex has experienced at one time or another, during its operation, a radiological release off-site of greater or lesser magnitude. Transport of radioactive isotopes has occurred by air, ground and water. Some radionuclides have been absorbed by plant life and concentrated in the food chain and so have contaminated food and livestock. During the atmospheric nuclear bomb testing era, some pathetic countermeasures such as the iodination of table salt and the promotion of baby formula over breast feeding were attempted to mitigate the effect of iodine-131, (a short-lived environmental

and food contaminant); but the majority of contaminants were simply ignored even though they most certainly caused harm. Scores of radionuclides of varying half-lives and activities combined in hundreds of chemical compound variations are produced by nuclear fission in both bombs and reactors. Although many of these decay quickly, others persist long enough to be incorporated chemically into animal and plant tissues, through a myriad of physiological and biochemical pathways to become constituent building blocks of cells. These incorporated radioisotopes can cause mutagenic and oncogenic transformations in the host or adjacent cells. Each compound can be metabolized by a variety of anabolic and catabolic pathways with different biological outcomes. The simple-minded approach used by the NRC to estimate risk is almost entirely based on the external fluence of gamma and beta radiation, distributed uniformly over large areas, and largely ignores the multitude of specific risks due to in-situ radionuclide incorporation. (0410-4 [Nelson, Dennis])

Comment: Unlike other toxic biochemical reactions which require a certain minimum concentration of reactants (toxicants) or activation energy to proceed, nuclear processes emit particles or photons with sufficient energy to precipitate a chemical reaction from the decay of a single nucleus. Thus, there is no threshold concentration for nuclear induced chemical processes as there is with chemical toxins. In fact, some radionuclides such as polonium-210, which can be present in waste fuel, are lethally toxic even in the sub-microgram range. Analyses of the radioisotope composition of the waste from each kind of starting fuel mixture, while taking into account the degree of fuel burn-up and the stage in the cooling/aging process, is essential to fully evaluate the toxicity of all the different radioisotopes in the waste fuel in the event of an accidental release. The NRC assertion that spent fuel from mixed-oxide fueled reactors is "substantially the same" as that from uranium fueled reactors shows that they have ignored the isotope composition of the waste fuel in their risk estimations. Ideally, when dealing with intact spent fuel elements shielded by water in pools or in steel and concrete casks only the fugitive gamma and x-radiation is of health significance; but we know from experience that the fuel doesn't always remain clad and in place and that fissionable elements, fission products and activated reactor components often end up contaminating the surroundings. We also know from experience that radioactive contamination is not distributed uniformly as the NRC has assumed. (0410-5 [Nelson, Dennis])

Comment: Ionizing radiation can cause cancer. The draft ruling and plan fails to appropriately emphasize that radiation is potentially harmful to humans. The GEIS should not rely on the United Nations UNSCEAR report for effects of radiation on humans. The UNSCEAR report only utilized the probable effect of radiation released in the first week of the Fukushima meltdown. The reality is that radiation continues to be released two and a half years later. Adverse health effects, especially malignancies are most thyroid cancers especially in children. (0417-4 [Clark, Terrence])

Comment: My particular worry has not been stated in the NUREG-2157. My particular worry concerns a new discovery by a Michael Skinner of the Washington State University and written up on Page 78 of the December 2013 issue of Smithsonian Magazine. Dr. Skinner's discoveries concern the new information about epigenetics. Epigenetics has shown that negative health effects can skip generations, and then become permanent to the following generations. Deaths and damage from radiation may not show in the generation that experiences the radiation, but appear in later generations and all following generations. The present methodologies for observing and calculating damage from radiation does not show these epigenetic effects. I contacted the NRC Chairman's office, and a staffer contacted me that the NRC does not observe genetic effects, but relies on present data that does not try to include genetic effects. Will the NRC try to include genetic effects in its evaluation of the radioactivity

from spent fuel and from the entire fuel cycle in its evaluation of the nuclear fuel cycle and ,specifically, spent fuel storage? (0427-2 [Lewis, Marvin])

Comment: Here I am again with more comments upon Waste Confidence and growing less confident in the NRC to handle rad wastes as I write. I continue to study the NRC's way of calculating doses to the public and am disappointed by the methodology. The NRC accounts for any doses to the public for releases-air, water and solids- for the first year only. In many or all cases the released isotopes are considered to be part of the background and ignored after the first year. Background has risen from 60 millirems per year when I was a child to 360 millirems per year reported in many NRC publications, and 600+ per year in Protective Action Guidelines released by the Environmental Protection Administration published this year. I submit that the rate of increase and the increase of background needs to be studied and that the contribution to the background from leaving radioactive wastes on the surface be calculated for its damage to the human genome and other radiation sensitive structures. Will the NRC determine how much increase in background will issue from storing radioactive waste, particularly spent fuel, on the surface in contrast to burying in a geological repository over time? (0430-1 [Lewis, Marvin])

Comment: The essential element, Uranium, wherever taken from its entombment in the earth has created a cancer cluster (i.e. Crownpoint N.M.) and environmental degradation that will last for generations along with the climate changing production of large amounts of carbon. (0450-9 [Bast, Nancy])

Comment: The rules and regulations ignore the cumulative dose past the first year that the radiation is emitted and enters the food, water and air. When radioactive waste appeared to be handled in a fast, efficient manner, the added radiation past the first year was a matter that fell thru the cracks as a geological depository was assumed available when needed. There is now no assumption of a timely geological repository, and an admission that such a repository may need centuries. The radiation release reduces over time as a function of half life. The reverse is true for radiation stored on the surface. Will the added dosage to the public and the workers be evaluated for the added time that the HL radwaste will be stored on the surface? (0455-2 [Lewis, Marvin])

Comment: Michael Skinner, Michael Meaney and Moeshe Szyf have discovered the phenomenon called epigenetics. Epigenetics increases the damage that radiation will do to future generations. Recent discoveries about the radiation dose during the PreCambrian Explosion of Life. The radiation dose during the PreCambrian Explosion of life was roughly that which is allowed in the EPA PAGs (Environmental Protection Agency Protective Action Guidelines). During the Precambrian Explosion of Life, many new life forms came upon the scene. Evolution blossomed due to the reduction in the background dose to a level that allowed evolution to introduce many forms of life never seen before on this Earth. Are we forcing evolution back with the increase in background radiation to the point that life will stop evolving and how much will be due to the nuclear fuel cycle with the addition of high level radiative waste storage on the surface of the Earth? (0455-3 [Lewis, Marvin])

Comment: Please understand that I started a facebook page in which there are high levels of diseases in the Riverside county areas especially Temecula, Fallbrook, Murrieta, and Lake Elsinore Etc... These areas are directly 22 miles away from San Onofre power station. Hopefully a billion dollar industry would protect the citizens over profits (0478-3 [Higgins, Kevin])

Comment: Nuclear radiation is devastating to the human body and this problem need to be faced and changed right away, for the safety of every person in this nation. (0494-2 [Orlinski, Patricia])

Comment: The WCGEIS fails to address new data and studies about the harmful effects of radiation. The WCGEIS needs to be revised to address these findings in terms of a national fleet of operating reactors and spent-fuel basins. (0496-12 [Batobato, Alicia])

Comment: Failure to adequately disclose radioactive air emissions. Many LR EISs failed to publicly and accurately disclose radioactive emissions and increased dosages over time, including failure to compute emissions from multiple reactors at a single station. Nor have they computed reasonable foreseeable trends in increased emissions such as those witnessed at the Columbia Generating Station. Nor have they adequately computed the cumulative emissions to individuals over the 20-years licensing extension period. The WCGEIS needs to the total emissions and health effects from all operating nuclear reactors, combined with the emissions from all spent-fuel storage. (0496-4 [Batobato, Alicia])

Comment: The WCGEIS failed to disclose controversial or opposing technical and scientific views including other radiation and health studies that contradict NRC's conclusions. The WCGEIS needs to be revised to address these opposing views. This comment applies to a host of other controversial issues described in the WCGEIS. (0496-5 [Batobato, Alicia])

Comment: -Radiation protection standards should apply to an interim period of up to a 300 year storage period. -The HPS has a position statement on public radiation exposure, PS005-3, Ionizing Radiation Safety Standards for the General Public that supports a mSv/yr dose limit. The HPS is pleased that the NRC has not proposed a different standard for spent fuel storage nor is there a proposal to change the standard over time. -Appropriate radiological monitoring should be required for the environment surrounding the storage facility. -The regulations for spent fuel storage include adequate requirements for a Radiological Environmental Monitoring Program (REMP). No additional requirements are justified. (0534-7 [Vetter, Richard])

Comment: Radioactive waste cannot be safe, secure, clean or green. It is deadly, very long-lasting, toxic stuff that irradiates cells and damages DNA--causing cancer, birth defects, heart problems, infertility, immune deficiencies, and more. There is no safe dose of radiation, but spent or irradiated nuclear fuel is so radioactive a person near it would receive a lethal dose of radiation in just a few minutes if not seconds. (0552-1-8 [Macks, Vic])

Comment: Radiation-linked diseases in communities near reactors vary and must be looked at on a site specific basis. Additional years of exposure from onsite storage will harm an already damaged population, even if the releases are at permissible levels. Both BEIR VII and previous nuclear worker studies show that the health effects of radiation are cumulative. See Morgenstern, H. and Ritz, B. Effects of Radiation and Chemical Exposures on Cancer Mortality Among Rocketdyne Workers: A Review of Three Cohort Studies. Occupational Medicine: State of the Art Reviews, Vol. 16, No. 2, April-June 2001, pages 219-238. For example: Increases in radiation-linked disease in the communities around Pilgrim were in part attributed to operating with defective fuel; operating without the off-gas treatment system in the first years; poor management and practices culminating in the releases in June 1982 that coincided with weather conditions that held the releases over surrounding communities and parts of Cape Cod. The cancers found in the communities around the power station were studied by Dr. Sidney Cobb and Dr. Richard Clapp and their results were published in a peer reviewed journal in 1987. They included elevated rates of Myelogenous Leukemia -- a type of cancer most likely to be triggered

by exposure to radiation.⁸ [footnote 8 text: An epidemiological analysis of five towns around Pilgrim shows a 60 percent increase in leukemia rate, excluding leukemias not caused by radiation exposure. - Sidney Cobb, et al. Lancet, 1987. The rate of myelogenous leukemia (the type most likely to be triggered by exposure to radiation) among males in the 5 towns around the Pilgrim reactor was found to be 2 1/2 times greater than the statewide average. Leukemia in Five Massachusetts Coastal Towns, Sydney Cobb, et al., Abstract for the American Epidemiologic Society, March 18, 1987; and Leukemia near Massachusetts Nuclear Power Plant, letter b Clapp, R.W., Cobb, S., Chan, C.K., Walker, B., Lancet 1987, No, 2:1324-5.] This led to a case-control study carried out by the Massachusetts Department of Public Health that showed a fourfold increase in adult Leukemia between 1978 and 1983. The report stated "a dose-response relationship was observed in that the relative risk of leukemia increased as the potential for exposure to plant emissions also increased."⁹ [footnote 9 text: Adults living and working within ten miles of the Pilgrim reactor had a fourfold increased risk of contracting leukemia between the years of 1978 and 1983 when compared with people living more than 20 miles away, according to a 1990 study by the Massachusetts Department of Public Health: Southeastern Massachusetts Health Study 1978-1986, Morris, M.S., Knorr, R.S., Massachusetts Department of Health, Oct. 1990. See also Archives of Environmental Health, 1996, Vol. 51(4), p. 266.] (0556-1-29 [Lampert, Mary])

Comment: BEIR VII showed that the young, elderly, and females are more susceptible to radiation so that the demographics of these population groups on a site-specific basis must be accounted for in assessing health impacts on the public of normal and above-normal releases from spent fuel storage. The DGEIS did not do so. (0556-1-30 [Lampert, Mary])

Comment: Bio-Accumulation of Radionuclides in the Environment The history of releases into the environment varies from reactor to reactor. Its significance must be evaluated on a site-specific basis because the effects of radiation exposure are cumulative. Some types of nuclear power plant emissions stay radioactive for a long time and, because they can enter biological food chains, those materials can accumulate in the environment and adversely affect public health. Reports show that, "If radioactive emissions persist for years, decades or even centuries within the environment, then even modest reductions in annual discharges may not be sufficient to prevent an environmental build-up of those materials over time." Estimates of Environmental Accumulations of Radioactivity Resulting from Routine Operation of New England Nuclear Power Plants (1973-84), Dr. Richard W. England, Mr. Eric Mitchell, p. 4, A Report of the Nuclear Emission Research Project, Whittemore School of Business and Economics, University of New Hampshire, Durham, N.H., August 1987. It is known for example that the following radionuclides have been released from Pilgrim into neighboring communities: plutonium 239 (half life 24,400 years); neptunium 236 or 237 (half life ranging from 120,000 years to 2.1 million years); cesium 137 (half life 30.2 years); strontium 90 (half life 28.5 years); tritium (half life 12.3 years), and xenon (half life 9.17 hours). Xenon transforms after its emission into cesium 135, which persists almost indefinitely in the environment. Examples of previous releases have been reported in the Annual Radiological Environmental Monitoring Program Reports [REMP].¹⁰ [footnote 10 text: For example, in June 1982, Pilgrim blew its filters and released contaminated resin material off site into surrounding communities. The licensee's own Radiological Environmental Monitoring Program Report for 1982 showed for example: Cesium-137, 1,000,000 times higher than expected in milk tested at the indicator sampling farm 12 miles west of the reactor and no elevation at the control station, 22 miles away; Cesium-137 again 1,000,000 times higher in vegetation samples from indicator farms .7 miles and 1.5 miles from the reactor. Plutonium 239/240: Radiological Environmental Reports (REMP) 1998, Plutonium found in indicator samples; and on Duxbury Beach: REMP 1999, Plutonium found Duxbury Beach; REMP 2000, Plutonium in indicator samples from Duxbury Beach, later excused by stating contamination

must have resulted from a dirty beaker; REMP 20 Plutonium Duxbury Beach; REMP from 2003 forward stopped testing for Plutonium on Duxbury Beach.] These releases include substances that will remain active in the local environment for the foreseeable future and should be taken into account on a site specific basis when evaluating the impact of releases from continued storage of spent fuel in normal and accident scenarios. Reactors' past history of releases vary and require separate analysis. (0556-1-31 [Lampert, Mary])

Comment: Recognizing that sky-shine is a measurable phenomenon at ISFSI facilities, the radiological affects of such facilities on the environment must be analyzed and included in the Draft GEIS. (0608-17 [Crocker, George])

Comment: Since BEIR VII there has been scientific certainty that every exposure to ionizing radiation increases the risk of adverse health affects, and it is not the case that any of these events, or routine radiation releases either, for that matter, are ever really over. It's not like a train wreck or a car crash, where you can pick up the bodies, clean up the mess, grieve and be sorry and move on. Due to the half-lives of all these radiological releases, the events continue causing biological destruction and premature human death for decades and centuries into the future. Just because you don't bother to monitor radiation plumes and hot spots and dispersion patterns for their biologically active 10 half-lives, doesn't mean that the released radioactivity you enable isn't killing people. (0608-2 [Crocker, George])

Comment: --[The NRC has failed to fully examine] the impacts on public health that may occur if a geological repository cannot be sited or cannot effectively contain radioactivity. (0611-13 [Shapiro, Susan])

Comment: Studies based on CDRC and New York State Cancer Registry Data have found significantly higher levels of thyroid cancer in the areas surrounding Indian Point and other nuclear reactor. (See Geographic Variation in U.S. Thyroid Cancer Incidence and a Cluster Near Nuclear Reactors in New Jersey, New York, and Pennsylvania published in the International Journal of Health Services Volume 39, Number 4, 2009, pages 643 - 661. <http://radiation.org/reading/pubs/091116Thyroidcancer.pdf>. In addition Childhood Leukaemia near nuclear plants has been proven in peer reviewed studies to be significantly higher. See http://radiation.org/reading/pubs/ecc_948.pdf. The GEIS fails to consider the long term health impacts of continued production of nuclear waste without a solution for safe and secure storage and waste disposal. (0611-49 [Shapiro, Susan])

Comment: Fund a comprehensive, continuous independent, citizen run radiation monitoring program (reports 4 times a year are not adequate to evaluate health impacts of ongoing radioactive releases and bioaccumulation) (0611-55 [Shapiro, Susan])

Comment: Cancer is now the number one killer of children in the US, and the National Cancer Institute of Japan has sent brochures to all the children in elementary school telling them they should not fear cancer as almost everyone will die of cancer one day. How is nuclear a "safe" technology? In what world? (0617-8 [Zure, Lisa])

Comment: Consolidated storage likely would increase worker exposure at the power plant and would certainly increase worker exposures during transportation and at the consolidated storage site. (0646-5 [Hanson, Courtney])

Comment: Acceptable exposure levels should be based on standards to protect the most vulnerable members of the community. (0662-10 [McClintock, Francene])

Comment: If you choose to believe that small amounts of radiation can actually be good for you, as Ann Coulter suggested, then it's perfectly clear you have absolutely no idea what ionizing radiation is and what it can do. I, for one, don't want leukemia, therefore I'm moving to the Southern hemisphere, and I suggest you consider doing the same. (0670-6 [Anonymous, Brian])

Comment: The radiation risks from nuclear power are carefully studied. The requirements for radiation exposure to the public are so stringent that nuclear power plants release less radiation than coal plants as coal contains radioactive elements that are unfiltered before entering the atmosphere. [Max Carbon, "Nuclear Power: Villain or Victim?"] Health physicists, nuclear engineers, and regulators have made and continue to make very conservative assumptions regarding how much radiation exposure to the public is acceptable and nuclear power plants are required to operate within those limits even in the event of an accident. (0674-8 [Lang, Amanda])

Comment: Recognition that Spent Nuclear Fuel Poses Human Health and Environmental Dangers: At high levels, radiation exposure can cause death. At lower doses, radiation can have devastating health effects, including increased cancer risks and serious birth defects such as mental retardation, eye malformations, and small brain or head size. Those health effects persist for very long time spans.⁸ [footnote 8 text: See generally *Nuclear Energy Inst. v. EPA*, 373 F.3d 1251, 1258 (D.C. Cir. 2004).] Depending on the amount, the dispersion of radionuclides can render residential areas uninhabitable, make drinking water resources unpotable, and cause agricultural lands to become unsuitable for dairy and agricultural farming. The State of New York requests that any final NRC environmental impact statement squarely acknowledge, as an initial matter, the dangers posed by release of radiation into the environment. (0681-8 [Peterson, Alyse])

Comment: The ace in the hole for the nuclear industry is the incubation period of radiation exposure. It's damage does not show up for a long time. It's 2-5 yrs for lung cancers and 15-17 years for solid cancers to appear. Because radiation is invisible, undetectable, workers and the public cannot tell they have been damaged by its affects for years. The employees of NCNPP apparently think they are immune to radioactivity. The public knows we are not. It is very revealing that though PG&E says its first concern in public safety, they have not done one study on the incidence of cancer in this area since the opening of Diablo Canyon. (0686-19 [Malboeuf, Simone])

Comment: •DGEIS Section 4.17 concludes that radiological impacts from public and occupational doses would be SMALL because the doses would continue to remain below the regulatory dose limits.¹⁰⁰ [footnote 100 text: DGEIS at 4-64 to 4-67.] TVA agrees. (0694-3-7 [Shea, Joseph])

Comment: •DGEIS Section 4.17 concludes that radiological impacts from public and occupational doses would be SMALL because the doses would continue to remain below the regulatory dose limits.⁸² [footnote 82 text: DGEIS at 4-64 to 4-67.] Entergy agrees. (0697-2-16 [Bessette, Paul] [Kuyler, Raphael])

Comment: Why does NRC report radiation risk based on documents that are not supported by real-world data? What does NRC do to factor in disproportionate impact of radiation to various parts of the human life-cycle? Children? Unborn? Female? Elders? (0711-28 [Olson, Mary])

Comment: Radiation[:] There would be far less concern about waste from NRC license activities if radiation were not harmful; there is no safe dose of radiation. This is not

controversial to anyone except those for whom it is a real or potential liability, and/or loss of profit. "No safe dose" or "no threshold" is also not merely a "conservatism" in regulation of radiation, as mistakenly stated by many. The classic reviews of harm, disease and death from radiation, the National Academy of Science Biological Effects of Ionizing Radiation reports (BEIR 1--7^{vii} [footnote vii text: National Academy of Science. Biological Effects of Ionizing Radiation (BEIR 1--7).]) all affirm that there is no dose of radiation with zero risk. In addition, the European Commission on Radiation Risk^{viii} [footnote viii text: ECRR--2010 Recommendations of the European Radiation Risk Committee: <http://www.euradcom.org/2011/ecrr2010.pdf>.] documents that internal radioactivity may result in very high doses since radioactive emissions from radionuclides that get into the body deposit energy directly into surrounding tissue. Another survey of a large number of peer-reviewed published studies on the impact of radiation focused on naturally occurring radioactivity, finding that even in evolutionary timeframes, organisms are never helped by radiation exposure; always harmed (Moeller and Mousseau, 2012^x [footnote ix text: Moeller and Mousseau, 2012. The effects of natural variation in background radioactivity on humans, animals and other organisms. Biological Reviews Volume 88, Issue 1, pages 226--254, February 2013.]). (0711-6 [Olson, Mary])

Comment: Dr. Gofman (September 21, 1918 — August 15, 2007) was a Professor Emeritus at the University of California, Berkeley (Ph.D. in nuclear-physical chemistry and an M.D.) who was the first Director of the Biomedical Research Division of the Lawrence Livermore Laboratory from 1963-65 and one of nine Associate Directors at the Lab from 1963-1969. He was involved in the Manhattan Project and was a co-discoverer of Uranium-232, Plutonium-232, Uranium-233, and Plutonium-233, and of slow and fast neutron fissionability of Uranium-233. He also was a co-inventor of the uranyl acetate and columbium oxide processes for plutonium separation. He taught in the radioisotope and radiobiology fields from the 1950s at least up into the 1980s, and did research in radiochemistry, macromolecules, lipoproteins, coronary heart disease, arteriosclerosis, trace element determination, x-ray spectroscopy, chromosomes and cancer and radiation hazards. Starting in 1969 he began to challenge the AEC claim that there was a "safe threshold" of radiation below which no adverse health effects could be detected. <http://www.ratical.org/radiation/inetSeries/nwJWG.html#line41>[.] (0713-10 [Keegan, Michael J.]

Comment: How can you even contemplate moving forward when the National Academy of Sciences is only beginning to study the health impacts? That in itself is deplorable. Whatever happened to the adage "err on the side of caution"? Is there no such thought process when it comes to the NRC making decisions about nuclear safety? Your actions do not seriously take our health into consideration. (0722-5 [Headington, Maureen])

Comment: For example, looking at the area of "public and occupational health," we see that the U.S. Centers for Disease Control and Prevention reports that cancer rates are 66% above the average in the communities surrounding Indian Point. In spite of this report from the U.S. agency reporting on health issues, table 1 of these DGEIS regulations reports a "small" "Health Impact "across the board" - in all areas of Short-term, Long-term and Indefinite storage. It is clear that the DGEIS is not applicable to the specific particularities and problems of Indian Point and that this table is grossly inaccurate. (0762-3 [Skopic, Catherine])

Comment: Under section 4.20, starting on page 4-90 and carrying over to page 4-91, Table 4.2 should be modified to reflect the changes in the analysis set forth by the City [Red Wing, MN] in this letter... ..Likewise, public and occupational health should be modified from small/moderate to large for all timeframes. (0783-3-25 [Harlan, Thomas])

Comment: Repeated studies conducted a couple decades ago show that any exposure to ionizing radiation harms people by changing the structures of blood cells and by changing the complete blood count (CBC) levels at the lowest levels. Low level ionizing radiation exposure causes fatigue and other subtle function problems with impacts that decrease well-being and cognitive sharpness. Thyroid cancer, leukemia, and other illnesses may occur decades after radiation exposure. Permanent irreversible damage to genetic pools often requires waiting for the 3rd and 4th generations to present itself reproductively. An growing epidemic of thyroid cancer and leukemia is occurring in the USA. Radiation exposure is the primary known cause. I am unaware of any considerations of the actual fraction of these impacts to be attributed by NRC to known radioactive isotope exposures from Three Mile Island and other leaks inside the USA, but the timing combined with the impacts that follows afterward is an indicator that requires addressing. These illnesses represent human suffering and dysfunction from exposure to ionizing radiation. While impacts on humans may fail to register in awareness, so to speak, in terms of connecting the dots, the impacts and observed changes of any exposure level, including medical exposures, can be found in the membranes of blood cells and in the fractions within the complete blood count (CBC) in direct linear response to the ionizing exposure. With these ignored human impacts (that may be causing fibromyalgia, chronic fatigue syndrome, Gulf War Disease, non-iodine deficiency multi-nodular thyroid, thyroid cancer, leukemia, still-born births), perhaps larger impacts may be occurring sooner in plant-life, insects, and wildlife. Far-ranging impacts have been recorded with the scanty measurements available following catastrophic radioactive releases into the environment. Scientific principles require measuring releases from the source in time and space and making that data available to any researcher; anything less is unacceptable. (0823-22 [Michetti, Susan])

Comment: The Draft Generic EIS unacceptably fails to address impacts to drinking water quality. The NRC casually accepts contamination of leaking water on site. This violates scientific thinking, methods, and practices that the onsite contamination of drinking water in excess of EPA drinking water standards is somehow assumed to be acceptable because it has not migrated offsite at this point in time. This is another example of unacceptable, unscientific and irrational thinking by NRC decision-makers that is driving flawed and dangerous policy and rules without sufficient analysis regarding the complete impacts of nuclear reactor operations through the complete impacted timeline, (which is the timeframe of the complete life span of the various radioactive isotopes that encompasses their entire sets of half-lives). Scientific practices do not permit radioactive contamination leaks to continue unabated, but such unacceptable leaks are happening on-site at every reactor site in the USA. Scientific thinking, methods, and practices must include the complete timeframes upon which to build the case for safety, but this Draft Generic EIS does not do what is required in terms of protecting drinking water quality through time. The importance of protecting drinking water quality has always been critical, but even more so now that the subject of water wars is being discussed. (0823-38 [Michetti, Susan])

Comment: Of special safety concern for drinking water is the use of high burn up fuel with increased tritium load. The use varies at individual reactors. Tritium appears to be impossible to remove from groundwater, making tritium contamination very seriously significant. This represents an example of NRC's insufficient dealing with environmental exposure in a timely way for actual adverse physical reality impacts with drinking water contamination. These impacts are worsening from not being cleaned up by reactor owners. People are drinking water contaminated with tritium and experiencing adverse health effects. Harmed nearby residents are not being compensated. The NRC assures a false public safety as this occurs. An unacceptable contradiction exists between reality and the safety concept. The safety claims have become distorted. The safety assurance is untrustworthy. (0823-39 [Michetti, Susan])

Comment: Page 3.38, Section 3.16 "Public and Occupational Health" again, you deal with exposure when everything goes well, when any accident is one of those expected accidents. But not if something unexpected happens. (0836-51 [Davis, Anonymous])

Comment: Cancer is now the number one killer of children in the US, and the National Cancer Institute of Japan has sent brochures to all the children in elementary school telling them they should not fear cancer as almost everyone will die of cancer one day. How is nuclear a "safe" technology? In what world? (0844-8 [Anonymous, Anonymous])

Comment: Not safe now ask people who are poisoned in communities by the nuclear power plants that were almost hit by recent tornados in Illinois, employees who worked at Olin & employees dying from cancer now from working at nuclear facilities. (0862-3 [Thompson, Tammy])

Comment: Happy Holidays to you & yours while many US citizens are drinking contaminated radioactive water because you're doing such a good job. Happy new year to you & yours while so many in nuclear neighborhoods & mined areas for the "yellow cake" are nursing their children suffering radiation overdoses, teeth separation in children, cancers in homes at epic proportions including their pets all while losing their financial futures to pay all the medical & funeral bills. Yes, Happiest Wishes to you & hope you get yourstoo; until you stop adding insult to injury, nobody is safe or immune. (0862-9 [Thompson, Tammy])

Comment: Moreover, NRC's assessment of the impacts of SFP leaks on public health is likewise improperly narrow. That is, NRC focuses only on whether releases would "exceed permissible levels set by the NRC and the EPA." DGEIS at E-18. However, it is appropriate and necessary under NEPA to assess all *foreseeable* impacts, and not to only focus on certain narrow standards. Thus, given the court's directive to NRC to assess potential future harm to the public and "the effect of the *additional* time in [pool] storage," (*New York*, 681 F.3d at 481 (emphasis added)), NRC's DGEIS must include a comprehensive evaluation of the risks to public health posed by potential future SFP leaks and long-term exposure to such leaks, and in this regard, NRC should examine the long-term impacts from low-level exposure to SFP leaks in light of the conclusion of the Biological Effects of Ionizing Radiation VII report that every exposure to radiation, regardless of how small, and no matter what pathway, produces a corresponding increase in the likelihood of cancer.¹⁴ [footnote 14 text: National Research Council, Health Risks from Exposure to Low Levels of Ionizing Radiation: BEIR VII – Phase 2 (2006), *available at*, https://download.nap.edu/catalog.php?record_id=11340 (finding that the risk of cancer is linear with dose and that there is no level of exposure below which there is no proportional risk). (0897-5-17 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: How will these corrective actions impact certain Chapters of the GEIS, for example Public and Occupational Health? (0913-9 [Bevill, Bernard])

Comment: Not to mention the "worker doses" (and downwind resident doses) for the poor soul unlucky enough to face the replacement work. (0919-2-10 [Kamps, Kevin])

Comment: Re: Page 3-38, Section 3.16.1, Radiological Exposure, NRC states: "The Atomic Energy Act of 1954 requires the NRC to promulgate, inspect, and enforce standards that provide an adequate level of protection for public health and safety and the environment"...The highly legalistic phrase, "adequate level of protection for public health and safety and the environment," seems highly significant. Could NRC please say the phrase in plain English, and explain what it means more clearly to non-lawyers, and a lay public audience? (0919-6-5 [Kamps, Kevin])

Comment: Re: Pages 4-18 to 19, Section 4.5, Climate Change--what about radioactive C-14 releases from atomic reactor stations, irradiated fuel storage pools, etc. during decommissioning? A climate change causing greenhouse gas, plus a severe radiological hazard, all rolled into one! C-14 is a significant biological hazard. It has a very long half-life, and can integrate into the food chain and human anatomy wherever carbon does, which is just about everywhere! (0919-7-1 [Kamps, Kevin])

Comment: Re: beginning at line 10, Page 4-29, Section 4.9.1, "Spent Fuel Pools," NRC states "Operation of a spent fuel pool and its associated cooling system during short-term storage would require the withdrawal of water and discharge of effluents into a nearby waterbody."...As NAS has long affirmed that any exposure to radioactivity carries a health risk of cancer, NRC's admission that "effluents" are discharged into nearby waterbodies bodes ill for those who live downstream, and up the food chain. Where is NRC's serious analysis re: those discharges' radioactivity content, and their impact on human health? (0919-7-15 [Kamps, Kevin])

Comment: At Page 4-23, NRC states "because surface waters in the vicinity of nuclear power plants are usually large to meet reactor cooling requirements, a large volume of surface water is usually available to dilute groundwater contaminants that flow into the surface waterbody. This dilution ensures that contaminants that may have been present above applicable groundwater-quality standards are diluted well below limits considered safe." NRC is stating its unacceptable "dilution is the solution to radioactive pollution" philosophy. This is a delusion, an illusion of a solution. NRC cannot call such dumping of radioactivity into the environment "safe"! "Acceptably risky," in their opinion, perhaps, but not "safe"! NRC has carried out a cost-benefit analysis, and determined that the levels of harm to human health caused by the radioactivity releases are acceptable in their eyes, given the benefit the industry derives from the practice. For NAS has affirmed for decades that any exposure to radioactivity, no matter how small, still carries a health risk for cancer. There is no such thing as a "safe" dose. NRC cannot and should not say such a thing. NRC is intentionally misleading and deceiving the public by doing so. (0919-7-5 [Kamps, Kevin])

Comment: On Page 4-23, lines 7 to, NRC remarkably attempts to make the argument that pool leaks are really no big deal, given how much they routinely discharge with a permit anyway: "The NRC estimated an annual discharge rate for leakage from the spent fuel pool of 380 L/d (100 gpd) with contaminants at certain concentrations assumed to be present at the start of short-term storage. These concentrations were compared to annual effluent ranges for BWRs and PWRs. Even in the unlikely event that spent fuel pool leakage flowed continuously (24 hours per day, 365 days per year) undetected and unimpeded to local surface waters, the quantities of radioactive material discharged to nearby surface waters would be comparable to values associated with permitted, treated effluent discharges from operating nuclear power plants (see Table E-4). Based on the above considerations, the NRC concludes that the impact of spent fuel pool leaks on surface water would be SMALL." That is, NRC is so enamored with its own "dilution is the solution" delusion that it flippantly decides here to just double it for good measure. Now "permitted" discharges from the atomic reactor's operations, and an equal discharge rate by accidental, unintended leak from the pool, can both flow together into local surface waters, double-dosing area residents in drinking water, double-concentrating up the food chain, downstream, and down the generations. According to NAS's linear, no-threshold model for understanding the cancer risk associated with human exposure to radioactivity, that would simply double the risk that such releases cause cancer in surrounding, exposed populations. NRC's flippant acceptance of pool leakage is unacceptable. (0919-7-6 [Kamps, Kevin])

Comment: As shown in the diagram published by NRC that is featured on the cover of the pamphlet, radioactivity, once leaked from a high-level radioactive waste storage pool, can and will "cycle" back through the ecosystem and food chain (bio-concentrating there), to harm humans (with the most concentrated, and thus harmful, doses, as we sit at the top of the food chain). (0925-2 [Kamps, Kevin])

Comment: I have also attached a diagram of the human body, prepared by Russell Hoffmann, that shows where in the human body various radioactive poisons lodge, and concentrate, and do their primary damage. Given NAS's affirmation for decades, in its seven Biological Effects of Ionizing Radiation (BEIR) reports, that any exposure to ionizing radioactivity carries a health risk for cancer, and these risks accumulate over a lifetime, I cannot understand how NRC has determined that radioactivity leakage from pools will have a SMALL impact on people and the environment! (0925-3 [Kamps, Kevin])

Comment: Page 3.38, Section 3.16 "Public and Occupational Health" again, you deal with exposure when everything goes well, when any accident is one of those expected accidents. But not if something unexpected happens. (0930-3-3 [Lutz, Ray])

Comment: The National Academy of Sciences has written of the looming issues from the lack of solutions to our nuclear waste problem on this continent. The public knows full well the cancer and genetic diseases, but has no way other than citizen comment to express the experiences of hundreds of thousands whose health has been impacted, and who have died prematurely from exposure to nuclear processes and waste. (0935-4 [Uhls, Agnes])

Comment: Having just read Kristin Iverson's "Full Body Burden," I am more aware of this terrible problem. People that have been exposed even to small doses of radiation come down with cancer years later. And, the incidence of cancer is notably higher among people who live close to these sights (e.g, Rocky Flats, CO.). As you know, radioactive waste can be potent for thousands of years. (0961-1 [Frantz, Charles])

Comment: [U]ntil CEO's, and employee's, reside in the area's they have these plants, they will never understand! Some jobs are just not worth the Health of a Community, when our health care costs are over the top! Then the Healthcare Industries, have the audacity, not to cover Americans with EXISTING Healthcare issues, when many of their lingering illnesses are from plants like these. (0973-1 [Johnson, Bobie])

Comment: My father spent most of his working life as an electrical engineer and physicist developing instrumentation for the nuclear reactors on board nuclear submarines. He was accidentally exposed to high doses of radiation from test reactors at least once, and has struggled with skin cancer for years even though he has never spent much time in the sun. Right now I am nursing him after his most recent squamous cell carcinoma. It is clear to me that nuclear radiation has caused this health condition, so I am particularly sensitive to the public health risk posed by possible radiation leaks - such as those from improperly stored used rods that will continue to emit radiation for many, many years. (0975-1 [Watkins, Karen])

35. Comments Concerning Accidents and Natural Events

Comment: The NRC and the nuclear power industry have been far too comfortable with the potential extreme consequences of nuclear accidents. No technology that has such dire consequences for so many people for so long should be permitted. Fukushima is just the latest

disaster to show this, especially since it is glaringly obvious that no one knows how to abate it, nor are any solutions being proposed. NRC presumably has the knowledge and skills, but has been silent. The Earth has been lucky to this point, but the law of averages will eventually devastate us. We can survive without nuclear power, but it is far from certain we can survive with it. (0024-2 [Thomas, Bill])

Comment: While catastrophic events are not a given, they also cannot be ruled out at any given location. Consequences of such events are not satisfactory due to potential impact on health and habitability all around the world, not just locally. Decisions based on generic risk assessments are not reasonable, and this should not become the rule, with a new facility or any existing one. (0026-3 [Campbell, Mary])

Comment: I did use the search engine on the computer to look for things like Stuxnet cyberattack, Carrington event. Look, there's nothing in there. You start unloading this fuel and you have a problem with your computers or with your smart grid because of a cyber attack and you're down. Carrington Event, also known as coronal mass ejection from the sun, if it hits. Okay. It hasn't hit hard in 150 years. That means it'll never hit hard? I doubt that. I'd like to see a little more work on coronal mass ejection and how it will affect smart grids and how we're going to be in the middle of unloading when the smart grid goes down. (0030-14-1 [Lewis, Marvin])

Comment: I live 33 miles from North Anna Nuclear Power Station that was knowingly built on a fault line. Fukushima happened in 2011 and a few months later Virginia experienced its 5.8 earthquake that exceeded the reactor's design and actually knocked the plants off line. When we're talking about storage, our concrete cask moved one to four inches. Luckily, there was no release, but it does go to show that there is a problem with stability. We don't know how many more earthquakes we will have in Virginia, let alone the rest of the country, so I'll stay more specifically with Virginia. After the earthquake we experienced at least in one well at North Anna a level of tritium in a well that exceeded EPA regulations for drinking water. It's very difficult to get information pertaining to the plant. (0030-15-1 [Gray, Erica])

Comment: I just wanted to mention that in light of the earthquakes that we've seen in the past besides the Fukushima -- you know, the 7.7 the other day in Pakistan quake actually created an island. I'm sure most of you all heard that. So I really think that what we are seeing is we're seeing a down-playing in the seismic activity in dealing with storage and the risk. I mean we have some serious risk here. And so I think it's important that more of that is looked at. (0030-15-10 [Gray, Erica])

Comment: The only thing that I'll have to comment on that at the last televised meeting with Muniz and a panel that I heard and read the testimony of David Lochbaum of the Union of Concerned Scientists, and I really was amazed when I saw his written documents and testimony because, you know, it showed if our spent fuel pools, which are by the way overloaded and to the brim -- if we were to have an accident with them as filled as they are, the consequences would be just outrageously horrible. I'm not talking about, you know, this 10-mile radius that the NRC puts as an emergency evacuation zone, which by the way is ridiculous. More than hundreds of miles. (0030-15-7 [Gray, Erica])

Comment: On 9/30/13 the group PEER, a federal workers' group, sues to disclose U.S. dam risk to nuclear plants and has filed a lawsuit against the U.S. NRC for their refusal to share information with the public about U.S. dam risk. The probability of a massive dam failure destroying a U.S. nuclear plant is higher than the probability of the Fukushima tsunami and what it contributed to the nuclear disaster. The risk in place is at three dozen U.S. nuclear plants. The

NRC has been removing dam failure risk information from public view and it was caught suppressing a critical report on the dam failure risk in recent years. NRC engineering staff went public with this incident. (0030-15-9 [Gray, Erica])

Comment: I do want to make one final point, which is to the assessment of risk, you know, in this rulemaking. And one of the fatal flaws in what's been proposed, you know, in the discussion of risk that we've been having today is that the risk is evaluated in a generic environmental impact statement that is going to be used to streamline the licensing process of an unknown number of facilities that could be licensed under it. The risk that's assessed is for a single facility. And as I assume from the answers I got to my earlier question today about how the risk was calculated, whether it was based on a sum total of all of the potential causes of a spent fuel pool fire in the 60 years post-license, it seems clear that the risk that's been assessed by the NRC staff doesn't even deal with the potential consequence of the rulemaking itself, but only of licensing each individual facility. And that seems completely, you know, irresponsible if the Agency moves forward on that basis. (0030-17-8 [Judson, Tim])

Comment: Having to shut down reactors while at peak energy of all the hottest days of the summer adds to the unreliability and safety issues of storing nuclear waste in fuel pools. Water is needed in case of accidents to prevent nuclear power cores and waste pools from overheating and melting, releasing enormous amounts of radioactivity in the air. We learned that from Fukushima, that the water has gotten contaminated and then is still being released into the Pacific Ocean over two years after the initiation of the triple meltdowns. (0030-21-7 [Carberry, Mike])

Comment: The environmental consequences of dry cask fires are truly being completely ignored in these proceedings. I think that people will be replacing these things as fast as we're building them, and that is not an optimistic scenario. We are not taking into account the chances of failures in what -- in how people do things. I mean, there is -- we have almost 10,000 dry casks. They are not all going to go right. So let's look at what a really bad accident would look like. (0030-4-5 [Hoffman, Ace])

Comment: Nuclear waste held in pools above the reactors are extremely dangerous because of possible earthquakes, and many plants are built on faults. (0035-3 [Fulton, Doris])

Comment: The NRC further ducks the reality and magnitude of these catastrophic events by failing to use honest language to describe the casualties/deaths and huge societal and environmental damages. Another major flaw with the risk analysis is duration of risk. NRC does not accommodate the issue of delay in managing wastes, defined as 60 years post power operation in the short term case, stretching out to indeterminant. Does that instill any sense of "waste confidence"? NO. The longer the period of potential exposure to threats, be they natural or manmade or terror, the greater the chance that the catastrophe will happen. Time span is relevant and using only a probability per year factor is simply warping the true expression of risk. (0059-8 [Andrews, Richard])

Comment: NRC's conclusion in the GEIS that the impact of a severe accident in a spent fuel pool would be small, based as it is on a vague and hopeful probability of occurrence rather than on actual experience from Fukushima, once again devalues consequences ordinary people would find monstrously unacceptable, and erroneously and unscientifically confounds (or multiplies) probability of occurrence with consequences. (0089-11 [Shaw, Sally])

Comment: NRC is ignoring the Courts order to base their decisions on reality, and to provide evidence in an EIS. In this GEIS, NRC persists in magical thinking. THE MAGIC IS IN MULTIPLYING UNACCEPTABLE CONSEQUENCES BY VANISHINGLY SMALL AND UNREALISTIC RISK ESTIMATES. This fatal flaw in all NRC thinking puts this country at risk. It is belied by NRCs decision to recommend evacuation of Americans to 50 km away from Fukushima, due to concerns about a catastrophic spent fuel pool failure. This demonstrates NRCs inconsistency and disingenuousness in this GEIS, and the failure of theoretical numbers to inform about stochastic events. (0089-13 [Shaw, Sally])

Comment: Under NEPA, an EIS is intended to carefully investigate the environmental impacts of a potential action. One of NRCs assumptions underlying the opinion that the impacts of spent fuel storage can be considered generically, not on a site-by-site basis, is that Changes in the environment around spent fuel storage facilities are sufficiently gradual and predictable to be addressed using a generic approach. This assumption clearly ignores past experience and the realities of a changing global climate. It ignores the very real possibility of severe storms and extreme circumstances such as earthquake, malicious attack, or multiple failures of equipment at multiple reactors, as we witnessed at Fukushima. It ignores the indirect cumulative impact of Murphys law and how it played out at Fukushima (failure of on and offsite power due to natural disaster, plus failure of onsite backup power due to destruction of cooling pumps at the waterline, flooding of the diesel generators themselves, failure of the hardened vents to open causing explosion, and certainly human error compounding all of the above. (0089-14 [Shaw, Sally])

Comment: There is no such thing as a probability-weighted consequence. However, there is such a thing as an unacceptable consequence. That is what the NEPA process, if it worked, would uncover, preventing catastrophically stupid alternatives from being acted upon. The public, and the Court want to know, if X happens, Y will result. It is the NRCs responsibility to investigate and describe in detail Y, the consequences. They have shirked this responsibility yet again. The waste confidence GEIS is flawed for the same reasons as the original Waste Confidence decision. It remains faith based, grounded in probabilistic thinking, not reality or experience-based science, which we unfortunately have in abundance, due to the severe accidents at Chernobyl and Fukushima. (0089-16 [Shaw, Sally])

Comment: Because of the explosion of the #4 fuel pool at Fukushima, and the wide dispersal of fuel elements up to a mile away, the area around those reactors will never again be habitable by humans. This is an environmental consequence that really happened. It is not a probability-weighted consequence, it is a real one. The proper multiplier is ONE, not 10-14.. Because of the need to continually cool the melted fuel, water is being pumped into a leaking SFP at Fukushima #4. Because there is no engineering solution to the infiltration of ground water to the site, the #4 fuel pool is listing dangerously and we, as a global community, are not yet out of the woods. Because the site has not been isolated or contained in any way the water intentionally poured on to prevent fire and the groundwater infiltration is carrying radioactive Cesium and Strontium into the Pacific Ocean. The fish caught in that area are too radioactive to eat. In California, across the Pacific, a study of Tuna found that 100% of the fish sampled were contaminated with radioactive Cesium. These are real environmental consequences the NRC cannot magic away with wishful probabilistic thinking. What is probabilistic is the likelihood of a tsunami or earthquake. A probability is not a certainty. But unacceptable consequences of such an occurrence are a certainty. If we could prevent earthquakes or tsunamis, we would. Former NRC Chairman Gregory Jaczko recently spoke at the State House in Boston. He said, Society doesnt not accept severe accidents at Nuclear Power Plants. That is an unacceptable consequence, not matter how low the probability. (0089-17 [Shaw, Sally])

Comment: The Institute for Policy Studies reports that: "Over the past 30 years, there have been at least 66 incidents at U.S. reactors in which there was a significant loss of spent fuel water. Ten have occurred since the September 11 terrorist attacks, after which the government pledged that it would reinforce nuclear safety measures. Over several decades, significant corrosion has occurred of the barriers that prevent a nuclear chain reaction in a spent fuel pool some to the point where they can no longer be credited with preventing a nuclear chain reaction. For example, in June 2010, the NRC fined Florida Power and Light \$70,000 for failing to report that it had been exceeding its spent fuel pool criticality safety margin for five years at the Turkey Point reactor near Miami. Because of NRCs dependency on the industry self-reporting problems, it failed to find out that there was extensive deterioration of neutron absorbers in the Turkey Point pools and lengthy delays in having them replaced. There are other strains being placed on crowded spent fuel pools. Systems required to keep pools cool and clean are being overtaxed, as reactor operators generate hotter, more radioactive, and more reactive spent rods. Reactor operators have increased the level of uranium-235, a key fissionable material in nuclear fuel to allow for longer operating periods. This, in turn, can cause the cladding, the protective envelope around a spent fuel rod, to thin and become brittle. It also builds higher pressure from hydrogen and other radioactive gases within the cladding, all of which adds to the risk of failure. The cladding is less than one millimeter thick (thinner than a credit card) and is one of the most important barriers preventing the escape of radioactive materials." All of the above argue for a comprehensive NEPA review of the environmental impacts of a failure of temporary storage of spent fuel at all operating reactors, and of all new licenses or license renewals. (0089-6 [Shaw, Sally])

Comment: "ES.13.1.18 Environmental Impacts of Postulated Accidents ...Based on the assessment in Section 4.18, the environmental impacts of these postulated accidents involving continued storage of spent fuel in pools are SMALL because all important safety structures, systems, and components involved with the spent fuel storage are designed to withstand these design basis accidents without compromising the safety functions." This analysis seems to lack awareness of significant accidents which have occurred such as Chernobyl and Fukushima. The extreme environmental damage caused by accidents such as these cannot be offset by stating that they are unlikely. To state that they are not possible, as the above statement seems to be asserting is not scientifically justifiable. There is always a possibility of safety system failure which will result in a catastrophic accident that cannot be contained to the site. The low probability of such an accident cannot allow the possibility to be ignored by asserting its low probability. The fact that you are asserting SMALL impact raises a question about the method by which you are weighting the consequences of such accidents in comparison to the probability of the accident occurring. The above criticisms are likewise applicable to the section "ES.13.2 Environmental Impacts of Away-From-Reactor Spent Fuel Storage" (0093-6 [Dennis, Harold E.B.]

Comment: There is no such thing as a probability weighted consequence; however, there is such a thing as an unacceptable consequence. That is what the NEPA process, if it worked, would uncover, preventing catastrophically stupid alternatives from being acted upon. The public and The Court wants to know if X happens, Y will result. It's the NRC's responsibility to investigate and describe in detail Y, the consequences. They have shirked this responsibility again. The Waste Confidence GEIS is flawed for the same reasons as the original Waste Confidence decision. (0112-18-7 [Shaw, Sally])

Comment: But the NRC, meanwhile, needs a paradigm shift. Instead of trying to convince us over and over again that a small risk outweighs a huge consequence, maybe NRC should face the fact that sometimes consequences are so unacceptable to the people and the environment that they outweigh even the smallest theoretical risk. (0112-18-9 [Shaw, Sally])

Comment: You also look at the word, "Oh, we provide reasonable protection." Let's look at reasonable. Plausible, and unfortunately what is probably the most accurate here, inexpensive. Plants -- in looking at the problems of safety with various types of storage, the NRC takes consequences on the one hand and it multiplies them by probability on the other. And if you look at the probability you see numbers like 10 to the minus 7, 10 to the minus 8, 10 to the minus 15, which basically guarantees that no matter how large the potential consequences are -- and a study done for the Mass attorney general said the potential consequences of a spent fuel fire at Pilgrim is \$488 billion. And this was in dollars a few years ago. And 24,000 latent cancers. Does anyone believe that that is generic? (0112-2-4 [Lampert, Jim])

Comment: The study [NRC-2013-0136] assumes there is no risk to cask, but it doesn't show that. What we need is a comparison of casks storage under various conditions to spent fuel pool various conditions, and then you might come out with something. That's what we expect. We don't expect no science to masquerade as science. (0112-3-6 [Lampert, Mary])

Comment: But we should all recognize that our plants, especially at Seabrook, they only have four hours of battery power. That, again, is an absurd situation in the age of extended batteries. And we do not trust the current systems to really protect us in the case of a power outage. And that's really what we're dealing with here whether it's due to an earthquake or due to a storm, it's the power going out that we have to be concerned about. (0112-5-5 [Bogen, Doug])

Comment: And my wish is that the people who make these rules spend time with the individuals who are impacted by the small risk. I see it over and over again in the 544-page document, small risk. I am sure that they said the same thing about Fukushima. (0112-7-2 [Sachs, Leslie Sullivan])

Comment: And what if an earthquake, terrorist attack or aging infrastructure expose the rods now stored at our nuclear facilities? (0129-2 [Cunningham, William and Barbara])

Comment: Risks, both natural (hurricanes, flooding, earthquakes, etc.) and man-made (intentional and unintentional), are obvious facts of life. We must also be prepared for the unexpected, the unimaginable. Prudence calls for policies that minimize our exposure. The NRC is in a position to determine how best to limit the radioactive waste in this region, and carefully control its disposition. Please do so. (0131-2 [Felder, H.M.])

Comment: What happens to dry casks of waste when there is an earthquake? After Fukushima and the earthquake in Virginia on August 23rd 2011, people are becoming nervous. Their homes may become unusable and off limits. There is little earthquake insurance for home owners in either the areas of Indian Point in New York or North Anna Power Station in Virginia. Seismographs at North Anna were removed at North Anna in 1990! Why? Do you know if Indian Point which is on two earthquake fault lines, has any seismograph reporting equipment? (0137-2 [Cypser, Betty])

Comment: The Draft EIS recognizes that spent fuel pools are susceptible to fires and that a fire would have severe consequences comparable to those of a severe nuclear reactor accident. However, the Draft EIS is critically flawed because it attempts to analyze those consequences generically for all nuclear facilities based on the modeled consequences of severe accidents at two nuclear power plants located in rural or less populated areas. Accident consequence factors specific to Indian Point, such as surrounding population, building density, critical infrastructure, and proximity to significant surface drinking water supplies have not been taken into consideration in assessing the consequences of a fire or other spent fuel pool accident. (0163-1-3 [Schneiderman, Eric])

Comment: [A]ccident reports I was looking at weren't accidents at all. They were simply incidents. Incidents of human error, human commission or omission, with unintended results. Now, if you look at the same thing with the nuclear accidents that occurred with Three Mile Island and Chernobyl, a large part of each disaster is attributable to human error. (0163-16-2 [Wolf, Peter])

Comment: There's a denial of the risk of a spent fuel pool and there are all kinds of studies, and I would cite the Union of Concerned Scientists for the work that they have done in that regard. There is no long-term plan to require, encourage, force the company to put those spent fuel pools -- high-level irradiated fuel assemblies is a more accurate word. Spent means they're kind of used up. These aren't. They're worse than when they went into the pool. And the NRC was created 40 years ago, and this is the best they can offer us. All of these exemptions, all of these oversights, all of these cracks in the wall of the model, so what would the real thing be like? (0163-21-3 [Elie, Marilyn])

Comment: Regarding Indian Point nuclear reactor site (Docket ID NRC-2012-0246) (located in Buchanan, New York) and its nuclear waste storage plan: Does the plan realistically take into account Hudson River increasing water levels expected over this century due to global warming and in particular during storm or hurricane events and during an earthquake event, happening at the same time or separately? Does it realistically take into account activities related to terrorism (including theft), assault with bombs or war? Does the plan realistically take into account presently proposed United Water desalination of water plant (Haverstraw Water Supply Project) several miles downstream and across the Hudson River? Or future desalination water plants that takes water from the Hudson River and place it into the water supply that is consumed by people? One concern is excess radiation release from the nuclear plant enters the water system. This excess radiation release can be from stored nuclear waste as well as other sources from the nuclear plant. (0195-1 [Tompkins, Robert])

Comment: Regarding Indian Point nuclear reactor site (Docket ID NRC-2012-0246) (located in Buchanan, New York) and its nuclear waste storage plan: Does the plan realistically take into account Hudson River increasing water levels expected over this century due to global warming and in particular during storm or hurricane events and during an earthquake event, happening at the same time or separately? Does it realistically take into account activities related to terrorism (including theft), assault with bombs or war? Does the plan realistically take into account presently proposed United Water desalination of water plant (Haverstraw Water Supply Project) several miles downstream and across the Hudson River? Or future desalination water plants that takes water from the Hudson River and place it into the water supply that is consumed by people? One concern is excess radiation release from the nuclear plant enters the water system. This excess radiation release can be from stored nuclear waste as well as other sources from the nuclear plant. (0206-1 [Tompkins, Robert])

Comment: Of course, this estimate is high. When one engineers a solution properly, one doesn't just come up with a single predicted outcome, one comes up with a range of predicted outcomes: This is basic error analysis. The goal is to design a system such that the entire range of predicted outcomes is acceptable. In this case, the high end of the predicted range of outcomes is clearly unacceptable. I don't have the time to look through the entire document for other inaccuracies (I am not getting paid to produce this commentary), but it doesn't bode well that there is a glaring deficiency in the first place I chose to spot check. (0208-6 [Robinson, Herb])

Comment: The DGEIS only analyzed reasonably-foreseeable events, such as design-basis and severe accident, and did not include worst-case scenarios. However, as the development of

nuclear technology, the safety standards of nuclear power plants have been upgraded. As we can see from the IAEA Specific Safety Requirements [1], Design Extension Conditions have been required to be considered. Therefore, it is necessary to include certain ensemble of worst-case scenarios. (0210-3 [Individual, Anonymous])

Comment: Historian Doris Walker, in the book "Dana Point Harbor/ Capistrano Bay" published by To-The-Point Press in Dana Point, reports on page 54 that an earthquake on December 12, 1812 caused the largest tidal wave ever reported on the Pacific coast -- the water rising 35 to 50 feet above sea level, washing away many shoreline encampments. This report by the Spanish friars from about 200 years ago (much less than 10,000) tells me that the spent fuel pool should be designed for at least a 50-foot tsunami. Of course the response will be that the friars were of doubtful reliability. On the other hand, modern attempts to predict tsunamis have been proven unreliable, not just doubtful. Remember that when the famous ship Titanic sank, all of the engineers testified at the official inquest that the ship went down in one piece, while other survivors reported that ship broke in half. The remains of the ship later demonstrated that the ship had broken on the surface. This should demonstrate to all of us that engineers and scientists resist accepting anything that they believe is not possible, even when that belief is based on incomplete knowledge. Let us not fall into that trap again. (0214-2 [Deshotels, Bob])

Comment: I would be completely confident in the design of the spent fuel storage at all sites subject to tsunami or storm surge hazards if the following actions would be taken: 1. Given the relatively undeveloped state of tsunami prediction technology (due to lack of information, not intelligence), non-expert reports should be included as credible possibilities for beyond-design-basis analysis of tsunami or storm surge damage. Specifically, the written reports of the friars after the 1812 earthquake that struck San Juan Capistrano should be included in the beyond-design-basis analysis of the storage pools and any back-up systems. Although there does not seem to be any obvious geology that could cause a tsunami as large as the 35 to 50-foot tsunami reported in 1812, I would like to mention that about half of the recent earthquakes in the Los Angeles area have been from faults that were previously unknown. Given the fact that the friars definitely saw something, we should consider it at least credible that there is a fault that has the potential for sudden vertical motion, or some other scenario that could cause a tsunami larger than the design basis for San Onofre. (0231-1 [Deshotels, Bob])

Comment: Computational fluid dynamics modeling can determine accurately whether any such unsafe condition could result from a beyond-design-basis tsunami by looking at a number of hypothetical cases with different height and direction. If unsafe conditions are possible according to the analysis, then mitigating structural features, standby systems, or offsite recovery plans could be developed to react to such unexpected, but credible situations. (0231-3 [Deshotels, Bob])

Comment: Natural disasters including hurricanes, tornados, flooding and earthquakes are clearly more common and present safety threats to the communities and industries that surround the plants. Davis Besse was within millimeters of a failure event due to internal corrosion of the reactor lid. The American nuclear community has experienced traumatic events (such as three mile island). (0240-2 [Remein, Warren])

Comment: We don't want to see that happen here, but it can. The reason being is that there are new shows coming out on the Science and History channels that talk about things like tsunamis and asteroid airburst. The most recent asteroid airburst -- the most recent asteroid airburst was in Russia about three months ago, that damaged the Russian town up in Siberia. There was a airburst back in 1908, I believe it is -- yeah, June 30th, 1908, an event that release

somewhere around 10 to 15 megatons of TNT. It was 1000 times greater than the atomic bomb dropped on Hiroshima. It's taken them up until just a few years ago to figure out exactly what caused the damage up there. Some thought it was a volcano, but the studies on tree rings have shown that it is a -- it was either an asteroid or comet that blew up somewhere around 10 miles high or so. They have found nuclear type of material in the tree rings showing that it was something that fell from the sky. If we have an asteroid burst or an asteroid hit somewhere in -- near any nuclear reactor it would devastate it. The event that happened in Russia damaged the entire town. It was caught on dashboard cameras. And it was quite interesting to watch because there was a four-story school there, it blew all the glass into the school and blew all the window frames out on the ground, and it was about 100 window frames that dropped out all at one time. But every single building in the entire town was damaged. (0244-13-2 [Wilson, Greg])

Comment: Another show that's came on is -- talks about the Hawaiian Islands and the volcanoes out there. And the scientists, with a reporter, went climbing down into the lava flow tubes that is in the shield volcano -- and this is on the big island -- that's still around. And they were just walking around and looking at things and realized that the rock that's made from the volcano is pumice, has a lot of air bubbles in it and it's very soft rock. And the scientists went over and picked up a rock and he flipped it over and there was rust on the backside, so there's a lot of iron in that rock and it causes the island to basically fall apart faster than normal erosion or any kind of thing like that. And they were wondering why a lot of the Hawaii Islands are elongated, they're not round, and they started looking from satellite pictures and they were able to see how the islands are basically peeling off like an onion with big chunks of rocks, some of them 10 miles long, that kick out tsunamis. One of them actually flooded the LA basin. (0244-13-3 [Wilson, Greg])

Comment: So these are massive earthquakes that can happen from volcanic islands. And the nuclear plant that's down in San Diego is directly in line of one of these tsunamis, because even though it's on a cliff it could still get hit by a tsunami and wipe it out. So basically the spent fuel rods that are stored along these power plants that are along the ocean coastlines are at a really high risk of having a tsunami. And this brings me to the island of -- in the Canary Island it's the island of, let's see, Viga -- wait a minute, Cumbre Vieja, in the Canary Islands, which belongs to Spain. The island is also an elongated island, it sits on a fault line that has fissures on it, which means there's several volcanoes on this island. Back in, I think it was about '49 or 1959, a 10-mile piece of the island slid over some 15 yards. So that piece of rock is loose and it's about 10 miles long. They say that if it falls into the ocean and drops the 2000 feet to the bottom of the Atlantic Ocean it will kick up a tsunami 600 feet tall moving at 600 miles an hour, and it will affect most of the Atlantic basin. Spain, France, and the British Isles will be hit within three hours. There's a place in Southwestern England that has 800 tons of plutonium -- excuse me -- 800,000 tons of plutonium stored there. That will be hit by a very tall tsunami. The East Coast of the United States will be hit in about five hours, and the movie that I was watching it said that -- and the movie's name is, Tsunami Apocalypse. It's on the Science and History channels. And it says that 26 nuclear power plants will be wiped out. So we'll have a whole bunch of Fukushimas going on at one time. The bridges and highways and roads around that area -- up and down the entire East Coast will be wiped out, so it will be very hard for anybody to get to these nuclear power plants. Turkey Point and Hutchinson Island, they'll be gone. There isn't anything that we have, if the spent fuel rods are blown out into the Everglades, that would be able to go out there and pick them up. We don't have air boats or swamp buggies or anything that big that could actually go out there and get it. I grew up in Miami and I've seen quite a number of very large swamp buggies. They're not going to be able to pick up big, heavy, spent fuel rods. It's just that the ground will support that much weight. And it will be scattered all over the place and it will be very hard to find until, you know, you come upon one and it will be too late. So basically all the

spent fuel rods in all them power plants up and down the East Coast and the West Coast need to be moved out of the range, up to high ground, away from where a tsunami could hit it. It would be like up in the Appalachian Mountains or up in the Rocky Mountains, a ways away from the power plants so that they're protected. And to build another power plant or two down at Turkey Point, that's just insane. To be honest with you, I don't see why they would want to do that. (0244-13-4 [Wilson, Greg])

Comment: And on the way over I realized I forgot to add in Yellowstone. I don't know if you all know about that, but there's a super volcano growing underneath Yellowstone National Park, and it's making moves like it's going to explode again. It explodes around every 600,000 years and it's been 660,000 years since the last time it blew up, so it's due any time. And a super volcano, like the last time Yellowstone blew up, it was a major impact upon the entire planet. I saw a movie the other night that was talking about Yellowstone, and the ash cloud will go from central Canada all the way down to Mexico and it will cover -- from side to side it will be from the Blue Ridge Parkway in the Appalachian Mountains over to the Continental Divide on the west side will be covered in hot ash, burning stones. Now, airplanes can't fly through volcanic ash. It burns up the jet engines and they come crashing down. That's already happened, or came close to happening on several occasions. So when there was the volcano in Iceland that happened just a few years ago all the jet travel in Europe was shut down days at a time, if y'all remember that. So anybody living in and around Yellowstone for several hundred miles, when that thing goes off they will probably be dead. (0244-13-5 [Wilson, Greg])

Comment: Underestimating the risk puts taxpayers, as some of the folks said, to significant risk due to the liability factor. Just because we haven't had one doesn't mean one can't happen. There's tons of unknown unknowns out there, and one accident will cap the liability of \$21 billion -- I believe it is. And with Congress not being able to allocate funding to Sandy, how are we going to expect them to fund a nuclear disaster? (0245-19-12 [Smith, Ed])

Comment: In the meantime, we are exposed to the possibility of a nuclear accident. Nobody here in this room can say with assurance that there will not be an accident. We have the evidence of Fukushima. I listened to the proponents. They downplay the effects of Fukushima. They downplay the accidents that can happen. And we're supposed to bear that kind of a risk. (0245-22-3 [Headington, Vince])

Comment: I just got some things that are echoed in the executive summary tonight categorizing everything as small risk, small risk, small risk. And I've done quite a bit of technical writing in my life and I was a little bit concerned as to how is that risk laid out and how are they analyzing it? And I didn't really find any metrics they gave me to my confidence. I didn't see that they had looked beyond just stating, hmm, infinitesimal possibility of this happening, therefore, we should dismiss it. To me, when we're looking at risk, we need to look at what's the probability that it's going to occur, how severe will it be if it occurs, and how likely is it that we can detect it early and put a stop to it? But I didn't see any of that kind of analysis done at all. And that's the kind of analysis that should underlie engineering. And it was painfully absent. (0245-31-4 [Fox, Tracy])

Comment: It ignores numerous catastrophic risks to everyone in and far beyond their heavily populated region. The Alliance for a Clean Environment, ACE, has studied these risks for over a decade and found volumes of evidence for these risks published at www.acereport.org. The Waste Confidence Statement is simply sweeping these risks under the carpet. Unless you give the draft statement a vote of no confidence, the NRC is recklessly endangering our communities and the risks described should make the NRC liable for regulatory mismanagement. (0246-17-2 [Dugdale, Jane])

Comment: After the nuclear disaster in Fukushima Japan, one of the arguments made that such a disaster couldn't happen here is that we were very unlikely to have a tsunami at most nuclear reactors in the USA. Statements like we won't have a tsunami in Illinois were being made by those defending the nuclear energy industry. Then the Mississippi River flooded and the Fort Calhoun Nuclear Facility was overwhelmed by water. It remains shut down to this day. Concerns of the failure of a dam upstream would break and finish off the facility were real and we were all lucky it didn't happen. The NRC did a study on the possibility of dam failures impacting nuclear facilities and it took an NRC whistleblower to reveal that the NRC covered up information that showed the vulnerability of nuclear facilities across the country to dam failures. The NRC's own reliability and risk engineer claimed, as reported in the Huffington Post article, that NRC officials falsely invoked security concerns in redacting large portions of the report detailing the Agency's preliminary investigation into the potential for dangerous and damaging flooding at U.S. nuclear power facilities due to upstream dam failure. Then joined by another NRC engineer, they suggested that the real motive for redacting certain information was to prevent the public from learning the full extent of these vulnerabilities and to obscure just how much the NRC has known about the problem and for how long. (0246-25-3 [Snyder, Gail])

Comment: It ignores numerous catastrophic risks to everyone in and far beyond our heavily populated region. The Alliance for a Clean Environment (ACE), has studied these risks for over a decade and found volumes of evidence for these risks. Ignoring these risks belies the NRC claim to have "confidence" about its nuclear waste. (0249-2 [Dugdale, Jane])

Comment: The intolerable and deadly effects of nuclear energy shown by Fukushima and the accident that happened there proves that nuclear energy is not safe, is not clean, and it's not reliable. Just because a major accident hasn't happened yet in the United States doesn't mean it won't[.] (0250-39-3 [Richards, Kitty Katherine])

Comment: I do follow history a little bit. I make an allusion to the Third Reich in this. And I very nearly lost my nerve to speak, but after hearing previous speakers, I realized that, although we are all breathing the same air in this room, we are living in two very different worlds. The allusion is to an institutionalized and unquestioning mindset. It is not a personal insult to anyone here. Let me mention a few names from history: HMS Titanic; the Halifax Harbor explosion; the airship Hindenburg; the Texas City dock explosion; two world wars; Three Mile Island; Bhopal, India; Chernobyl; Challenger and Discovery explosions; and Fukushima. All of these tragic events represent human failures interacting with the advanced technologies of their time. In hindsight, most were avoidable but for misplaced confidence in the technology, human error, and bad luck. (0250-46-1 [Stein, Ed])

Comment: As I read the draft EIS statement, I am afraid that the Nuclear Regulatory Commission with its judgments about so many of these activities and possible resource areas having a small risk; the word "small" is used throughout this document. It is used because of their determination with the probability that the occurrence of any single accident taking place is small. (0250-68-1 [Robinson, David])

Comment: But, you know, spread from coastlines to mountains, you have a variety of natural things from hurricanes, tsunamis, et cetera, that can be taken into account for and can be engineered for. And we have heard, you know, about all of the great engineering that goes into these things. But what worries me is what you can't see coming over the horizon. (0250-69-2 [Rundle, Steve])

Comment: I have not witnessed anywhere in your documents your consideration for the prospect of a super storm wiping out nuclear power plant(s) in this country and the ramifications of such an occurrence. Instead, we are told that all steps that you and your staff have taken are "adequate" -- adequate for what and for whom? (0277-6 [Pierman, Bette])

Comment: Keeping radioactive waste in an area prone to earthquakes and in a tsunami zone is a disaster waiting to happen. (0282-4 [Haber, Jim])

Comment: California's nuclear waste is sited on an eroding coastline, in tsunami zones, and is exposed to a highly humid and corrosive coastal environment. NRC's NUREG/CR-7030 states "atmospheric corrosion of sea salt can lead to stress corrosion cracking within 32 and 128 weeks in austenitic (corrosion resistant) steel canisters". (0284-6 [Borchmann, Patricia])

Comment: A radiological disaster impacts the nations, and world's security, economy, and food supply. California is the eighth (8th) ranking economy in the world, virtually tied with Italy and Russian Federation, larger than Canada, Australia, and Spain.

More than 40 percent of containerized imports enter the country through California ports. A radiological release from San Onofre would destroy public infrastructure, and disable Ports of Long Beach, Los Angeles, and possibly San Diego, causing irreversible economic damage at a local, regional, statewide, national, global scale.

California produces nearly ~ of US grown fruits, nuts, vegetables. Californias remained the number one state in case farm receipts in 2011, with \$43.5 billion in revenue representing 11.6 percent of US total. US customers regularly purchase several crops produced solely in California.

San Onofre is located adjacent to the primary vehicle transportation artery between Los Angeles and San Diego (1-5), and one of the largest military installations (and targets) on West Coast (Camp Pendleton). (0284-8 [Borchmann, Patricia])

Comment: In determining the risks of a spent fuel pool accident, the NRC is relying on a 1994 study of plants east of the Rocky Mountains. And then, in an unsupported leap of faith, it claims that the risks and consequences of an accident are the same for the west coast plants. (I have attached to my written comments a copy of the paragraph and footnote in the draft GEIS with this information. - footnote included below) 5. The seismic risk analysis performed in NUREG-1738 was based on site-specific seismic hazard estimates for nuclear power plants in the central and eastern United States found in NUREG-1488, "Revised Livermore Seismic Hazard Estimates for 69 Nuclear Power Plant Sites East of the Rocky Mountains" (NRC 1994). As such, nuclear power plants in the western United States, such as Diablo Canyon, San Onofre, and Columbia, were not specifically considered in this study. Nothing in NUREG-1738, or the NRC's reliance on it here, undermines the NRC's determination that the impacts of a severe accident in a spent fuel pool will be comparable to severe reactor accidents for all facilities. (0287-5 [Swanson, Jane])

Comment: The short-term storage methods currently in use are too vulnerable to accidents and terrorism. (0288-1 [Wickham, Wendelyn])

Comment: It is not safe to have nuclear power on an earthquake fault on a coast vulnerable to sunamis (sic). These are only a few of the many safety issues. Over the lifetime (250,000 years) of the fuel the likelihood of an accident is very very probable. The results of an accident are

more horrific than I can imagine. Accidents have and will happen. I care too much about the earth. Nuclear energy is obsolete. (0289-2 [Curren, Elizabeth])

Comment: San Luis Obispo was named the "happiest place on earth," so long as you don't consider the fact that Diablo Canyon Power Plant is sitting just over the hills, with pools full of spent fuel rods, which were never supposed to be stored on site. Every one who lives in SLO county is gambling that the big earthquake, that is overdue, is not going to take place while we are still residing in this county. We all try to pretend that it isn't going to happen. The fact is, that if the quake does happen, there will be a disaster similar to that of Fukushima, and San Luis County will instantly become one of the most nightmarish places on earth. (0298-2 [Terra, Ben])

Comment: One cannot but be struck by the Commission's stated opinion, based on the DGEIS, that any and all potential impacts of long-term HL and SNF storage, whether on-site at the reactors or elsewhere, are "small." They are seemingly written off as being so minor that they will "not noticeably alter any attribute of the resource." How "minor" to the Commission are the findings from studies of wildlife and flora in Chernobyl and Fukushima, published in dozens of refereed, respectable scientific journals? Those of similar studies which document widespread malformations in insect populations around nuclear plants in several countries in Europe? Those of highly increased thyroid abnormalities in children around Fukushima? Those increased cancers among children living near nuclear plants, in northern Germany? How "small" is the damage if land is made uninhabitable for hundreds of years, of people losing home and livelihood by the thousands, through major nuclear accidents? (0303-11 [Lamberts, Frances])

Comment: [I urge that] to-be-expected worst scenario nuclear accidents be included in new EIS analyses. (0303-14 [Lamberts, Frances])

Comment: The Waste Confidence rule prevents radioactive waste issues from even being considered, based on the presumed low probability of an accident, which is proven false by Fukushima, Chernobyl, Three Mile Island, and less severe releases of radiation and accidents at other nuclear plants. (0319-4 [Nichols, John])

Comment: Of particular interest to our chapter were the environmental impacts of postulated accidents and of potential acts of sabotage or terrorism to spent fuel pools and dry casks, ranging from short-term to indefinite storage, all of which were found by the NRC to have small impact, small being defined as effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attributes of the resource. These findings are in agreement with findings of the United States Nuclear Waste Technical Review Board in their evaluation of the technical basis for extended dry storage and transportation of used nuclear fuel in December 2010, which noted that reinforced concrete structures for dry storage systems can be designed with a life over 100 years and longer. And the American Physical Society in their consolidated interim storage of commercial spent nuclear fuel in February 2007, which concludes that there are no technical barriers to the safe and secure interim storage of spent fuel as long as adequate resources and attention are devoted to maintaining storage facilities. This is mirrored, as well, by the stance of Senator Feinstein's office communicated in person during a student delegation last July with Matthew Nelson and Mr. Platz. Give me any corrections afterwards, but where Matt stated, "The remaining hurdles to managing waste are political rather than technical. Senator Feinstein's office has been deeply informed and involved in the management of used nuclear fuel through the process of drafting the Nuclear Waste Administration Act." (0325-17-2 [Pearson, Jeremy])

Comment: Risks are under-estimated, consequences are very large, though. The consequences are huge. We don't even know how bad these consequences are. We'd have to all move out of the area. The probability is real, real low but not zero, so that will happen somewhere. Over thousands of years, it's going to happen. Accidents happen, this is what Gregory Jaczko said, the former NRC Chair, I guess he is. He said all the nuclear reactors in the United States should be shut down. This was the former Chair of the NRC. (0325-19-2 [Lutz, Ray])

Comment: The fuel pools at Fukushima, there is one that's just about to go down that they're desperately trying to save. Part of what this talk is about is fuel pools, that they're safe in seismic conditions. Bullshit. Okay? This is what this whole document is talking about. That's in there. They are not hardened. The roof of the fuel pool, a plane can go right through it, and then splash the water out, it would be a disaster. Seismic concerns. We don't know how big the earthquake is going to be. We just don't. We've only been around for so long. They keep going up, what's possible. Mexico just had a 7.5. This is only designed for 7.0. It can happen, way over. Just because NRC says a plant shows -- is supposed to be designed to withstand a maximum quake doesn't mean it's designed that way. It doesn't mean it would withstand it. Just because it says it -- this is what this says. And, you know, the problem with this is they're putting this out, we're supposed to be confident, and that means that all of these plants will have permanent nuclear waste dumps next to them that we can't stop, because it's already there. SONGS already has it. (0325-19-5 [Lutz, Ray])

Comment: It's about the fact that that could be a source of not one disaster, but a series of disasters. And people don't seem to be as aware of it as in -- and if you're here just for this and it's a part of your Federal job, I can understand that, but it looks a little different when you live nearby. (0325-24-3 [Kernahan, Gary])

Comment: This is a time of increasingly severe storms, sea rise, and increasing frequency of major earthquakes on the Ring of Fire. Catastrophic events at nuclear power stations have happened much more frequently than the NRC and the nuclear industry have assumed would ever happen. We had Three Mile Island, we had Chernobyl, we had Fukushima, we've had Rocketdyne, and there are many, many more. (0325-28-2 [Branigan, Mary Beth])

Comment: The Draft EIS evaluates environmental topics and issues if all goes according to plan. It would be virtually pointless if unexpected stochastic events take place. And we live in a day and age now where, unfortunately, the norm is no longer what one needs to expect. I've been living in fear, as my neighbors have, since 2001 of San Onofre in general. I'm even more horrified knowing that the spent nuclear fuel is going to be standing there for even seven years, let alone the 60, 160, and indeterminate time that is being considered in this generic document. (0325-34-2 [Waller, Viviane])

Comment: I'm concerned about tsunami damage to the pool that contains the fuel, and for two reasons. One is that the tsunami that struck Fukushima showed that we don't have the technology, even with the brilliant minds working on the problem, to really do a good estimate of tsunami magnitude. The second concern I have is that back in 1812, the earthquake that knocked down the mission at San Luis Obispo was accompanied by a tsunami that was estimated and recorded by the friars there to be 35 to 50 feet high above sea level, depending what Indian village you were at the time. And this makes me worry that modern scientists, knowing that these friars were not ISO 9000 certified, and knowing that they're not calibrated against other tsunamis, might discount and say that their reporting was not believable. On the other hand, scientists have a poor record of not believing things unless there's a good

explanation for what happened. I would like the NRC and other people to give some credibility, maybe not 100 percent to the friars, and consider an earthquake that might happen not 200 years ago, and a tsunami that might occur on the basis of maybe a 1,000 year interval, in other words, a one in thousand chance of occurring while the fuel is in the cooling pool. (0325-6-1 [Deshotels, Bob])

Comment: At the heart of this analysis lies the use of probabilistic risk assessments. Yet, such assessment suffers fundamentally from the fact that the results don't reflect the remotest real-life occurrences. The reason it appears to be, that classical probability risk assessments cannot accurately predict nuclear catastrophe because of the low base rate for events in the past, and that such events usually have a multitude of causes and/or causes based on human error, or contributables, which are not calculable in mathematical equations. Examples: Three-Mile Island occurred after 500 reactor years, while the prediction was once in 3 million. Chernobyl, after 300 reactor years; the prediction was once in 10 million. And the prediction for Fukushima would have been off the scale all together. For three reactor meltdowns and pool problems all at once, the series of unpredicted events, combined with unforeseen human errors: the beyond design basis quake, the drop in the coal slime, insufficient sea walls, emergency generators in the basement, and battery backup power for just eight hours. (0326-15-4 [Schumann, Klaus])

Comment: In determining the risks of a spent fuel pool accident, the NRC is relying on a 1994 study of plants east of the Rocky Mountains. And then, in a totally unsupported, unscientific leap of faith, the NRC concludes that the assumptions they have about the plants east of the Rockies will apply to the coastal plants on California's coast. I've attached to my written statements, a direct quote from the DEIS to show where this assumption is made. (0326-8-5 [Swanson, Jane])

Comment: You say it's safe to store it onsite anywhere. It's actually insulting to the intelligence of anyone who's concerned about the dangers of nuclear power to make that kind of assertion. Of course, your calculations do not take into account the core meltdowns that have already happened all around the world. I guess those are statistically inadmissible to your Draft GEIS. (0326-9-4 [Seeley, Linda])

Comment: The probability of accidents are not low, as you say in your DGEIS, which Connie so greatly put it, has no substance, and it's been designed that way. It is inaccurate to say that the probability of accidents are low and dismiss it like this, because the consequences of the accidents are not low. Look at Three Mile Island, look at Chernobyl, look at Fukushima. "One nuclear accident can wipe out half the globe," to quote Yablokov and Nesterenko's book on the catastrophe of Chernobyl. That's one nuclear accident such as the ongoing disaster of Fukushima Daiichi with all of its spent nuclear fuel rods that are a million times more radioactive than when we put them in the core. This can wipe out the globe. This is not science fiction, this is the reality that we are dealing with, and this is the insane risk that we are taking when we allow the reactors to operate and produce radioactive waste. (0327-21-4 [Miskena, Jessice])

Comment: Remember the tornado that started the whole Wizard of Oz story? One major tornado hit, a simple tornado hit to a nuclear reactor could cause a major disaster. And like disasters at Chernobyl and Fukushima, what will we do with the waste then? Throw it somewhere over the rainbow? (0327-35-2 [Poprasky, Nancy])

Comment: And when it [nuclear power] is not safe, it is catastrophically unsafe. Let us ask the people in Chernobyl, Russia who may not be able to return to their homes for 20,000 years, the people of Fukushima, Japan, Three Mile Island, and how close were the residents in northern

Ohio to a catastrophic disaster in 2002 when a corrosive hole was found in a Davis-Besse nuclear plant reactor. The list could go on and on. (0327-42-3 [Faris, Kelly])

Comment: Low probability is not a substitute for protection. As we all have learned from the disastrous spread of radioactive materials from reactor disasters at Windscale in England in 1957, Three Mile Island, Pennsylvania and Church Rock, New Mexico both in 1979, Russia's Chernobyl in 1986, and its 1993 waste explosion in Tomsok, and the unending radiation geyser catastrophe in Fukushima today. (0328-9-5 [LaForge, John])

Comment: And to follow on another earlier commenter, I think he was right in saying that these vulnerable storage facilities along the coastline, for example, need to be moved to higher ground, to more stable geology. And, in fact, that's been part and parcel of hardened onsite storage from the very start, a recognition that some of these nuclear power plant sites are entirely inappropriate and unsuitable for long-term storage. Prairie Island, Minnesota is another key example of that, a flood plain in the Mississippi River immediately adjacent to a Native American reservation. The reactors never should have been built there in the first place against the will and consent of the Tribe. And, of course, the storage for high-level waste should not be there either. (0329-11-6 [Kamps, Kevin])

Comment: We have other problems that are not really adequately addressed in anything that's going to talk about waste confidence, one of which is the aboveground wet storage at places like Browns Ferry where the reactors are the Fukushima-style reactors and have these wet storage pools at higher, much higher than design density stored up in the air and were only recently, by the grace of God, saved from a direct hit by a tornado which did, in fact, cause a station blackout for several days as the high-tension system went down. (0329-12-6 [Paddock, Brian])

Comment: They're [the nuclear industry] not covering the cost of accidents or anything like that. These are barely being discussed here or in any other way, the problem of making the waste. We're only discussing, well, what to do now that we've got it. We're part of an organization, the NRC and the public, that can determine that this whole idea is bad, and that's what we need to do. How much are we putting into these waste confidence hearings? A hundred thousand dollars, if that, to go around the country and have a couple of meetings? There could be a trillion dollar accident based on what we decide here, so we're not even spending a million of what it might cost if we fail to come to the correct decision here. So I think we need to consider that. (0329-16-4 [Hoffman, Ace])

Comment: North Anna was built on a fault line. We had a fairly large earthquake in -- it's an active fault line -- in 2011, we had a large earthquake. It damaged the plant. And it moved the dry cask storage containers that were onsite. We were told that couldn't happen. So I have to say that, frankly, we don't trust industry as far as we can throw them. And we are extremely dubious about the level of government oversight on this. (0329-30-1 [Price, Scott])

Comment: The trouble with the east coast of Florida is there is an island in the Canary Islands that has a volcano on it called Cumbre Vieja, I believe is how it's spelled in the Isle of La Palma that has, the western side of the island is starting to slide off, a ten-mile long piece of land of volcanic rock. And I was watching a science show talking about the Hawaiian islands and why some are round and some are elongated. Apparently, as the magma comes up, it has iron in it which rusts out, which allows the island to basically rust out and fall apart, like an onion being peeled apart. The Isle of La Palma could have that ten-mile long piece of island fall off and create a tsunami, which they claim that will be about a thousand feet tall moving at a thousand

miles an hour. This will affect the entire Atlantic Basin, so everything from the bottom part of the western side of Africa to all the way up to England and including South America and North America will be hit by a monster tsunami. As it relates to the U.S. East Coast, we would be hit in about 5 hours by a tsunami about 600 feet tall moving at about 600 miles an hour. In Florida, there is no place to bury the nuclear waste or even secure it that it would withstand the force of that magnitude by a monster wave. (0329-8-1 [Wilson, Greg])

Comment: But to leave the spent fuel rods down in South Florida would be insane because, if it does ever get hit by a tsunami from La Palma or even an asteroid strike out in the Atlantic Ocean and the fuel rods get basically shot out across the Everglades, there is no way to go pick them up. Nobody has any type of equipment that could actually reclaim those fuel rods, and you'd have a massive environmental disaster on your hands. (0329-8-3 [Wilson, Greg])

Comment: When the Deep Horizon sank during the BP Oil spill, it caused earthquakes as far away as in the New Madrid fault line zone up around Memphis, Tennessee. So we cannot predict what's going to happen in the Gulf Coast either, and to leave any waste close to the coastline, basically any coastline in the country, is not doable. Short-term to long-term storage units should be set up to where all the waste is moved away from the coastline to the closest safe location, such as on the West Coast where the San Onofre and the El Diablo sites, nuclear power plants, they should be moved up away from the San Andreas fault line and into elevated hills or mountains in the area, which would probably be over a thousand feet in elevation from the Pacific Ocean. (0329-8-5 [Wilson, Greg])

Comment: The tsunamis that are kicked up by the Hawaiian earthquakes or tsunamis where the islands are falling apart as seen from space. One of them actually did flood the LA Basin, and I haven't seen any further studies on that so I don't know how bad it flooded it, but it was a pretty big tsunami that hit. So that being said, even though transportation is very dangerous, to leave the spent fuel in areas where it could be basically destroyed or, you know, scattered about by things that we really don't know that much about at this time. (0329-8-6 [Wilson, Greg])

Comment: There was an air blast asteroid that exploded over Russia that was caught on dashboard cams, and they say that one was about the size of two school buses or so. It wasn't very big, but it blew out every window in the entire city and there was over a thousand people injured from flying glass. If you ever seen it on the dashboard cam videos from that explosion, it was quite amazing to see the amount of damage that happened, and that was a small one. In the early 1900s, there was the Tunguska event that it took them about 30 years to figure out that something had happened up there. And it was in Siberia, and it knocked down almost 900 miles, square miles of trees. So it was a major event, larger than the Hiroshima blast from World War II. And we should really take a look at what we're doing with the spent fuel as to what could actually happen. It should be moved away from earthquake and fault line zones. (0329-8-7 [Wilson, Greg])

Comment: In the U.S., there are nuclear plants and nuclear waste sites such as Indian Point which sit in densely and highly populated areas. The majority of climate scientists around the globe have warned that climate change is occurring and that it brings risks of warming and extreme weather. Regardless of whether the "cause" is anthropogenic activity or not, events in recent decades such as hurricanes Katrina, Irene and Sandy, the prolonged droughts and forest fires that have plagued the Southwestern U.S., powerful tornadoes, earthquake activity, flooding, and numerous severe wind and snow storms, which have severely stressed the nation's infrastructure. Many of these events have caused prolonged and wide-scale electric outages due to downed power lines, substation flooding and transformer explosions. Difficulties

in power recovery have resulted in areas challenged by downed trees, flooding, damaged bridges, impaired rail lines and obstructed roads. Deteriorated infrastructure conditions add other challenges. Nuclear power stations and spent fuel pools need electricity for safe operation. Indeed the root cause of the Fukushima disaster was loss of electric power. (0341-1-11 [Mermelstein, Richard])

Comment: An honorable and honest GEIS would make these points clear. And it would not bury the reality that very serious - potentially catastrophic - consequences could ensue if current NRC calculations are wrong. Whether significant amounts of radioactivity will be released into the environment is not a question of if, but of when, and where and with what impact? The Sept 11 and Fukushima disasters put such questions into stark relief. Further they show why it is critical to understand the impact the GEIS will have at the global level. (0341-1-5 [Mermelstein, Richard])

Comment: It must also be pointed out that the NRC does not even apply its own absurdly reductive probabilistic risk formulation correctly. Firstly, by determining every serious event with negative consequences to be "unlikely," the GEIS unceremoniously excises a key factor out of the formula upon application. Secondly, despite using the word "consequences," the analysis wholly ignores the likely consequences of a severe accident such as a major spent fuel pool fire at Indian Point which could render the New York Metropolitan area uninhabitable for centuries. (0341-2-3 [Mermelstein, Richard])

Comment: We urge GEIS analysis be reformulated to consider all risks and include rare yet credible events including: internal and external hazards, during all modes of plant operation, evaluated in a riskinformed manner. This approach should include consideration of so-called "cliff-edge" events - those for which a small incremental increase in severity can yield a disproportionate increase in consequences. This argument was made in ASME Technical Report which resulted from a task force set up at the direction of the president of the American Society of Mechanical Engineers (ASME). The ASME task force was co-chaired by the former Chairman of your agency, Dr. Nils Diaz, and the former Senior Vice President and Chief Technology Officer at Westinghouse Electric Company, Regis A. Matzie. The report observes:

- * The Fukushima accident "has indicated that the events now needing to be protected against include large fires and explosions, extreme natural phenomena, station blackouts of indefinite duration, and combinations of internal failures that can cause the loss of normal and backup core cooling..." (ASME Technical Report, p. 39)
- * Fukushima shows the risks of not preparing "for the possibility that the safety-related electrical distribution system, and many of the plant safety systems, could be rendered inoperable by a single event. Also, the possibility of losing all AC power for an extended period of time, and the resulting depletion of the plant batteries (i.e., all DC power) was not considered in preparations for accident management....They also had to deal with spent fuel pool cooling and potential damage to the spent fuel pools." (ASME Technical Report, pp. 50-51; see also NRC Special Inspection Report, 2003)
- * "Many recent examples exist of the occurrence of highly improbable events with unforeseen loss of control, where human actions and decisions have contributed to, or ultimately led to, unacceptable consequences. Recent examples include the Deepwater Horizon fire, explosion, and oil leak in the Gulf of Mexico; inundation of New Orleans following Hurricane Katrina; crashes of the Space Shuttle Columbia and Concorde aircraft; and collapse of the World Trade Center buildings after terrorist actions on September 11, 2001. It is presently not possible to predict the occurrence of such events; furthermore, attempts to predict such events even if information is available will encounter significant uncertainty. The capability to predict and control an event becomes increasingly more difficult as the frequency of occurrence of the event decreases." (ASME Technical Report, p. 40)
- * "The probability of any action is represented and weighted or

adjusted by situational multipliers representing stress, environment, and time pressures. It is practically impossible to describe the nuances, permutations, and possibilities behind individual and collective human decisionmaking, so the human-technological system must be treated as an integral system." (ASME Technical Report, p. 40) America has had numerous nuclear power plant safety and security lapses. America has also endured a sobering series of terrorist and criminal events (9/11, Boston Marathon, etc.) and extreme weather events since commencement of the current century. So far we have dogged the bullet of a concurrent nuclear emergency, grid failure, and extreme weather and/or security crisis. But at what point do the odds change for that bullet to connect? (0341-2-6 [Mermelstein, Richard])

Comment: The level of denial that things can go wrong in the GEIS borders on the level of delusion. Sept 11th, Katrina, BP, now Fukushima. How many more examples do we need of the way events can aggressively overwhelm human-engineered systems? How many failures of "fail safe" structures must destroy the lives of thousands? Somebody at the NRC, pick up a newspaper. Read it. Please.[10] (0341-2-8 [Mermelstein, Richard])

Comment: With climate change, the likelihood of extreme weather events is increasing along with the potential for catastrophic results affecting any waste storage facility, especially those near the coast. We are concerned that seismic risks have been underestimated just as the NRC has historically underestimated flooding and seismic risks. (0348-6 [Agnew, David] [Roscoe, Lee])

Comment: With climate change, the likelihood of extreme weather events is increasing along with the potential for catastrophic results affecting any waste storage facility, especially those near the coast. We are concerned that seismic risks also have been underestimated. (0352-8 [Roscoe, Lee])

Comment: 2. The decision to allow DCNPP to be built next or near 13 active earthquake faults has proven to be reckless, especially in light of the recently discovered Shoreline fault and the events at Fukushima! (0358-4 [Schumann, Klaus])

Comment: With climate change, the likelihood of extreme weather events is increasing along with the potential for catastrophic results affecting any waste storage facility, especially those near the coast. We are concerned that seismic risks have been underestimated just as the NRC has historically underestimated flooding and seismic risks. (0373-6 [O'Malley, Brian])

Comment: I point out in the TMI#2 and in the Fukushima accident, the plants were allowed to run because they met 'regulation'. In the Fukushima accident conditions exceeded design. In the TMI#2 accident a technician (Hartman) described how adding hydrogen allowed the reactor to run despite leakage that should have caused a stop. The NRC believes that meeting regulation will provide adequate safety to the public. Fukushima and TMI#2 accidents provide examples of meeting regulation and causing disaster. Is the NRC sticking to its belief that meeting regulation is sufficient provision of safety to the public? (0376-3 [Lewis, Marvin])

Comment: LIMERICK'S PACKED FUEL POOLS ARE VULNERABLE TO EARTHQUAKES: Limerick's fuel pools are stories high over the reactors, similar to Fukushima's. There is no protective containment such as exists around the reactors; Shaking from earthquakes can cause cracking in cement of fuel pools leading to leaks. Power and cooling water sources can be disrupted by damage in the miles of underground pipes due to an earthquake. Eventually consequences from an earthquake can lead to radiation leaks and meltdowns (0377-4-6 [Cuthbert, Lewis])

Comment: Health and Economic Impacts Of A Fuel Pool Accident or Terrorist Attack Could Be Astronomical (0377-4-9 [Cuthbert, Lewis])

Comment: EARTHQUAKE THREATS TO CASKS. The earthquake in Virginia proved heavy cement casks, each weighing many tons, can be jarred and even moved. Casks at a nuclear plant 12 miles from the epicenter of the August 23, 2011 earthquake in VA were moved by the earthquake. There is an earthquake fault directly under the Limerick site with two others within 2 miles. Two other earthquake faults are very close to Limerick. One 9 miles away is active. The other is 17 miles away. After a natural disaster like an earthquake, there is no proof that this deadly waste will be able to be removed safely, especially after corrosion has taken place. None have ever been removed after a long period of time. What could happen if damaged or overheating fuel rods in casks cannot be removed because of jarring from an earthquake? No one knows. It's like playing Russian Roulette. (0377-5-1 [Cuthbert, Lewis])

Comment: There no long-term solution for atomic waste. The NRC's "confidence" that this waste will never cause a threat to public health and safety based on the low probability of an accident is ... misguided to say the least. This is not, say, an oil refinery blowing up with only local effect; deadly radioactivity spreads worldwide. Ignoring alleged "low" probability threats which would affect millions is way too chancy and appears to be manslaughter or even criminally negligent homicide PLUS suicidal with people who self-harm being institutionalized. (0401-1 [Hoffman, David])

Comment: Any cask storage should be protected from corrosion, natural disasters, and attack. (0404-4 [Smith, Roger])

Comment: It [the GEIS] doesn't even mention the fact that the Fukushima plant was sited in an earthquake and predicted tsunami zone, due to bad management decisions, and that such an "accident" was eventually inevitable. It cites the earthquake at the North Anna facility in Virginia as proof that dry casks can survive an earthquake; but fails to mention that the siting of this reactor failed to even predict such an earthquake in the first place. (0410-28 [Nelson, Dennis])

Comment: This type of hubris on the part of the NRC officials shows that their analyses are not comprehensive and cannot be expected to represent the truth, much less to protect the public from such disasters in the future. The NRC draft report does not discuss the important issue of the lack of insurance for radiation damages in the event of a widespread release nor does it explain who will pay to make people whole again afterwards. (0410-29 [Nelson, Dennis])

Comment: The NRC classifies the risk of catastrophic accidents as "small" not because it believes that widespread radiological contamination is not a catastrophic event; but because it assumes the likelihood of such an event to be vanishingly small. Unfortunately, history shows us that this assumption is flat-out wrong. History shows that catastrophic nuclear accidents with widespread contamination, (with various combinations of land use sacrifice and large population relocations), have occurred about every 20 to 30 years. Examples include the reactor accidents at Fukushima and Chernobyl and the radiological waste accident at Kyshtym/Mayak/Techa River. Other intentional releases and contaminations, some with widespread dislocations, have occurred at Bikini, Mururoa, Eniwetok, Hanford, Nevada, Semipalatinsk, Lop Nor, Novaya Zemlya, Maralinga, Christmas Island, North Africa, etc. Serious accidents with major releases of radioactive materials off-site have occurred approximately once every decade. Some examples include: Windscale, Fermi and Three Mile Island in addition to the above incidents. Accidents at a military reactor in Idaho and a research reactor in Yugoslavia, as well as several lethal and non-lethal criticality accidents like the one at Tokaimura, which usually affect only workers,

happen with about the same frequency. Near misses include numerous "excursions," an electrical fire at a Browns Ferry plant and a near perforation of the reactor vessel at a Davis-Bessie plant. All these demonstrate the extreme risks and perils of the nuclear enterprise. There is no reasonable expectation that in the future we will be any more clever or lucky than we were in the past. (0410-6 [Nelson, Dennis])

Comment: The GEIS needs to add more consideration of the environmental impact of water on waste management. A persistent source of water is needed for cooling spent fuel rods. Please address the impact of droughts and floods on nuclear waste management. The catastrophe in Fukushima demonstrated the continual need for huge amounts of water needed for cooling year after year. The GEIS needs to address the environmental and health risks of floods, earthquakes tsunamis and droughts. (0417-11 [Clark, Terrence])

Comment: As a concerned citizen who lives only about 25 miles from San Onofre Nuclear Power Plant, I want the NRC to know that storing nuclear waste on-site for many more years is totally unacceptable to me, my family and my neighbors. We also happen to live in a very geologically active area, perhaps over due, for a large earthquake. Earthquakes and nuclear fuel do not mix well as can be demonstrated by the disaster of Fukushima. There are over 8 million residents in the potential disaster area which would need to be first evacuated, then housed and fed, and would we/they ever be allowed to return? (0425-1 [Individual, Anonymous])

Comment: The GEIS framework may not be adequate or appropriate for nuclear risk assessment. EIS analyses focus upon impacts of proposed human activity on the environment. Yet hazards related to nuclear plant operations and to spent fuel storage can be profoundly affected by the reverse; i.e., impacts of the environment upon a facility. The earthquake, tsunami, and subsequent nuclear emergency at Fukushima demonstrate this sequence, with negative interaction between the environment and the facility that continues. This example applies most clearly to reactors in active earthquake zones but all reactors are sited near water, and earthquakes can strike at widely varied points in the U.S. including the national record 8.5 magnitude quake at New Madrid, Missouri in 1835. (0431-6 [Pascall, Glenn] [Watland, George])

Comment: Approximately 75% of the nuclear waste is currently being stored in pools which are vulnerable to natural disasters, terrorist attack or human error. (0433-3 [Stone, Gene])

Comment: Suspended pools, fields of casks, all unacceptable. My closest reactor is on a fault that had a 5.8 quake a couple of years ago and over a hundred aftershocks. That quake caused considerable damage over 100 miles away. Luckily the reactor and casks remained intact, luckily. I do not appreciate such a potential hazard depending on luck, I find it reprehensible that the NRC allows this hazard to remain and is even considering permitting an additional reactor, and I am sitting here stroking a rabbit's foot depending on luck to keep me safe. That is what regulatory agencies like the NRC are for. I urge you to do your job and not gamble with the well being of Americans. Statistics and probabilities are not the surety we desire. (0436-3 [Patrick, Kay])

Comment: The other inane argument the NRC document makes is that there is a low probability that a serious accident will occur. Really? What world are these people living in? A climate gone wild with enormous and destructive storms, tsunamis and hurricanes that have wiped out entire cities, earthquakes that have shattered major areas of the world - and the NRC thinks that "accidents" are rare? (0443-2 [Sabo, Betty])

Comment: The NRC flawed methodology of determining risk is founded a formula of multiplying consequences times probability. NRC cannot with certainty define either of these

multipliers, and consequently risk is not properly assessed. In many scenarios of accidents or intentional radiological or chemical releases from spent nuclear fuel, the consequences can be defined with more certainty than the probabilities of occurrence. NRC chooses to assign exceedingly low probability of occurrence to events that have very high consequences. They go on to assert low or very low risk without also assigning a relative probability of accuracy to the product, risk. While the NRC acknowledges that environmental and health and impact consequences may be very high, they state that the probabilities of accident or attack events are very low, and then simultaneously discredit their own methods when a few pages or paragraphs later state they event probability is not quantifiable. Using clear logic one must then conclude that the risk assessment is flawed and risk is also not quantifiable or is subject to extreme uncertainty. I argue that with such circumstances of either unquantifiable impacts and consequences or unquantifiable probability that risk has to solely relate to the consequences alone as best they can be determined, not relying on unquantifiable probability multipliers. Instead the NRC bluntly asserts very low risk in text and tables throughout the DGEIS to numerous accident events, and notably for the next topic, events of terrorist attacks. Legitimate catastrophe theory and logic reveals this methodology flaw, no matter how entrenched these methods may be at NRC. NRC must correct its methods of risk assessment and more importantly revise appropriate responses, particularly to events with high consequence. (0447-1-10 [Andrews, Richard])

Comment: Another major flaw with the risk analysis is the handling of duration of risk, the opportunity time interval for an event to occur. Specifically NRC does not accommodate the issue of delays in managing wastes, defined as 60 years post power operation in the short term case, stretching out to indeterminate. Does that instill any sense of "waste confidence"? NO. The longer the period of potential exposure to threats, be they natural or manmade or terror, the greater the likelihood that the catastrophe will happen over the extended interval. Time span is relevant and using only a probability per year factor is simply warping the true expression of risk. Furthermore, given the continued population growth of our country, nuclear power plants and ISFSIs that were once somewhat remote are being and will continue to be encroached upon by urbanization, particularly over the long periods in the three EIS cases of continued on-site storage of SNF (60 years, 160 years, indefinite periods). (0447-1-12 [Andrews, Richard])

Comment: The NRC in the Waste Confidence DGEIS further ducks or obscures the reality and magnitude of these catastrophic events by failing to use plain honest language to describe the casualties/deaths and the huge essentially perpetual societal, financial, and environmental damages. Those failings must either be corrected or the DGEIS scrapped as inadequate. (0447-1-23 [Andrews, Richard])

Comment: The DGEIS simply fails to address reality of the dangers of SNF, in fact throughout the document the NRC continually denies and misrepresents by understating the dangers of inherent catastrophic consequences from any of many potential causes for system failures, failing to even legitimately or completely describe the consequences. (0447-1-4 [Andrews, Richard])

Comment: flawed methodology used by NRC to calculate and describe risk for high consequence events (0447-1-5 [Andrews, Richard])

Comment: Since our collective will to avert disaster is weak, (note the incomprehensible collective failure to address climate change in a meaningful manner) probabilities abound for disasters untold, which neither we nor our immediate descendants will be able to imagine. (0454-7 [Waldstein, Joe])

Comment: Large-Scale, Long-Term Power Outages Could Lead to Multiple Concurrent Reactor Meltdowns and Spent Fuel Pool Fires. An extreme solar storm (geomagnetic disturbance) could cause over 300 extra high voltage (“EHV”) transformers¹¹ [footnote 11 text: The NRC has explained that “[l]arge transformers are very expensive to replace and few spares are available. Manufacturing lead times for new equipment range from 12 months to more than 2 years.” See NRC, “Long-Term Cooling and Unattended Water Makeup of Spent Fuel Pools: Proposed Rules,” Docket No. PRM–50–96, NRC–2011–0069, Federal Register, Vol. 77, No. 243, December 18, 2012, p. 74794.] to fail, “leading to probable power system collapse[s] in the Northeast, Mid-Atlantic, and Pacific Northwest,” which could last months or longer, “affecting a population in excess of 130 million.”¹² [footnote 12 text: *Id.*, pp. 74788-74798.] Such a solar storm—with an intensity similar to that of the 1859 Carrington event¹³ [footnote 13 text: The Carrington event in 1859 is the largest solar storm ever recorded.]—could occur as frequently as once in 153 years to once in 500 years ($2.0 \times 10.3/\text{yr}$ to $6.5 \times 10.3/\text{yr}$), according to the NRC, and initiate “a series of events potentially leading to core damage at multiple nuclear sites.”¹⁴ [footnote 14 text: NRC, “Long-Term Cooling and Unattended Water Makeup of Spent Fuel Pools: Proposed Rules,” p. 74790.] (This is an international nuclear safety issue, not only pertinent to the U.S.) (On March 14, 2011, Thomas Popik, submitted a petition for rulemaking, PRM50-96,¹⁵ [footnote 15 text: Thomas Popik, PRM-50-96, March 14, 2011 (ADAMS Accession No. ML110750145).] on behalf of the Foundation for Resilient Societies, requesting regulations to help prevent SFP severe accidents—like zirconium¹⁶ [footnote 16 text: For consistency, this report will use the term “zirconium” to refer to all the various types of zirconium alloys that comprise fuel cladding. Zircaloy, ZIRLO, and M5 are particular types of zirconium alloy fuel cladding. In a SFP accident, the oxidation behavior of the different fuel cladding materials, with various zirconium alloys, would be similar because of their shared zirconium content.] fires in racks of densely-packed spent fuel assemblies—in the event of prolonged outages of “North American commercial electric power grids...caused by extreme space weather, such as coronal mass ejections and associated geomagnetic disturbances.”¹⁷ [footnote 17 text: NRC, “Long-Term Cooling and Unattended Water Makeup of Spent Fuel Pools: Proposed Rules,” p. 74788.] In 2012, the NRC decided to consider the issues raised in PRM-50-96 in its rulemaking process.)¹⁸ [footnote 18 text: *Id.*, pp. 74788-74798.] Additionally, either devices designed specifically to disrupt (or destroy) electronic equipment or the detonation of a nuclear device high above the earth’s atmosphere could also produce an electromagnetic pulse with a magnitude that could cause large-scale, long-term power outages.¹⁹ [footnote 19 text: Metatech Corporation, “Electromagnetic Pulse: Effects on the U.S. Power Grid,” Executive Summary, January 2010. A June 2010 North American Electric Reliability Corporation (“NERC”) and U.S. Department of Energy (“DOE”) report states that such power outages could also be caused by pandemics, “coordinated cyber, physical, and blended attacks”²⁰ [footnote 20 text: NERC, DOE, “The High-Impact, Low-Frequency (HILF) Event Risk Effort,” June 2010, pp. 3, 8.] and that “[d]eliberate attacks (including acts of war, terrorism, and coordinated criminal activity) pose especially unique scenarios due to their inherent unpredictability and significant national security implications.”²¹ [footnote 21 text: *Id.*] (**0463-1-1** [Leyse, Mark])

Comment: In a SBO boil-off accident, if enough water boiled off, the water level would drop in the pool, uncovering the fuel assemblies; and if temperatures in the SFP were to increase to approximately 657°C (1214°F), the Boral plates of the fuel assembly storage racks would melt.⁶³ [footnote 63 text: Zachary I. Franiewski et al., Pennsylvania State University, “Spent Fuel Pool Analysis of a BWR-4 Fuel Bundle Under Loss of Coolant Conditions Using TRACE,” NucE431W S2013, May 2013, pp. 1-2.] (Boraflex would melt at even lower temperatures and not be effective once heated above approximately 300°C (572°F).⁶⁴ [footnote 64 text: EPRI, “Severe Accident Management Guidance Technical Basis Report,” Volume 2: “The Physics of Accident Progression,” 1025295, Appendix EE, p. EE-9.]) Boral and Boraflex are neutron-absorber

materials that are placed in high-density storage racks to help prevent criticality accidents. (Fission—the splitting of atoms in the nuclear fuel—occurs in a criticality accident.) If Boral were to melt in *BWR* high-density storage racks, neutrons would diffuse throughout the SFP; in scenarios in which water was injected back into the boiled-off SFP, fission could possibly commence. (BWR SFPs do not use borated water.⁶⁵ [footnote 65 text: NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” p. 30.] If fission were to occur, local fuel and fuel-cladding temperatures would rapidly increase. Fission would also “cause an increase in decay products, which [would] have a delayed effect on temperature increase[s].”⁶⁶ [footnote 66 text: Zachary I. Franiewski et al., Pennsylvania State University, “Spent Fuel Pool Analysis of a BWR-4 Fuel Bundle Under Loss of Coolant Conditions Using TRACE,” NucE431W S2013, pp. 1-2.] (A June 2013 NRC document states that “if an [inadvertent criticality event] were severe enough to produce significant heat, the fuel will be harder to cool.”⁶⁷ [footnote 67 text: NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” p. 29.] Rapid increases in the fuel and fuel-cladding temperatures could lead to a SFP fire. And radiation releases, caused by a criticality accident in a SFP, would impede (or possibly prevent for significant time periods) efforts to mitigate either a partial SFP LOCA or SBO boil-off accident, making it more probable that such accident scenarios would lead to SFP fires. (Criticality accidents are discussed in more detail in Section D.) (0463-1-12 [Leyse, Mark])

Comment: As the NRC observes, large-scale, long-term power outages, which lasted months or longer, could initiate “a series of events potentially leading to core damage at multiple nuclear sites.”⁶⁸ [footnote 68 text: NRC, “Long-Term Cooling and Unattended Water Makeup of Spent Fuel Pools: Proposed Rules,” p. 74790.] Radiological releases resulting from core damage would contaminate the NPP site and impede efforts to mitigate the accident, especially if radioactive debris were propelled throughout the site by hydrogen explosions, as occurred in the Fukushima Daiichi accident.⁶⁹ [footnote 69 text: Institute of Nuclear Power Operations (“INPO”), “Special Report on the Nuclear Accident at the Fukushima Dai-ichi Nuclear Power Station,” INPO 11-005, November 2011, pp. 9, 12, 21, 24, 25, 32, 37, 79, 85, 86, 96.] After the Fukushima Dai-ichi site was contaminated, workers had to wear additional protective clothing and limit the time they spent, working to mitigate the accident.⁷⁰ [footnote 70 text: Id., p. 9.] Efforts to mitigate a SFP accident would also be impeded (or possibly entirely prevented for significant time periods) by the radiologically-contaminated environment. Hence, if large-scale, long-term power outages lead to core damage, it would be more probable that such outages would also lead to at least one SFP boil-off accident and fire. (0463-1-13 [Leyse, Mark])

Comment: Regarding nuclear electromagnetic pulse (“EMP”) attacks, a May 21, 2013 Wall Street Journal op-ed, “How North Korea Could Cripple the U.S.: A Single Nuke Exploded above America Could Cause a National Blackout for Months,” states: The Congressional Electromagnetic Pulse Commission, the Congressional Strategic Posture Commission and several other U.S. government studies have established that detonating a nuclear weapon high above any part of the U.S. mainland would generate a catastrophic electromagnetic pulse. An EMP attack would collapse the electric grid and other infrastructure that depends on it—communications, transportation, banking and finance, food and water—necessary to sustain modern civilization and the lives of 300 million Americans. EMP effects can be made more powerful and more catastrophic by using an Enhanced Radiation Warhead. This is a low-yield nuclear weapon designed not to create a devastating explosion, but to emit large amounts of radiation, including the gamma rays that generate the EMP effect that fries electronics.²² [footnote 22 text: R. James Woolsey, Peter Vincent Pry, “How North Korea Could Cripple the U.S.: A single nuke exploded above America could cause a national blackout for months,” Wall

Street Journal, May 21, 2013.] And discussing the North American power grid's vulnerabilities to large-scale, long-term power outages, the executive summary for "Electromagnetic Pulse: Effects on the U.S. Power Grid," a series of reports Metatech prepared for the Oak Ridge National Laboratory ("ORNL"), states: The nation's power grid is vulnerable to the effects of an electromagnetic pulse (EMP), a sudden burst of electromagnetic radiation resulting from a natural or man-made event. EMP events occur with little or no warning and can have catastrophic effects, including causing outages to major portions of the U.S. power grid possibly lasting for months or longer. ... The cost of damage from the most extreme solar event has been estimated at \$1 to \$2 trillion with a recovery time of four to ten years,²³ [footnote 23 text: National Academy of Sciences, "Severe Space Weather Events—Understanding Societal and Economic Impacts: A Workshop Report," 2008.] while the average yearly cost of installing equipment to mitigate an EMP event is estimated at less than 20 cents per year for the average residential customer.²⁴ [footnote 24 text: Metatech Corporation, "Electromagnetic Pulse: Effects on the U.S. Power Grid," Executive Summary, January 2010.] (0463-1-2 [Leyse, Mark])

Comment: Neutron-Absorber Materials and How the Potential for Criticality Accidents in SFPs Has Increased. Neutron-absorber materials are needed in the SFP storage racks that have densely packed fuel assemblies—high-density storage racks. Neutron-absorber materials are needed *to help prevent criticality accidents*; in fact, "new rack designs rely heavily on permanently installed neutron absorbers to maintain criticality requirements."¹⁰⁴ [footnote 104 text: NRC, "On Site Spent Fuel Criticality Analyses NRR Action Plan," May 21, 2010, (ADAMS Accession No. ML101520463), p. 1.] High-density storage racks also rely on the particular arrangements of discharged and fresh fuel assemblies that help to control reactivity in the SFP. In the SFP, fuel assemblies might be arranged within checkerboard configurations. One of the reasons that criticality accidents could occur in SFP high-density storage racks is that the center-to-center distance between the spent fuel assemblies (the pitch) in such racks is close to that of fuel assemblies in the reactor core. For example, some BWR reactor cores have a fuel assembly pitch of 6.0 inches (in)¹⁰⁵ [footnote 105 text: OECD Nuclear Energy Agency (NEA), "Boiling Water Reactor Turbine Trip (TT) Benchmark," Volume I, "Final Specifications," NEA/NSC/DOC(2001)1, February 2001, p. 9.] and some BWR SFPs have a spent fuel assembly pitch of 6.28 in.¹⁰⁶ [footnote 106 text: K. C. Wagner, R. O. Gauntt, Sandia National Laboratories, "Mitigation of Spent Fuel Pool Loss-of-Coolant Inventory Accidents And Extension of Reference Plant Analyses to Other Spent Fuel Pools," November 2006, (ADAMS Accession No. ML120970086), p. 57.] Furthermore, some PWR reactor cores have a fuel assembly pitch of 8.587 in¹⁰⁷ [footnote 107 text: NRC, "Pressurized Water Reactor, B&W Technology, Crosstraining Course Manual," Chapter 2.1, "Core and Vessel Construction," Rev 10/2007, (ADAMS Accession No. ML11221A103), p. 2.1-14.] and some PWR SFPs have a spent fuel assembly pitch of 9.0 in.¹⁰⁸ [footnote 108 text: NRC, "Regulatory Analysis for the Resolution of Generic Issue 82, 'Beyond Design Basis Accidents in Spent Fuel Pools'," NUREG-1353, April 1989, (ADAMS Accession No. ML082330232), p. 4-6.] (0463-1-23 [Leyse, Mark])

Comment: A May 2010 NRC document states that "the dimensions of the SFPs cannot be changed so licensees are putting more fuel assemblies into the same volume." The May 2010 NRC document provides an example: "One plant went through several steps to go from a SFP originally licensed for a capacity of 600 fuel assemblies to its current licensed capacity of 3300."¹⁰⁹ [footnote 109 text: NRC, "On Site Spent Fuel Criticality Analyses NRR Action Plan," pp. 1, 2.] The May 2010 NRC document observes that over the years "fuel assemblies have become more reactive," and states: Increased U235 enrichment is an example [of increased reactivity]. But there are other more subtle changes; e.g., increased fuel pellet diameter; increased fuel pellet density; the BWR transition from fuel assemblies with 49 fuel rods to those with 91 fuel rods; increased use of fixed and integral burnable absorbers; and, changes to core

operating parameters due to power uprates resulting in more reactive fuel assemblies to be stored in the SFP.¹¹⁰ [footnote 110 text: Id., p. 3.] Regarding historical limitations of critical experiments that did not include actinide and fission product nuclides that are important to determining reactivity in a SFP environment, the May 2010 NRC document states: [H]istorically the critical experiments used in the benchmarking do not include Actinide and Fission Product nuclides that are important to determining reactivity in a SFP environment. Rather than address the issue in the validation, SFP [license amendment requests] were silent on the issue. This is inconsistent with NRC guidance on performing these validations as described in NUREG/CR-6698¹¹¹ [footnote 111 text: NRC, “Guide for Validation of Nuclear Criticality Safety Calculational Methodology,” NUREG/CR-6698, January 2001, (ADAMS Accession No. ML050250061).] [published in January 2001]. Historically there were no publicly available experiments with Actinide and Fission Product nuclides. With the issuance of NUREG/CR6979¹¹² [footnote 112 text: NRC, “Evaluation of the French Haut Taux de Combustion (HTC) Critical Experiment Data,” NUREG/CR-6979, September 2008, (ADAMS Accession No. ML082880452).] [in September 2008], experiments with Actinides are available for benchmarking. However, *there are still limited experiments that contain Fission Products* that can be used in the validation¹¹³ [footnote 113 text: NRC, “On Site Spent Fuel Criticality Analyses NRR Action Plan,” p. 5.] [emphasis added]. And regarding the fact that thinner fuel cladding usually results in a higher reactivity for spent fuel rods, the May 2010 NRC document states: As a fuel assembly is depleted in an operating reactor, it undergoes physical changes. Some of those changes have the potential to affect the SFP criticality analysis. For example, fuel rods experience irradiated rod growth. As the rods get longer, the cladding gets thinner. Thinner cladding usually results in a higher reactivity. As the amount of burnup credited in the analysis increases the more of an effect this could have on the criticality analysis.¹¹⁴ [footnote 114 text: Id.] (0463-1-24 [Leyse, Mark])

Comment: The May 2010 NRC document concludes that industry trends over the years “have resulted in reduced conservatism/margins to criticality, thus reducing or eliminating the ability to use engineering judgment when determining that there is reasonable assurance an inadvertent SFP criticality cannot occur. Additionally, uncertainties associated with SFP criticality analyses, due to lack of benchmark data for example, also decrease margins to criticality.”¹¹⁵ [footnote 115 text: Id., p. 3.] III.D.1.a. Information about Newer BWR Fuel Assemblies: Regarding axial variations in BWR fuel assemblies of the loading of the U235 enrichment and gadolinium integrated burnable absorber material, an October 2000 Oak Ridge National Laboratory (“ORNL”) report states: [N]ewer BWR fuel designs typically employ larger arrays (e.g., 9 x 9 and 10 x 10) of smaller fuel rods with higher enrichments, increased gadolinium loading through higher concentrations and more gadolinium-bearing rods, and greater axial variation in enrichment and gadolinium loading. ... The axial variations in enrichment and gadolinium loading naturally necessitate separate calculations for unique axial segments and are important to the criticality calculations.¹¹⁶ [footnote 116 text: J. C. Wagner, M. D. DeHart, and B. L. Broadhead, Oak Ridge National Laboratory (“ORNL”), “Investigation of Burnup Credit Modeling Issues Associated with BWR Fuel,” ORNL/TM1999/193, October 2000, pp. 62-63.]. There are also axial variations in the number of fuel rods in BWR fuel assemblies.¹¹⁷ [footnote 117 text: NRC, “On Site Spent Fuel Criticality Analyses NRR Action Plan,” p. 1.] And regarding the effect of integrated burnable absorbers on the reactivity behavior of BWR fuel as a function of burnup, the October 2000 ORNL report states: [F]or BWR fuels (with integrated burnable absorbers) the reactivity increases as fuel burnup proceeds, reaches a maximum at a burnup where the absorber (gadolinium) is nearly depleted, and then decreases monotonically with burnup in a nearly linear fashion. The initial period of burnup (i.e., before the gadolinium is depleted and the reactivity peaks) adds an additional complication to BWR depletion that is not present in the depletion of PWR fuels (without integrated burnable absorbers).¹¹⁸ [footnote 118 text: J. C. Wagner, M. D. DeHart, and B. L. Broadhead, Oak Ridge National Laboratory (“ORNL”),

“Investigation of Burnup Credit Modeling Issues Associated with BWR Fuel,” ORNL/TM-1999/193, p. 13.]. (The October 2000 ORNL report states that “[f]or PWR fuels (without integrated burnable absorbers), the reactivity decreases monotonically with burnup in a nearly linear fashion.”¹¹⁹ [footnote 119 text: Id.]) (0463-1-25 [Leyse, Mark])

Comment: Neutron-Absorber Materials Could Melt in a Station Blackout Boil-Off Accident. In a SBO boil-off accident, if enough water boiled off, the water level would drop in the pool and uncover the fuel assemblies. If fuel assemblies were uncovered, temperatures in the SFP could increase enough to cause neutron-absorber materials placed in high-density storage racks to melt. Boraflex and Boral are neutron-absorber materials. Boraflex vitrifies and melts at approximately 300°C (572°F) and 500°C (932°F), respectively; Boraflex would be ineffective once heated above approximately 300°C (572°F).¹²⁰ [footnote 120 text: EPRI, “Severe Accident Management Guidance Technical Basis Report,” Volume 2: “The Physics of Accident Progression,” 1025295, Appendix EE, p. EE-9.] And Boral melts at approximately 657°C (1214°F).¹²¹ [footnote 121 text: Zachary I. Franiewski et al., Pennsylvania State University, “Spent Fuel Pool Analysis of a BWR-4 Fuel Bundle Under Loss of Coolant Conditions Using TRACE,” p. 1.] Regarding the melting of Boral in a SFP accident, EPRI SFP accident guidance states: With the aluminum cladding and the aluminum in the mixture, the BORAL would melt at temperatures of 1200°F (660°C). With this low melting temperature, the conservative evaluations for the intact response of those SFP configurations using this absorber are recommended to not use temperatures higher than 1100°F (593°C). If conditions are detected that would lead to conditions where the estimated fuel assembly/bundle temperature exceeds this value, the SFP should be assumed to have a degraded configuration *including the possible melting and downward relocation of the BORAL absorber plates to the bottom of the SFP*. Specifically, the reactivity of the SFP should be considered to be uncertain and somewhat increased from the nominal pool value¹²² [footnote 122 text: EPRI, “Severe Accident Management Guidance Technical Basis Report,” Volume 2: “The Physics of Accident Progression,” Appendix EE, pp. EE-8-EE-9.] [emphasis added]. (0463-1-26 [Leyse, Mark])

Comment: EPRI SFP accident guidance also notes that “[t]ypically the fuel assemblies/bundles are supported within stainless steel racks that form a square matrix” but that “[s]ome racks are also fabricated from aluminum.”¹²³ [footnote 123 text: Id., Appendix EE, p. EE-9.] And EPRI states that Boraflex could “begin to relocate due to softening or melting” above approximately 300°C (572°F).¹²⁴ [footnote 124 text: Id.] (It is noteworthy that in a SNL experiment simulating a complete SFP LOCA in which BWR fuel assemblies were heated in air, “[p]ost-mortem examination of the integral test assemblies revealed gross distortion of the pool rack and channel box, rubblization of the tubing bundle and accumulation of debris on the bottom tie plate that resulted in flow blockage. Flow blockage was also evident from molten aluminum (*originating from Boral plates built into the pool rack*) that *collected on and below the bottom tie plates*”¹²⁵ [footnote 125 text: E. R. Lindgren, Sandia National Laboratory, “Characterization of Thermal-Hydraulic and Ignition Phenomena in Prototypic, Full-Length Boiling Water Reactor Spent Fuel Pool Assemblies After a Postulated Complete Loss-of-Coolant Accident,” NUREG/CR-7143, March 2013 (ADAMS Accession No. ML13072A056), p. xx.] [emphasis added].) And regarding what the SFP water levels would be when Boraflex and Boral began to lose their integrity, EPRI SFP accident guidance states: If the water level [in the SFP] were to decrease to approximately 0.85 (Boraflex) or 0.75 (Boral) of the fuel height, the fuel assembly/bundle outlet temperature would approach a level where the integrity of the neutron absorber shims would be in question and the geometric configuration of the structures in the SFP could begin to change.¹²⁶ [footnote 126 text: EPRI, “Severe Accident Management Guidance Technical Basis Report,” Volume 2: “The Physics of Accident Progression,” 1025295, Appendix EE, p. EE-17.] (0463-1-27 [Leyse, Mark])

Comment: A 2001 NRC report, NUREG-1738, states that “[i]f the stored assemblies are separated by neutron absorber plates (e.g., Boral or Boraflex), loss of these plates could result in a potential for criticality for BWR pools.”¹²⁷ [footnote 127 text: NRC, “Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants,” NUREG-1738, February 2001 (ADAMS Accession No. ML010430066), p. 3-26.] (BWR SFPs do not use borated water.¹²⁸ [footnote 128 text: NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” p. 30.] One of the reasons that criticality accidents could occur in BWR SFP high-density storage racks is that the center-to-center distance between the spent fuel assemblies (the pitch) in such racks is close to that of fuel assemblies in the reactor core.) (0463-1-28 [Leyse, Mark])

Comment: EPRI SFP accident guidance does not specify the extent that the neutron-absorber materials would relocate downward immediately after they began to melt in a SFP boiloff accident; however, it is not likely that neutron-absorber materials located below the water surface would be adversely affected by any downward relocation of melted materials. Hence, the neutron-absorber materials located below the water surface would remain intact and continue to prevent criticality accidents. But if the water level continued to drop, additional neutron-absorber materials, located at lower elevations, would melt. In this scenario, the SFP would be vulnerable to criticality accidents if water were injected back into the SFP to raise the water level and cover the fuel assemblies, again. Regarding injecting water into a SFP with a reduced water level, EPRI SFP accident guidance recommends considering whether or not “the water level has been sufficiently low [such] that *the location of the absorber material* could have been jeopardized”¹²⁹ [footnote 129 text: EPRI, “Severe Accident Management Guidance Technical Basis Report,” Volume 2: “The Physics of Accident Progression,” 1025295, Appendix EE, p. EE-12.] [emphasis added]. EPRI also recommends injecting borated water into the SFP if it is available.¹³⁰ [footnote 130 text: Id., Appendix EE, p. EE-13.] (0463-1-29 [Leyse, Mark])

Comment: The NRC has pointed out that a 2012 NERC report, “Effects of Geomagnetic Disturbances on the Bulk Power System,”²⁵ [footnote 25 text: NERC, “2012 Special Reliability Assessment Impact Report: Effects of Geomagnetic Disturbances on the Bulk Power System,” February 2012.] disagrees with conclusions of the Metatech report, stating that “[b]ased on an assumed frequency of a once-in-100-year geomagnetic event, the NERC report indicates that potential damage to EHV transformers of recent design is of a low probability, and thus challenges the assertions of the Metatech report that 300 large EHV transformers would be at risk of failure.”²⁶ [footnote 26 text: NRC, “Long-Term Cooling and Unattended Water Makeup of Spent Fuel Pools: Proposed Rules,” p. 74795.] The 2012 NERC report states that “[t]he most likely consequence of a strong GMD [geomagnetic disturbances] and the accompanying GIC [geomagnetic induced currents] is the increase of reactive power consumption and the loss of voltage stability,” “which could lead to...power system collapse.”²⁷ [footnote 27 text: NERC, “2012 Special Reliability Assessment Impact Report: Effects of Geomagnetic Disturbances on the Bulk Power System,” pp. iii, iv.] The NERC report concludes that if the power system were to collapse from a loss of voltage stability that it could be restored in a time period of “hours to days.”²⁸ [footnote 28 text: Id., p. iv.] However, Lawrence J. Zanetti, a physicist in the Space Department of the Johns Hopkins University Applied Physics Laboratory, disagrees with conclusions of the 2012. NERC report, stating that “[i]n this NERC report, the strong denial of the likelihood of a large number of multiple transformer failures is misleading and purveys a false sense of grid security.”²⁹ [footnote 29 text: Zanetti, L. J., “Review of North American Electric Reliability Corporation (NERC) Interim Report: Effects of Geomagnetic Disturbances on the Bulk Power System—February 2012,” Space Weather, Vol. 11, doi:10.1002/swe.20060, 2013, p. 335.] (0463-1-3 [Leyse, Mark])

Comment: Discussing the progression of a partial BWR SFP LOCA, a 2013 PSU report observes that after the Boral in high-density storage racks melted, neutrons would diffuse throughout the SFP, and possibly cause fission to commence.¹³¹ [footnote 131 text: Zachary I. Franiewski et al., Pennsylvania State University, “Spent Fuel Pool Analysis of a BWR-4 Fuel Bundle Under Loss of Coolant Conditions Using TRACE,” NucE431W S2013, May 2013, p. 1.] (Although not explicitly stated, the 2013 PSU report must be referring to scenarios in which water would be injected back into the drained SFP.) If fission were to occur, local fuel and fuel-cladding temperatures would rapidly increase. Fission would also “cause an increase in decay products, which [would] have a delayed effect on temperature increase[s].”¹³² [footnote 132 text: Id., pp. 1-2.] (A June 2013 NRC document states that “if an [inadvertent criticality event] were severe enough to produce significant heat, the fuel will be harder to cool.”¹³³ [footnote 133 text: NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” p. 29.]) And radiation releases, caused by a criticality accident in a SFP, would impede (or possibly prevent for significant time periods) efforts to mitigate a SBO boil-off accident (or a partial SFP LOCA), making it more probable that such accident scenarios would lead to SFP fires. (SFPs would also be vulnerable to criticality accidents after Boraflex vitrified in high-density storage racks and became ineffective.) EPRI SFP accident guidance states that “BWR analyses have indicated that spraying water into fresh, uncovered fuel bundles could result in a critical configuration. This could possibly also be the case for spent fuel where there has been sufficient decay of fission products that act as poisons.”¹³⁴ [footnote 134 text: EPRI, “Severe Accident Management Guidance Technical Basis Report,” Volume 2: “The Physics of Accident Progression,” 1025295, Appendix EE, p. EE-12.] (0463-1-30 [Leyse, Mark])

Comment: *Perhaps* it would be valid to speculate that if there were one or more criticality accidents, severe enough to produce significant heat, a SFP fire would not always commence on a fuel assembly that was part of the group most recently discharged from the reactor core—the group producing the highest amount of decay heat in the pool. (0463-1-31 [Leyse, Mark])

Comment: (It is noteworthy that a June 2013 NRC report on how earthquakes could affect BWR Mark I SFPs provides the results of a number of MELCOR computer safety model simulations of SFP LOCAs in which there was a *moderate leakage rate*.¹³⁵ [footnote 135 text: A moderate leakage rate is “[a] state with leakage from the bottom of the SFP, corresponding to through-wall concrete cracking at the bottom of the walls and tearing of the liner that propagates to an extent such that water leakage is controlled by the size of the cracks in the concrete.” See NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” p. 61.] In some simulations, SFP temperatures reached the point at which neutron-absorber materials would melt; spray cooling was employed,¹³⁶ [footnote 136 text: NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” pp. 211-213.] however, the MELCOR simulations did not even consider the possibility of criticality accidents.¹³⁷ [footnote 137 text: Id., p. 20.]) (0463-1-32 [Leyse, Mark])

Comment: The Potential for Criticality Accidents When Water is Sprayed onto Fuel Assemblies in Certain Spent Fuel Pools. Optimum-moderation conditions occur in water films and low-density water; optimum-moderation conditions could increase the potential for criticality accidents in a SBO boil-off accident if the pitch of PWR fuel assemblies were in a range between approximately 25 centimeters (“cm”) (9.84 in) and 50 cm (19.68 in).¹³⁸ [footnote 138 text: G Caplin et al., “Criticality Accident in Case of a Spent Fuel Pool Dry-Out,” Institut de Radioprotection et de Sûreté Nucléaire (“IRSN”), 2011, Information Sheet.] It would seem that the range of vulnerable pitches would be similar for BWR fuel assemblies; however, criticality

analyses should be conducted on a case by case basis to make such a determination. Criticality analyses need to consider how optimum moderator conditions would affect BWR fuel assemblies with or without channel boxes. Plant specific criticality analyses should also be conducted for PWR fuel assemblies. According to an April 1989 NRC report, NUREG-1353, BWR and PWR medium-density storage racks have fuel-assembly pitches of 22.86 cm (9.0 in) and 33.02 cm (13.0 in), respectively. And NUREG-1353 states that BWR and PWR low-density storage racks both have fuel-assembly pitches in a range from 50.8 cm (20.0 in) to 76.2 cm (30.0 in).¹³⁹ [footnote 139 text: NRC, “Regulatory Analysis for the Resolution of Generic Issue 82, ‘Beyond Design Basis Accidents in Spent Fuel Pools’,” NUREG-1353, April 1989, (ADAMS Accession No. ML082330232), p. 4.6.] It is clear that NUREG-1353 provides values of typical fuel-assembly pitches; plant-specific values of fuel-assembly pitches would be likely to vary. In the US, there are not many (if any) SFPs that have fuel assemblies stored in low-density racks. Any plans to re-rack fuel assemblies stored in high-density racks to either medium-density or low-density racks, need to consider requiring that neutron-absorber materials be placed into the new storage racks; criticality analyses should be conducted on a case by case basis to determine if neutron-absorber materials would be needed. (It is noteworthy that “[a] PWR SFP would typically end up with high density and “moderate density” racks. ... PWRs have a need to store fresh fuel assemblies in the SFP. To accommodate that need PWRs typically installed “moderate density” storage racks with smaller flux traps than the original and usually more neutron absorber than the high-density storage racks. With a fully intact neutron absorber, burnup requirements for the high-density storage racks can be fairly low and fresh fuel up to 5.00 w/o U235 could easily be accommodated in the moderate density storage racks.¹⁴⁰ [footnote 140 text: NRC, “On Site Spent Fuel Criticality Analyses NRR Action Plan,” May 21, 2010, (ADAMS Accession No: ML101520463), pp. 1-2.]) (0463-1-33 [Leyse, Mark])

Comment: Optimum-moderation conditions in water films and low-density water do not increase the potential for criticality accidents in PWR SBO boil-off accidents if the pitch of the fuel assemblies is less than approximately 25 cm (9.84 in). It would seem that the dividing pitch-value of approximately 25 cm would also be true for BWR fuel assemblies; however, criticality analyses should be conducted on a case by case basis to make such a determination. In an operating reactor core, a decrease of water density decreases the reactivity of the core,¹⁴¹ [footnote 141 text: G Caplin et al., “Criticality Accident in Case of a Spent Fuel Pool Dry-Out,” IRSN, 2011, Information Sheet.] because the pitch of the fuel assemblies is less than approximately 25 cm; in BWR cores, the fuel assembly pitch is approximately 6.0 inches. In fact, in the upper regions of BWR cores, steam voids, which decrease water density, reduce the core reactivity. An inherent safety feature of BWRs is that “a transient power increase will produce more steam voids, reducing reactivity, which reduces power and thus limits the excursion.”¹⁴² [footnote 142 text: NRC, “BWR/4 Technology Manual (R-104B),” NRC Technical Training Center, Rev 0100, (ADAMS Accession No: ML022830867), p. 1.3-1.] (0463-1-34 [Leyse, Mark])

Comment: A June 2013 NRC report on how earthquakes could affect BWR Mark I SFPs recommends cooling fuel assemblies with a “spray flow” in partial SFP LOCA scenarios in which there would be “no natural circulation of air through the racks.”¹⁴³ [footnote 143 text: NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” Appendix D, p. D-12.] It is pertinent that in the Fukushima Dai-ichi accident “pumper trucks employing high booms spray[ed] water from a distance into the spent fuel pools.” There was no other means available to the operators; hence, the Near-Term Task Force that the NRC established in response to the Fukushima Dai-ichi accident recommended that the NRC “[o]rder licensees to have an installed seismically qualified means to spray water into the spent fuel pools, including an easily accessible connection to

supply the water (e.g., using a portable pump or pumper truck) at grade outside the building.”¹⁴⁴ [footnote 144 text: Charles Miller et al., NRC, “Recommendations for Enhancing Reactor Safety in the 21st Century: The Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident,” SECY-11-0093, July 12, 2011, (ADAMS Accession No. ML111861807), pp. 45, 46.] In the event of a partial SFP LOCA, it would be important to cool the fuel assemblies if a means were available. However, spraying water onto exposed fuel assemblies (especially unused fresh-fuel assemblies—more reactive than spent fuel), stored in racks that had a fuel-assembly pitch in a range between approximately 25 cm and 50 cm and did not have neutron-absorber materials, or whose neutron-absorber materials had previously melted, could cause a criticality accident. (In some partial SFP LOCA and boil-off scenarios, neutron-absorber materials would begin melting when the water level dropped 15 or 25 percent (depending on the materials) below the top of the fuel assemblies.) Historically, neutron-absorber materials were not typically placed in either low-density open racks or medium-density racks with flux traps in order to help prevent criticality accidents.¹⁴⁵ [footnote 145 text: NRC, “Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants,” NUREG-1738, p. 3-25.] (PWR SFPs are required to use water that is borated with at least 2000 parts per million (“ppm”) of boron; BWR SFPs do not use borated water.¹⁴⁶ [footnote 146 text: NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” p. 30.]) (0463-1-35 [Leyse, Mark])

Comment: If large-scale power outages were to last months or longer, multiple nuclear power plants (“NPP”) would lose their supply of offsite alternating current (“ac”) power, which is necessary for daily operation and preventing severe accidents. Multiple loss-of-offsite power (“LOOP”) events—especially in the event of prolonged electrical grid failures—could lead to a number of station-blackouts (“SBO”); a SBO is a complete loss of both grid-supplied and backup onsite ac power. The Fukushima Dai-ichi accident was a SBO accident that caused three reactor core meltdowns. Many of the safety systems that are required for cooling the reactor core and SFP in a SBO—removing decay heat: the heat generated by the radioactive decay of the nuclear fuel’s fission products—need ac power to operate. In a LOOP event, a NPP’s emergency diesel generators (“EDG”) are intended to “supply power [promptly and] continuously to the equipment needed to maintain the plant in a safe condition” for an extended time period, “with refueling every 7 days.”³⁰ [footnote 30 text: NRC, “Application and Testing of Safety-Related Diesel Generators in Nuclear Power Plants,” Regulatory Guide 1.9, March 2007, Revision 4, p. 2.] The NRC has stated that, in a LOOP event, EDGs should be able to maintain a NPP in a safe condition for a mission time of “typically around 30 days.”³¹ [footnote 31 text: NRC Inspection Manual, “Emergency Diesel Generator Technical Specification Surveillance Requirements Regarding Endurance and Margin Testing,” May 2008, (ADAMS Accession No. ML080420064), p. 3.] Most U.S. NPPs are required to have an a 7-day capacity of fuel oil for EDGs onsite; many NPPs have additional fuel oil onsite and arrangements to receive prompt deliveries of fuel oil.³² [footnote 32 text: NRC, “Long-Term Cooling and Unattended Water Makeup of Spent Fuel Pools: Proposed Rules,” p. 74796.] However, there could be problems with transporting and maintaining a fuel supply, amidst varying degrees of social disruption, in the event of large-scale, long-term power outages. There could be cases in which EDGs would not be able to either operate promptly or continuously for months (or longer), causing a SBO. A 2011 report, “Fukushima Fallout,” states “that there have been recurrent prolonged malfunctions of [EDGs] at nuclear power plants in the U.S” and that “[i]n the past eight years there have been at least 69 reports of EDG inoperability at 33 nuclear power plants. A total of 48 reactors were affected, including 19 failures lasting over two weeks and 6 that lasted longer than a month.”³³ [footnote 33 text: The Staff of Congressman Edward J. Markey, “Fukushima Fallout: Regulatory Loopholes at U.S. Nuclear Plants,” May 12, 2011, pp. 9, 25.] (EDG endurance and margin tests are typically performed every 18 to 24 months; a 24-hour test period is intended to ensure that

an EDG would be able to meet its 30-day mission time. The NRC allows some NPP personnel, including Indian Point's, to perform the test for *an 8-hour test period*.³⁴ [footnote 34 text: NRC Inspection Manual, "Emergency Diesel Generator Technical Specification Surveillance Requirements Regarding Endurance and Margin Testing," pp. 1, 3.] (0463-1-4 [Leyse, Mark])

Comment: It has been documented that solar storms have damaged NPPs. For example, in March 1989, a geomagnetic storm caused a generator step-up ("GSU") transformer to fail at the Salem Nuclear Plant.³⁹ [footnote 39 text: John Kappenman, "Geomagnetic Storms and Their Impacts on the U.S. Power Grid," Metatech Report Meta-R-319, January 2010, p. 2-29.] And, in April 1994, a "moderate intensity" geomagnetic storm caused a GSU transformer at Zion Nuclear plant to fail: "[t]he failure was so severe that the transformer tank, containing thousands of gallons of oil, ruptured and started a major fire in the yard at the plant, which eventually involved control circuits and other sensitive systems."⁴⁰ [footnote 40 text: *Id.*, p. 2-33.] It has also been documented that high-altitude electromagnetic pulses produced by nuclear detonations *caused diesel generators to fail* in 1962, when the USSR detonated a few nuclear weapons at high altitudes—above an altitude of approximately 30 kilometers—in an experimental program.⁴¹ [footnote 41 text: Edward Savage et al., "The Early-Time (E1) High-Altitude Electromagnetic Pulse (HEMP) and Its Impact on the U.S. Power Grid," Metatech Report Meta-R-320, January 2010, pp. i, 2-1, 3-4.] (The NRC maintains that solar storms would not adversely affect EDGs, because they are normally not operating and that "any [geomagnetically-induced currents] that enter the plant's electrical system during EDG operation should not result in excessive overheating of the generator windings."⁴² [footnote 42 text: NRC, "Long-Term Cooling and Unattended Water Makeup of Spent Fuel Pools: Proposed Rules," p. 74796.] The NRC does not require NPP owners to be prepared for large-scale, long-term power outages, and notes that "in the event of a widespread electrical transmission system blackout for an extended duration (beyond 7 days and up to several months), it may not be possible to transport...necessary offsite resources to the affected NPPs in a timely manner. Thus, government assistance (local, state, or Federal) may be necessary to maintain the capability to safely shutdown nuclear plants and cool spent fuel pools in the affected areas. Prior planning is needed to efficiently and effectively use government resources to ensure protection of public health and safety."⁴³ [footnote 43 text: *Id.*, p. 74797.] In other words, in the event of prolonged electrical grid failures, neither the NRC nor any other government agency has a strategy for implementing measures that would effectively prevent multiple concurrent reactor core meltdowns and SFP fires, which would cause catastrophic releases of radiation. It is worrisome that the frequency of extreme solar storms, causing the large-scale, long-term power outages that could lead to at least one SFP fire, is estimated to be *as high as once in 100 years* ($1.0 \times 10^{-2}/\text{yr}$).⁴⁴ [footnote 44 text: John Kappenman, "Geomagnetic Storms and Their Impacts on the U.S. Power Grid," Meta-R-319, pp. 3-14, 3-22, 3-26, 3-27.] The U.S. is particularly vulnerable to SFP fires, because its SFPs are densely-packed with spent fuel assemblies. (Low-density storage would help prevent SFP fires.) For example, in August 2013, Indian Point Unit 3's SFP—located less than 25 miles north of New York City—contained 1199 fuel assemblies, approximately 89 percent of storage capacity.⁴⁵ [footnote 45 text: NRC, "Summary of August 26, 2013, Meeting with Entergy Nuclear Operations, Inc. and Netco on Indian Point Unit 2 Spent Fuel Pool Management," September 24, 2013, (ADAMS Accession No. ML13256A086), p. 1.] (0463-1-6 [Leyse, Mark])

Comment: A 2011 Institut de Radioprotection et de Sûreté Nucléaire ("IRSN") information sheet on preventing SFP criticality accidents, in the event that PWR fuel assemblies would be uncovered by the pool's water, discusses results of an investigation of the potential affects of low-density optimum-moderator water conditions. The CRISTAL computer code was used to simulate scenarios in which a SFP did not have neutron-absorber materials in its storage racks;

the SFP contained 625 undamaged uranium-oxide PWR 17x17 assemblies in a height of 1.5-meters water.¹⁴⁷ [footnote 147 text: G Caplin et al., “Criticality Accident in Case of a Spent Fuel Pool Dry-Out,” IRSN, 2011, Information Sheet.] The CRISTAL computer code simulated how different low-density optimum-moderator water conditions would affect the effective neutron multiplication factor (*keff*)¹⁴⁸ [footnote 148 text: The effective neutron multiplication factor (*keff*) is the estimated ratio of neutron production to neutron absorption and leakage.] of fuel assemblies that had different pitches in a range between approximately 25 cm and 50 cm. The 2011 IRSN information sheet states that “injecting borated water to cool the [uncovered] assemblies [is] preferable when possible.” The use of borated water would help prevent a criticality accident, because boron absorbs neutrons; however, the 2011 IRSN information sheet states that water borated with 2000 ppm of boron reduces yet does not completely eliminate the risk of criticality.¹⁴⁹ [footnote 149 text: G Caplin et al., “Criticality Accident in Case of a Spent Fuel Pool Dry-Out,” IRSN, 2011, Information Sheet.] (It is pertinent that “BWR SFPs do not use borated water so the fact that the SFP may be refilled with unborated water is not a deviation from the norm.”¹⁵⁰ [footnote 150 text: NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” p. 30.] (0463-2-1 [Leyse, Mark])

Comment: The NRC’s 2010 “On Site Spent Fuel Criticality Analyses NRR Action Plan,” states that “virtually every permanently installed neutron absorber, for which a history can be established, has exhibited some degradation. Some have lost a significant portion of their neutron absorbing capability;” and states that “[t]he ability of licensees to control the material condition of any permanently installed neutron absorber that is credited for maintaining sub-criticality *is essential for the prevention of an inadvertent criticality event*” [emphasis added].¹⁷⁷ [footnote 177 text: NRC, “On Site Spent Fuel Criticality Analyses NRR Action Plan,” May 21, 2010, (ADAMS Accession No. ML101520463), pp. 1, 6.] And NRC information notice 2009-26 states that “[t]he degradation mechanisms and *deformation rates* of any of the neutron-absorbing materials in the SFP are not well understood” [emphasis added].¹⁷⁸ [footnote 178 text: NRC, “Information Notice 2009-26: Degradation of Neutron-Absorbing Materials in the Spent Fuel Pool,” p. 4.] (The degradation of neutron-absorber materials is especially worrisome for BWR SFPs, because they do not use borated water.¹⁷⁹ [footnote 179 text: NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” p. 30.] It is possible that the degradation of neutron-absorber materials would increase the potential for a criticality accident occurring in the event a SFP boil-off accident. If overheated, it is probable that previously-degraded neutron-absorber materials would lose their effectiveness more quickly than non-degraded neutron-absorber materials. (0463-2-10 [Leyse, Mark])

Comment: Experiments measuring the densities of water discharged from sprinklers and fire hoses have found that the maximum water density (0.004 g/cm³) is well below the *optimum-moderation* densities of water (0.05 to 0.1 g/cm³) that could cause fuel assemblies to have a criticality accident. However, “it has been observed¹⁵¹ [footnote 151 text: The source of this information is provided in the report: D. A. McCaughey and G. H. Biding, “Film Effects of Fire Sprinklers on Low-Enriched-Uranium Storage Systems,” Transactions of the American Nuclear Society, Vol. 56, p. 329 (1988).] that a quantity of mist moderation judged to be safe might still be unacceptable due to water film formation on the fuel material. The film thickness is due to the viscosity of water.”¹⁵² [footnote 152 text: E. D. Clayton, Pacific Northwest Laboratory, “Anomalies of Criticality: Revision 6,” PNNL19176, February 2010, pp. 76-77.] (In a SBO boil-off scenario with heated uncovered fuel assemblies, there would be water film formation on fuel-cladding surfaces after the cladding was cooled by the sprayed water. EPRI SFP accident guidance states that “effective cooling could be initiated because the spray droplets wet the high

temperature cladding surface and cause the formation of a sputtering water film that slowly drains over the high temperature cladding and quenches it.”¹⁵³ [footnote 153 text: EPRI, “Severe Accident Management Guidance Technical Basis Report,” Volume 2: “The Physics of Accident Progression,” 1025295, Appendix EE, p. EE-11.] Simulations with a computer safety model—KENO V.a—demonstrated that super-criticality could occur if water films formed on fresh fuel assemblies in dry storage racks, “display[ing] this effect for fuel assemblies containing 256 rods, composed of UO₂ at 4.1 wt.% enrichment, in a 16 x 16 array. The assemblies were in 19 x 34 storage array.”¹⁵⁴ [footnote 154 text: E. D. Clayton, “Anomalies of Criticality: Revision 6,” PNNL-19176, pp. 77, 80.] (See Figure 3.) [See Figure 3. Film Effects of Water Sprinklers on Storage Array of 4.1%-enriched UO₂ Rods in NRC Adams Database ML13351A310]. In storage racks that had a fuel-assembly pitch in a range between approximately 25 cm and 50 cm and did not have neutron-absorber materials, or whose neutron-absorber materials had previously melted, the upper end of exposed spent fuel rods also could be susceptible to criticality if sprayed with water. In the case of PWR rods, “[t]he majority of [spent] PWR fuel assemblies have...significantly under-burned fuel at the ends (with burnup of 50 to 60% of the assembly average);” and the “under-burned [end] regions are dominant in terms of reactivity.”¹⁵⁵ [footnote 155 text: J. C. Wagner, M. D. DeHart, Oak Ridge National Laboratory, “Review of Axial Burnup Distribution Considerations for Burnup Credit Calculations, ORNL/TM-1999/246, March 2000, pp. 2, 5.] The 2011 IRSN information sheet states that there could be a risk of criticality in PWR rods with a burnup of 10 GWd/t *in their upper ends*¹⁵⁶ [footnote 156 text: G Caplin et al., “Criticality Accident in Case of a Spent Fuel Pool Dry-Out,” IRSN, 2011, Information Sheet.] (their average burnup would be greater). (0463-2-2 [Leyse, Mark])

Comment: III.D.4. The Potential for Criticality Accidents When Water Boils in Certain Spent Fuel Pools: If a SFP had a SBO boil-off accident, optimum-moderation conditions—caused by water films—could occur at locations where the boiling water’s bubbly surface directly contacted fresh fuel assemblies.¹⁵⁷ [footnote 157 text: This is pertinent to racks (without neutron-absorber materials) that had fresh fuel assemblies stored with a pitch in a range between approximately 25 cm and 50 cm.] The temperature at the surface of the fuel rods would be approximately 100°C; hence, water films in the bubbly surface would be in direct contact with the cladding. 100°C is below the temperature at which a boundary layer of vapor would form between water and a metal surface (the Leidenfrost phenomenon). Furthermore, the 2011 IRSN information sheet states that there could be a risk of criticality in a SFP boil-off accident from the water mist generated by boiling water;¹⁵⁸ [footnote 158 text: G Caplin et al., “Criticality Accident in Case of a Spent Fuel Pool Dry-Out,” IRSN, 2011, Information Sheet.] the mist just above the boiling surface would be *extra-dense* water mist (with a density of approximately 0.05 g/cm³) prone to optimum-moderation conditions. Hence, after fuel assemblies were uncovered, BWR SFPs would be susceptible to criticality accidents in *boiling water*—provided the fuel assemblies had a pitch in a range between approximately 25 cm and 50 cm and their storage racks did not have neutron-absorber materials. As stated, the 2011 IRSN information sheet states that water borated with 2000 ppm of boron reduces yet does not completely eliminate the risk of criticality;¹⁵⁹ [footnote 159 text: Id.] therefore, if PWR fuel assemblies were uncovered in boiling water, they would be also susceptible to criticality accidents.¹⁶⁰ [footnote 160 text: Provided the fuel assemblies had a pitch in a range between approximately 25 cm and 50 cm and their storage racks did not have neutron-absorber materials.] Therefore, any plans to re-rack fuel assemblies stored in high-density racks to either medium-density or low-density racks, need to consider requiring that neutron-absorber materials be placed into the new storage racks; criticality analyses should be conducted on a case by case basis to determine if neutron-absorber materials would be needed. (In the US, there are not many (if any) SFPs that have fuel assemblies stored in low-density racks.) (0463-2-3 [Leyse, Mark])

Comment: 10 C.F.R. § 50.68 requires that safety analyses be conducted for scenarios in which SFP “spent fuel storage racks loaded with fuel of the maximum fuel assembly reactivity” would be flooded with unborated (and with borated water) water. 10 C.F.R. § 50.68 also needs to require that safety analyses be conducted for SFP-accident scenarios in which fuel assemblies that had a pitch in a range between approximately 25 cm and 50 cm and were stored in racks that did not have neutron-absorber materials, or whose neutron-absorber materials had previously melted, would be exposed to either low-density, optimum-moderation firefighting foam or water mist, or water films. (0463-2-5 [Leyse, Mark])

Comment: Perhaps the NRC would argue that in SFP-accident scenarios, it would not be a safety risk if such fuel assemblies¹⁶³ [footnote 163 text: Fuel assemblies that had a pitch in a range between approximately 25 cm and 50 cm and were stored in racks that did not have neutron-absorber materials, or whose neutron-absorber materials had previously melted.] were exposed to either low-density, optimum-moderation firefighting foam or water mist, or water films. A 2001 NRC report, NUREG-1738, states: The phenomenon of a peak in reactivity because of low-density (optimum) moderation (firefighting foam) *is not of concern* in spent fuel pools since the presence of relatively weak absorber materials, such as stainless steel plates or angle brackets, is sufficient to preclude neutronic coupling between assemblies. Therefore, personnel actions to refill a drained spent fuel pool containing *undeformed* fuel assemblies would not create the potential for a criticality¹⁶⁴ [footnote 164 text: NRC, “Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants,” NUREG-1738, Appendix 3, p. A3-2.] [emphasis added].; In their assessment that the presence of *relatively weak absorber materials*, such as stainless steel plates or angle brackets, would be sufficient to preclude neutronic coupling between assemblies, it is possible that the authors of NUREG-1738 were only considering spent fuel assemblies, overlooking the fact that fresh fuel assemblies—which are much more reactive—are also stored in SFPs. (In March 2011, the Fukushima Dai-ichi Unit 4 SFP was storing 204 fresh fuel assemblies (and 1331 spent assemblies).¹⁶⁵ [footnote 165 text: Juan J. Carbajo, Oak Ridge National Laboratory, “MELCOR Model of the Spent Fuel Pool of Fukushima Dai-ichi Unit 4,” 2012, p. 1.]) It is pertinent that fresh fuel storage racks, *in a dry environment*, also have stainless steel material—a relatively weak absorber material. The authors of NUREG-1738 might have also overlooked the fact that the upper ends of spent fuel rods (perhaps PWR rods more than BWR rods) are significantly under-burned—“with burnup of 50 to 60% of the assembly average”—making those locations “dominant in terms of reactivity.”¹⁶⁶ [footnote 166 text: J. C. Wagner, M. D. DeHart, Oak Ridge National Laboratory, “Review of Axial Burnup Distribution Considerations for Burnup Credit Calculations, ORNL/TM-1999/246, March 2000, pp. 2, 5.] The authors of NUREG-1738 might have *non-conservatively* assumed that spent fuel assemblies have a uniform axial burnup distribution. Additionally, the authors of NUREG-1738 did not consider that “[s]ome [spent fuel] racks are also fabricated from aluminum,”¹⁶⁷ [footnote 167 text: EPRI, “Severe Accident Management Guidance Technical Basis Report,” Volume 2: “The Physics of Accident Progression,” 1025295, Appendix EE, p. EE-9.] which like zirconium is quite transparent to neutrons. (0463-2-6 [Leyse, Mark])

Comment: The results of the CRISTAL computer code simulations discussed in the 2011 IRSN information sheet on preventing SFP criticality accidents, in the event that PWR fuel assemblies¹⁶⁸ [footnote 168 text: The PWR fuel assemblies could be either fresh fuel assemblies or assemblies with a burnup of 10 GWd/t in their upper ends; in both cases, the fuel assemblies would be stored in racks without neutron-absorber materials with a pitch in a range between approximately 25 cm and 50 cm.] would be uncovered by the pool’s water, indicate that criticality accidents, caused by optimum-moderation low-density water or water films, could occur in SFPs.¹⁶⁹ [footnote 169 text: G Caplin et al., “Criticality Accident in Case of a Spent Fuel Pool Dry-Out,” IRSN, 2011, Information Sheet.] This means that optimum-moderation

conditions could cause criticality accidents in either low-density open racks, without neutron-absorber materials, or medium-density racks with non-borated flux traps—provided the stored fuel assemblies had a pitch in a range between approximately 25 cm and 50 cm. (0463-2-7 [Leyse, Mark])

Comment: III.D.5. Boraflex and Boral Degradation in Spent Fuel Racks: In a September 2013 NRC, Japan Lessons Learned Project (“JLLP”) meeting, Rodney McCullum of the Nuclear Energy Institute (“NEI”) stated: “We understand in the industry we can no longer rely on Boraflex. We’re not relying on it anymore.”¹⁷⁰ [footnote 170 text: NRC, “Japan Lessons Learned Project Directorate Public Meeting,” September 18, 2013, Transcript of Proceedings, (ADAMS Accession No: ML13277A215), p. 214.] As stated above, Boraflex is a neutron absorber, intended to help prevent criticality accidents, that is located in spent fuel racks. Boraflex degrades; nonetheless, it is still used in a number of SFPs, including Indian Point Unit 2’s.¹⁷¹ [footnote 171 text: NRC, “Summary of August 26, 2013, Meeting with Entergy Nuclear Operations, Inc. and Netco on Indian Point Unit 2 Spent Fuel Pool Management,” September 24, 2013, (ADAMS Accession No. ML13256A086), p. 1.] In May 2002, the high-density storage racks in Region 1-2 of the Indian Point Unit 2 SFP were “assumed to have sustained a 50 percent loss of Boraflex,” due to degradation.¹⁷² [footnote 172 text: NRC, Letter Dated May 29, 2002 to Michael R. Kansler, Entergy, “Indian Point Nuclear Generating Unit 2: Amendment Regarding Credit for Soluble Boron and Burnup in Spent Fuel Pit,” Enclosure 2, “Safety Evaluation Regarding Indian Point Unit 2,” (ADAMS Accession No: ML021230367), p. 3.] And, a NRC document, dated September 24, 2013, states that “[t]he existing Unit 2 SFP criticality analysis of record, which takes credit for Boraflex inserts as neutron absorbers, was submitted by letter dated September 20, 2001.”¹⁷³ [footnote 173 text: NRC, “Summary of August 26, 2013, Meeting with Entergy Nuclear Operations, Inc. and Netco on Indian Point Unit 2 Spent Fuel Pool Management,” p. 1.] Hence, even though there has doubtless been further degradation of Boraflex over the last dozen years, the Boraflex in a region of Indian Point Unit 2’s SFP is still assumed to have sustained a 50 percent loss. (Indian Point Unit 2 is a PWR; its SFP is required to use water that is borated with at least 2000 ppm of boron.) (0463-2-8 [Leyse, Mark])

Comment: Regarding Boraflex degradation and eroded subcriticality margins, a September 2012 NRC document states: Among neutron absorbing materials used in spent fuel pools, Boraflex degraded most severely. Boraflex is a neutron absorber material comprised of silicone polymer and boron carbide powder. When gamma-irradiated by spent nuclear fuel, Boraflex is prone to degradation and dissolution in the aqueous environment of the spent fuel pool. Consequently, *the subcriticality margins that existed when Boraflex was first installed have eroded*¹⁷⁴ [footnote 174 text: NRC, “Boraflex, RACKLIFE, and BADGER: Description and Uncertainties,” September 2012, (ADAMS Accession No: ML12216A307), p. ii.] [emphasis added]. As stated above, Boral is also a neutron absorber that is located in spent fuel racks; and like Boraflex, Boral degrades. Regarding Boral degradation, NRC Information Notice 2009-26 states: Blisters and bulges of Boral cladding are material deformations that change the dimensions of the material. These blisters and bulges can be either water filled or gas filled (from the reaction of the SFP water and aluminum from the Boral), which may not be accounted for in the criticality analysis.¹⁷⁵ [footnote 175 text: NRC, “Information Notice 2009-26: Degradation of Neutron-Absorbing Materials in the Spent Fuel Pool,” October 28, 2009, (ADAMS Accession No: ML092440545), p. 4.] And providing an example of the progression of Boral degradation, NRC Information Notice 2009-26 states: [T]he licensee at Beaver Valley stated that licensee inspections in 2007 of the Boral neutron absorber material coupons identified numerous blisters of the aluminum cladding, while only a few small blisters were identified in 2002. ...blisters can displace water from the flux traps between storage cells and challenge dimensional assumptions used in the criticality analysis.¹⁷⁶ [footnote 176 text: Id., p. 2.] (0463-2-9 [Leyse, Mark])

Comment: EIS analyses focus upon impacts of proposed human activity on the environment. Yet hazards related to nuclear plant operations and to spent fuel storage can be profoundly affected by the reverse; i.e., impacts of the environment upon a facility. (0464-2 [Nelson, Pam])

Comment: The NRC's flawed environmental study is based on a number of unrealistic assumptions that must be reconsidered. Instead of a strict risk/consequence approach, the NRC relies on a "probabilistic risk analysis" which allows it to underestimate the consequences of an intentional attack, based on its belief that the risk is extremely low. (0465-4 [Commenters, Multiple])

Comment: THE DRAFT GEIS DOES NOT PROPERLY EVALUATE THE CUMULATIVE RISKS OF POTENTIAL LOW PROBABILITY BUT HIGH-CONSEQUENCE EVENTS AND THEREFORE DOES NOT SUPPORT ITS CONCLUSIONS THAT ASSOCIATED ENVIRONMENTAL IMPACTS ARE "SMALL" ACROSS ALL TIMEFRAMES CONSIDERED. Even if the framework applied in the GEIS were valid, and the conclusion that environmental benefits do not differ across Alternatives were supported, the approach used in the GEIS to describe the cumulative risks of low probability / high consequence events is flawed. (0473-1-15 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: 1. The Draft GEIS provides very limited quantitative information on the probabilities or consequences of severe accidents or events associated with continued storage. Both pieces of information are required to support the NRC's conclusion that risk is "low" and therefore impacts are "small." The Draft GEIS states that severe accidents, such as spent fuel pool fires, would generate significant and destabilizing impacts (Draft GEIS, pg. 4-68). In weighing these environmental consequences, the NRC multiplies the expected impacts by the probability of occurrence of an initiating event (e.g., seismic events, loss of offsite power, cask drops, aircraft crashes, or tornado missiles). The Draft GEIS describes multiple types of accidents that may occur over the short-term, long-term, and indefinite time frames, but only includes a quantitative assessment of the risk of spent fuel pool fires from seismic events.² [footnote 2 text: 2 The NRC concludes that the probability-weighted impacts from a spent fuel pool fire are small because the probability of an initiating event is extremely remote (Draft GEIS, pg. F-1). The NRC relies on two key pieces of information to support this conclusion. First, to determine the probability of an event, the NRC references the expected frequency of the most likely initiating events (i.e., seismic events or cask drops). The probability of these events occurring in a given year is based on information from previous NRC studies and varies between 5.8×10^{-7} (one chance in 1.7 million) to 2.4×10^{-6} (one chance in 417,000). Second, the NRC estimates the total economic cost per spent fuel pool accident of approximately \$57 billion (Draft GEIS, pg. F-4).]; For all other types of accidents and events (cask drops, earthquakes, floods, high winds, terrorist attacks, etc.), the NRC simply asserts that existing design criteria and safety requirements ensure environmental consequences would be small because licensees must demonstrate that either probabilities or consequences of events are sufficiently low. This Draft GEIS repeatedly points to the NRC's existing safety programs as evidence of low probabilities of accidents despite the following statement in the Court decision with respect to the 2010 Waste Confidence Decision: "With full credit to the Commission's considerable enforcement and inspection efforts, merely pointing to the compliance program is in no way sufficient to support a scientific finding that spent-fuel pools will not cause a significant environment impact during the extended storage period. This is particularly true when the period of time covered by the Commission's predictions may extend to nearly a century for some facilities." (New York v. NRC, 681 F.3d 471 (D.C. Cir. 2012), pg. 17). (0473-1-16 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The evaluation of impacts of accidents and events associated with spent fuel storage should consider both the probability and consequences of events, as described by the D.C. Circuit Court: "As should be clear by this point in our opinion, an agency conducting an EA generally must examine both the probability of a given harm occurring and the consequences of that harm if it does occur. Only if the harm in question is so "remote and speculative" as to reduce the effective probability of its occurrence to zero may the agency dispense with the consequences portion of the analysis." (New York v. NRC, 681 F.3d 471 (D.C. Cir. 2012), pg. 18-19). (0473-1-17 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: In fact, the Draft GEIS has not demonstrated that the effective probability of accidents and events is zero. The Draft GEIS makes the assertion regarding low probabilities of all initiating events despite describing significant uncertainties and information gaps: With respect to sabotage or terrorist attacks, despite acknowledging that the probabilities are "numerically indeterminable," the Draft GEIS nevertheless asserts they are "very low" (Draft GEIS, pg. 4-86). (0473-1-18 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: In fact, the Draft GEIS has not demonstrated that the effective probability of accidents and events is zero. The Draft GEIS makes the assertion regarding low probabilities of all initiating events despite describing significant uncertainties and information gaps: Following the March 2011 earthquake and tsunami incident at the Fukushima Dai-ichi nuclear power plant in Japan, the NRC requested that all U.S. nuclear power plants identify and address vulnerabilities and adequacies of monitoring and maintenance procedures, as well as re-evaluate the flooding and seismic hazards of the plants. The Draft GEIS states that it has not yet received these responses and so has not decided whether any existing licenses need to be modified, suspended, or revoked (Draft GEIS, pg. 2-11). Here, the Draft GEIS acknowledges that such vulnerabilities are site-specific, and that the NRC requires more information from licensees to better understand them. NRC's conclusion that they can rely on a GEIS approach and conclude that probabilities are low enough to result in "small" impacts is not consistent with this acknowledgement. (0473-1-19 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Despite insufficient information to demonstrate the probability of these events is effectively zero, the NRC dispenses with the need to evaluate consequences of certain types of accidents and events (the only impact estimates presented are for spent fuel fires, as described above). The Draft GEIS acknowledgement of insufficient information regarding the probabilities of particular high-consequence events should have led to the conclusion that codifying that environmental impacts of continued storage are small based on a generic assessment is premature and erroneous. Without information on both the probabilities and consequences of all postulated accidents and severe events, it is unclear how the NRC has the information to generically conclude that the product of the two is "small" across all sites and timeframes. (0473-1-21 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The Draft GEIS does not properly evaluate the cumulative risks of potential low probability but high-consequence events and therefore does not support its conclusions that associated environmental impacts are "small" across all timeframes considered. (0473-1-5 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: As discussed above, not only does this characterization violate NEPA and CEQ regulations, it is also in direct conflict with the D.C. Circuit's holding that "[o]nly if the harm in

question is so 'remote and speculative' as to reduce the effective probability of its occurrence to zero may the agency dispense with the consequences portion of the [NEPA] analysis." New York v. NRC, 681 F.3d 471, 482. (D.C. Cir. 2012). Commissioner Magwood has observed that "there were several interveners or NGO groups that had the comment that the [license renewal] GEIS is deficient because it doesn't take into account these future unplanned releases, and I struggle with this because I don't know how you go about estimating that." Transcript of Proceedings, Briefing On Proposed Rule To Revise The Environmental Review For Renewal Of Nuclear Power Plant Operating Licenses (Part 51) (Jan. 1, 2011), ML120180209 at 69. (0473-10-10 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: NRC's cumulative impacts assessment for severe accidents in Section 6.4.17 of the DGEIS is wholly insufficient. The DGEIS completely ignores the fact that if a severe accident were to occur at a reactor site, it could affect not only a spent fuel pool, but also one or more reactors at the site - and one or more spent fuel pools at the site. The multi-facility accident at Fukushima demonstrated that such events are not speculative. Moreover, the radiation that was released during the Fukushima does not reflect the upper limit of severe accident scenarios. See Official Exhibit - NYS000420-00-BD01 - Pre-filed Rebuttal Testimony of Dr. Francois J. Lemay, Ph.D. in support of Contention NYS-12C at 11-16 (June 29, 2012) (ML12340A678). (0473-10-11 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: There is no attempt to quantify this in the DGEIS, or perform a site-wide SAMA-type analysis. In fact, some of the assumptions in the DGEIS regarding what will happen at a site following an accident involving the spent fuel pool assume that the rest of the plant is intact. However, if the initiating cause of the accident is an earthquake or other natural disaster, it is likely that the entire plant, not just the spent fuel pool, will be damaged, as occurred at Fukushima. This synergistic destruction is ignored in the DGEIS's optimistic assessment of the consequences of a severe accident. (0473-10-12 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: In the license renewal context, recent severe accident mitigation alternatives analyses have focused on a severe accident occurring at a single reactor. In a similar manner the DGEIS and its Appendix F focus on a severe accident occurring at a single spent fuel pool. This approach ignores the real world reality that several sites have two reactors along with two adjacent spent fuel pools and that some sites have three reactors and three adjacent spent fuel pools. In July 2011, following the multi-unit accident at Fukushima, the NRC Commissioners convened a meeting to discuss site-wide probabilistic risk assessments. (0473-10-13 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Although the DGEIS does not mention any ongoing NRC efforts to prepare a comprehensive, site-wide level 3 PRA analysis (including a consequence analysis) of severe accident risk, publicly-available documents show that such an effort is underway, but appears to be at a preliminary stage. It is not clear when this will be completed or for which sites this will be completed. See, e.g., SECY-13-0118 - Recent Accomplishments and Near-Term Anticipated Accomplishments - 2013 at p. 11 (ML13273A122). It is for one plant only, and will not be completed by NRC for several years. The DGEIS should at least mention this effort, explain how and if it relates to the cumulative impact analysis, and examine whether it should be prioritized. For sites such as Indian Point where the potential severe accident consequences are enormous, a site-wide level 3 PRA that considers the risk of a severe accident for the whole site (reactors, spent fuel pools, and dry casks included) must be performed to evaluate the true cumulative impacts under NEPA. See Expert Review of Analytic Assumptions and Methods Applied in the NRC's September 2013 Draft Waste Confidence GEIS prepared by Robert E.

Unsworth and Maura Flight of Industrial Economics, Incorporated, Ex. E ("IE Report") (discussing probabilities that are calculated for one year at one reactor and not multiplied by the number of reactors and the number of years).¹⁸ [footnote 18 text: The IE Report is discussed in more detail below.] (0473-10-14 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Instead of performing a site-wide level 3 PRA to assess the severe accident risks at a plant site, the DGEIS essentially concludes that the probability-weighted risk of a severe reactor accident is small and the probability-weighted risk of a spent fuel pool fire is small, so the cumulative impacts of a severe accident, even when allowing continued on-site fuel storage in pools, is small. The DGEIS and the Spent Fuel Pool Consequence Study approach that looks only at a severe accident to one spent fuel pool at a multi-facility nuclear power station segments the analysis from the site wide risk and avoids examining cumulative impacts. Such a narrow inquiry violates NEPA. (0473-10-15 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: As counsel for the State of Connecticut represented to the Commissioners in January of 2012 at a public meeting regarding the License Renewal GEIS, Connecticut would shoulder the environmental consequences of displacements from residents fleeing an accident at Indian Point. *Id.* at 17-24. Those impacts have not been analyzed in the DGEIS, though they are indirect impacts from the long-term storage of high level nuclear waste on-site at Indian Point and thus required to be addressed under NEPA. (0473-10-17 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: NRC's Characterization of the Probability-Weighted Impacts of Severe Accidents As "Small" Is Inadequate Under NEPA: In evaluating the potential impacts of severe accidents, the DGEIS acknowledges that "[t]he consequences of a severe (or beyond-design-basis) accident, if one occurs, could be significant and destabilizing," but then goes on to characterize them as "small." See, e.g., DGEIS at 4-68- 69. NRC is only able to reach the conclusion that severe accident impacts are small by accounting for "the low probability of these events." *Id.* Former NRC Chairman Jaczko expressed his concern about this approach during a public meeting on the impacts of an accident in the license renewal context: CHAIRMAN JACZKO: So, you know, I can appreciate that so, you know, it's kind of the catch-all with all the things dealing with severe accidents is that it becomes small because you don't think it's going to happen. I can't say the more I hear of this that I'm comfortable with that. The more I hear it I think I don't think that's the right approach. I mean, I think the practical reality is that we should be honest about what the consequences are and, you know, again it is -- we are dealing in the environmental space, so our ability here is not regulatory requirements that we're putting in place, but I think it would be much more straight forward if we were actually communicating severe accidents in the actual way in terms of what their consequences were, which would bring in then, more naturally, I think this discussion about what are the environmental impacts of an evacuation. So, it's probably one of the most confusing things I think about the EIS and the - it's not restricted, of course, to this GEIS or to how we do it. I mean, the good part about it is we do it consistently in all our EISs. So in that vein, and I want just to highlight, I know that severe accidents are generally site-specific. To what extent, I mean, when we look at the site- specific analysis, to what extent is the site-specific analysis, the severe accident analysis, is that most of what is really in the site-specific or there are other things that get addressed? ANDREW IMBODEN: Well, in the site-specific reviews, the staff -- well, the applicants bring us in and the staff assesses the severe accident mitigation alternatives, how the severe accidents would be mitigated and then are the costs beneficial or not? And all of that is discussed in the site-specific reviews, because it is, you know, very dependent on which site and how you mitigate those.

CHAIRMAN JACZKO: And, again, we're dealing with this in NEPA space and we're not in -- this is not a licensing review piece. To what extent, you know, we ultimately have no authority then. I mean, we're not -- these mitigating measures are not things that we have authority to implement, maybe in some cases we put license conditions on, I don't know. But in general there are things that come about as part of the analysis. Do we keep track then of what they do for mitigation measures or anything that comes out of the same analysis? I mean, do we track that in any way? Does it become a commitment or does it get any kind of tracking? MELANIE GALLOWAY: No, no we don't. ANDREW IMBODEN: And to explain that a little bit further is sometimes, and we're seeing this in Columbia's environmental review, the applicant goes through this process, identifies something and does it by the time we finish our review. CHAIRMAN JACZKO: [affirmative] ANDREW IMBODEN: So there's that. CHAIRMAN JACZKO: But it's not -- I mean it's not captured other than maybe being referenced in the EIS. ANDREW IMBODEN: Well, and if there is anything that then needs to be done - CHAIRMAN JACZKO: Yeah. (0473-10-8 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: ANDREW IMBODEN: The staff would have a process for, you know, making sure it goes through the backfit as appropriate and those kinds of things. *Id.* at 81-82. CEQ regulations require the opposite of the NRC's approach, providing that impacts "include[] *impacts which have catastrophic consequences, even if their probability of occurrence is low*, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason." 40 C.F.R. § 1502.22(b)(4)(emphasis added). Under NEPA, an agency cannot dispense with impacts based on probability alone. (0473-10-9 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The Draft GEIS does not properly evaluate the cumulative risks of potential low probability but high-consequence events and therefore does not support its conclusions that associated environmental impacts are "small" across all timeframes considered. (0473-12-2 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The IE Report also demonstrates that even if the generic approach were acceptable, the DGEIS fails to properly evaluate the consequences and probabilities, and thus the risks, of indefinite spent fuel storage at reactor sites because it ignores the cumulative risks associated with the proposed action. By using the DGEIS to support a rule that excludes consideration of any environmental impacts associated with spent fuel storage at reactor sites on an individual basis, the DGEIS provides a generic approval of such storage but it fails to conduct a generic analysis of the consequences of that approval. To do that the DGEIS would have to look at the cumulative risks of allowing these conditions to exist at over 100 reactors for the indefinite future. Instead the DGEIS provides a single year's risk for a single hypothetical reactor. NEPA does not allow the use of such a distorting methodology to assess environmental consequences. This problem is made even worse by the failure of the DGEIS to use well-accepted methodologies to properly discount impacts to estimate a present value. Both EPA and the OMB have developed such methodologies but the DGEIS relies on neither. (0473-12-5 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: In addition, the DGEIS includes a few short sections briefly discussing potential severe accidents at spent fuel pools including spent fuel leaks, spent fuel pool fires, and sabotage or terrorist acts. DGEIS at Sections 4.18, 5.18, and 6.4.17. However, the only type of accident that is analyzed in detail is a spent fuel pool fire. (0473-13-7 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The ISR report explains that one of the lessons learned from the Fukushima accident is that mitigation measures that stop the progression of a severe accident may have clear benefits in the short term, but may create longer term hazards from liquid releases to the environment. ISR Report at 18-19. At Fukushima, the emergency workers pumped water into the damaged reactors. This water became contaminated on contact with the damaged fuel elements and leaked out into the basement of the reactors. This additional volume of highly radioactive water continues to add to the complexity and severity of the Fukushima accident. A recognition of this issue, much less any discussion of it, is utterly lacking from the DGEIS. There have been many reports regarding continuing radiological aqueous releases at the Fukushima site - more than two and a half years after the start of the severe accidents that damaged four of the Dai-ichi nuclear facilities. According to news articles, the receptacles holding radiation contaminated fluids at the Fukushima site have leaked and have released radiological material to the environment. See, e.g., Martin Fackler, *Damaged Nuclear Plant in Japan Leaks Toxic Water*, New York Times (April 6, 2013); Mari Iwata, *Japan Nuclear Plant Finds New Leaks*, Wall Street Journal (April 7, 2013); Hiroko Tabuchi, *Nuclear Plant in Japan Has Leak in Other Tank*, New York Times (April 9, 2013); Hiroko Tabuchi, *Fukushima Nuclear Plant Is Still Unstable, Japanese Official Says*, New York Times (April 10, 2013); *Fukushima Plant Has 300-Ton Water Leak*, Associated Press, New York Times (Web Edition) (August 20, 2013) ("The operator of Japan's tsunami-crippled nuclear power plant said Tuesday that about 300 tons (300,000 liters, 80,000 gallons) of highly radioactive water have leaked from one of the hundreds of storage tanks there -- its worst leak yet from such a vessel."); Martin Fackler & Hiroko Tabuchi, *Memo From Japan With a Plant's Tainted Water Still Flowing, No End to Environmental Fears*, New York Times (October 24, 2013); *Latest Leak at Japan's Fukushima Plant Contaminates Six Workers*, Mari Saito, Reuters (October 9, 2013); Mari Iwata & Toko Sekiguchi, *Japan Unveils Strategy to Deal With Fukushima Daiichi Water Leaks Projects to Cost Around \$475 Million Include a Wall of Ice, Second Processing Plant to Filter Radioactive Particles*, Wall Street Journal (Sept. 3, 2013). On August 1, 2013, NRC made the transcript of a December 2012 Advisory Committee on Reactor Safeguards ("ACRS") subcommittee meeting publicly available. July 30, 2013 Memorandum to ACRS Members regarding Certified Minutes of the ACRS Reliability and PRA Subcommittee Meeting on Level 3 PRA on December 4, 2012 (ML13211A477) ("ACRS Transcript"). At that meeting Alan Kuritzky from NRC's Office of Research, Division of Risk Analysis, explained Aqueous transport and dispersion of radioactive materials, this is something very big given the Fukushima event, but something we simply are not going to address in our study, but the Agency as a whole is looking into it. ACRS Transcript at 43:17-21. (0473-14-1 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: In fact, the MACCS2 code, used by the NRC to examine severe accidents, does not even take aqueous releases into consideration. A presentation by the Director of NRC's Research Office from NRC's March 2013 Regulatory Information Conference makes clear that the MACCS2 computer code used to examine severe accidents lacks the ability to analyze the impacts to water resources and the environment resulting from aqueous radiological releases accompanying such an accident. International Session - Post-Fukushima Research, Brian Sheron, Director, NRC Office of Nuclear Regulatory Research (March 13, 2013).²⁶ [footnote 6 text: 26 The document is available at <https://ric.nrc-gateway.gov/m/Docs/Abstracts/sheronb-rev1-hv-w15.pdf>.] In slide 7 of that presentation (reproduced below), NRC notes (1) aqueous releases occurred during the Fukushima accident, and (2) current models do not address aqueous release pathways. The term "current models," as used in the slide, would include computer codes such as MACCS2. Aqueous releases following a severe accident would be of particular concern at Indian Point, which sits on the Hudson River. Aqueous releases have the potential to contaminate the Hudson River's waters, riverbanks, riverbed and sediment, adjacent

freshwater tidal wetlands, and fish and other aquatic organisms, and impacts to the environment and human health could exceed the impacts flowing from the aqueous releases into the Pacific Ocean at Fukushima. (0473-14-2 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The DGEIS offers absolutely no analysis of the impact of a spent fuel pool fire, accident, or leak on non-human biota. As discussed above, the low probability of an accident or fire does not absolve the NRC of performing the analysis of potential impacts, as the D.C. Circuit made clear. Quantifiable impacts to biota occur after releases of radioactivity from power plants. For example, after the meltdown at Fukushima, the New York Times reported that:

- Initially, scientists found that the abundance of birds, butterflies and cicadas had decreased significantly as the level of radiation increased. Bumblebees, dragonflies and grasshoppers were not affected by the release of radioactive materials, however. Surprisingly, spiders actually increased in abundance with the rise in radiation. *Fukushima v. Chernobyl: How Have Animals Fared?*, NYTimes GreenBlog, July 13, 2012, available at http://green.blogs.nytimes.com/2012/07/12/fukushima-vs-chernobyl-how-have-animals-fared/?_r=0 (last visited Nov. 15, 2013).
- Dr. Mousseau (a biologist at the University of South Carolina at Columbia) speculates that perhaps the insect prey that spiders normally feed on are weaker and easier to catch in the radioactive zones, and that spiders are possibly not particularly sensitive to the immediate contaminants. He predicts that over the long term, the [population of] spiders, bees, dragonflies and grasshoppers will eventually begin to drop off. *Id.*
- In Fukushima, animals have only cycled through a few generations at most since the disaster, so any mutations have probably not begun to manifest themselves. For short-lived species like insects, however, mutations could soon start to appear. *Id.*
- Scientists found that contaminated areas of Chernobyl and Fukushima are unlikely to be hospitable habitats for years to come. In Chernobyl, for example, the amount of americium-241, a highly radiotoxic isotope if ingested, is actually increasing as its parent nuclide, plutonium, decays. Radioactive materials like cesium are brought back to the surface soil each year by plant growth and pollination. *Id.*
- Scientists conclude that "artificial radionuclides from the Fukushima Nuclear Power Plant caused physiological and genetic damage to [pale grass blue butterflies.]" CNN, "Mutant butterflies a result of Fukushima nuclear disaster, researchers say" (Aug. 14, 2012), available at <http://news.blogs.cnn.com/2012/08/14/mutant-butterflies-a-result-of-fukushima-nuclear-disaster-researchers-say/> (last accessed Nov. 18, 2013), citing Hiyama, et al., The biological impacts of the Fukushima nuclear accident on the pale grass blue butterfly, SCIENTIFIC REPORTS (Aug. 9, 2012), available at <http://www.nature.com/srep/2012/120809/srep00570/full/srep00570.html> (last accessed Nov. 18, 2013). Moreover, sensitivity to irradiation varies between species (CNN, *supra*), warranting a species-by-species examination of the impacts of a spent fuel pool accident or fire. Similarly, past studies by Fukushima Prefecture found that as time passed, radioactivity levels declined at a faster pace for fish and shellfish in deeper parts off the coast than those on the seabed closer to the coast, indicating that analyses must be done both near and farther from each plant to capture full impacts. Asahi Shimbun, "With radiation fears rekindled, researchers seek truth off Fukushima coast," available at <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201308120096> (last accessed Nov. 18, 2013).

(0473-16-1 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: NRC's analyses of the adequacy of a current design to protect against natural phenomena hazards are based upon the original design basis. Climate change renders invalid analyses that rely only on historical conditions as a proxy for the future. In addition, the original design for plants in the Northeast, particularly Indian Point, were based on seismic analyses that are outdated. Recent analyses conducted by the United States Geological Survey show a

greater probability of a severe earthquake in the Northeast in general, and at Indian Point in particular, and a greater likelihood of more severe damage from such an earthquake, than was assumed when Indian Point was sited and when its seismic design was determined. Statement in Support of New York State Contentions and in Response to the April 30, 2007 License Renewal Application Submitted by Entergy for Indian Point Units 2 and 3 by Lynn. R. Sykes, Ph.D. Higgins Professor Emeritus, Earth & Environmental Sciences Lamont-Doherty Earth Observatory of Columbia University, Palisades NY 10964 (Nov. 29, 2007) and Declaration Of Leonardo Seeber, senior research scientist at the Lamont-Doherty Earth Observatory of Columbia University (Nov. 29, 2007) both filed as exhibits to New York State Notice Of Intention To Participate And Petition To Intervene in Entergy Nuclear Indian Point 2, LLC, Entergy Nuclear Indian Point 3, LLC and Entergy Nuclear Operations, Inc., Docket Nos. 50-247-LR and 50-286-LR (Nov. 30, 2007), ML073400205. If meteorological and climate conditions relevant to the design basis have changed over the intervening years, which is likely given observations in, for example, current trends in rainfall intensity, such changes have not been considered. As vulnerabilities from natural hazards change over time, a determination on the adequacy of systems to protect against such hazards should include up to date information available at the time of the DGEIS is written, not no longer relevant historical information. In this same vein, when the DGEIS states that General Design Criterion 2 (of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 C.F.R. Part 50) requires the design bases for structures, systems, and component reflect appropriate consideration of the most severe natural phenomena historically reported for the site and surrounding area (DGEIS at 4-71), the phrase "historically reported" should be interpreted as information available up until publication of the DGEIS in September 2013. DGEIS states that All safety-significant structures, systems, and components are required to be protected against the design basis flood by siting them above the highest flood water-surface elevation or providing adequate flooding protection. The NRC requires that this protection be achieved by using a dry site concept, external barriers, or incorporated barriers (NRC 1976). The dry site concept involves constructing the nuclear power plant above the design basis flood water surface elevation using either the natural terrain or engineered fill. External barriers are engineered solutions that can include levees, seawalls or floodwalls, bulkheads, revetments, or breakwaters. Incorporated barriers are also engineered solutions that involve specially designed walls or penetration closures. (0473-17-4 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The Draft GEIS does not evaluate the cumulative risk associated with the potential for multiple types of accidents and severe events over time. Furthermore, the Draft GEIS inappropriately evaluates probabilities and consequences on a per-year and per-accident or event type basis, separately concluding that the environmental impacts of each accident or event type are small in a given year. In a given year, however, the expected value of accidents/events would include the cumulative risk of all potential types of events (floods, earthquakes, terrorist attacks, cask drops, etc.). The Draft GEIS does not attempt to sum consequences across risk categories to determine the cumulative risk of multiple types of accidents and events (i.e., the combined probability and consequences of all potential disasters) in a given year. The Draft GEIS also does not include any acknowledgement that risks are cumulative over time. Even in the case that the environmental impact of severe events in a given year is small, the Draft GEIS considers continued storage over long timeframes (160 years and indefinitely). In short, over longer time frames the cumulative probability of a high consequence event is greater than over shorter timeframes, and such calculations could have been easily performed. (0473-2-1 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: *The Draft GEIS excludes any consideration of the effects of people's perceptions of risk associated with continued storage. Despite historical or statistical data describing risk, risk perceptions drive people's behavior and can generate real economic impacts.* In addition to not being supported by available information, a sole focus on statistical risk of high-consequence events, without consideration of people's perception of risk, is inconsistent with well-accepted risk-perception literature. Factors unrelated to historical or statistical data affect perceptions of risk. Many of these factors are relevant to the management of nuclear waste, including: voluntariness of exposure, dread associated with the hazard, the extent to which the risk can be controlled, the potential for catastrophe, and the level of uncertainty associated with the hazard.⁷ [footnote 7 text: Jenkin, Clinton M. July 2006. "Risk Perception and Terrorism: Applying the Psychometric Paradigm." *Homeland Security Affairs*. Vol II, No. 2.] For high-consequence events, the perception of risk, whether or not data demonstrate the risk is actually present, may generate real impacts. One example is the adverse effect of hazardous waste sites on neighboring property values, despite data demonstrating safety. Because perceptions of risk drive behavior and the public's priorities, and result in real impacts and consequences, these perceptions need to be taken into account in order to appropriately reduce impacts and consequences.⁸ [footnote 8 text: Ibid.] In light of this, the NRC's persistent assurance throughout the Draft GEIS that the probabilities of initiating events are very low is unlikely to reduce public perceptions of risk. In only addressing historical and statistical data describing probabilities of events, the NRC ignores that these data are not indicative of the public's level of concern with respect to management of spent fuel. Despite repeated assurances of low probabilities of severe accidents and events, the public remains significantly concerned as evidenced through the scoping process on the Draft GEIS. Importantly, it is the public's perception of risk that generates some types of environmental consequences (e.g., property values or participation in recreational activities in areas surrounding plants). In addition to reducing property values, in the case that people choose not to recreate within the area of a continued storage site, local economies may suffer from the reduced tourist spending. It is therefore important for NRC to recognize and assess the impacts of these risk perceptions. As opposed to repeated assurances of low probabilities, a more effective analysis would focus on the site-specific consequences of events, and the best approaches to avoid or mitigate events within the context of a given site. In line with this approach, in response to September 11, the Department of Homeland Security has treated high consequence events differently, effectively doing everything they can to avoid such events. The NRC asserts in the Draft GEIS that it applies a "defense-in- depth philosophy" to identify all safety features, measures, and plans to protect human and environmental health and safety (Draft GEIS, pg 4-68). It follows that this philosophy should include capitalizing on every opportunity to obtain site-specific information on vulnerabilities and risks, and design appropriate management and mitigation strategies accordingly. The decision to rely on a generic evaluation of environmental impacts and codify that no site-specific evaluation of continued storage is required is counter to the NRC's own stated philosophy. (0473-3-1 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Finally, the limited information provided in the Draft GEIS does not support the finding that environmental consequences of continued storage, particularly as relates to postulated accidents and severe events, are "small" across all sites. (0473-4-2 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: It is extremely unsafe to leave nuclear waste so near so many earthquake faults. It is in a highly populated county with no evacuation routes EXCEPT the 5 which is already overcrowded. There is potential for so much damage to so many not to mention the economic ramifications. (0485-1 [Karas, Catherine])

Comment: Rather than insist on a robust waste management system intentionally designed to handle conceivable accidents whether through equipment failure, natural disasters, operator error or any other cause that could release radioactive materials to the environment, the NRC's draft document ultimately relies on the low probability of an accident to justify its position that reactor licensing and relicensing may resume. Low probability is not a substitute for protection, as the world already has learned from Fukushima to Chernobyl to Bhopal and Love Canal. (0491-5 [Commenters, Multiple])

Comment: Most people who live within a 50 mile radius of SONGS want the spent fuel stored there removed to assure safety in the case of a large Earthquake and the possible resulting Tsunami - while the odds of such events occurring are low they are possible. (0495-1 [Grigg, Richard])

Comment: On reviewing the Draft of "Waste Confidence Generic Environmental Impact Statement" the NRC states (Draft NUREG-2157 - page xxx dated September 2013) : "The NRC's concept of risk combines the probability of an accident with the consequences of that accident. In other words, the NRC examines the following questions: . What can Go Wrong? . How likely is it? . What would be the consequences?" They conclude that the risk for Short Term, Long Term and Indefinite Storage the risk of problems or of injury is SMALL see Draft NUREG-2157 Pages xlv, xlv dated September 2013. I believe this position is very close to the position the Japanese Regulators took prior to the disaster at Fukushima. The problem that is not addressed in the NRC approach is that the extremely large amount of damage and the extreme cost of the sort of disaster that a loss of spent fuel cooling water could cause by contaminating a large area is staggering (it is estimated that the existing spent fuel at SONGS contains 50 times the Cesium 137 that was released during the 1986 Chernobyl disaster which resulted in the initial evacuation of 350,000 people and at this time the land and homes in a 19 mile radius have been forcibly abandoned with entry limited to Monitoring and Research Personnel who stay only a short time). Most will agree with the NRC that the chances of a monster earthquake which causes a widespread disaster may in fact be quite low, however, the potential extent of damage is so great that it over rides the conclusion that the risk is small because the chance of such an event occurring is small - reason demands that every step possible be taken to eliminate the chance of such a disaster be taken immediately (0495-4 [Grigg, Richard])

Comment: Inadequate Consideration of Impacts or Mitigation of a Station Blackout: One of the most devastating events facing any nuclear plant is that of a station blackout. DLR's EISs have virtually ignored such an event and consequently have failed to evaluate the impacts on the public or mitigation measures for preventing such an event. The WCGEIS needs to be revised to address these risks and impacts posed by such events in terms of a national fleet of operating reactors and spent-fuel basins. (0496-10 [Batobato, Alicia])

Comment: 1. This constitutes a national program and requires a programmatic EIS. 2. Purpose and Need. 3. xxviii Risk Assessment (<http://www.nrc.gov/aboutnrc/regulatory/riskinformed.html/>) doesn't exist therefore cant understand it. 4. Admitte on page Xiii that env impacts of spent fuel are "large" should be "LARGE." 5. Flooding, Earthquakes Page 4-73 risk is small- no evidence. Solar flares never considered. 6. Page xii states "the environmental impacts of these postulated accidents involving continued storage of spent fuel in pools are SMALL" Incorrect, the risk is small not consequences. 7. No consideration of beyond design accidents 8. Page 4-68/69 says that impact could be low if prob is low- incorrect. The risk is low but the consequences are large. 9. New Alternative: Shut reactors down until a permanent method of disposal is found.

10. Cumulative risk from all spent fuel sites in the nation. They only looked at risk from spent fuel fire at one site! I can absolutely, unequivocally prove that the risk of an accident is not small. I took half a day off from my consulting practice to review the Waste Confidence EIS. In just half a day, I can see this analysis is profoundly flawed. The flaws start on Chapter 1 (Statement of Purpose and Need [SPN]) and continue into all the other sections that I briefly reviewed. For instance, NRC couldn't even define its "purpose" and "need" correctly - and in fact confused both terms).¹ [endnote 1 text: 1 Eccleston, Environmental Impact Statements: A Comprehensive Guide to Project and Strategic Planning, "Schmidt's Model for Defining the Scope of Alternatives." pp92-93 Eccleston, The EIS Book, Chapter 3, "Defining the Statement of Purpose and Need," 2013.] Since the SPN forms the basis for the range of alternatives this may mean that the scope of alternatives is also flawed. (0496-14 [Batobato, Alicia])

Comment: But I see much more interesting problems. For example: 1. The EIS actually states (admits) that the impacts of a severe accident would be "large" and "significant and destabilizing." [This is a logical and correct statement] 2. It then argues that impact determinations are made with consideration of the low probability of an accident. The environmental impact determination is based on the risk (product of the probability and the consequences of an accident). [This is incorrect. The risk determination is based on probability. The consequences are as they admitted above "large"] 3. It then incorrectly concludes that a high-consequence low-probability accident (severe accident), could result in a "small impact determination, if the risk is sufficiently low." This conclusion is completely bogus. They have mixed up the engineering concept of "risk" with NEPA's concept of "impacts." They started off admitting that the "impacts" of a large accident are "large" and "significant and destabilizing." Then they introduce "risk" to argue that these same impacts are actually "SMALL." They have mixed up the concept. The "risk" of an accident could indeed be "SMALL." But that does not mean that the "impact" posed on the public is "SMALL." The actual impact of a severe accident would in fact be "LARGE"! In other words: $R = I \times P$; The impacts are large and will always remain large. It is the risk that they argue (incorrectly) is small. But as the equation shows, it is the risk of an accident that they argue is small not the impacts. I did a word count. The NEPA Regulations provide direction and mention the concepts of "impact", "effect", and consequences, 77 times, 55 times, and 5 times, respectively. Not once do the regulations state that "risk" can be substituted for evaluating impacts or reaching a significance determination of an impact (e.g., effect or consequence). NRC is on mighty shaky ground in its attempt to show the public that there is nothing to worry about. This is a huge error and very misleading to political leaders, decision-makers, stakeholders, and the public. Moreover the entire analysis has neglected other vital considerations such "similar actions," "cumulative impacts," "cumulative risk"....I could go on and on. These other factors could significantly increase both the impacts and risk of an accident. Finally, they have reached these implausible conclusions without a technical justification or basis. To me, this looks, walks, and quacks like an "arbitrary and capricious" conclusion. In fact, I have a published mathematical technique that can absolutely prove, unequivocally prove, that the risk of an accident is not small. I can irrefutably prove that the risk is "LARGE;" If this is anything like the LR EISs (I suspect it's much worse given how fast they slapped this thing together) it is flawed to high heaven. You should be able to rip this thing to smithereens! I only wish I had more time to examine this in real detail. (0496-15 [Batobato, Alicia])

Comment: 1. Risk of Severe Accidents: NRC has routinely concluded that the risk of a "severe accident" at a nuclear power is "small." Likewise the Waste Confidence Generic Environmental Impact Statement (WCGEIS) concluded that the risk of a "severe accident" involving a spent fuel is "small." This conclusion is bogus and indefensible. The probability of a severe accident involving spent fuel is much larger than NRC is attempting to portray to the public. The

probability of a severe nuclear reactor accident triggering a severe accident involving spent fuel only increases the risk of a tragic accident. The analysis presented in the WCGEIS needs to be redone to openly assess and disclose the true probability and consequences of a severe accident. Based on this re-analysis, the risk needs to be reassigned as "moderate" or "large". 2. Failure to Compute the Complete Risk of an Accident: Neither the WCGEIS nor NRC's LR EISs have evaluated the total risk that the public faces from accidents involving the nation's fleet of operating reactors. Nor has the WCGEIS evaluated the total risk from all spent-fuel stored around the nation. The WCGEIS must be revised to assess the total national risk posed by a severe accident from the entire fleet of operating nuclear reactors and spent fuel storage. The WCGEIS must also be revised to assess the total risk posed by a severe accident from all nuclear reactors combined with the risk posed by a severe accident involving the spent-fuel for all nuclear power plants. (0496-2 [Batobato, Alicia])

Comment: 3. The Impacts of Severe Accidents are not Investigated: The NEPA regulations are clear: The "impacts" or "consequences" must be evaluated NOT the risk of an accident. The LR EISs utterly fail to perform even a rudimentary assessment of the consequences of a severe accident. The environmental and health consequences of a severe accident need to be evaluated and disclosed to the public. Conflicting scientific opinions by other experts must also be addressed. This LR EIS re-analysis needs to be combined with the impact assessment of the spent-fuel basins provided in the WCGEIS to evaluate the combined effect posed by the nation's fleet of operating reactors. (0496-3 [Batobato, Alicia])

Comment: Impacts of Natural Disasters: The potential risk and effects posed by potential disasters such as posed by floods, dam failures, solar storms, and tsunamis' have not been adequately evaluated in the WCGEIS. New scientific data clearly shows that the risk posed by some of these events is much greater than NRC has acknowledged. For instance, the risk of a dam failure and flooding resulting in a severe accident to the nuclear reactor and/or spent fuel basin has not been adequately addressed. The WCGEIS needs to be revised to address the risks and impacts posed by such events in terms of a national fleet of operating reactors and spent-fuel basins. (0496-8 [Batobato, Alicia])

Comment: Did you know that an extreme solar storm hit Earth in the late 1890's? Did you know that this storm sent large electrical sparks shooting out of the telegraph line machines that existed at the time? http://youtu.be/_6th-VLxKrk Did you know that a huge solar super storm is powerful enough to fry all electric circuits, fry all transformers, and burn/short circuit all electric power grids WORLDWIDE? Did you know that this super solar storm (the Carrington Effect) has been extensively studied, researched and talked about in scientific circles? The scientists are even predicting another one will hit Earth soon, with potentially catastrophic results. "The National Academy of Sciences and several other federal government studies suggest that this extreme solar activity and emissions may result in complete blackouts for years in some areas of the nation. Moreover, there may also be disruption of power supply for years, or even decades, as geomagnetic currents attracted by the storm could debilitate the transformers. supply for years, or even decades, as geomagnetic currents attracted by the storm could debilitate the transformers. <http://youtu.be/GjgDhbKY8vs?t=4m>; Our research team talked with an engineer that is an expert with EMP pulses, such as those that can and will be generated by the sun, via the Carrington Effect. He said there is no way to protect electrical circuits from EMP generated damage or destruction unless they are inside a Faraday Cage, even if they are DISCONNECTED and turned OFF. Watch the PBS NOVA program, called Secrets Of The Sun, which talks in great detail about the Carrington Effect, but leaves out the nuclear power plant link to it. So what did we just learn? Solar scientists, NOAA, NASA, and other researchers all agree that a Carrington Effect is not only possible, but that it is coming. The only question is

when the next huge solar storm will hit Earth. The next question is; will we be ready for it? So what do the pro nuclear apologists say in response to this. First of all, they claim this Carrington Effect does not exist, and will never happen, much like the climate change deniers are all hired by huge corporations to come up with a pro pollution conclusion. Others will claim that this never happened, and it was just ordinary lightning that caused sparks to come out of the telegraph wires. Some naysayers will even claim that they know that an EMP pulse is not possible and cannot exist. The EMP pulse is a well known, well researched and known effect. Read more about it in the following article, by clicking on this link. EMP; lectromagnetic Pulse Effect And High Altitude Nuclear Bombs; via A Green Road Blog; <http://agreenroad.blogspot.com/2012/04/emp-electromagnetic-pulse-effect-and.html>; Next, the pro-nuclear power advocates may say that they will just disconnect a nuke plant from power grids during a Carrington Effect. Unless the whole nuclear plant is inside a Faraday Cage (which not one is) disconnecting it from the grid will make absolutely no difference. But let's assume for a second, just for argument's sake, that the nuclear plant is safe, and the power grid goes down for a lengthy period. (0498-1 [AGreen Road Project, Anonymous])

Comment: A government remote viewing program contained in the CIA reports the same thing is going to happen. The team of remote viewers confirm that the sun will in the very near future produce a HUGE solar storm that will reach Earth and knock out all electricity, plus fry all communications methods. See related articles links below to see the video by a remote viewer. (0498-10 [AGreen Road Project, Anonymous])

Comment: SOLUTIONS FOR THE CARRINGTON EFFECT; Dr Christopher Busby and RSRRW President Roland Von Malmberg discuss this issue in the video below and propose some solutions. They discuss and predict 4,000 Chernobyl disasters will happen worldwide, if nothing is done to prepare for the Carrington Effect. <http://youtu.be/P3L1atAcXwU> The book Busby recommends everyone read is titled: "Defending the Environment: Civil Society Strategies to Enforce International Environmental Law". By Linda A. Malone, Scott Pasternack. 2004, New York. Let's say that somehow you still believe that a solar storm cannot cause a major nuclear disaster. Ok, what are the odds of a major nuclear disaster happening in the USA, even without the Carrington Effect, or a nuclear war? Bottom line, the odds are astronomically high, that a major Fukushima like mega accident will happen in the USA in the foreseeable future. What Is The Statistical Probability Of A Major Nuclear Accident Like Fukushima In The USA? via @AGreenRoad <http://agreenroad.blogspot.com/2013/09/what-is-statistical-probability-of.html> (0498-11 [AGreen Road Project, Anonymous])

Comment: There is only one small problem. This super mega nuclear disaster of 800 nuclear plants and spent fuel pools melting down will go on for tens of thousands of years, with no end. Unless they are willing to live underground PERMANENTLY and forever, they better make some changes happen above ground. No life can survive above ground if all of these plants and spent fuel pools melt down. (0498-13 [AGreen Road Project, Anonymous])

Comment: Bottom line, having the power turn off for a year is a bummer and a lot of people will die. But having the power off for a year and having 400 nuclear power plants and their 400 associated spent fuel pools melt down, melt through and then blow up, just like Fukushima did recently, that is a MUCH BIGGER bummer and a terminal one for humanity. This sad horror story is entirely preventable. Humanity can live through a super solar storm, but only if we all get ready. Do you need some encouragement and passion to be part of the solution, instead of the problem? Listen to a song, and maybe that will help. FRYING DUTCHMAN "humanERROR" <http://www.youtube.com/watch?v=Q5p283KZGa8&feature=youtu.be> This young performer deserves to be on Oprah, all of the news channels and every talk show and

become a #1 hit song worldwide. SAVE THE CHILDREN! If not you, then who? If not now, then when? Who will save the children after the Carrington Effect melts down 400 to 1,000 nuclear power plants, 400 - 1,000 spent fuel pools and they all self destruct, start burning and releasing their HUGE Pandora's Box of horrors on humanity? Will it turn out that for lack of you, it will be too little, too late, with warnings ignored, and predictors silenced? This song should be on NPR, PBS, and all public access cable channels. Get involved. Make a difference. Do what you can. Write a letter to the editor. Pass on the Youtube song. Start a blog and post the link to this article. Copy the article and pass it around at work. Those who serve to cover up the crimes that these criminals are committing are JUST AS GUILTY, as accessories after the fact. HIDING A MURDER ABOUT TO HAPPEN IS NOT ANY DIFFERENT THAN MURDER ITSELF. (0498-17 [AGreen Road Project, Anonymous])

Comment: Most people will agree that having the power go out all across the globe for months, a year, or even longer is a HUGE problem. That power loss will cause a lot of suffering, loss of life and maybe even collapse entire civilizations. But the human race can live through this, if it were not for nuclear power plants. There is something that is even worse than non power for a year. What could be worse than mass starvation, no power, no gasoline pumps and no water pumps working? What we are pointing at is the Fukushima Effect. When the power went out there, we all know what happened there, within 8 hours. MULTIPLE Fukushima nuclear plants melted down, and blew up, along with their spent fuel pools, because they lost their power source FOR 8 HOURS. The pro nuclear apologists promised everyone that this would NEVER happen. source FOR 8 HOURS. The pro nuclear apologists promised everyone that this would NEVER happen. What will happen to all of these 400 global nuclear power plants and their 400 spent fuel pools, if planet Earth loses power for MONTHS or YEARS GLOBALLY, as these scientists and solar researchers are predicting? Remember, this is going to happen, for sure. It is not subject to debate. It is only a question of when it happens, not if. How do we keep all 400-1000 nuclear power plants, spent fuel pools, research facilities, university nuclear research plants, military plants and secret facilities around the world and their associated spent fuel pools globally from melting down and blowing up, after the power has been out for potentially weeks and/or months? The backup power systems of batteries and generators only last for a couple of days at most, if they are not burned out immediately by the EMP pulse. The "experts" all said that the Titanic could NEVER sink. The experts also said that the tsunami that hit Fukushima could NEVER happen. The experts said a multiple melt down and melt through of nuclear power plants could NEVER happen. The experts in the nuclear industry are claiming that a Carrington Effect can NEVER happen. They are not getting ready for it. Do you trust them, after all of the broken promises of free power, safe energy source, and an easy solution for the nuclear wastes? These same nuclear 'experts' knew 20 years ago that a tsunami was coming, but they ignored the warnings. These supposed nuclear experts had plenty of time to get ready for both a tsunami and an earthquake, but they depended on luck more than preparation. It would have cost 100 million bucks to get ready and modify the plant to protect against the tsunami. The experts did nothing. except attack the messengers and 'outsiders' who tried to warn them. The nuclear industry is doing NOTHING to get ready for this Carrington Effect, at least so far. (0498-18 [AGreen Road Project, Anonymous])

Comment: The next climax of solar storms is going to happen, possibly as soon as late in the year 2013, according to various sources. Here is a really neat video and close ups of the sun doing what it does <http://www.youtube.com/watch?v=t0Ehe77wrV0&feature=related> The Solar SuperStorm of 1859 It can happen again, and it will happen again..... guaranteed. NOAA, NASA and all solar scientists, plus PBS experts featured in the video above, all agree on this point. Just like gigantic tsunamis, earthquakes and fires happening at regular though infrequent intervals in human history, a Super Solar Storm will happen again.

http://science.nasa.gov/science-news/science-at-nasa/2009/29may_noaaprediction/ We had better get ready, because the perfect super solar storm is coming soon, just like the tsunamis that have hit various areas of the world recently.. Tsunamis are part of what happens normally every couple of hundred to several thousand years. They are natural. Look what happened to Japan, because they did not get ready for something that was in their historical documents, and in warning monuments placed all along the coast. Super solar storms are natural too. They happen every 50 to 200 years. We may very well experience a Super Solar Storm very soon. Are we ready for this? (0498-19 [AGreen Road Project, Anonymous])

Comment: What happens to a nuclear power plant without ANY POWER supply? As we know, Fukushima melted down within 8 hours of no power. If the generator control circuits are fried, if the computer systems inside the nuclear plant are fried, then the same thing happens and the nuclear plant melts down, along with the spent fuel pools. For those who don't know what happened at Fukushima, here is a short video explaining this mega disaster. Fukushima 5 Minute Summary Of Events 2011 to 2012; via A Green Road <http://agreenroad.blogspot.com/2012/06/fukushima-5-minute-summary-of-events.html>; If the EMP pulse from the sun (or a nuclear weapon) fries the large transformers that connect the nuclear power plant to the grid, that also means the end of human civilization. If the EMP pulse fries the electronics that controls the valves, pumps, meters, etc, that still means a nuclear plant will melt down. ALL of these things have to be protected from an EMP pulse. These circuits, transformers, computers and controls can be protected, but someone has to get these things ready for what is coming. Of course, this all costs a lot of money. The nuclear industry definitely does not want to spend money on this, despite risking an extinction level event. The US military has been doing EMP pulse protection preparation for many years now. They have 'hardened' much of their communications, vehicles and infrastructure to prevent them from being 'fried' in case of a huge solar storm, or an EMP pulse from a nuclear weapon explosion, which is another way this can happen. What if this EMP PULSE/Solar Storm lasts for eight hours or longer? Again, we know that without any doubts or arguments, Fukushima melted down within 8 hours of NOT HAVING ANY POWER.. None of the spent fuel pools will last much longer than that. None of the spent fuel pools can be passively cooled. The spent fuel pools all take electricity and powerful pumps to keep them cool. Fuku again proved this fact by actual example. Without power, the spent fuel pools will boil off the water inside of them, melt down and catch on fire or explode, releasing all of their radioactive contents. This also happened at Fukushima, to multiple spent fuel pools, but is being covered up by TEPCO, the regulators and the Japanese government. (0498-2 [AGreen Road Project, Anonymous])

Comment: We might not be as ready as people were back in the 1890's when the last Solar Super Storm hit Earth, to live without any power at all. Back then, human and animal power accounted for about 95-99% of all power needed for a task. Nowadays, less than 1% of all power needs are generated by animals or humans in the USA. Back then all that existed were a few telegraph wires. When the storm hit, sparks flew out of the telegraph clickers, and started a few fires, but that is about all. Electricity and technology as we know it today did not exist back then. (0498-5 [AGreen Road Project, Anonymous])

Comment: Imagine 10,000 times as much radioactive elements (or more) as Fukushima mega nuclear disaster going into the air, globally, and then NEVER STOPPING, due to radiation releases from uncontrolled melting blobs of corium fissioning into the air forever and possibly causing 400-800 China Syndromes all at the same time. Once these coriums get started, they never stop, and these fires never go out. There is no way to 'extinguish an out of control raging 2,500 - 5,000 degree Fahrenheit nuclear fireball, which is called corium. Corium melts through concrete, steel and soil like a hot knife through butter. What is the Nuclear Regulatory

Commission (NRC) doing to protect the public? What is the EPA doing to protect the public? What is the IAEA doing to protect the public? What are any of the other regulatory, safety, or nuclear marketing and sales organizations doing to protect the public from this Super Solar Storm? NOTHING. As a matter of fact, they are covering up what is happening and protecting the people who are responsible for the potential life extinction event above. (0498-8 [AGreen Road Project, Anonymous])

Comment: In the GEIS, the "probability weighted" impacts of severe accidents (i.e. "design basis" accidents, exceeding parameters to which facilities are designed and built) and "postulated accidents" (hazards from natural phenomena) are estimated to be small, since severe potential consequence is offset by very low calculated probability. Particularly when the potential consequence is severe, NRC's equal weighting of probability and consequence simply does not "calculate" for those most directly affected. For them, the potential consequence of a spent fuel fire or potential sabotage cannot be offset by an analyst's calculation of its very low probability. Thus, the same stakeholders make the same criticisms and suggestions over and over; NRC listens politely; and the critics never feel "heard" by NRC. Perhaps the recently-released NRC white paper on a risk management regulatory framework² [footnote 2 text: Which entertains questions regarding the acceptable level of risk, how risk should be measured and monitored, how to treat uncertainties, and the application of "defense-in-depth"] can suggest ways in which NRC can adjust its heavy reliance on technical risk to the exclusion of other perspectives and other dimensions. (0505-4 [Williams, Jim])

Comment: Storing spent fuel rods on location at nuclear power plants is unsafe from acts of nature and acts of mankind. Dry cask storage is not 100% safe either. The magnitude of the risk is so great that even a slight chance of something going wrong should not be taken. (0512-1 [Bibb, William])

Comment: IED could easily penetrate. Tornadoes, ice storms, flooding, solar flares, meteorites, or even a suicide aircraft could penetrate. (0512-5 [Bibb, William])

Comment: Robert Alvarez, formerly of the DOE, has said the spent fuel from Reactor 4 at Fukushima alone, if its building were to fail and it fell to the ground, could "end civilization" as we know it. In the U.S. reactors have been granted extensions to operate far beyond their useful lives, and beyond design capacity. Our air and aquifers are being contaminated; billions of gallons of water containing dangerous tritium are allowed to enter waterways and our coastal areas. The U.S. has tens of thousands of tons of spent nuclear fuel sitting in waste storage ponds and spent fuel pools. This is a disaster in the making. It has the makings of an event of Biblical proportions. The potential consequences of the failure of one of these pools is unthinkable, and could destroy the Northern Hemisphere, if not the entire world. We truly should learned more, and applied the lessons from Fukushima Daichi. An international response to the crisis is desperately needed. (0515-4 [Stennes, Nancy])

Comment: The Draft tells us that impact of a severe accident would be small. Based on what empirical evidence? Other nuclear powered nations seem to have information - and caution - very differently from the NRC. (0541-4 [Justesen, Evelyn])

Comment: - The Waste Confidence Rule should require that safety margins for spent fuel storage pools and dry cask storage mitigate risks associated with the widest reasonable range of accidents, natural disasters, and security threats. - The safety margins for natural disasters should explicitly consider earthquake seismic threats to storage facilities. - The GEIS does not

appear to explicitly consider seismic risks in the analysis assumptions of potential impacts (Sec 1.8.3) (0548-2 [Gibson, Bruce])

Comment: The NRC has approved on-site storage casks that are not approved for transportation of spent nuclear fuel (SNF). In the event that sea-level or river-level rise threatens the cask site, the fuel would have to be re-casked immediately into approved-for-transportation casks. This would result in an unnecessary radiation exposure to workers, as well as added costs and delays. It is not clear how this transfer would be accomplished since fuel pools will be decommissioned with the reactors. Any additional handling of irradiated fuel increases the odds of an accident and release of radioactivity. (0552-1-18 [Macks, Vic])

Comment: The NRC's Office of Nuclear Security and Incidence Response uses a predictive tool to aid emergency responders during nuclear accidents which indicates that the radiological release from a pool fire following an earthquake could dwarf that of a reactor meltdown. It also indicates that the consequence of the breach of a dry cask is thousands of times less severe. (U.S. Nuclear Regulatory Commission, Office of Nuclear Security and Incidence Response, RASCAL 3.0.05 Workbook, NUREG-1889, September 2007). (Curran). Curran, Diane." Mothers for Peace Attorney Diane Curran urges public participation in Sept. 18 NRC meeting", San Luis Obispo Mothers for Peace, <http://mothersforpeace.org/data/mothers-for-peace-attorney-diane-curran-urges-public-participation-in-sept.-18-nrc-meeting> (0552-2-19 [Macks, Vic])

Comment: Consider, for example, that a storage facility location makes it vulnerable to a catastrophic event of uncommon occurrence. How many facilities located in such places would it take to make a low-probability event be categorized as having a greater than SMALL impact? For example, the NRC recognizes six US reactor sites to have "high" vulnerability to severe flooding by upstream dam failure, and an additional nine reactors have "medium" vulnerability. This information was obtained from a memo entitled "Identification of Generic External Flooding Issue Due to Potential Dam Failures" prepared by the Chief of the Probabilistic Risk Assessment Operational Support Branch of the NRC. The memo further states that "Since dam failures were excluded from consideration of most [safety reviews], its risk contribution has not been addressed to date," and "There is an increase in the estimated frequency of potential dam failure of an order of magnitude" from previous assessments. It is evident from the testimony of Fukushima that one such event would have enormously greater environment impact than all the generic factors considered in the GEIS put together. The left hand of NRC needs to know what the right hand is doing. This particular issue must be evaluated in this GEIS. (0553-12 [Wilshire, Howard])

Comment: Furthermore, this section fails to include an important cause of accidents or exacerbation of accidents: the human factor: There is a very large literature on the contributions of human errors to accidents that have significant impacts on the environment. That history is ignored in this GEIS, but it needs to be factored in for all time frames considered. Human errors are not a given, but their frequency and persistence throughout our grand nuclear experiment have a certain generic flavor. The opportunity for mistakes with environmental consequences is enhanced by the large, and getting larger, number of dry cask designs, which require broadened knowledge for activities designed to ensure cask integrity, including inspection, monitoring, and replacement repeated at intervals greater than typical life-times of the inspectors-that is, the "activity" may be the same or similar forever, but those implementing the actions have by comparison a very rapid turnover. The historical record shows clearly that the majority of significant accidents are due to, or exacerbated by human errors, so calling on the "protections" of design, construction, and regulations is irrelevant. The opportunity for human error, especially considering the time that continued storage at a reactor is rationalized as

generically safe (up to 140 years), warrants assessment. In effect, most of the environmental impact assessments are best case scenarios. (0553-13 [Wilshire, Howard])

Comment: The draft assessed environmental impacts using a faulty and outdated Probabilistic Risk Assessment (PRA). NRC multiplied consequences by an unjustified low probability so that no matter how large the consequences, they are trivialized by NRC's choice of a "generic," infinitesimally small, probability of occurrence. (0556-1-12 [Lampert, Mary])

Comment: NRC relied on consequence studies that used an unreliable and outdated consequence code - MACCS or MACCS2. David Chanin, who wrote the FORTRAN for the code while at Sandia said, "It is my firm belief that the MACCS2 cost model is so seriously flawed that even with reevaluation and modification of all its input parameters, its cost results should not be used unless for replicating prior studies." (0556-1-13 [Lampert, Mary])

Comment: Reactors vary in susceptibility to flooding. For example, the Prairie Island reactors are located on an island in the Mississippi River and the Three Mile Island reactors are located in an island on the Susquehanna River. The Columbia Washington Reactor is located close to the Columbia River, and Indian Point is located close to the eastern shore of the Hudson River. Reactors also vary in whether NRC has covered up a reactor's susceptibility to flooding. The Huffington Post² [footnote 2 text: Flood Threat to Nuclear Plants Covered Up By Regulators, NRC Whistleblower Claims, Huffington Post, Sept., 14, 2013] reported in September that: In a letter submitted Friday afternoon to internal investigators at the Nuclear Regulatory Commission, a whistleblower engineer within the agency accused regulators of deliberately covering up information relating to the vulnerability of U.S. nuclear power facilities that sit downstream from large dams and reservoirs. The letter also accuses the agency of failing to act to correct these vulnerabilities despite being aware of the risks for years. (0556-1-17 [Lampert, Mary])

Comment: In addition to failing to evaluate impacts on a site specific basis and relying on unsupported and absurd assumptions, the DGEIS used an outdated and faulty PRA to reach its conclusions, which defy common sense. NRC evaluated environmental impacts using probabilistic risk assessment, multiplying the probability of an accident with the consequences of the accident. Because NRC used an outdated and unsupported low probability and minimized consequences, the environmental impacts were assessed as small over the three time frames, with the exception of historic and cultural resources, for which it could not determine the impact over the long and indefinite storage time frames. For example, NRC determined that "The consequences for severe (or beyond-design-basis) accident, if one occurs, could be significant and destabilizing. The impact determinations of these accidents, however, are made with consideration of the low probability of events... a high- consequence low-probability event, like a severe accident, could still result in a small impact determination, if the risk is sufficiently low." (DGEIS, 4-68) NRC's evaluation of environmental impacts -- consequences -- relied on "cherry-picked" studies that used pre-Fukushima probabilities and assumptions, and antiquated consequence codes: MACCS and MACCS2. It is as if NRC started with the answer and worked backwards to get the predetermined result. (0556-2-11 [Lampert, Mary])

Comment: Qualitative factors are ignored in the DGEIS analysis and as a consequence they do not account for unknowns such as human error, meteorology, future sea level rise, manufacturing defects, corrosion rates, etc. Chairman Macfarlane explained in the Notation Vote that, "These uncertainties are best done qualitatively (and) [t]he uncertainties in attempting to quantify an accident frequency should be offset by defense-in-depth. Being a geologist, I have an acute appreciation for the challenge of predicting the Earth's behavior. Since the earth

is constantly changing and our recorded knowledge represents one millionth of the Earth's history, there is much we do not know. In light of this, we must be wise in balancing confidence in our engineering prowess with the humble recognition that natural systems have repeatedly demonstrated the ability to confound us. The staff (SECY-12-107) also points out the large uncertainties involved in estimating the economic consequences given a large release of radioactive material using the existing economic consequences framework. An increase in either the event frequency or economic consequences of a severe accident at a nuclear power facility could easily push a filtered vent (in the Notation Vote context) into cost beneficial space." (0556-2-13 [Lampert, Mary])

Comment: If NRC treated uncertainties qualitatively, it "could easily push" the environmental impacts from small or moderate to large. Kamiar Jamali's *Use of Risk Measures in Design and Licensing Future Reactors*,¹⁹ [footnote 19 text: Kamiar Jamali, *Use of Risk Measures in Design and Licensing Future Reactors*, Reliability Engineering and System Safety 95 (2010) 935-943. Jamali is DOE Project Manager for Code Manual for MACCS2.] explained further that "PRA" uncertainties are so large and so unknowable that it is a huge mistake to use a single number coming from them for any decision regarding adequate protection. "Examples of these uncertainties include probabilistic quantification of single and common-cause hardware or software failures, occurrence of certain physical phenomena, human errors of omission and commission, magnitudes of source terms, radionuclide release and transport, atmospheric dispersion, biological effects of radiation, dose calculations, and many others." (Jamali, Pg., 935) (Emphasis added) Probability analysis has other pitfalls. PRAs do not consider human error. More important, PRAs project into the future and assume (based on very little real experience) that there is a likelihood that an accident scenario will occur in hundreds, if not thousands, of years is vanishingly small. But no reactors have operated more than 45 years, and there have been at least six severe accidents.²⁰ [footnote 20 text: Including the 1961 fatal accident at SL-1] The uncertainty inherent in predicting the future must be respected by making certain that appropriate and up-to-date assumptions are used in the analysis. NRC did not do this. (0556-2-14 [Lampert, Mary])

Comment: In the event of a severe accident at Pilgrim's location, there will be enormous aqueous radioactive releases and damage. The NRC's approved consequence analysis code (MACCS/MACCS2) ignores aqueous releases. Fukushima shows their huge impact on environmental resources. (0556-2-16 [Lampert, Mary])

Comment: NRC assumes that an accident will last only a day (that is also the usual industry practice) and in any event not more than 4 days (MACCS2 code's maximum limit). Fukushima showed accidents can extend for weeks and months, greatly increasing environmental impact. (0556-2-17 [Lampert, Mary])

Comment: The MACCS2 code that referenced documents used to model economic consequences of a severe accident is, at best severely limited in what it can do and what it cannot. Even in those areas where the MACCS2 code has some applicability, the code is manipulated to intentionally minimize potential consequences, to ignore real health costs, and to assign a too low cost to the value of a human life, compared to other agencies such as EPA. It uses essentially useless evacuation time estimates; the user chooses the input parameters into the model and chooses to average the code's inputs by a mean instead of using the 95th percentile. David Chanin, who wrote the MACCS/MACCS2 code's FORTRAN and SAND96-0957, finds the economic cost model "seriously flawed": "I have spent much time thinking of a way to--jigger the inputs so that the cost model of MACCS2 could be used in a sensible way. As the person who coded it into MACCS and then refined it for MACCS2, and also the person who

wrote SAND96-0957, I think what you are attempting is impossible. The economic cost model in MACCS2 was included (at request of sponsors) only for historical reasons to allow comparison of its cost estimates to those of previous studies. It is my firm belief that the MACCS2 cost model is so seriously flawed that even with reevaluation and modification of all its input parameters, its cost results should not be used unless for replicating prior studies. When I was involved with the MACCS2 project (from 1991-1996, and also later in 2000-2001) the NRC had no interest in implementing the cost model of SAND96-0957 into MACCS2. I could have done it without a lot of work, but they weren't interested."²¹ [footnote 21 text: EHD, Pilgrim 50-293-LR, Intervenor Exhibits, PWA00004, August 23, 2006] (PWA00004, August 23, 2006) (0556-2-21 [Lampert, Mary])

Comment: Mr. Chanin also explained²² [footnote 22 text: Ibid, PWA00004, "The Development of MACCS2: Lessons Learned," [written for:] *EFCOG Safety Analysis Annual Workshop Proceedings*, Santa Fe, NM, April 29–May 5, 2005]] that the MACCS2 code was not held to the QA requirements of NQA-a (American Society of Mechanical Engineering, QA Program Requirements for Nuclear Facilities, 1994). Rather it was developed using following the less rigorous QA guidelines of ANSI/ANS 10.4. [American Nuclear Standards Institute and American Nuclear Society, *Guidelines for the Verification and Validation of Scientific and Engineering Codes for the Nuclear Industry*, ANSI/ANS 10.4, La Grange Park, IL (1987)]. What this means is that all steps of the code development have not been documented and tested, and hand calculations have not verified the code's implementation of major transport and exposure pathways for a subset of the radionuclide library. (*Ibid.*) Mr. Chanin says further that, "If errors are later found in authorization basis calculations, an Unreviewed Safety Question (USQ) could be raised, and continued operation of the facility would then require a demonstration that the facility's safety basis was adequate." (Emphasis added.) Further, Mr. Chanin explains the importance of this point in his concluding remarks in *The Development of MACCS2, Lessons Learned*, prepared for the Energy Facilities Contractor Operating Group Safety Analysis Working Group, Annual Workshop, April 29–May 5, 2005, Santa Fe, NM. [T]he QA distinctions between an NQA-1 "licensing code" and a "research code" like MACCS2 have been emphasized in light of the fact that MACCS2 calculations are being used to support the Severe Accident Mitigation Alternatives (SAMA) analyses required for the license renewal of commercial nuclear power plants. It seems to me that the code's QA shortcomings and the lack of input justifications are again being ignored. The analysis described above applies to use of the code in studies referenced for support by the DGEIS and in turn the Waste Confidence decision. (0556-2-22 [Lampert, Mary])

Comment: Pilgrim's situation is instructive, in that its location on the coast of the Atlantic Ocean, unprotected from storm and wave action, creates unique environmental exposures relative to an inland plant. We need look no further than the Fukushima Nuclear Plant disaster to see how destructive wave action and salt water can affect a nuclear plant's systems. When we take into account the world's rising sea levels, and the inevitability of a destructive 100-year storm, the dangers of nuclear storage for Pilgrim become even more apparent. (0607-3 [Messinger, Michael])

Comment: The NRC is inappropriately applying the same weighting of probability and risk ratios that one would apply to a standard industrial mishap to an accident involving the release of radio-nucleotides into the environment. In fact, the NRC is unable to calculate the likelihood of all the variables and contingencies that attend major nuclear accidents, most significantly operator error. The NRC's theoretical probabilistic risk assessment is fraught with ambiguity and uncertainty, and does not rise to the level of accuracy needed to justify the claim of insignificant risk. The GEIS cannot assess or quantify the billions of small events that contribute to nuclear

accidents in the real world. We note that the probabilistic risk assessment used in the GEIS is the same approach used by Japan's Nuclear and Industrial Safety Agency in assessing the safety of Fukushima Daiichi and served as the basis of approval of a ten-year extension of the plant's operating license a month before it was destroyed by an earthquake and tsunami. The GEIS fails to note that nuclear accidents happen with greater frequency than the NRC's probabilistic risk assessment model predicts.⁴ [footnote 4 text: 4 Bulletin of the Atomic Scientists, "Beyond our Imagination: Fukushima and the problem of assessing risk," April 20, 2011.] The Bulletin of the Atomic Scientists cites the actual frequency of severe accidents in contrast to misleading claims about reactor accident frequency based on PRA, the poor record of PRA in modeling unexpected failure modes and common-cause failures, and the finding by MIT researchers that the PRA model fails to include indirect, non-linear and feedback relationships in chain-of-event risk assessments. It concludes: "The multiple problems with the probabilistic risk assessment method suggest that any conclusions about overall accident probabilities derived from its use are far from dependable...[Probabilistic risk assessments] create overconfidence among those designing and operating reactors." We agree that the complete reliance of the GEIS on probabilistic risk assessment to determine the actual risk and impact of accidents at nuclear power plants is misplaced. (0614-10 [Christie, Andrew])

Comment: The GEIS omits meaningful description of risk. In virtually every instance, the GEIS underplays or omits the actual consequences of a nuclear accident or an attack on a facility resulting in the release of radioactive material into the environment. The GEIS primarily contents itself with a single adjective -- "small" or "large," or "significant" and "destabilizing" -- offered as an analysis of environmental impacts. Had such an analysis been performed for Fukushima Daiichi, pre-tsunami, the potential impact of multiple reactor core meltdowns would have been classified as "small" because the possibility was remote. Potential effects would have been termed "large" or "significant and destabilizing" but such details of the possible evacuation of Tokyo and the destruction of Japan's economy would have been omitted. (0614-5 [Christie, Andrew])

Comment: The NRC's method of determining risk is deficient. The NRC's method of determining risk of accident or attack, in every instance, results in a determination that a high-consequence/low-probability scenario equates to a "small" environmental effect: The NRC finds that even though the environmental consequences of a successful attack on a spent fuel pool during continued storage are large, the very low probability of a successful attack ensures that the environmental risk is SMALL. Similarly, for operational ISFSIs during continued storage, the NRC finds that the environmental risk is SMALL. (0614-9 [Christie, Andrew])

Comment: In reality, PRAs utterly fail to assess the dangers of ongoing operations with no end in sight. 100-year floods and earthquakes become inevitable instead of rare if you wait long enough -- and that seems to be exactly what the nuclear industry wants: For us all to wait until there is a disaster, only to claim they never saw it coming. (0616-7 [Hoffman, Ace])

Comment: There isn't any city or town in Southern California which is a suitable site for a nuclear waste dump, and certainly not ours. San Onofre is situated in an earthquake and tsunami zone in the middle of two large metropolitan areas. (0618-3 [Johnson, Roger])

Comment: Severe accidents: Section 4.18 of the draft GEIS discusses the environmental impacts of postulated accidents (design basis or severe) and concludes that, although the consequences would be significant and destabilizing, the risk is SMALL because the likelihood of these events occurring is remote. There is no discussion of the potential economic consequences of postulated accidents. This should be included in the final GEIS. It is not

enough to state that the likelihood is remote and end the discussion. These consequences must be fully evaluated in the draft GEIS. As the final Waste Confidence GEIS will no doubt be held up by some as 'proof' that long-term or indefinite storage is without environmental impact, the final GEIS must include some discussion or evaluation of the socioeconomic impacts to communities from severe or design-basis accidents. As one of the closest communities to an ISFSI, our Tribe has a lot at stake. Our lands are held in Trust by the United States government for the benefit of all current and future tribal members. Our main source of revenue -Treasure Island Resort and Casino -is located on this land, just one mile from the PINGP ISFSI. The economic consequences to our Tribe from an accident would be great: the Tribe could no longer provide needed benefits and services to our tribal members, tribal members could no longer reside on tribal lands (due to contamination), and our traditions and culture would be irreparably harmed. This is not an impact or consequence that can be addressed generically. (0619-2-1 [Mahowald, Philip R.])

Comment: Lastly, the impacts of postulated accidents on surface water quality and use should be fully assessed in Section 4.18 of the DGIS. (0622-2-10 [Vale, Karen])

Comment: Lastly, the impacts of postulated accidents on groundwater quality and use should be fully assessed in Section 4.18 of the DGIS. (0622-2-17 [Vale, Karen])

Comment: Lastly, the NRC should also fully assess the impacts of postulated accidents on site-specific aquatic resources. (0622-3-7 [Vale, Karen])

Comment: Section 4.18 discusses the environmental impacts of postulated accidents involving the continued storage of spent fuel. However, the NRC primarily discusses the impacts that natural phenomena and external events would have on the safety systems associated with pools and ISFSIs. Instead, the DGEIS should fully assess the impacts that postulated accidents would have on the affected environment (e.g., aquatic resources, special status species, terrestrial resources, etc.). (0622-4-1 [Vale, Karen])

Comment: We disagree with the statement on page 1-5, where the NRC states, "Changes in the environment around spent fuel storage facilities are sufficiently gradual and predictable to be addressed using a generic approach." While climate change is predicted, its impacts are not considered to be exact and orderly, nor are these changes expected to be "gradual." Storms such as "Superstorm Sandy" in October 2012 and the recent cyclone in the Philippines are but two examples of unexpected, unpredicted, and rapid changes with extraordinary significance. The environmental consequences of super storms, storm surges, and excessive wave action on dry casks are not acknowledged nor are they addressed in the DGEIS (the issues are only briefly mentioned as they relate to pool storage). (0622-4-10 [Vale, Karen])

Comment: Section 4.18 of the DGEIS also concludes that the environmental impacts of postulated accidents involving continued storage of spent fuel in pools and ISFSIs would be "SMALL" because all important safety structures, systems, and components involved with the spent fuel storage are designed to withstand these design basis accidents without compromising the safety functions. However, the NRC should assess environmental impacts associated with postulated accidents where safety structures and systems do not work properly -as has happened in real world situations. (0622-4-2 [Vale, Karen])

Comment: The DGEIS also does not consider the issue of marine debris. More debris comes ashore during and after periods of inclement weather (e.g., storms and heavy seas).²⁴ [footnote 24 text: Ribic CA, Sheavly SB, Rugg DJ, and Erdmann ES. 2010. Trends and drivers of marine

debris on the Atlantic coast of the United States 1997-2007. Marine Pollution Bulletin. 60: 1231-1242] Therefore, when storms occur and their intensity increases due to climate change, the coast could increasingly be subject to problems associated with marine debris. The NRC should assess impacts of marine debris clogging intake structures needed to provide cooling water for spent fuel pools as well as clogging ISFSI cooling vents. There are regional differences in quantity, composition and trends of marine debris, therefore the NRC should carry out site-specific assessments of this potential problem. (0622-4-6 [Vale, Karen])

Comment: Out of sight does not mean out of mind for most of us who are aware of where this deadly waste is being kept until an earthquake or some other natural or man made event damages the storage facility, as it 100% will. (0625-4 [Mandrell, Rebecca])

Comment: Further, the current storage periods are grossly out of touch with known and established hazards and potential loss of life and habitat following any breach of containment or cooling. (0629-2 [Individual, Anonymous])

Comment: In addition, plants are close to population centers--over 1/3 of the U.S. population now lives within 50 miles of a nuclear power plant. Many plants are in flood plains, or in earthquake, hurricane, or tornado zones. (0633-4 [Kurz, Carol])

Comment: The Fukushima disaster in Japan, Chernobyl in the Soviet Union and Three Mile Island in the USA have demonstrated very clearly that a technologically elite country with a strong government, like the USA can still have a disaster with stored radioactive waste (spent fuel) that literally may be so costly as to make the countries future uncertain, and ruin the health of literally millions of people. (0634-7 [Cato, Michael])

Comment: Probabilistic Risk Assessments are empty words and math when they fail utterly to assess the dangers of ongoing operations with no end in sight. The 100-year flood or earthquake WILL happen. (0640-5 [Geary, B.])

Comment: I have to write to you again after listening to the NPR interview of a former anti-nuclear activist who now believes the only way to counter global warming is to increase nuclear power and to "make it safer". He overlooks that it has not been made safer in the half century it has existed and that saying it will "be safer" does not make it so. He forgets that in over 50 years, the nuclear industry has found no solution to the problems of nuclear waste and the countless contaminating accidents and errors and catastrophes that have already occurred.. (0641-1 [Fasten, Susan])

Comment: Please act in the most responsible way possible and choose the surest and quickest path for PREVENTING any chance of a future problem by putting the waste in the most secure and advanced form of storage far away from oceans, people and seismic zones. History has proven that it is not safe to accept any level of risk, because now matter how conservatively we estimate tolerances and requirements, nature always exceeds our wildest estimates. (0659-2 [Stanick, Kim])

Comment: If there was just one lesson to be learned from the ongoing nuclear disaster in Japan it is that our best science and engineering is no match for the unpredictable forces of nature. (0660-4 [Headrick, Gary])

Comment: Nuke plants are grid dependent for cooling. When the grid goes down, there is only one week of diesel on site to provide back-up to cool the plants. The diesel generators have

been known to fail. More Chernobyls and Fukushima's are a certainty if we do not shut these plants down while we have some control and foresight. (0662-5 [McClintock, Francene])

Comment: California is not safe ground, we have not had a earth quake of powerful magnitude in the San Clemente area. Even worse if there is an earthquake in this area, we could have another Japan incident which is radiating the ocean and our fish and moving to all coasts i that meet the pacific ocean (0664-2 [BojeLebs, Nannette])

Comment: ESPECIALLY WITH EARTHQUAKES! JAPAN, NOW HAVING ABOUT A 5.0 per day, after Fukushima (and probably before). We are long overdue and a Cascadia Sub-duction event could trigger a San Andreas Fault event. (0668-3 [Gordon, Mark] [Gordon, Michelle])

Comment: The NRC 's analysis of a design basis event in dry cask storage fails to consider at least one foreseeable event , and provides no rationale as to why the two accidents that it does consider are representative. It examines only two scenarios involving a DTS : rods getting stuck and a loss of the air filtration system while a cask is open. (4-77 to 4-78 .) It calls these "representative" of types of events that could impact the environment, but it provides no basis or reason for this. (4-77.) The draft GEIS also states that the accident with highest consequences is a canister being dropped during cask loading when an earthquake happens. (4-82.) Consequently, it would be reasonable to expect analysis of the effects of an earthquake occurring while a cask is open; but it does not appear that the NRC considered this. (0669-14 [Walter, Joan])

Comment: The four reactor sites located in New York have different characteristics from one another. NRC also must carefully examine the environmental impacts that would occur as a result of an accident with the waste storage facilities at Indian Point. The Indian Point reactors and waste storage pools and casks are located in Westchester County -- 24 miles from the northern border of the City of New York. In 1956, the federal government authorized the construction of a nuclear power reactor at the Indian Point site before there were siting criteria for such facilities - and before there was a federal policy to allow the accumulation of spent nuclear waste at such facilities. During the construction of the second and third reactor at Indian Point, the federal government told New Yorkers that the spent nuclear fuel generated at the Indian Point facilities would be quickly removed from the site and transported to facilities located elsewhere where the waste would be reprocessed. Indian Point Unit 2 Final EIS ML072390276 at 257 (Sept. 1972); Indian Point Unit 3 Final EIS, ML072390284 at 412 (Feb. 1975). The Indian Point site has the highest surrounding population of any licensed reactor site in the United States. NRC previously found that more than 15 million people lived within 50 miles of Indian Point as of 1990.⁹ [footnote 9 text: NUREG-1437 Generic Environmental Impact Statement for License Renewal (1996) at Table 2.1 & § 2.2 (pages 2-2 - 2-8).] That population will grow in coming years. According to the Environmental Report prepared by Entergy and submitted as part of its application to renew the operating licenses for Indian Point Unit 2 and Unit 3, by 2035 19.2 million people will live within 50 miles of the Indian Point site and its inventory of spent nuclear fuel.¹⁰ [footnote 10 text:Environmental Report for License Renewal of Indian Point Unit 2 and Unit 3 (2007) at 2-35 ("The total population (including transient populations) within a 50-mile radius of the site is projected to be 19,228,712 in 2035.").] As confirmed by NRC's own data, no reactor site in the country comes close to the population profile of Indian Point [Table included in original correspondence...See ML13360A111 for table] Top Ten U.S. Nuclear Power Plant Sites in Terms of Surrounding Population Based on NRC NUREG-1437 (1996) Table 2-1, Nuclear Power Plant Baseline Information. Moreover, each day tens of thousands people commute or travel into the 50 mile radius around the plant site. According to Entergy, "An estimated 41 million people visit the New York Metropolitan area each year, or approximately 112,329 people

per day."¹¹ [footnote 11 text:Entergy Environmental Report for License Renewal of Indian Point Unit 2 and Unit 3 at 2-62./rulemaking1cem.resource@nrc.gov.] Indian Point is in close proximity to the New York City metropolitan area, the financial center of the country, critical transportation links, and unique scientific, medical, educational, and historical resources. Indian Point's spent fuel pools, dry storage casks and reactors are 6 miles from reservoirs that are part of the New York City Watershed - which provides drinking water for 8 million city residents. It is also near drinking water resources for other New York and Connecticut communities. (0681-10 [Peterson, Alyse])

Comment: Given these unique and specific characteristics, the State requests that NRC conduct an open, credible, and transparent site specific severe accident mitigation (SAMA) alternatives analysis for the continued storage of spent nuclear fuel in the pools and in the casks at the Indian Point site - similar to the SAMA analysis that NRC conducted for each reactor at the Indian Point site. 10 C.F.R. § 51.53(c)(3)(ii)(L). (0681-11 [Peterson, Alyse])

Comment: In terms of risk analysis, I am troubled by the epistemic uncertainties that fundamentally undermine any claim to adequately model and regulate systems as complex and hazardous as nuclear power plants, used fuel storage pools, interim storage sites, waste transportation infrastructures, and permanent waste repositories. (0684-2 [Kinsella, William])

Comment: The Draft GEIS claims that impact of a severe accident would be small. Such a conclusion cannot be supported by logic or experience. A severe accident would release deadly radioactivity into the environment. Every release of manmade radioactive matter into the environment to date has had serious and long-lasting impacts on humans and other living things within the area affected. (0686-3 [Malboeuf, Simone])

Comment: It's my understanding based on the former Chief of the Nuclear Regulatory Commission that all 104 of our nuclear plants have safety issues as well. Many sit beneath dams or near earthquake faults. Many on the East Coast are old and now endangered by climate change tremendous hurricanes as Hurricane Sandy demonstrated. (0690-2 [Eisman, Val])

Comment: The Near Term Task Force said, "NRC Inspection and licensing programs give less attention to beyond design basis requirements and little attention to industry voluntary initiatives since there are no requirements to inspect against. As a result the NRC gives much more attention to design-basis events than to severe accidents." (p. 19) The Task Force called for correction of the patchwork regulatory approach that consists of some requirements as well as voluntary industry initiatives. Spent fuel pools were identified as being in this regulatory patchwork with some safety related equipment and some equipment not identified as safety related. The potential for catastrophic harm from spent fuel falls into the severe accident scenarios that NRC has not given sufficient attention to. The Waste Confidence GEIS should have provided an opportunity to address the patchwork and to address severe accidents associated with fuel pools. Instead the NRC deferred this entire issue to the future, making the assumption that the entire regulatory structure remains the same. (p. 2-12 GEIS) NRC has requested additional information from licensees regarding spent fuel pools but has not yet received this information. (0693-2-16 [Warren, Barbara])

Comment: •According to the NRC, there is no potential for accidents, for release of radioactivity, for leaks that impact air or water quality, for adverse impacts because they are all under some sort of regulatory control. This view is factually and scientifically unsupportable. Under such a belief system, a grain silo would pose a more significant environmental impact than a highly radioactive spent fuel storage facility. As we have experienced in many different

situations, regulatory control is not fool proof - airplanes and trains crash, industrial facilities explode, catch fire and release poisonous gases, food is contaminated and recalled, etc, etc. (0693-3-12 [Warren, Barbara])

Comment: •The environmental analyses are repeatedly constrained to NORMAL operations. In other words, adverse impacts from errors, spills, accidents, fires, loss of water in fuel pools have not been analyzed, because they are not NORMAL. Severe accidents have largely been dealt with by NRC under voluntary industry initiatives, and as a result have few regulatory requirements. This issue was highlighted by the Fukushima Near Term Task Force as part of the "regulatory patchwork" problem. Unfortunately severe accidents are a major concern associated with the storage of spent fuel. (0693-4-4 [Warren, Barbara])

Comment: •For risk-based determinations, NRC uses the probability of occurrence as well as the potential consequences, to find such occurrences unlikely. The experience of Richard Feynman, Nobel Prize winner, in analyzing the Challenger Disaster, that killed all astronauts aboard, is illustrative. NASA assumed that a severe accident would occur very infrequently--almost never--when the actual probability was once in 200 flights. US banks used probabilistic risk assessment to evaluate the risks of their portfolios only to find after the 2008 economic crash they caused, that their analyses served to ensure failure rather than providing a measure of safety. (0693-4-5 [Warren, Barbara])

Comment: Moreover, the significant robust protection from external events has been demonstrated by real world events, including the August 23, 2011 Mineral, Virginia earthquake near the North Anna nuclear power plant and the March 11, 2011 earthquake and subsequent tsunami that damaged the Fukushima Dai-ichi nuclear power plant. Neither event resulted in significant damage to or the release of radionuclides from the dry cask storage containers. (0694-3-9 [Shea, Joseph])

Comment: Moreover, the significant robust protection from external events has been demonstrated by real world events, including the August 23, 2011 Mineral, Virginia earthquake near the North Anna nuclear power plant and the March 11, 2011 earthquake and subsequent tsunami that damaged the Fukushima Dai-ichi nuclear power plant. Neither event resulted in significant damage to or the release of radionuclides from the dry cask storage containers. With respect to the earthquake near North Anna, Entergy's ISFSIs, including the IPEC ISFSI, similarly use NRC-approved casks and comply fully with the requirements of 10 C.F.R. Part 72. (0697-2-18 [Bessette, Paul] [Kuyler, Raphael])

Comment: The theory that Spent Nuclear Fuel should be stored at the existing Nuclear Power Plants is a very dangerous theory. The information below is why I know that storing Spent Fuel at Nuclear Power Plants is a very reckless activity. Nuclear Power Plants were built in locations that are ideal for nuclear production of electricity. Recent discoveries of previously unknown fault lines and our improved understanding of Tectonic Plate Activity has changed the safety factor for storing spent fuel at Nuclear Power Plants. Each Nuclear Power Plant must have a separate topographical survey and access to a safe transportation corridor to the closest safe location for spent fuel to be stored in a safe accessible manor. (0701-1 [Wilson, Greg])

Comment: No one can safely predict what changes the California Coastline will experience over the next 250,000 years. The west coast could be hit by an Hawaiian tsunami. The movie "Hawaiian Tsunami" exposes the fact that the Hawaiian Islands crumble apart due to iron mixed in with the lava erupting out of the volcano. The iron rusts causing the volcano dome to fall apart creating massive tsunamis. At least one tsunami has flooded the Los Angeles Basin in California.

Large tsunamis from several different fault lines have hit the West Coast without warning and a Fukushima type of event or meltdown could happen to any spent fuel stored along the Pacific Coast. (0701-11 [Wilson, Greg])

Comment: The active volcano named Cumbre Vieja is on the Isle de La Palma in the Canary Islands west of Africa in the Atlantic Ocean. During a previous eruption of Cumbre Vieja 10 miles of the western flank of the island slid several yards to the west. A large portion of the island is ready to slide into the Atlantic Ocean. The assumption can be made that Cumbre Vieja also has iron mixed in the lave that comprises the lave rock on the island. When the large part of the island falls into the Atlantic Ocean a large 1,000 foot tall massive tsunami moving at 1,000 miles per hour will hammer all of the surrounding continents in the Atlantic. Western Europe, The British Isles, the Irish Sea, Ireland and West Africa will be hit in three hours with devastating results. All nuclear power plants and spent fuel must be moved off the Atlantic Ocean including the facilities Europe and the British Isles and the Irish Sea. The East Coast of the United States, The Caribbean Islands, Puerto Rico, Cuba, and South America will be hit in five hours by a 600 foot tall tsunami traveling at 600 miles per hour. Millions of Americans will die and 26 Nuclear Power Plants will be destroyed. The spent fuel containers at every Atlantic nuclear power plant will be destroyed and the spent fuel will be washed away and scattered across the land. All of the spent fuel must be moved away from the Atlantic Ocean and to a Long Term Storage on high ground. The Long Term Storage must be at the closest possible site for the Nuclear Power Plant that it supports. If two Nuclear Power Plants are close to each other a common Long Term Storage site could be used. The Long Term Storage sites must be built on a raised ground at least 1,000 feet in elevation. This same strategy could increase the safety during hurricanes with their 20 foot plus tall storm surge wave and the 12 foot high surf zone. Hurricanes are getting bigger and stronger due to global warming and they are having a greater impact on northern coastlines. (0701-12 [Wilson, Greg])

Comment: All spent fuel and associated waste must be moved away from all coast lines world wide. Russia has lost two unmanned nuclear power lighthouses into the Arctic Ocean. The land under the lighthouses was washed away by storms. Predicting earthquakes, volcanoes, landslides, asteroids, comets, methane gas bubbles will always cause tsunamis that will destroy coastlines. Long Term Storage at a nuclear power plant of spent fuel and/or nuclear waste should never be an option. I have zero confidence in storing any spent fuel on any coastline in the world. The oceans must be respected as the source of all life on Mother Earth. (0701-15 [Wilson, Greg])

Comment: No one can predict when or even if the Yellowstone Volcano will erupt but the warning time is very short and there will not be any time to develop a plan to deal with total destruction in the middle of the country. All of the Nuclear Power Plants in that region must be shut down and moth balled as fast as possible. All nuclear material must be transported out of the predicted ash cloud area. Internal combustion engines have a very hard time running with volcanic ash in the air. The back up diesel for the nuclear power plants will not run very well as the air filters will clog up. The workers that survive the eruption working at the power plants must be evacuated to a safe part of the country. The ash cloud could last for decades and it may be centuries before the region is repopulated. The eruption of the Yellowstone Super Volcano will be a planet wide near extinction event. Add in the radioactive nuclear debris to the volcano event and it will be a complete worldwide extinction event. (0701-16 [Wilson, Greg])

Comment: An asteroid the size of Tunguska exploding over a nuclear power plant would destroy the reactor core and all of the spent fuel storage containers. All Long Term Storage Containers must be stored underground to protect them from asteroid air blasts. A direct hit on

any spent fuel storage by an asteroid will be a major radiation release event. Many more Nuclear Power Plants are located over unknown fault lines and which may not be revealed for centuries. (0701-17 [Wilson, Greg])

Comment: The prediction by the geologists in this movie is 99% that Southern California will have a major San Andreas earthquake in the next 30 years. The movie did not mention what will happen to the San Onofre Nuclear Power Plant or the spent fuel. A safe long term storage site that is near San Onofre should be found. Due east within ten miles of the nuclear plant would be a better location than keeping the spent nuclear fuel on the coast line and on the fault line. Everyone must see this movie before a decision is made about what to do with the spent fuel rods and how they are stored. This is not the only movie that explains Plate Tectonics, and/or volcanoes that will destroy Nuclear Power Plants. (0701-8 [Wilson, Greg])

Comment: Probabilistic Risk Assessments and Environmental Impact Statements: Both of these tools must assume that events such as earthquakes and 100-year floods will happen at some time during the lifetime of a nuclear facility, because these events do happen sooner or later. (With climate change and fracking, they are happening more often.) If we continue to operate nuclear power plants, there will eventually be another disaster. (0705-4 [Spring, Janet])

Comment: If high burnup fuel rods (or other spent fuel rods) were involved in a criticality accident as the water boiled away in the pool, any degraded thermal conductivity of such fuel rods would play a *significant* role in increasing local fuel and fuel-cladding temperatures, because the heat flux would be high. (0706-5-25 [Fettus, Geoffrey])

Comment: In reality, PRAs utterly fail to assess the dangers of ongoing operations with no end in sight. 100-year floods and earthquakes become inevitable instead of rare if you wait long enough -- and that seems to be exactly what the nuclear industry wants: For us all to wait until there is a disaster, only to claim they never saw it coming. (0709-7 [Wythe Elnagar, Romi])

Comment: NRC Fails to Address, Communicate or Mitigate Real Hazards[:] NRC staff uses the GEIS to merely dismiss risks associated with the clear--and--present--dangers associated with the waste that has resulted from the licenses it has granted as "insignificant" or not "cost effective" to mitigate. NRC has a long-term historical pattern of protecting its licensees rather than the public. In addition, the notion of "The Public" misses impacts to real people that occur on a daily basis. NRC must stop the policy of protecting its licensees from the outcomes of nuclear failures. In addition to "risk" there is the matter of "significance." It is time that the significance of the impact of nuclear events be understood from the perspective of our communities. After the impacts and consequences of a potential event (like a fuel pool fire) are assessed, they should be disclosed, in full, without a risk or probability "factor" or modifier. Once a clear statement of the potential impacts and consequences (it may be a range) is done--and communicated, then it would be appropriate to communicate the probability / risk factors including the assumptions used, choices made, how the analysis was generated, how it would be applied. All of this should be fully disclosed in lay-person's terms so that a baby's mother can understand it. She may still not agree to accept the plan, but elected and appointed decision-makers have a right to know what, exactly, they are "signing-off" on if they choose to accept NRC staff's mortal calculations and assurances. If the terms "risk," "acceptance" and "significant" are defined solely by the NRC staff and its licensees, the so-called "protection" NRC offers will not be for the planet we live on; it will be pure fiction. (0711-23 [Olson, Mary])

Comment: How does a larger fraction of transuranics impact hazard (calculated for cancer and cancer death) from a major reactor, fuel pool, transport or storage accident? (0711-31 [Olson, Mary])

Comment: How high would a "reference" artificial surface for waste storage have to be to be above a typical storm surge at that sea level given existing US reactor sites? (0711-40 [Olson, Mary])

Comment: It is sad to think that NRC staff might be subject to the popularized junk science that holds that large distribution of radioactivity including the Chernobyl and Fukushima Daiichi nuclear disasters can be dismissed as low to no impact. While there is a range of discussion as to how many cancers over time will be attributable to these mass contaminations of our environment even the low end of official analysis projects thousands of cancer deaths from each. Anyone who justifies thousands of deaths resulting from a licensed industrial activity as a "low" or SMALL impact needs to reread our comment on "impact" and "significance" and the Principles section, and take a course in ethics. Further, the legal projections of health consequences completely and deliberately ignore impacts other than cancer in humans and ignore all impacts to other species and biosystems or in rare cases claim to assess impacts on a reference mammal or fish or bird. Nonetheless, these estimates of effects on humans from Chernobyl and Fukushima have been criticized by world class experts,^x [footnote x text: Letter to Secretary General of the United Nations, November 2013: <http://www.nirs.org/fukushima/expert-ltrbankimoon-09-2013.pdf>.] some of whom have documented why the impacts of large-scale environmental contamination are much higher. See for instance the 2006 TORCH Report.^{xi} [footnote xi text: The TORCH report was published by Dr Ian Fairlie and Dr David Sumner on the 20th anniversary of what was then the worst nuclear power reactor accident in history. A summary that makes the relevant points (and link to download the full report is posted here: <http://www.chernobylreport.org/?p=summary>.] The findings include for Chernobyl: about 30,000 to 60,000 excess cancer deaths are predicted, 7 to 15 times greater than IAEA/WHO's published estimate of 4,000; predictions of excess cancer deaths strongly depend on the risk factor used; predicted excess cases of thyroid cancer range between 18,000 and 66,000 depending on the risk projection model; other solid cancers with long latency periods are beginning to appear 20 years after the accident; Belarus, Ukraine and Russia were heavily contaminated, but more than half of Chernobyl's fallout was deposited outside these countries; fallout from Chernobyl contaminated about 40% of Europe's surface area; collective dose is estimated to be about 600,000 person Sv, more than 10 times greater than official estimates; about 2/3rds of Chernobyl's collective dose was distributed to populations outside Belarus, Ukraine and Russia, especially to western Europe; Caesium-137 released from Chernobyl is estimated to be about a third higher than official estimates[.] All of these findings are relevant to the assumptions underpinning the finding of SMALL impact in GEIS/NUREG 2157. It is also worth noting that even the low estimates of cancer deaths from Chernobyl likely exceed, by a large factor the dose--risk tables published by NRC in 1990.^{xii} [footnote xii text: See NRC, 1990 Expanded Policy Statement on Below Regulatory Concern(risk table).] None of these reports factor disproportionate level of harm to females; particularly in the 0--5 age group (BEIR VII data shows 10 times more cancer developing in girls exposed 0--5 than in boys at the dose), but the data also shows a 50% greater impact (cancer) over the entire lifespan.^{xiii} [footnote xiii text: See Olson, Mary "Atomic Radiation is more Harmful to Women, posted with other materials: <http://www.nirs.org/radiation/radhealth/radhealthhome.htm> and "Healthy from the Start" campaign at Institute for Energy and Environmental Research: <http://ieer.org/projects/healthy-from-the-start/>.] (0711-7 [Olson, Mary])

Comment: A second example of NRC failing to take into account both reality and a reasonable measure of anticipatory thinking is the near catastrophe at the Port Calhoun (nee "Fort" Calhoun) reactor in Nebraska in 2012. It stands as a perfect example of NRC failure "to analyze the cumulative impacts that may result from past, present, and reasonably foreseeable future radiological leaks from non-SFP systems, structures, and components." Photographic evidence shows that while in 2012 the spent fuel casks at the reactor stood above the catastrophic flood level, NRC has no means to assure that this would be the case in future catastrophic flooding; or that Cooper NPP or Oconee NPP dry casks would be above flood level after a catastrophic upstream dam failure. Should this occur the lower cooling vents of the casks could potentially become submerged or clogged with debris that staff would not be able to intervene to clear. Should the vents become plugged or submerged, convection air cooling would cease in the casks. This could result in the fuel overheating and possibly becoming damaged; or, possibly could result in a cask rupture if severe enough. In this case, intermingling of radionuclides from a NON-SFP source would occur. NRC has provided no analysis of this possibility; nor has it taken into account at all the effects of NON-SFP sources of contamination. (0716-15 [Kraft, Dave])

Comment: In a Nov. 14, 2013 webinar meeting scheduled by NRC itself to "inform" the public on the virtues of ISFSIs and dry casks, we asked the NRC "experts" several questions: Q: *If those vents [on the dry casks] are blocked, how long can the canister go before experiencing overheating and fuel damage?* NRC staff replied that, well, they did not know, but that site staff would surely be able to intervene before any consequential overheating occurred. We submitted a follow up question: Q: *That does not answer the question about blockage. In an emergency on the order of Fukushima, there was no guarantee that personnel could have intervened effectively if those vents got blocked. If Port Calhoun went under any more water the same situation would have existed. So the question stands -- HOW long before the canister overheats, and fuel damage occurs? If you have not done that calculation, you're doing the same "assuming" that the Courts said is not acceptable in the waste confidence docket.* We received no response to this question, neither during the session or afterwards. This demonstrates that 1.) NRC itself has not done sufficient homework to answer fundamental questions about cask and fuel integrity, and perhaps does not have the answers itself, yet claims that both will operate flawlessly for indefinite periods; and 2.) NRC displays no vitally necessary creative imagination into likely future emergency scenarios over the next, say, 10,000 years, in express violation of what the 2012 Court ruling mandated they should do. It has not done sufficient future analyses into these matters. REQUEST TO NRC: We request that NRC provide written answers to the above two questions asked (not merely responses predicated on baseless opinions or assertions), demonstrating the model used, the calculated temperatures derived, and predictions about fuel and cask failure times over the entire line of currently licensed storage casks; within 75 days of the submittal of these comments. (0716-16 [Kraft, Dave])

Comment: As NRC seeks to fulfill its mandate under the National Environmental Policy Act and examine the site-specific environmental impacts associated with authorizing the operation of Indian Point facilities in the future, it should in a proactive way address the issue of how it deals with severe nuclear events – be they releases from reactors or spent fuel pools – that lead to significant environmental impacts including, as in the case of Japan, land contamination and displacement, perhaps permanently, of people from their homes and their livelihoods and their communities. (0718-1-10 [Sipos, John])

Comment: Need for Site-Specific and Site-Wide Severe Accident Review for the Indian Point Facilities[.] Recent events should compel NRC to conduct a site specific analysis of spent fuel pool risks. Such events include: the U.S. government has withdrawn its application to create a

spent nuclear fuel repository at Yucca Mountain; events in Japan and Virginia demonstrated that external events (such as earthquakes or flooding) can pose severe risks to spent nuclear fuel residing at nuclear plants; the Tennessee Valley Authority, a federal agency that operates commercial nuclear reactors, has announced plans to consider an alternative strategy to shift spent nuclear fuel from spent fuel pools to dry cask storage; and recently-released NRC and Sandia National Laboratories documents confirm the State's concern and that alternatives are readily available. These developments indicate that spent nuclear fuel will continue to be housed indefinitely in densely-packed spent fuel pools at individual nuclear reactor sites, that such storage entails substantial, yet differing, site-specific risks due to the potential for seismic activity and other external events, and also, that alternatives exist to mitigate these site-specific impacts. Based on the experience it has gained in the Indian Point license renewal proceeding, the State of New York has concerns over the scope and adequacy of the required site-specific analyses of severe accidents at nuclear power plants, known as severe accident mitigation alternatives analyses, or "SAMA" analyses. NRC conducts SAMA analyses pursuant to NEPA and as a result of the Third Circuit's ruling in *Limerick Ecology Action, Inc. v. Nuclear Regulatory Commission*, 869 F.2d 719 (3d Cir. 1989). The SAMA analyses submitted with license renewal applications examine only severe accidents resulting in releases from the reactor core; they do not consider the site-specific impacts of spent fuel pool accidents. Because NRC Staff and reactor owners do not consider the environmental impacts of spent fuel pool accidents as part of their NEPA analysis when reviewing an application to renew an operating license, they do not consider alternatives to current spent fuel pool storage configurations. Moreover, NRC Staff and the industry steadfastly oppose any State or citizen request under NEPA to review the environmental impacts of spent fuel pool accidents or alternatives to current spent fuel pool practices. It does not appear that NRC Staff's NEPA-based SAMA analyses take severe accidents resulting in a radiological release from the spent fuel pools into consideration at all. This is a significant gap in Staff's NEPA analyses. To close that gap, the State requests that NRC perform a site-specific analysis of severe accidents to include both reactor core and spent fuel pool releases as well as the means and alternatives to mitigate the impacts of such accidents. The State also wishes to bring to the NRC's attention a separate concern over the conduct of site-specific severe accident mitigation alternatives analyses. Separate and apart from the concern over dense storage of spent nuclear fuel in spent fuel pools, the State is also concerned that site-specific SAMA alternatives have relied on inputs developed for Surry, a relatively rural reactor site, that are not appropriate for reactors whose emergency planning zones include more suburban or urban areas. The site-specific analysis of potential severe accidents must rely on site-specific data from the region around the specific reactor in question, and not replicate the data from the Surry site or a "sample problem" for a computer code. (0718-1-11 [Sipos, John])

Comment: To comply with NEPA, NRC's should expand its analysis to include the impact of severe spent fuel pool accidents on drinking water resources within NRC's designated 50-mile Emergency Planning Zone around the Indian Point facilities. (0718-1-2 [Sipos, John])

Comment: NRC uses a computer code, known as MACCS2, to assist its analysis of severe accidents. The economic cost model of the MACCS2 code is intended to estimate the direct offsite costs from a severe nuclear accident. If other indirect costs were included such as medical expenses, adverse health effects, permanent income loss, costs of disposal of contaminated wastes, and economic impact of losing a resource— including the loss of drinking water and replacement for reservoirs during interdiction, the total economic cost would increase. See, e.g., Transcript of Evidentiary Hearing, Indian Point License Renewal Proceeding ("Tr.") 2278:7-8 (Bixler) (MACCS2 code "does not consider the migration through the ground water."); Tr. 2284:6-10 (Bixler) (MACCS2 code "does not account any economic value to the loss of the

water. I think what would probably happen in reality is that people would buy bottled water in that area, and consume that. . . . [but it] is not factored in."); Tr. 2285:5-8 (Ghosh) ("[A]re we accounting for the economic impact of losing some resource? I just want to comment on that. Certainly, MACCS does not do that."); Tr. 1975:9-20 (J. McDade/Bixler) (While an input parameter called per capita cost of long-term relocation (POPCST) does address unemployment for 20 weeks under Sample Problem A, it does not address permanent salary loss.). (0718-1-3 [Sipos, John])

Comment: In the wake of the Fukushima disaster, NRC is considering conducting site-specific reviews of the risks involved with spent fuel pools as part of a Level 3 Probabilistic Risk Assessment ("PRA"). In the policy position paper on options for PRA activities, NRC wrote, "To be complete, estimation of total site accident risk should also include an assessment of the risk from accidents involving other site radiological sources, to include spent nuclear fuel."¹²⁵ [footnote 125 text: Nuclear Regulatory Commission, *Options for Proceeding with Future Level 3 Probabilistic Risk Assessment Activities*, SECY-11-0089, at 6, ML11090A042 (July 7, 2011).] The scope of the proposed PRA is depicted in the diagram below.¹²⁶ [footnote 126 text: Figure taken from slides prepared by NRC Staff: Nuclear Regulatory Commission Office of Nuclear Regulatory Research, *Severe Accidents and Options for Proceeding with Level 3 PRA Activities*, ML11209B927 (July 28, 2011).] [figure inserted] In a July 28, 2011 public meeting on PRA activities, Commissioner Apostolakis observed: ["It seems to me that a major change in the way that we think about things . . . after Fukushima, is that we really have to talk about the site risk. We should start talking about site years rather than reactor years. So that is probably a major change."] ¹²⁷ [footnote 127 text: *Id.* at 83. Also in that meeting, Stuart Lewis, Program Manager for Risk and Safety Management, Electric Power Research Institute, Inc., said, "[W]e have started to do some investigations that lead us to believe there is more that ought to be done in the area of understanding spent fuel pool risk . . . " *Id.* at 26.] During the same meeting, NRC Chairman Jaczko stated: ["I think that there's no question that the state of the art has improved significantly over the last two decades and that there are new issues that perhaps should be examined through the completion of Level 3 PRAs. As the staff notes in their paper, those include issues raised by the Fukushima accident, specifically the challenges posed by multi-unit events in the risks of radiological releases from spent fuel pools."] ¹²⁸ [footnote 128 text: Nuclear Regulatory Commission, *Briefing on Severe Accidents and Options for Proceeding with Level 3 Probabilistic Risk Assessment Activities*, Transcript of Proceedings, at 3, ML112140574 (July 28, 2011).] The State supports a comprehensive and realistic analysis of the risks posed by spent fuel pools and requests that such a review be brought into the site-specific NEPA review. (0718-2-12 [Sipos, John])

Comment: The recent earthquakes in Japan and Virginia present significant new information that affirm the importance of site-specific evaluation of spent fuel pool risks. (0718-2-4 [Sipos, John])

Comment: Nor does the DGEIS effectively identify, discuss, and evaluate other available mitigation measures to reduce or minimize the impacts of a severe spent fuel pool accident. For example, although the DGEIS relies upon NUREG/BR-0184's calculation of the consequences of pool fire accidents, including protective measures such as the use of a spray system, post-Fukushima US-NRC Order EA-12-049 does not mandate the installation of fixed spray systems in spent fuel pools. Similarly, the DGEIS does not examine the alternative of reducing the volume of spent nuclear fuel (and hence the potential accident source term) in spent fuel pools, although this information is available in other documents (US-NRC 2013a). (0718-3-10 [Sipos, John])

Comment: Quantitative Health Objective[.] The following quantitative health objectives are used in determining achievement of the two safety goals set forth in the policy document discussed above in Section 2.2 (US-NRC 2001, p. A4C-2): •*"The risk to an average individual in the vicinity of a nuclear power plant of prompt fatalities that might result from reactor accidents should not exceed one-tenth of 1 percent (0.1 percent) of the sum of prompt fatality risks resulting from other accidents to which members of the U.S. population are generally exposed."* •*"The risk to the population in the area near a nuclear power plant of cancer fatalities that might result from nuclear power plant operation should not exceed one-tenth of 1 percent (0.1 percent) of the sum of cancer fatality risks resulting from all other causes."* These objectives have been translated into two numerical objectives as follows: •*"The individual risk of a prompt fatality from all 'other accidents to which members of the U.S. population are generally exposed,' such as fatal automobile accidents, is about 5×10^{-4} per year. One-tenth of one percent of this figure implies that the individual risk of prompt fatality from a reactor accident should be less than 5×10^{-7} per reactor year."* •*"The sum of cancer fatality risks resulting from all other causes for an individual is taken to be the cancer fatality rate in the U.S. which is about 1 in 500 or 2×10^{-3} per year. One tenth of 1 percent of this implies that the risk of cancer to the population in the area near a nuclear power plant because of its operation should be limited to 2×10^{-6} per reactor year."* The numerical objectives above are compared to the early fatality risk to an average individual within 1.6 km (1 mi) and the latent cancer fatality risk to an average individual within 16 km (10 mi) of the plant. When NRC established these criteria, it developed them to be applicable to all sites since individual prompt fatality risks are the same regardless of the population density surrounding a reactor. Although the policy statement mentions societal risks, the numerical objectives do not. The risk to society should be comprised of, at minimum, the latent health effects (i.e., the radiological impact to the population) and economic costs. One possible quantitative objective for the radiological component of societal risk may be obtained by multiplying the objective for latent fatalities (2×10^{-6} latent fatalities per reactor year) by the nominal risk of latent fatalities (assumed to be 5% per person-Sv based on guidance from the International Commission on Radiological Protection (ICRP 2007)). This results in a numerical objective for collective dose of 4×10^{-5} person-Sv per reactor year, or 4×10^{-3} person-rem per reactor year. If the DGEIS had adopted societal risk criteria, the analysis would have been dependent on the population density around the site, making it impossible to develop a generic approach that applies at all sites. (0718-3-14 [Sipos, John])

Comment: After reporting the results of NUREG-1738, NUREG/BR-0184, and NUREG-1353, the DGEIS attempts to benchmark the radiation dose consequences and the economic cost of a spent fuel pool accident against values for severe reactor accidents. Based on these results, the US-NRC concludes (US-NRC 2013, p. F-10): *"This analysis shows that the probability-weighted consequences for a spent fuel pool fire, as analyzed in NUREG-1738, are comparable to the probability-weighted consequences for severe power reactor accidents analyzed in the 1996 and 2013 License Renewal GEIS (NRC 1996, 2013)."* Based on this conclusion, it is reasonable to expect that US-NRC would implement similar requirements for severe reactor accidents and spent fuel pool accidents. This would include the conduct and documentation of a Severe Accident Mitigation Alternatives (SAMA) analysis that is based on a site-specific cost-benefit comparison of the costs of implementing mitigation alternatives with the benefits achieved by those mitigation alternatives. Furthermore, risk assessments and SAMA analyses for reactor and spent fuel pool accidents at the same site should not be conducted independently; an integrated, site-wide analysis is the way to quantitatively assess the risks posed by all operations conducted on a single site. In conclusion, although US-NRC reports the similarities between spent fuel pool fires and reactor accidents, the DGEIS does not actually use this information. The DGEIS does not contain societal dose acceptance criteria or a SAMA analysis

considering the costs and benefits of mitigation alternatives given the cost of a spent fuel pool fire. (0718-3-16 [Sipos, John])

Comment: Severe Accident Mitigation Alternatives Analyses and Spent Fuel Pools[.] The destruction of the Fukushima facilities demonstrates that severe accidents can occur and can have significant, real world consequences.¹⁷⁰ [footnote 170 text: NRC Chairman Gregory Jaczko, *Looking to the Future*, S-12-002 (Feb. 9. 2012).] The State calls on NRC to revise its approach to severe accident mitigation alternatives (or SAMA) analyses. Under 10 C.F.R. § 51.53(c)(3)(ii)(L), NRC must conduct a site-specific review of alternatives to mitigate a severe accident at a reactor that seeks to renew its operating license. NRC promulgated this regulation in 1996 in response to the court ruling in *Limerick Ecology Action, Inc. v. Nuclear Regulatory Commission*, 869 F.2d 719 (3d Cir. 1989). However, while NRC purports to examine alternatives to mitigate severe accidents that occur in the *reactor*, applicants and NRC do not review alternatives to mitigate severe accidents that occur in the *spent fuel pool* that is adjacent to the reactor but outside of the containment shell. In fact, the SAMA analyses only take into account releases from the reactor core. Releases from spent fuel pools that would occur during a severe accident are not taken into consideration at all in the SAMA analyses. Thus, the communities and states that host power reactors do not receive a comprehensive review of all severe accidents at a licensed facility or the available means to mitigate the environmental effects of such severe accidents. It is important that radionuclide releases from spent fuel pools be considered as part of the SAMA analyses because the offsite cost risks of these releases can be higher than those from the reactor core.¹⁷¹ [footnote 171 text: Gordon R. Thompson, Risk-Related Impacts from Continued Operation of the Indian Point Nuclear Power Plants, at 28 (Nov. 28, 2007).] Today's reality is that large quantities of spent fuel are being stored at nuclear reactor sites. Indeed, under the dense storage regime in place today at Indian Point and other reactors, the spent fuel pool holds considerably more fuel assemblies than the reactor core. The NEPA review of severe accident mitigation alternatives should not exclude releases from these spent fuel pools or alternatives that could mitigate severe spent fuel pool accidents or releases. NRC Commissioners should revise current NRC NEPA policy and ensure that during this proceeding or during a license proceeding, a comprehensive and objective review of severe accidents takes place for the entirety of each facility that NRC licenses. Similarly, for sites that have more than one reactor and spent fuel pool, the SAMA review should not be limited to a severe accident at a single reactor or a single pool, but should examine the consequences of, and mitigation alternatives for, a severe accident that affects more than one reactor or pool at a NRC licensed site. (0718-3-2 [Sipos, John])

Comment: In addition, the SAMA analyses must reflect the true, site-specific costs of an accident involving a spent fuel pool or resulting in a release from a spent fuel pool. As discussed in the accompanying report from ISR, in the context of SAMA analyses for severe nuclear reactor accidents, applicants have not been using site-specific data to calculate the economic costs. Instead, licensees have been relying on data from "Sample Problem A" to calculate the economic costs associated with a severe nuclear reactor accident in their SAMA analyses. Sample Problem A was one of fourteen sample problems provided with the MACCS2 code as an example for users to check whether the MACCS2 software was installed and operating properly. Sample Problem A is an example set of inputs that were developed for the Surry reactor site located in rural Virginia and was not meant to serve as default input values in the MACCS2 program.¹⁷² [footnote 172 text: The "Sample Problem A" values were derived from the Surry facility and discussed in NUREG-1150, *Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants* (Dec. 1990).] Yet NRC Staff, Entergy, and other applicants rely on Surry's Sample Problem A in conducting SAMA analyses for other reactor sites, such as Indian Point, that differ markedly from Surry and its environs. Each of the approximately 65 sites that

host the 104 operating nuclear power reactors has a different profile and "context."¹⁷³ [footnote 173 text: "Context is the geographic, biophysical, and social context in which the effects will occur. In the case of license renewal, the context is the environment surrounding the facility." *Draft GEIS for License Renewal* at 1-5.] NRC cannot credibly maintain that all U.S. reactor sites are the same or that an accident at one site will have the same consequences as an accident at another site. Stated differently, the 50-mile emergency planning zone around the two operating Indian Point reactors in New York is materially different from the 50-mile emergency planning zone around the single Fort Calhoun reactor in Nebraska. The two Indian Point plants and single Calhoun plant are different with respect to: electrical output; spent fuel pool inventory; surrounding population; topography; prevailing wind; precipitation and snowfall; seismic hazards; tornado hazards; surrounding agricultural resources; and surrounding public drinking water/reservoirs—to name just a few material differences. (0718-3-3 [Sipos, John])

Comment: By using Sample Problem A inputs instead of inputs derived from site-specific data, applicants are failing to conduct the required site-specific SAMA analyses for nuclear reactor accidents in violation of NEPA, CEQ regulations, and NRC regulations. This error should not be carried into ongoing or future SAMA analyses of the reactor accidents, risks from a spent fuel pool accident, or radiological releases from a spent fuel pool. Any such SAMA analyses must rely on site-specific data from the plant at issue and its surrounding community and environment, not from Surry and its inputs in Sample Problem A. Use of accurate, site-specific cost is especially important in light of a recent inter-agency dispute among federal agencies over which agency is responsible for ensuring the clean-up and decontamination of contaminated property and the funding source of such decontamination. A November 2010 article entitled *Agencies Struggle To Craft Offsite Cleanup Plan For Nuclear Power Accidents*, reported: "[E]PA, the Nuclear Regulatory Commission (NRC) and the Federal Emergency Management Agency (FEMA) are struggling to determine which agency—and with what money and legal authority—would oversee cleanup in the event of a large-scale accident at a nuclear power plant that disperses radiation off the reactor site and into the surrounding area. The effort, which the agencies have not acknowledged publicly, was sparked when NRC recently informed the other agencies that it does not plan to take the lead in overseeing such a cleanup and that money in an industry-funded insurance account for nuclear accidents would likely not be available [T]he NRC officials also indicated during the meetings that the industry-funded account established under the Price Anderson Act—which Congress passed in 1957 in an effort to limit the industry's liability—would likely not be available to pay for such a cleanup."]¹⁷⁴ [footnote 174 text: Douglas P. Guarino, *Agencies Struggle To Craft Offsite Cleanup Plan For Nuclear Power Accidents*, Inside EPA (Nov. 10, 2010).] Moreover, meaningful site-specific severe accident mitigation alternatives analyses should be conducted each time a facility seeks to extend its operating license. This is so because the population in the emergency planning zones, characteristics of the surrounding community, set of potential mitigation alternatives, and economic cost values may all experience significant change over the course of a 20-year operating license. (0718-3-4 [Sipos, John])

Comment: Since hydrological and geological properties vary from site to site, as does the proximity of sites to bodies of water and the configuration of the reactor(s) and spent fuel pool(s), the consequences of contaminated water leaking into ground water and surface water should be assessed on a site-specific basis. (0718-4-10 [Sipos, John])

Comment: NUREG-1150, however, contains a gaping hole—the source of the decontamination cost parameters in NUREG-1150, and thus the source of the decontamination cost parameters used in Sample Problem A, simply does not exist. Neither NUREG-1150 itself nor its companion, NUREG/CR-4551, explain how the Sample Problem A costs were obtained.

NUREG/CR-4551 cites NUREG/CR-3673, as a reference for the Sample Problem A decontamination cost values, but NUREG/CR-3673 states only that: *"The cost estimates used in this study for various levels of decontamination effort in an area are taken from a detailed review of decontamination effectiveness and costs performed at Sandia National Laboratories (SNL) [Os84]."* "Os84" is listed as "Ostmeyer, R.M., and G.E. Runkle, An Assessment of Decontamination Costs and Effectiveness for Accident Radiological Releases, Albuquerque, N.M.: Sandia National Laboratories, *to be published*," in NUREG/CR3673's references section. NUREG/CR-3673 at p. 8-8 (emphasis added). The Os84 document does not exist, at least in any available form. Os84 appears to have never been published, nor peer-reviewed. Even if Os84 did still exist, the author of NUREG/CR-3673 (which cites to Os84) made it clear that these were tentative results: *"Little data exist which are directly applicable to the small particle sizes (0.1-10 μ m) and soluble materials which are anticipated in releases from the LWR accidents. The cost and effectiveness estimates for decontamination contain large uncertainties, and results of future experimentation with decontamination techniques should be used to update models for decontamination."* (NUREG/CR-3673 at p. 4-15) No one knows the origin of the NUREG-1150 decontamination cost values, other than a cryptic description that they were based upon "national average statistics." NUREG/CR3673 at p. 4-17. Public comments on a draft of NUREG-1150 state "Decontamination costs used in the calculations may be based on decontamination of test sites in deserts instead of agricultural, residential, and commercial property." NUREG-1150 at D-32. The comments received on a draft of NUREG-1150 suggest that its authors expected that site-specific estimates of decontamination costs would be developed. NUREG-1150 states: *"[PUBLIC] COMMENT: The models used in calculating the cost of a severe accident lack many factors that should be taken into account. Many of the assumptions are questionable and unfounded. The models have not been benchmarked. Some interpretations and conclusions that were made in draft NUREG-1150 are questionable. The cost estimates need to be more thoroughly documented to understand and evaluate the calculations. [NRC] RESPONSE: The present version of NUREG-1150 provides a limited set of risk-reduction calculations, principally related to the potential benefits of accident management strategies in reducing core damage frequency. It does not assess the cost of these or other improvements. Such analyses are more properly considered in the context of specific regulatory action. * * * [PUBLIC] COMMENT: Decontamination costs used in the calculations may be based on decontamination of test sites in deserts instead of agricultural, residential, and commercial property. [NRC] RESPONSE: The draft NUREG-1150 cost/benefit analyses reflected the conventional NRC methods for assessing costs and benefits. Because cost/benefit analyses are more properly considered in the context of specific regulatory activities, they are not provided in this version of NUREG-1150."* These comments support the notion that reliance on Sample Problem A instead of developing site-specific inputs is unreasonable. (0718-4-17 [Sipos, John])

Comment: The DGEIS should contain a discussion of how aqueous releases can occur during a severe accident, and the potential consequences of aqueous releases during a severe accident, given the unfolding experience at Fukushima. The MACCS2 code does not model "aqueous release pathways." NRC Regulatory Information Conference (RIC) International Session - Post-Fukushima Research, NRC Office of Nuclear Regulatory Research (March 13, 2013) slide 7; see also Certified Minutes of the ACRS Reliability and PRA Subcommittee Meeting on Level 3 PRA on December 4, 2012 (ML13211A477). The DGEIS should acknowledge this limitation of the code, and discuss options for determining and mitigating the effects of aqueous releases. (0718-4-9 [Sipos, John])

Comment: Revise the MACCS2 consequence assessment to be conservative and bounding or make it site-specific and compatible with the current practices for severe accident mitigation alternative analyses for reactors. (0718-5-10 [Sipos, John])

Comment: Include a re-assessment of the time and cost of decontamination for severe accidents, which are higher for areas with higher population densities. (0718-5-11 [Sipos, John])

Comment: Develop a quantitative health risk acceptance criteria compatible with the Commission's Policy Statement regarding societal risk (in addition to the criteria for individual risk). (0718-5-3 [Sipos, John])

Comment: Analyze alternatives to mitigate the potential severe accident impacts. This should be done in a site-wide manner that integrates all hazards and corresponding risks that exist on the site (i.e., all reactor units and spent fuel pools are assessed in a single risk assessment). The DGEIS should either employ conservative bounding or direct site-specific review for certain plants like Indian Point (0718-5-4 [Sipos, John])

Comment: Include an assessment of the environmental consequences and cost of liquid releases during a spent fuel pool accident, with specific reference to and discussion of the unfolding events at Fukushima. (0718-5-9 [Sipos, John])

Comment: Instead the short-term programs currently followed have proved to be inadequate to guarantee public safety in case of earthquake, tornado, tsunami, hurricane etc. -- events which have become devastatingly common in this warming world. In cases of potential accidents caused by equipment failure or human error the NRC provides no safeguard beyond "low probability." This is absolutely not a substitute for actual protection! Those of us who are paying attention have not forgotten Fukushima, Chernobyl, Bhopal, or Love Canal. Why -- when there are rapidly developing clean alternatives to nuclear power generation -- would we end the moratorium on new power plants? (0719-3 [Hibbard, Angela])

Comment: An NRC technical expert, working on NUREG-1738, averred that a cask drop in a Mark I spent fuel pool would not be significantly slowed by passage through water and that a drop from as little as four feet from the bottom would result in complete cask penetration. That would be an approximately 11 foot/diameter hole with potentially several tons of spent fuel crushed and punched through to ground level. (0723-9 [Shadis, Raymond])

Comment: If there was just one lesson to be learned from the ongoing nuclear catastrophe in Japan it is that our best science and engineering is no match for the unpredictable forces of nature. (0757-10 [Lynch, Laura])

Comment: •California's nuclear waste sits in the world's earthquake "ring of fire", the same as Fukushima, the most active and dangerous earthquake zone in the world. California's nuclear waste is surrounded by known active earthquake faults and the USGS says no one has ever predicted a major earthquake. •Most of California's nuclear waste sits along an eroding coastline, in tsunami zones, and is exposed to a highly humid and corrosive coastal environment. NRC's NUREG/CR-7030 states atmospheric corrosion of sea salt can lead to stress corrosion cracking within 32 and 128 weeks in austenitic [corrosion resistant] stainless steel canisters. (0764-4 [Gilmore, Donna])

Comment: •A radiological disaster impacts the nation's and world's security, economy and food supply. California is the eight ranking economy in the world, virtually tied with Italy and the

Russian Federation, and larger than Canada, Australia and Spain. •More than 40 percent of containerized imports enter the country through California ports, and nearly 30 percent of the country's exports depart through them. •California produces nearly half of the U.S. grown fruits, nuts and vegetables. California remained the number one state in cash farm receipts in 2011, with its \$43.5 billion in revenue representing 11.6 percent of the U.S. total. U. S. consumers regularly purchase several crops produced solely in California. •San Onofre is located adjacent to the primary vehicle transportation artery between Los Angeles and San Diego (I-5), and one of the largest military installations (and potential target) on the West Coast (Camp Pendleton). (0764-6 [Gilmore, Donna])

Comment: If there was just one lesson to be learned from the ongoing nuclear disaster in Japan it is that our best science and engineering is no match for the unpredictable forces of nature. (0774-4 [Revilla, Oscar])

Comment: Do not assume that nuclear power plants in the Central and Eastern USA will not be exposed to major earthquakes. The New Madrid Earthquake was a very large historical earthquake that affected part of this region. Also, there is evidence that hydraulic fracturing and/or underground disposal of wastewater are triggering or causing earthquakes, so earthquakes may occur where they have not historically happened. (0788-3 [Sattler, Alfred])

Comment: Each spent fuel pool can contain up to six times the mass of nuclear fuel as is stored in the reactor core itself. Spent fuel is much dirtier--much more radioactive--than new fuel. Any event that causes a single spent fuel pool to lose its integrity could result the release of a large portion that highly radioactive spent fuel into the environment, as airborne radioactive contamination similar to what was seen in Fukushima. With six times the fuel of an operating reactor core, it would release twice the contamination compared to the 3 Fukushima cores which became meltdowns. But because it is dirty spent fuel, it would be much worse. We simply cannot allow such a development. And most certainly, we cannot allow such a development to be kept secret. But if recent history is any indication, we cannot expect to be informed. (0801-3 [Magyar, Michael])

Comment: p. 4-67 to 4-83. Environmental Impacts of Postulated Accidents. p. 4-68. The consequences of a severe (or beyond-design-basis) accident, if one occurs, could be significant and destabilizing. The impact determinations for these accidents, however, are made with consideration of the low probability of these events. The environmental impact determination with respect to severe accidents, therefore, is based on the risk, which the NRC defines as the product of the probability and the consequences of an accident. This means that a high-consequence low-probability event, like a severe accident, could still result in a small impact determination, if the risk is sufficiently low. **Comment:** Consider, for example, that a storage facility location makes it vulnerable to a catastrophic event of uncommon occurrence. How many facilities located in such places would it take to make a low-probability event be categorized as having a greater than SMALL impact? For example, the NRC recognizes six US reactor sites to have "high" vulnerability to severe flooding by upstream dam failure, and an additional nine reactors have "medium" vulnerability. This information was obtained from a memo entitled "Identification of Generic External Flooding Issue Due to Potential Dam Failures" prepared by the Chief of the Probabilistic Risk Assessment Operational Support Branch of the NRC. The memo further states that "Since dam failures were excluded from consideration of most [safety reviews], its risk contribution has not been addressed to date," and "There is an increase in the estimated frequency of potential dam failure of an order of magnitude" from previous assessments. It is evident from the testimony of Fukushima that one such event would have enormously greater environment impact than all the generic factors considered in the

GEIS put together. The left hand of NRC needs to know what the right hand is doing. This particular issue must be evaluated in this GEIS. (0805-12 [Wilshire, Howard])

Comment: Furthermore, this section fails to include an important cause of accidents or exacerbation of accidents: the human factor: There is a very large literature on the contributions of human errors to accidents that have significant impacts on the environment. That history is ignored in this GEIS, but it needs to be factored in for all time frames considered. Human errors are not a given, but their frequency and persistence throughout our grand nuclear experiment have a certain generic flavor. The opportunity for mistakes with environmental consequences is enhanced by the large, and getting larger, number of dry cask designs, which require broadened knowledge for activities designed to ensure cask integrity, including inspection, monitoring, and replacement repeated at intervals greater than typical life-times of the inspectors--that is, the "activity" may be the same or similar forever, but those implementing the actions have by comparison a very rapid turnover. The historical record shows clearly that the majority of significant accidents are due to, or exacerbated by human errors, so calling on the "protections" of design, construction, and regulations is irrelevant. The opportunity for human error, especially considering the time that continued storage at a reactor is rationalized as generically safe (up to 140 years), warrants assessment. In effect, most of the environmental impact assessments are best case scenarios. (0805-13 [Wilshire, Howard])

Comment: Human error or equipment failure in moving loaded dry casks, weighing more than 100 tons, could have catastrophic consequences. Dropping an empty or loaded cask inside the fuel pool building could severely damage critical safety equipment and the entire integrity of the pool. A near-miss occurred in 1995 at Prairie Island in Minnesota when a loaded, 120 ton TN-40 cask became stuck and dangled precariously for 16 hours over the spent fuel pool containing tons of irradiated fuel stored for over 22 years. Should we just rely on NRC's wishin', hopin', and sheer luck that everything will be okay? In some GE BWRs, the fuel storage pools are several stories up in the reactor building, making cask movement even more dangerous and potentially disastrous. (0819-13 [Kline, Connie])

Comment: 4) "Sites and areas where tectonic processes -such as faulting, folding, seismic activity or volcanic activity -and surface geological processes such as mass wasting, erosion, slumping, landsliding, or weather -occur ... must be avoided." The Perry area is subject to earthquakes like the 1986 one that registered 5.0 on the Richter Scale, the epicenter of which was less than 10 miles from the plant. According to the Perry FSAR, there is a known "offshore fault intersecting the cooling water tunnels." According to 1979 Plain Dealer newspaper articles, a huge chasm -"30 feet wide and 20 feet deep in the bedrock running through about two-thirds of the Perry site's huge excavation " was discovered during construction, deemed glacial in nature, and "filled with concrete." After the 1986 earthquake, a fault line running from Lake Erie near the plant south to Akron, Ohio was confirmed, and there have been numerous smaller earthquakes in the area since. The Perry site which sits on a high bluff is also subject to severe erosion which caused an entire park just west of the plant to fall into Lake Erie and has forced multi-million dollar erosion control to protect safety structures such as the emergency service water pumphouse. The Ohio EPA has said that the Perry site would be deemed unsuitable for any type of solid waste facility. At a 10/1/92 NRC informational meeting held in Lake County, the NRC admitted that due to its proximity to Lake Erie, high groundwater table, erosion, and other factors, the Perry site could not meet the bare minimum NRC criteria for radioactive waste disposal per 10CFR61. They were unable to reconcile how Perry can continue to operate and generate tons of radioactive waste on such an environmentally unsuitable site. (0819-20 [Kline, Connie])

Comment: The NRC's security regulations insufficiently ensure that spent fuel pools are protected from electric blackouts. If the electric grid has a blackout to a nuclear power plant that lasts more than the 4 or 8 hours for which the backup generator provides, that electrical blackout becomes a vulnerability for that location. Spent fuel pools require constant cooling. (0823-26 [Michetti, Susan])

Comment: Astrophysicists have warned US Congress that extreme sun spot activity can direct a CMT into the earth's atmosphere with the potential to knock out a significant part of the world's interconnected electric grid in a domino effect. The US grid is interconnected with much of Canada and parts of Mexico. In the recent past, various locations in the USA were hit by super tornados or hurricanes often with surge waves. Some areas were totally leveled. Some areas were without electricity for more than a month. Other areas were flooded. Yet, the backup steam generators are stored in the basement where irrationally flood potential is maximized, returning back to NRC's approval with insufficient safety assessment and overview. The lessons of Fukushima have not been adapted to vulnerabilities. (0823-28 [Michetti, Susan])

Comment: Such lengthy lack of electricity likely will occur at a nuclear plant in the future. Potentially catastrophic, this lengthy lack of electric grid access could seriously impact safety at a nuclear power plant and its spent fuel pool which requires constant cooling. The impact is not if, but when. Without access to sufficient, constant electricity, the security regulations to protect us from this predictable catastrophic problem are missing. It is unacceptable, given the extreme dangerousness of burning ionizing spent fuel pools or a reactor core with the potential for a chain reaction, to not mandate sufficient backup electricity solutions to provide the full potential timeframe when access to grid electricity may be unavailable. Safety claims without sufficient backup energy are invalid. This was the vulnerability at Fukushima. One-quarter of the US's 103 nuclear plants are of the same General Electric design. All nuclear power plants have that vulnerability, which makes it insane to continue to incorrectly assume that sufficient electric grid energy will always be available. (0823-29 [Michetti, Susan])

Comment: A sufficiently scientific overview and assessment requires placing this safety vulnerability at the top of the decision tree, where licensing plant operation must first go through the appropriate gate-keeping, that first requires that the problem be solved, in order to guarantee sufficient backup or reliable alternative energy solution that can keep working for at least a month or for the entire timeline of any potential electrical shortage, whichever is longer. The very operation of any nuclear plant and the creation of its storage pools should depend upon its ability to be able to continue necessary operations for safety indefinitely. (0823-30 [Michetti, Susan])

Comment: This recommendation is not directed towards the process of decommissioning. The recommendation is directly related to the general confidence of the surrounding community towards onsite storage of spent nuclear fuel addressed in NUREG-2157. Although the NRC believes both the spent fuel pools and dry cask storage are equally safe means of storing spent nuclear fuel, Fukushima has shown that spent fuel pools are nowhere near as robust in surviving an earthquake-tsunami event when compared to dry cask storage. (0826-20 [Morgal, Rick])

Comment: The NRC's use of probability-weighted consequences to determine overall risk in environmental impact reviews has been upheld by the Courts. In *Carolina Environmental Study Group v. United States*, the Court found that the Commission's general consideration of the probabilities and severity of a Class 9 accident did not amount "to a failure to provide the required detailed statement of its environmental impact."⁷¹ [footnote 71 text: 510 F.2d 796, 799]

(D.C. Cir. 1975).] There, the Court ruled that it was "entirely proper, and necessary" for the agency to consider both the probabilities and consequences of Class 9 accidents when assessing the environmental impacts of those accidents.⁷² [footnote 72 text: *Id.*] It reasoned that "[t]here is a point at which the probability of an occurrence may be so low as to render it almost totally unworthy of consideration. Recognition of the minimal probability of such an event is not equitable with nonrecognition of its consequences."⁷³ [footnote 73 text: *Id.*] It follows that very low probability of an occurrence can lead to a finding of no significant impact, notwithstanding the population distribution and density, and the hypothetical consequences at any particular site. (0827-2-12 [Ginsberg, Ellen])

Comment: NRC has appropriately cited NUREG-1864, its 2007 probabilistic risk assessment (PRA), in support of statements made about the low risk associated with dry cask storage. These statements could be further strengthened by also citing an independent PRA study conducted by EPRI (EPRI Document 1009691, dated Nov 2004), which also supports the conclusion that the risks are low. Industry agrees with NRC that the low risks calculated by these studies were confirmed during the Mineral, Virginia and Fukushima earthquakes, neither of which resulted in significant damage to dry cask storage systems or release of radionuclides. (0827-4-1 [Ginsberg, Ellen])

Comment: We find this attempt to avoid oversight by the public as a serious concern, given the obvious lack of oversight and poor choices by the industry, exemplified by the failures of the San Onofre Nuclear Generating Station (SONGS), and the disaster at Fukushima, which used similar "Probability Risk Assessment" approaches to conclude that a tsunami of that size would be extremely improbable, and therefore inconsequential. PRA is a broken approach. (0836-10 [Davis, Anonymous])

Comment: We disagree that you can make safety determinations using Probability Risk Assessment (PRA). First, you take a really small number, which is a wild guess as to the probability that some event will occur. Then you take another number, which is a wild guess as to the total consequences of an accident. You multiply these together, making the uncertainty wild-guess-squared, or actually indeterminate. Then, you multiply this by a constant cost of \$2000 or maybe \$4000 per mREM of release, and compare that with an ever-changing and inflated cost for providing safety measures. At the end of all this, you predictably discover that the risk is small, and any changes to improve safety cost too much. (0836-17 [Davis, Anonymous])

Comment: You also ignore the fact that the RISKS increase with every additional NWO that exists and the extended period of time they are envisioned to be in operation. Thus, you need to multiply the indeterminate risk by the number of years and by the number of NWOs in operation. You also have no means to increase the cost per mREM as it is a fixed number, but the utilities charge as much as they can to fulfill regulatory requirement, sometimes exceeding the NRC (and any reasonable estimate) by as much as 10x. (0836-18 [Davis, Anonymous])

Comment: There is never much of any consequence that needs to be analyzed if everything goes well. The problem is when things don't go well. You analyze spent fuel fires based on limited concept of type of accidents that might occur. "Design basis accidents" are used as a way to limit the cost for dealing with accidents, because only a limited number of scenarios need be considered. In this document, you consider only two possible scenarios, when in fact there are an unlimited number of scenarios, some of which we could not think of because we don't understand everything. For example, at SONGS, the steam generator tubes were analyzed for only one type of rattling motion. Motion along the other plane was considered inconsequential.

In actuality, the steam generators were rattling themselves apart at the seams. So what is the likelihood that you have it wrong? Probably 100%. (0836-19 [Davis, Anonymous])

Comment: Section 3.0 "Affected Environment" considers only the effects when everything goes well, not when the accidents happen, and THEY WILL HAPPEN! This is the lesson, more than anything else, we must accept from Fukushima, and the nuclear industry in general. No matter how unlikely the accident, they STILL WILL OCCUR, and you SHOULD consider this in the affected environmental analysis. THE ENTIRETY OF THIS SECTION MUST BE CHANGED to address the consequences of accidents, not operation without any problem. No one is concerned about non-accident operation of an ISFSI!!!! If there is no accident, there is by definition, no problem. But when there is an accident, then there is, and this is why your treatment of the effects on the environment are ALL INSUFFICIENT! (0836-47 [Davis, Anonymous])

Comment: Section 3.14 "Waste management" only concerns EXPECTED waste when everything is going well. What happens when something happens that is out of expectation? Not addressed. (0836-49 [Davis, Anonymous])

Comment: Page 4-77, Line 30+, you consider two design basis accidents in the hypothetical DTS. You did not consider unusual and unexpected events, like partial meltdown inside a canister due to failure of cladding around high-burnup fuel pellets, a problem that has been described as a concern. At this point, we assert that there are simply TOO MANY UNKNOWNs and "unresolved issues" for this DGEIS to apply to any period longer than the normal decommissioning period. As more information is learned, if a DTS is actually ever designed and constructed, if we get statistics about how well the fuel lasts inside canisters, etc. etc. then it may be possible, IN ABOUT ANOTHER 50 YEARS to speculate about the subsequent 100. Until then, your optimism is far too apparent, and again a sign that the NRC has gone so far astray that it does not even realize that it is lost. (0836-55 [Davis, Anonymous])

Comment: Page 4-78, you consider a "loss of containment event" but constrain it to filters that are inoperable. Why not assume the entire DTS fails and radiation is emitted? Then what? There is no containment around the DTS, in the design you have conceptualized. Ridiculous. STANDARDS FOR DRY/WET TRANSFER MUST BE IMPROVED! (0836-56 [Davis, Anonymous])

Comment: The affect on Aquatic resources, again, assumes NO ACCIDENTS occur. (0836-71 [Davis, Anonymous])

Comment: The NRC has yet to recognize the risks related to solar flares, their incapacitating impact on the nation's electrical infrastructure, and the resulting impact on the ability to cool nuclear power plant spent fuel pools. Nuclear power plants and their electrical systems have not been made impervious to the effects of such electrical storms. A large solar flare has the potential to incapacitate the nation's electrical distribution infrastructure for years and/or render all electrical components at plants inoperable. In either scenario, the lack of a constant source of power to the spent fuel pool cooling systems will inevitably result in radiological fires at all spent fuel pools across the US. (0840-5 [Taylor, Tom])

Comment: So, the NRC's new Waste Confidence Generic Environmental Impact Statement acknowledges prolonged above-ground storage and a multitude of issues including ground water contamination from spent fuel pools, severe accident consequences, and terrorism. The NRC considers "reasonably foreseeable" events including a severe accident that may result in evacuating millions of people, vacating thousands of square miles, rendering expansive areas of

land unsuitable for agriculture, and costing billions of dollars not including replacement power costs. With evacuation, the NRC emphasizes that radiological doses to the public should be low. The NRC declares that the impact of indefinitely continued spent fuel storage is "SMALL" with a probability-weighted determination that almost sounds reasonable until you consider multi-year operation of multiple plants which makes a severe accident likely. (0851-1 [Thatcher, Tami])

Comment: In the 40 years since SONGS has been operating, the number of people living within 50 miles of the plant has grown exponentially representing one of the most populous areas in the state. This includes 65,000 residents now living in San Clemente within 10 miles of San Onofre. Since 9-11 Americans are acutely aware of the ongoing threat of a terrorist attack on a facility like this, and all southern Californian's know that a major earthquake in our region is long overdue. The disaster at Fukushima is yet another reminder of our vulnerability to earthquakes, tsunamis, and circumstances beyond human control. (0855-2 [Holloway, Patricia])

Comment: In reality, PRAs utterly fail to assess the dangers of ongoing operations with no end in sight. 100-year floods and earthquakes become inevitable instead of rare if you wait long enough -- and that seems to be exactly what the nuclear industry wants: For us all to wait until there is a disaster, only to claim they never saw it coming. (0856-7 [Fritz, John])

Comment: If there was just one lesson to be learned from the ongoing nuclear disaster in Japan it is that our best science and engineering is no match for the unpredictable forces of nature. (0860-4 [Headrick, Gary])

Comment: After Frankenstorm Sandy, I am especially concerned that the NRC has not updated its computer simulations and accident-probability calculations to reflect greater likelihood of the electric power grid going down. As it was, despite the "evacuation routes" being completely closed, Indian Point continued to operate as the water rose (remember: the power was out-there was no need for it to keep generating electricity!). Many of us called to check on the situation as the storm progressed; we were transferred from office to office without our questions being answered; nobody really seemed to know what was happening. We turned to the experts for answers; they had none. Loss of off-site power is a major contributor to accident scenarios at nuclear reactors. Many potential scenarios would also include damage to the fuel pool and its back-logged waste inventories. (0864-12 [Gellert, Sally Jane])

Comment: An additional issue is the potential problem of decontamination and cleanup in the event of an incident at any one of these individual spent fuel storage facilities. What are the guarantees from the NRC for the costs and expertise needed to address such remediation events if in fact the NRC does not recognize these in their vision of the future? An example of an unfunded mandate now being imposed on states from mismanaged nuclear wastes is that states all over the United States are forced to devote staff, time, political and social attention to the problems created by the contamination of DOE site. For example, the need for Nevada to maintain a Bureau of Federal Facilities devoted solely to the problems of overseeing DOE facilities (<http://ndep.nv.gov/boff/index.htm>). The record is clear - agencies like the DOE and NRC have in the past left such issues off of analysis when in fact those have very real environmental consequences. (0867-3-11 [Griffin, William])

Comment: A vital ingredient for the continued management of the spent fuel is the skilled and trained staff able to perform the work. The potential failure to train and identify high quality staff will have a variety of effects not discussed in the DGEIS. The NRC and the nuclear industry have paid close attention to human factors engineering as it relates to plant operations because

of its effect on accident and other risks. There has been relatively less work on human factors risks associated with the dry cask storage of spent nuclear fuel. If the quality of human capital declines, the risks associated with continually transferring and packaging the spent nuclear fuel will increase. The DGEIS does not comment on this problem. (0867-3-7 [Griffin, William])

Comment: I cannot believe that what was the case then is now considered unimportant, that is that it is all right to have containers of radioactive material left on site where it is vulnerable to weather, fire, or terrorism, or earthquake. (0882-2 [Wright, Margaret Z.])

Comment: A fundamental problem with the draft GEIS is its method of assessing risk. The DGEIS defines radiological risk as the numerical product of the probability and the consequences of an event, and further argues that a high-consequence, low-probability event, such as a severe accident, could be determined to have a small environmental impact if the risk is sufficiently low. In the context of the DGEIS, that definition of radiological risk, and the associated determination of environmental impact, are fundamentally flawed from at least four overlapping perspectives: • First, numerical estimates of consequences and probability are typically incomplete and highly uncertain. • Second, significant aspects of consequences and probability are not susceptible to numerical estimation. • Third, larger consequences can be qualitatively different than smaller consequences. • Fourth, devotees of this definition of risk typically argue, as does the DGEIS, that equal levels of “risk”, as they define it, should be equally acceptable to citizens. That argument may be given a scientific gloss, but is actually a statement laden with subjective values and interests. An informed citizen could reject the argument on reasonable grounds. (0897-6-13 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Thompson Declaration, Section IV. The qualitative difference between large and small consequences is not a well-known factor in the United States, but is recognized in Europe. For example, analysts at the French government’s Institut de Radioprotection et de Surete Nucleaire (“IRSN”) have found a qualitative difference between larger and smaller radiological consequences. The IRSN analysts estimated the costs (i.e., economic damage) that would arise from an accidental, atmospheric release of radioactive material from the Dampierre nuclear generating station in France. They considered two types of release – a “controlled” (smaller) and a “massive” (larger) release. A paper summarizing their findings was presented at the 2012 Eurosafe conference. Thompson Declaration, par. IV-11. The IRSN analysts concluded that the costs arising from a massive release would differ “profoundly” from the costs arising from a controlled release, in terms of both qualitative and quantitative factors. Indeed, they described the massive release as “an unmanageable European catastrophe.” Their paper concluded with the statement: “Safety decisions may also be informed by this picture, in particular if it is realized that the most severe cases actually carry huge stakes for the nation and therefore that their lower probability may not balance their catastrophic potential.” (0897-6-14 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: As Dr. Thompson observes, the full array of consequences of a large, atmospheric release of radioactive material from a nuclear facility in the United States is difficult to predict. The nature and scale of those consequences would vary according to the characteristics of the release and other factors. It is clear, however, that there are unresolved socio-political tensions in this country. Thus, the consequences of a large release could include substantial political stress. It is unlikely that aggrieved citizens would be comforted if they learned that NRC had determined, at a prior time, that the release was a low-risk event. Thompson Declaration, par. IV-16. The DGEIS relies on probabilistic risk assessment (“PRA”)-type studies for its estimation of radiological risk. Studies of this type can provide useful information about radiological risk, for certain purposes. However, these studies cannot provide a credible estimate of the probability

of a radiological event such as a pool fire. Thompson Declaration, pars. X-31–X-39. (0897-6-15 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The Draft GEIS should comprehensively analyze all aspects of accidents involving dry cask storage and inter-cask fuel transfers based on sound scientific information. When the information is incomplete or has significant uncertainties, these should be stated. If there are methodological studies that provide a guide to how calculations should be done, the guidance should be used to develop estimates. In some cases, the data gaps are so large, that a realistic calculation of uncertainties can be operationally meaningless in the sense of its usefulness for choosing among alternative courses of action. The Draft GEIS should have assessed data gaps in this manner. Instead of such a procedure, the Draft GEIS has improperly used a pilot study (hereafter Pilot Study) intended to demonstrate a method to declare that public health impacts due to an accident during spent fuel storage transfer would be SMALL⁴⁵ [footnote 45 text: 45 NRC 2013a, pp. 4-82 and 4-83] for the purpose of the waste confidence regulation, when the study explicitly states that it should not be used for regulatory purposes: The methodology developed in this study can be used as a guide for performing other similar PRAs [probabilistic risk assessments]. Moreover, the results of this study can be used in conjunction with the methodology selected to determine the need for other PRAs, improvements in data gathering and analysis, and additional engineering design analysis. It should be noted that the focus of this pilot study *was solely on the methodology* and its limited (i.e., case-specific) application. Thus, *no inferences or conclusions should be drawn with regard to the study's regulatory implications*.⁴⁶ [footnote 46 text: NRC Pilot 2007, p. v, italics added] (0898-1-13 [Curran, Diane] [Makhijani, Arjun])

Comment: There are a number of reasons that the Pilot Study should not be used in a generic, regulatory context, especially in a situation where the impacts of indefinitely long periods of storage and repeated transfers are being assessed, as is the case in the Draft GEIS. First, it was a pilot study done to develop methodology; it was not designed for general use. For instance, the study considered high burnup Boiling Water Reactor (BWR) spent fuel.⁴⁷ [footnote 47 text: NRC Pilot 2007, p. 1-2] Most U.S. reactors are pressurized water reactors (PWR). The space between the fuel pellet and the fuel rod decreases with burnup. However, the gap between the fuel pellet and the fuel rod is reduced much more in a PWR than a BWR.⁴⁸ [footnote 48 text: NRC Pilot 2007, Table D-2, p. D-8] As the Nuclear Waste Transportation Review Board (NWTRB) has pointed out, “[h]igh-burnup fuels tend to swell and close the pellet-cladding gap, which increases the cladding stresses and can lead to creep and stress corrosion cracking of cladding in extended storage.”⁴⁹ [footnote 49 text: NWTRB 2010, p. 11] This shows that the difference in the fuel pellet cladding gap between PWRs and BWRs is of material importance for high burnup fuel; it needs to be taken into account in the analysis of impacts of spent fuel storage and transport. (0898-1-14 [Curran, Diane] [Makhijani, Arjun])

Comment: The Pilot Study listed a number of uncertainties but did not consider them in its quantitative analysis: The changes that occur in the properties of the fuel and the cladding while in-reactor may introduce *large errors* into the determination of the release factors, because of the uncertainty of the database....*No attempt has been made to quantify the degree of the uncertainties* or to determine if they are significant to the risk.⁵⁰ [footnote 50 text: NRC Pilot 2007, p. D-19, italics added] By implication, the estimate of health impact cited in the Draft GEIS has not considered a substantial number of uncertainties. (0898-1-15 [Curran, Diane] [Makhijani, Arjun])

Comment: The NRC's first proposed findings are that spent fuel can be safely stored for an indefinite time period (10 CFR 51.23(a)(2)) and that it can be stored indefinitely without

significant adverse environmental impacts (Table B-1).¹² [footnote 12 text: NRC 2013b, p. 56804-56805] These findings have scant technical support; the available analysis generally points in the opposite direction. The Draft GEIS fails to provide a detailed quantitative analysis of the impacts to public health and the environment that would occur in the event of an accidental release of radiation during spent fuel storage or transfer. Given the high level of radioactivity in spent fuel, the high burnup of much of the spent fuel, and the very long half-lives of certain radioactive materials (including plutonium-239 and long-lived fission products with half-lives that range from 30 years to millions of years), these impacts could be substantial. (0898-1-2 [Curran, Diane] [Makhijani, Arjun])

Comment: The Draft GEIS has considered only criticality accidents in spent fuel pools.⁹² [footnote 92 text: NRC 2013a, pp. 4-69 - 4-70] However criticality is an issue for dry cask storage and transport, notably for high burnup fuel as noted in NUREG/CR-6835. Irradiation of nuclear fuel to high-burnup values increases the potential for fuel failure during normal and accident conditions involving transport and storage. The objective of this work is to investigate the consequences of potential fuel failure on criticality safety and external dose rates for spent nuclear fuel (SNF) storage and transport casks, with emphasis on high-burnup SNF. Analyses were performed to assess the impact of several damaged/failed fuel scenarios on the effective neutron multiplication factor (k_{eff}) and external dose rates. The damage or failure was assumed to occur during use in storage or transport, particularly in an accident. Although several of the scenarios go beyond credible conditions, they represent a theoretical limit on the effects of severe accident conditions. Further, the results provide a basis for decision making with regard to failure potential and a foundation to direct future investigations in this area.⁹³ [footnote 93 text: NUREG/CR-6835 (2003), p. iii] (0898-3-5 [Curran, Diane] [Makhijani, Arjun])

Comment: As the abstract quoted above in paragraph 5.1 notes, the study explored the theoretical limit of criticality risks for high burnup fuel. The fuel was assumed to have been in storage for 20 years. The Draft GEIS could have used these calculations to provide bounding calculations on doses to the public and to workers in the event of an accident approaching the limits described. But it did not consider criticality risks associated with dry storage at all. (0898-3-6 [Curran, Diane] [Makhijani, Arjun])

Comment: The Draft GEIS fails to provide a detailed quantitative analysis of the impacts to public health and the environment that would occur in the event of an accidental release of radiation during spent fuel storage or transfer. Given the high level of radioactivity in spent fuel, the very long half-lives of certain radioactive materials (including plutonium-239 and long-lived fission products with half-lives that range from 30 years to millions of years), and the high burnup of much of the spent fuel, these impacts could be substantial. (0898-5-14 [Curran, Diane] [Makhijani, Arjun])

Comment: Having initially testified before the A.E.C. in 1969 of my experiencing numerous earthquakes (6.0+ in 1966) in Avila Beach, I was quickly, superficially & continuously ignored. Ignoring the NRC's own regulations on seismic issues & without initially shutting down the Devil until the seismic studies are completed, only further demonstrates the committees collusion & corruption. Is that your legacy? (0905-2 [Schmidt, Otto])

Comment: The Draft GEIS claims that impact of a severe accident would be small. Such a conclusion cannot be supported by logic or experience. A severe accident would release deadly radioactivity into the environment. Every release of manmade radioactive matter into the environment to date has had serious and long-lasting impacts on humans and other living things within the area affected. (0908-3 [Mikkelsen, Sara])

Comment: On page xxx, the box states "NRC's concept of risk probability consequences HOW LIKELY IS IT ...etc". Surely the facts of Hiroshima/Nagasaki, Three Mile Island [where setting a manageable fire was considered], Chernobyl [and its continuous wind-caused unexpected hotspots], and Fukushima ongoing uncontrolled hazards etc..... sadly show the Industry/NRC/etc. disrespect for human, environmental and planetary welfare. (0910-7 [Carey, Corinne])

Comment: Design Basis Events in Dry Cask Storage Systems[:] The draft GEIS assumes that during repackaging, hundreds of thousands of assemblies will have to be transferred one-by-one across all DTS facilities. The draft GEIS also uses a "stuck assembly" accident as bounding for the accident scenario analyses. However, a "stuck assembly" accident does not include rupture of the cladding and release of radioactive material, while a cask/assembly drop scenario would be likely to include a release. It is not clear why the "stuck assembly" accident is used for bounding the accident scenario analyses when the consequences of a cask/assembly drop would be more severe than those of a "stuck assembly" accident. The draft GEIS also states that since the postulated fuel assembly or cask drop is among the design basis accidents analyzed by licensees, the environmental consequences associated with these accidents during continued storage would be small. It is our understanding, however, that existing facilities are not currently licensed for extended fuel storage, and they are not licensed to perform fuel inspections and repackaging involving multiple assembly transfers. The number of projected assembly transfers during ISFSI/DTS operations is not provided in the draft GEIS, although we expect the number of such transfers will likely be significant. With a large number of transfers, even low frequency events may have a non-negligible, non-speculative 1likelihood of occurring during the lifetime of all of the assumed DTS facilities. The draft GEIS does not provide information provided on the number, frequency and consequences of assembly drops anticipated during ISFSI/DTS operations for all three timeframes. *Recommendation:* Provide the following information in the final GEIS in Section 4.18.1.2: (i) total number and annual frequency of assembly drops across the industry, (ii) projected frequency of assembly drops during transfers of assemblies in the course of loading, repackaging, inspection, and other pertinent ISFSI/DTS operations for all three timeframes, (iii) whether cask/assembly drops could occur at least once in the lifetime of any of the assumed DTS facilities, and (iv) projected consequences of these cask/assembly drops during transfer operations. Assume high burnup fuel and degraded cladding for all three scenarios, and provide information on why the consequences of "stuck assembly" accidents are considered more severe than consequences of the cask/assembly drops during transfer operations. (0915-7 [Bromm, Susan E.]

Comment: Natural Phenomena Hazard Events[:] The draft GEIS does not discuss the potential for an increased likelihood of the occurrence of natural phenomena hazard events, such as seismic events, given extended storage time frames. We also note that because the fuel, cladding and assembly hardware are not designed for storage beyond 100 years after irradiation, the potential degradation of the hardware may exacerbate the impact of natural phenomena hazard events. *Recommendation:* Provide information on the potential for an increased likelihood of the occurrence of natural phenomena hazard events over extended time frames, as well as the potential degradation of the hardware and how that may exacerbate the impacts of natural phenomena hazard events. (0915-9 [Bromm, Susan E.]

Comment: (V-21) These five core-melt incidents provide a data set that is comparatively sparse and therefore does not provide a statistical basis for a high-confidence estimate of CDF. Nevertheless, this data set does provide a reality check for PRA estimates of CDF. From this data set - five core-melt incidents over a worldwide experience base of about 15,500 RY - one observes a CDF of 3.2×10^{-4} per RY (1 event per 3,100 RY). This value can be regarded as a

"simple" estimate of CDF. (V-22) A PRA analyst employed by NRC, Raymond Gallucci, has written a paper that develops CDF estimates based on direct experience.³⁷ [footnote text 37: Gallucci, 2012.] Gallucci's paper accompanies this declaration as Exhibit #21. The paper considers both reactor core-melt and ASP experience, leading to a "simple" CDF estimate of 6.0×10^{-4} per RY (1 event per 1,700 RY). The paper does not adopt that estimate. Instead, it makes some analytic assumptions, and ultimately concludes that CDF, worldwide and in the USA, is in the range 0.7×10^{-4} to 4.0×10^{-4} per RY (between 1 event per 14,300 RY and 1 event per 2,500 RY). I question the assumptions underlying this downward adjustment of the "simple" CDF estimate. However, Gallucci's analysis deserves careful consideration in view of his professional expertise. On another note, Gallucci ends his paper by expressing his personal willingness to tolerate a CDF of the level that he has identified. On that matter, his opinion has no more weight than the opinion of any citizen. (V-23) As shown in the preceding paragraphs, direct experience suggests a CDF as high as 6.0×10^{-4} per RY. The lowest value in the range suggested by Gallucci is 0.7×10^{-4} per RY. It is instructive to compare these numbers with the CDF estimates shown in Figures V-1 and V-2. The only CDF estimates in those figures that approach direct-experience levels are the upper-bound (95th percentile) levels of earthquake-caused CDF using Livermore seismic estimates. Thus, direct experience indicates that NUREG-1150 substantially under-estimated CDF. This finding does not mean that NUREG-1150 was a bad study. On the contrary, as stated above, NUREG-1150 was the high point of PRA practice. My finding simply confirms that PRA cannot account for all of the factors that determine the probability component of radiological risk. (0916-1-10 [Curran, Diane] [Thompson, Gordon R.]

Comment: (V-27) A paper by Sornette et al reveals the limitations of PRA findings by comparing them with lessons from direct experience.³⁸ [footnote text 38: Sornette et al, 2013.] That paper accompanies this declaration as Exhibit #22. The paper considers monetized losses from nuclear-facility incidents, using two sources of information. One source is a reactor PRA. The other source is a compilation of data on actual incidents at nuclear facilities. Figure V-5 of this declaration reproduces a figure from Sornette et al. That figure shows that the PRA substantially under-estimates the probability of a monetized loss. The under-estimation grows as losses become larger. In other words, the PRA findings show a thin-tail probability distribution, whereas the empirical data show a fat-tail distribution. (0916-1-11 [Curran, Diane] [Thompson, Gordon R.]

Comment: (V-30) At this point in Section V, I have shown that reactor PRAs typically yield estimates of probability (i.e., the probability of accident outcomes) that are substantially lower than is implied by direct experience and insurers' judgment. This finding carries over to PRAs for non-reactor facilities, because it arises from limitations in the art of PRA itself. Those limitations are significant for the draft GEIS, because the draft GEIS relies upon PRA findings for estimation of radiological risk. (0916-1-12 [Curran, Diane] [Thompson, Gordon R.]

Comment: (VIII-9) At this point, I have established that pool storage of spent fuel, as considered in the draft GEIS, could occur, and probably will occur, at locations near operational reactors. It follows that the draft GEIS should have carefully considered the potential linkage of pool risk and reactor risk. (VIII-10) PRA practice has neglected linkage of risk among multiple reactors at a site. That neglect is summarized in Karl Fleming's paper, discussed above. The paper says:⁷² [footnote text 72: Fleming, 2011.] "Our current state of knowledge about the risks from accidents is derived from PRAs. For the most part PRAs on multi-unit sites have been performed on individual reactors separately. In fact, some multi-unit sites have performed a PRA only for one of the sited reactors, arguing that symmetry considerations justify a single reactor PRA. In order to meet expectations for PRA quality, as defined in the various PRA standards, such PRAs must address certain multi-unit dependencies in the modeling of risks

that involve damage to a single reactor. The capability to use equipment from one reactor to back up failures on another is typically considered, however the probability that resources are consumed by concurrent reactor accidents is almost always ignored." (VIII-11) In a 2013 journal article, Schroer and Modarres proffer an event classification schema for applying PRA to multiple reactors at a site.⁷³ [footnote text 73: Schroer and Modarres, 2013.] That article accompanies this declaration as Exhibit #34. At the time of publication, co-author Suzanne Schroer was a member of the NRC staff. The article says:⁷⁴ [footnote text 74: Schroer and Modarres, 2013, page 49.] "Currently, multi-unit nuclear power plant PRAs consider the risk from each unit separately and do not consider combination events between the units. To gain an accurate view of the site's risk profile, the CDF for the site rather than the unit must be considered. This paper has presented a classification system that utilizes existing single-unit PRAs and combines them into a multi-unit PRA. Six main commonality classes that can cause multiple units to be dependent have been presented: initiating events, shared connections, identical components, proximity dependencies, human dependencies, and organizational dependencies. A seventh class, independent events, was only marginally discussed because it does not address dependencies between the units." (VIII-12) From the two preceding paragraphs and the documents cited therein, one sees that linkage of risk among multiple reactors at a site has been long neglected, but is beginning to receive some attention from NRC and licensees. Linkage of pool risk and reactor risk at a site has been similarly neglected, but has not been properly addressed by NRC or licensees. (0916-1-17 [Curran, Diane] [Thompson, Gordon R.]

Comment: (VIII-13) Although NRC has not properly addressed the linkage of pool risk and reactor risk, NRC has taken a small, initial step in that direction. This step was taken in a pool-fire study that NRC published in 2013. As discussed in paragraph I-11, above, NRC published a draft version of the pool-fire study in June 2013.⁷⁵ [footnote text 75: Barto et al, 2013a.] The study was republished in final form in October 2013, with no substantial change.⁷⁶ [footnote text 76: The October 2013 version is: Barto et al, 2013b. It was published as an enclosure under the SECY memo: Satorius, 2013a. That memo stated: "None of the comments or responses [i.e., on the draft version of the study] has necessitated making substantial changes to the report." (See: Satorius, 2013a, page 3.)] The October 2013 version, with its cover memo, accompanies this declaration as Exhibit #35. Hereafter, I refer to it as "NRC's consequence study". I assume that the technical parts of the June 2013 and October 2013 version are identical. Thus, the Thompson draft consequence declaration applies equally to both. (VIII-14) NRC's consequence study took a small step toward addressing the linkage of pool risk and reactor risk in the sense that it identified aspects of that linkage. It did not proceed to analyze those aspects. The identification occurred under the rubric, Multi-Unit Considerations, via the following statement:⁷⁷ [footnote text 77: Barto et al, 2013b, Section 2.2, pp 28-29.] "Observations Regarding a Concurrent Reactor Event: There are four broad interplays that can be defined between the SFP [spent fuel pool] and the reactor: 1. an initiating event that directly affects both the reactor and the SFP 2. a reactor accident that prevents accessibility to the SFP for a prolonged period of time (e.g., due to high radiation fields), leading to a SFP accident 3. a reactor accident that includes ex-containment energetic events (e.g., a hydrogen combustion event) or other ex-containment interplays (e.g., steaming through the drywell head that affects refuel floor combustible gas mixtures) and creates a hazard to the SFP (e.g., by causing debris to fall in to the pool) or otherwise changes the SFP event progression 4. an SFP accident that prevents accessibility to key reactor systems and components for a prolonged period of time or which creates a hazard for equipment used to cool the reactor (e.g., the flooding of low elevations of the reactor building due to a leak in the pool or excessive condensation from continuous boiling of SFP water), leading to a reactor accident[.] For each of these interplays, large seismic events and severe weather SBO [station blackout] events are logically the most relevant initiators, as

they are the type of initiators that are most likely to initiate an accident at the reactor and SFP, while simultaneously hampering further accessibility to key areas, key systems and components, and key resources. To the extent practicable, this study has attempted to qualitatively account for some of these effects. For example, when the reactor and SFP are hydraulically connected (during refueling), the decay heat and water volumes from both sources are considered. The study also explores these effects on mitigation (Section 8), and addresses some aspects of the uncertainty associated with this treatment (Section 9). However, explicitly modeling multiunit effects was not a focus of this study, because of the existing limitations with the available computational tools. An ongoing project described in SECY-11-0089 will attempt to more rigorously address these effects in the framework of a multiunit Level 3 PRA for Vogtle Electric Generating Plant Units 1 and 2." (0916-1-18 [Curran, Diane] [Thompson, Gordon R.]

Comment: (VIII-15) The four "interplays" described in this statement are far from the final word about linkage of pool risk and reactor risk, but they would provide a useful starting point for technical analysis on that linkage. These interplays could occur in situations where pool storage of spent fuel, as considered in the draft GEIS, occurs at a location near an operational reactor. Thus, the draft GEIS should have carefully considered the implications of these interplays for the environmental impacts of storing spent fuel in pools. Unfortunately, the draft GEIS failed to consider those implications. (VIII-16) The second half of the statement quoted in paragraph VIII-14 shows clearly that NRC's consequence study does not provide credible technical analysis of the pool-reactor interplays that it identifies. Instead, it says that another project "will attempt" to address these interplays at some future date. Until that work is done properly, NRC will not be able to complete an adequate GEIS on the environmental impacts of storing spent fuel. (0916-1-19 [Curran, Diane] [Thompson, Gordon R.]

Comment: (IV-4) NRC has articulated several, inconsistent definitions of risk. The definition in the NRC Glossary is, on its face, similar to my definition. Other NRC definitions, discussed below, deviate from the NRC Glossary to the point where they become fundamentally flawed. The NRC Glossary defines risk as:¹⁸ [footnote 18 text: NRC website, <http://www.nrc.gov/reading-rm/basic-ref/glossary/risk.html>, accessed on 21 October 2013.] "The combined answer to three questions that consider (1) what can go wrong, (2) how likely it is, and (3) what its consequences might be. These three questions allow the NRC to understand likely outcomes, sensitivities, areas of importance, system interactions, and areas of uncertainty, which can be used to identify risk-significant scenarios." (IV-5) In the draft GEIS, the concept of risk is first introduced using a definition close to, but not identical with, the definition in NRC's Glossary. The Executive Summary of the draft GEIS says:¹⁹ [footnote 19 text: NRC, 2013b, page xxx.] "NRC's concept of risk combines the probability of an accident with the consequences of that accident. In other words, the NRC examines the following questions: What can go wrong? How likely is it? What would be the consequences?" (IV-6) Later in the draft GEIS, the definition of risk deviates further from NRC's Glossary and becomes fundamentally flawed. In Section 4 of the draft GEIS, this later definition is embedded in an instructive paragraph. The paragraph is:²⁰ [footnote 20 text: NRC, 2013b, pages 4-68 and 4-69 (emphasis added).] "The consequences of a severe (or beyond-design-basis) accident, if one occurs, could be significant and destabilizing. The impact determinations for these accidents, however, are made with consideration of the low probability of these events. The environmental impact determination with respect to severe accidents, therefore, is based on the risk, which the NRC defines as the product of the probability and the consequences of an accident. This means that a high-consequence low-probability event, like a severe accident, could still result in a small impact determination, if the risk is sufficiently low." (IV-7) Through this deviation, NRC has ended up with a particular, limited definition of risk, as the arithmetic product of a numerical indicator of harmful consequences and a numerical indicator of the probability that those

consequences will occur.²¹ [footnote text 21: Often, the arithmetic product is calculated for each of a range of scenarios, and these products are summed across the scenarios to yield an overall "risk".] I refer to that definition hereafter as the "arithmetic" definition of risk. The arithmetic definition is flawed from several perspectives, as discussed below. It is, however, used extensively in the nuclear industry. (IV-8) The above-quoted paragraph from the draft GEIS suggests a powerful motive for use of the arithmetic definition of risk. Consider the following situation. The consequences of a potential event could be severe; indeed, they could be "significant and destabilizing", to use the words of the draft GEIS. Yet, if the event has, allegedly, a sufficiently low probability, then its "risk", arithmetically defined, would be very low. A devotee of the arithmetic definition could then argue that no action is required to mitigate the risk. In that way, the cost of mitigating actions would be avoided. (0916-1-2 [Curran, Diane] [Thompson, Gordon R.]

Comment: (VIII-18) Figure VIII-2 illustrates how intimately a spent-fuel pool can be associated with the reactor it serves. Moreover - as discussed in paragraph VIII-6, above - at 17 sites in the United States, any fuel in a pool is intimately associated with two adjacent reactors. In other instances, the association between a pool and a different, nearby reactor may not be quite so intimate. Nevertheless, physical proximity, sharing of buildings, and/or sharing of support systems could establish a strong linkage of pool risk and reactor risk. One concern is that a release of radioactive material from a reactor could create a radiation field that precludes personnel access needed to keep a nearby spent-fuel pool in a safe state. Lack of that access could lead to a pool fire. (0916-1-20 [Curran, Diane] [Thompson, Gordon R.]

Comment: In the context of radiological risk in the commercial nuclear sector, the arithmetic definition of risk is flawed from at least four overlapping perspectives: First, numerical estimates of consequences and probability are typically incomplete and highly uncertain. Second, significant aspects of consequences and probability are not susceptible to numerical estimation. Third, larger consequences can be qualitatively different than smaller consequences. Fourth, devotees of the arithmetic definition typically argue that equal levels of "risk", as they define it, should be equally acceptable to citizens. Their argument may be given a scientific gloss, but is actually a statement laden with subjective values and interests. An informed citizen could reject their argument on reasonable grounds. (0916-1-3 [Curran, Diane] [Thompson, Gordon R.]

Comment: (IV-11) The third perspective is that larger consequences can be qualitatively different than smaller consequences. There is ample evidence to support this proposition. For example, analysts at the French government's Institut de Radioprotection et de Surete Nucleaire (IRSN) have found a qualitative difference between larger and smaller radiological consequences. The IRSN analysts estimated the costs (i.e., economic damage) that would arise from an accidental, atmospheric release of radioactive material from the Dampierre nuclear generating station in France. They considered two types of release - a "controlled" (smaller) and a "massive" (larger) release. A paper summarizing their findings was presented at the 2012 Eurosafe conference.²² [footnote text 22: Pascucci-Cahen and Patrick, 2012.] That paper accompanies this declaration as Exhibit #11. (IV-12) The IRSN analysts concluded that the costs arising from a massive release would differ "profoundly" from the costs arising from a controlled release, in terms of both qualitative and quantitative factors. Indeed, they described the massive release as "an unmanageable European catastrophe". Their paper concluded with the statement: ²³ [footnote text 23: Pascucci-Cahen and Patrick, 2012.] "Safety decisions may also be informed by this picture, in particular if it is realized that the most severe cases actually carry huge stakes for the nation and therefore that their lower probability may not balance their catastrophic potential." (IV-13) To illustrate the potential for qualitative difference between larger

and smaller consequences, consider the IRSN description of a massive release as "an unmanageable European catastrophe". Underlying that description is the potential for major sociopolitical impacts that would, in Europe, have substantial trans-boundary dimensions. The European Union might not survive the political stress arising from this event. (0916-1-4 [Curran, Diane] [Thompson, Gordon R.]

Comment: (IV-16) The full array of consequences of a large, atmospheric release of radioactive material from a nuclear facility in the United States is difficult to predict. The nature and scale of those consequences would vary according to the characteristics of the release and other factors. It is clear, however, that there are unresolved socio-political tensions in this country. Thus, the consequences of a large release could include substantial political stress. It is unlikely that aggrieved citizens would be comforted if they learned that NRC had determined, at a prior time, that the release was a low-risk event. (0916-1-5 [Curran, Diane] [Thompson, Gordon R.]

Comment: (IV-17) As mentioned above, the arithmetic definition of risk is used extensively in the nuclear industry, despite its flaws. It is also used in other contexts. One manifestation of this definition is the "probability-threshold position" on risk. Supporters of that position argue that levels of risk below some numerical threshold can be ignored. That position means, in effect, that risks below the threshold are assigned a value of zero. The threshold might be, for example, an average probability of human fatality of 1×10^{-6} per annum. The probability-threshold position has been critiqued in a paper by the philosopher Kristin Shrader-Frechette.²⁶ [footnote text 26: Shrader-Frechette, 1985.] That paper accompanies this declaration as Exhibit #14. Shrader-Frechette found that arguments for the probability-threshold position are fundamentally flawed. (0916-1-6 [Curran, Diane] [Thompson, Gordon R.]

Comment: (IV-18) Devotees of the arithmetic definition of risk often claim that their position is "scientific" and "rational". It is neither. The arithmetic definition is laden with subjective values and interests, and is prone to abuse. It is given a scientific gloss because it is expressed in numbers. However, the neatness of its numerical expression is achieved by ignoring significant factors that are not susceptible to numerical assessment. Ignoring such factors is the antithesis of a scientific approach. Moreover, the arithmetic definition pre-empts important ethical considerations, such as the tolerability of large consequences. Accordingly, the Thompson scoping declaration offered the following recommendation, which I continue to endorse:²⁷ [footnote text 27: Thompson, 2013b, Sections IX and X.] "Recommendation #21: In considering radiological risk, the proposed EIS [i.e., the draft GEIS] should repudiate the arithmetic definition of risk." (0916-1-7 [Curran, Diane] [Thompson, Gordon R.]

Comment: (V-8) The first reactor PRA was the NRC's Reactor Safety Study (RSS).²⁹ [footnote text 29: NRC, 1975.] NRC set up a group of experts, chaired by the physicist Harold Lewis, to review the RSS. Their report accompanies this declaration as Exhibit #15. In their report, the review group succinctly described the challenge of developing a credible PRA as follows:³⁰ [footnote text 30: Lewis et al, 1978, page 6.] "RSS was faced with the problem of estimating the probability of occurrence of an extremely rare event - core melt - in a system of great complexity, a nuclear power reactor. Since the event has never occurred in a commercial reactor, there are no direct experimental data on which to base an estimate. The only datum that exists is the observation that there have been no core melts [as of 1978] in several hundred reactor-years of light water power reactor operation, and this fact provides at best an upper bound on the probability to be estimated. Therefore, it is necessary to resort to a theoretical calculation of the probability. But since the system is so complex, a complete and precise theoretical calculation is impossibly difficult. It is consequently necessary to invoke simplified

models, estimates, engineering opinion, and in the last resort, subjective judgments." (V-9) The preparation of a "complete and precise theoretical calculation" of core damage frequency remains "impossibly difficult" today, just as it was when Lewis and his colleagues wrote in 1978. This difficulty is intrinsic to the complexity of a reactor and the large number of potential failure modes. The difficulty is compounded when PRA analysts move from estimation of CDF (Level 1) to estimation of radioactive release (Level 2) and to estimation of offsite consequences (Level 3). At Level 2 there are many phenomenological uncertainties and variabilities. At Level 3 there is great variation in a variety of factors, such as atmospheric characteristics, and basic difficulties in characterizing indirect consequences. Thus, the radiological risk posed by a reactor is much more uncertain than other technological risks that are readily susceptible to actuarial analysis (e.g., automobile accidents). (V-10) The complexity of a reactor is not the only reason why PRA findings are uncertain. Another reason is that a PRA examines an idealized system. The idealized system is properly designed, properly built, properly operated, and composed of independent components that typically fail randomly. PRA analysts have recognized that component failures may not always be independent. In response, they have developed analytic techniques to account for "common mode" failures that are attributable to influences (e.g., an earthquake, or a maintenance error) that can simultaneously affect more than one component. Although these techniques are useful, they leave some significant threats unaddressed. (V-11) Three exemplary threats show how the idealized system examined in a PRA can be an incomplete representation of reality. First, a PRA cannot account for gross errors in design, construction, or operation. Second, it cannot account for malevolent acts. Third, it cannot account for deficiencies in institutional culture and practice. Each threat is significant. All three threats can lead to common mode failures. PRA's inability to account for malevolent acts is notable because a malevolent human intellect can identify weak points in a system, and can exploit destructive forces that are latent in the system. (0916-1-8 [Curran, Diane] [Thompson, Gordon R.]

Comment: (V-13) A commission, chaired by John Kemeny, was established by US President Carter to investigate the TMI accident. The commission's report accompanies this declaration as Exhibit #16. The commission concluded that systemic deficiencies in human behavior and organization were the dominant causes of the accident. To illustrate, their report included the statement:³¹ [footnote text 31: Kemeny et al, 1979, page 8.] "We are convinced that if the only problems were equipment problems, this Presidential Commission would never have been created. The equipment was sufficiently good that, except for human failures, the major accident at Three Mile Island would have been a minor incident. But, wherever we looked, we found problems with the human beings who operate the plant, with the management that runs the key organization, and with the agency that is charged with assuring the safety of nuclear power plants." (V-14) Two Harvard University physicists, one of whom had previously worked in a reactor physics group in the USSR, published a paper in 1992 that examined the Chernobyl accident. Their paper accompanies this declaration as Exhibit #17. The abstract of their paper stated:³² [footnote text 32: Shlyakhter and Wilson, 1992.] "The Chernobyl accident was the inevitable outcome of a combination of bad design, bad management and bad communication practices in the Soviet nuclear industry. We review the causes of the accident, its impact on Soviet society, and its effects on the health of the population in the surrounding areas. It appears that the secrecy that was endemic in the USSR has had profound negative effects on both technological safety and public health." (V-15) The National Diet (i.e., parliament) of Japan established an independent commission to investigate the Fukushima accident. The executive summary of their report accompanies this declaration as Exhibit #18. The commission's principal conclusion was:³³ [footnote text 33: Diet, 2012, page 16.] "The TEPCO Fukushima Nuclear Power Plant accident was the result of collusion between the government, the regulators and TEPCO, and the lack of governance by said parties. They effectively betrayed

the nation's right to be safe from nuclear accidents. Therefore, we conclude that the accident was clearly "manmade". We believe that the root causes were the organizational and regulatory systems that supported faulty rationales for decisions and actions, rather than issues related to the competency of any specific individual." (V-16) The combined experience of these three incidents strongly suggests that a non-quantifiable factor, which cannot be accounted for in a PRA, will be a major or dominant risk factor underlying the next core melt at a commercial nuclear reactor. Thus, reliance on PRA to estimate the probability of the next core melt would be neither reasonable nor prudent. (0916-1-9 [Curran, Diane] [Thompson, Gordon R.]

Comment: The flawed nature of the arithmetic definition of risk is clearly evident in the draft GEIS, NRC's consequence study, and the NRC staff's Tier 3 analysis. Each of those documents uses frequency-weighted consequences, as discussed in paragraph X-40, above, as a measure of environmental impact. In that manner, disastrous consequences of a potential pool fire, such as the long-term displacement of 4.1 million people, are made to appear small by multiplying the consequences by a supposedly low frequency. (0916-3-1 [Curran, Diane] [Thompson, Gordon R.]

Comment: The draft GEIS relies on PRA-type studies for its estimation of radiological risk. Studies of this type can provide useful information about radiological risk, for certain purposes. However, these studies cannot provide a credible estimate of the probability of a radiological event such as a pool fire. The relationship between a PRA finding and reality can be represented as follows: Actual probability of event = (PRA finding)x(Reality factor #1) + (Reality factor #2) Where the variables in this equation are as follows: "Actual probability of event" refers to the real-world numerical probability of an outcome such as: fuel damage; release of a specified amount of radioactive material; contamination of a specified area of land above a specified dose threshold; or accrual of a specified collective dose to people offsite. "PRA finding" refers to a PRA estimate of the probability of the outcome in question – this could be a mean, median, or other representation of a probability distribution. "Reality factor #1" is a number, typically greater than 1, that represents influences that are within the paradigm of PRA but are not properly accounted for in contemporary PRAs – these influences include: complexity; inadequate data; and deficiencies in institutional culture and practice. "Reality factor #2" is a number that represents influences outside the paradigm of PRA – these influences include: gross errors in design, construction, or operation; and malevolent acts. And the following observations apply: Experience suggests that Reality factor #1 for severe accidents may have a value that exceeds 1 by several orders of magnitude (i.e., factors of 10). Reality factor #2 has two numerical components: (i) a retrospective component that can be determined empirically based on the occurrence of events; and (ii) a prospective component that will remain unknown for the foreseeable future. Both Reality factors may vary significantly in response to variations in the future risk environment. This version of the equation is applicable when the values of "PRA finding" and "Actual probability of event" are both less than 1. At higher values, the term "probability" would be replaced by the term "frequency". (0916-3-19 [Curran, Diane] [Thompson, Gordon R.]

Comment: Also, NRC focuses on each facility in isolation. That focus is evident in NRC's discussion of frequency in terms of occurrence per reactor-year or per pool-year. For some, limited, technical purposes, this single-facility focus is appropriate. It is, however, inappropriate when considering the risk experienced by a citizen. The United States currently has 100 operational, commercial reactors, roughly the same number of spent- fuel pools, and various other nuclear facilities.¹³⁴ [footnote 134 text: An operational reactor is a reactor that is normally in operation except when shut down for refueling, maintenance, or repair.]A citizen is exposed to the radiological risk associated with a number of facilities. This point is illustrated by NRC's finding, as discussed in paragraph X-42, above, that a pool fire at the Peach Bottom site could

lead to the long-term displacement of 4.1 million people. About 800,000 of those people would have resided within 50 miles of the site, while about 1.2 million would have resided between 50 and 100 miles from the site, and about 2.1 million would have resided between 100 and 500 miles from the site.¹³⁵ [footnote 135 text: Barto et al, 2013b, Table 36 (page 169).] Clearly, this event would have long-range consequences, extending far beyond the vicinity of the afflicted site. A citizen at a given location could be vulnerable to impacts of this nature originating at any of a number of sites.¹³⁶ [footnote 136 text: The flexRISK project in Austria developed a computer-model capability to assess the radiological risk, at any location in Europe, that arises from operation of all nuclear facilities across Europe. That capability could be applied to the United States. An overview of the flexRISK project was accessed on 14 December 2013 from: <http://flexrisk.boku.ac.at/en/index.html>] (0916-3-2 [Curran, Diane] [Thompson, Gordon R.]

Comment: The draft GEIS considers the risk of a pool fire in terms of the probability of its occurrence at a particular pool within a 1-year timeframe. That approach to risk assessment does not account for the potential magnitude and scope of the consequences of a pool fire. Instead, the radiological risk of a pool fire should be considered in terms of the cumulative frequency of its occurrence, over a period of a century, at any location within the United States. (0916-3-23 [Curran, Diane] [Thompson, Gordon R.]

Comment: (X-55) Thus, in considering the probability of a pool fire, an appropriate indicator would be the frequency of the event occurring anywhere in the United States during a specified time period. Given the existence of operational reactors in Canada and Mexico, the geographic perimeter might logically be extended to North America. For the purposes of this declaration, however, I set that option aside because it would be legally and politically difficult to implement. (X-56) What would be the appropriate time period for a determination of frequency? Given that a pool fire could be a national disaster of historic dimensions, a reasonable time period would be a century. If that time period were employed in the context of the United States as a geographic unit, then the frequency of a pool fire would be expressed in terms of the number of occurrences per century, where the occurrence could be at any location within the United States. This concept of frequency would be compatible with the particular characteristics of pool-fire risk. Hereafter, I refer to this concept as “cumulative frequency”. Note, as discussed previously, that this indicator could have a value greater than 1. (X-57) There are now 100 operational reactors in the United States. As discussed in Section IX, above, the draft GEIS allows for the continuation of this situation indefinitely. Thus, for the purpose of illustrating pool-fire risk, it is reasonable to consider a scenario in which 100 reactors are operational throughout a period of 100 years. In this scenario, each reactor has a risk linkage with one nearby pool other than its own pool, and vice versa. Each of these nearby pools is assumed to fall under the ambit of the draft GEIS because the reactor that it served is no longer licensed for operation. I assume that each nearby pool is equipped with high-density racks, and that the risk posed by each reactor-pool linkage is uniform across the fleet and constant over time. This “status quo” scenario is entirely compatible with the draft GEIS. (X-58) For this illustrative scenario, the cumulative frequency of a pool fire can be determined by simple extrapolation of current estimates of pool-fire frequency, which are expressed on a per-pool-year basis. Consider first the frequency estimate of 2.4×10^{-6} per pool-year that is set forth in the draft GEIS in the context of an accident-induced pool fire, as discussed in paragraph X-31, above. In that case, the cumulative frequency would be $100 \times 100 \times 2.4 \times 10^{-6} = 0.024$ events per century. Now, consider the revised frequency estimate of 3.2×10^{-5} per pool-year that is set forth in paragraph X-33. This revised estimate accounts for linkage of pool risk and reactor risk, still in the context of an accident-induced pool fire. In this case, the cumulative frequency would be $100 \times 100 \times 3.2 \times 10^{-5} = 0.32$ events per century. (0916-3-4 [Curran, Diane] [Thompson, Gordon R.]

Comment: Section 4.18, pgs. 4-71 to 4-76--This section discusses the impact of earthquakes, floods, high winds from tornadoes and hurricanes, and climate change on the facilities, with the summary on page 4-76. According to the summary the environmental risk from accidents related to these hazards is small since all important safety features and components related to the spent fuel are designed to withstand the "design basis" for each of these accidents. A review of the design basis for tornadoes indicates a reduction in the design wind speed from the original design basis. For the earthquake hazard, as a result of the March 2011 earthquake and tsunami at the Fukushima Dai-ichi nuclear power plant, NRC requested all US nuclear power plants to (1) conduct walkdowns of their facilities including spent fuel pools and address plant-specific vulnerabilities and verify the adequacies of monitoring and maintenance procedures and (2) reevaluate the seismic hazards against present day NRC requirements and guidance. Page 4-75 indicates the lowest-grade above sea level for an NRC-licensed facility is currently about 14 feet. Hurricane Sandy had storm surges in the area of Oyster Creek up to at least 7 feet above mean sea level with very little rainfall for the storm. If Sandy produced a normal amount of rainfall for a hurricane-tropical storm, the flooding on the bay in and around Oyster Creek would have been substantially greater. (0920-37 [Foster, Ruth])

Comment: We disagree that you can make safety determinations using Probability Risk Assessment (PRA). First, you take a really small number, which is a wild guess as to the probability that some event will occur. Then you take another number, which is a wild guess as to the total consequences of an accident. You multiply these together, making the uncertainty wild-guess-squared, or actually indeterminate. Then, you multiply this by a constant cost of \$2000 or maybe \$4000 per mREM of release, and compare that with an ever-changing and inflated cost for providing safety measures. At the end of all this, you predictably discover that the risk is small, and any changes to improve safety cost too much. (0930-1-10 [Lutz, Ray])

Comment: You also ignore the fact that the RISKS increase with every additional NWO that exists and the extended period of time they are envisioned to be in operation. Thus, you need to multiply the indeterminate risk by the number of years and by the number of NWOs in operation. You also have no means to increase the cost per mREM as it is a fixed number, but the utilities charge as much as they can to fulfill regulatory requirement, sometimes exceeding the NRC (and any reasonable estimate) by as much as 10x. (0930-1-11 [Lutz, Ray])

Comment: There is never much of any consequence that needs to be analyzed if everything goes well. The problem is when things don't go well. You analyze spent fuel fires based on limited concept of type of accidents that might occur. "Design basis accidents" are used as a way to limit the cost for dealing with accidents, because only a limited number of scenarios need be considered. In this document, you consider only two possible scenarios, when in fact there are an unlimited number of scenarios, some of which we could not think of because we don't understand everything. For example, at SONGS, the steam generator tubes were analyzed for only one type of rattling motion. Motion along the other plane was considered inconsequential. In actuality, the steam generators were rattling themselves apart at the seams. So what is the likelihood that you have it wrong? Probably 100%. (0930-1-12 [Lutz, Ray])

Comment: We find this attempt to avoid oversight by the public as a serious concern, given the obvious lack of oversight and poor choices by the industry, exemplified by the failures of the San Onofre Nuclear Generating Station (SONGS), and the disaster at Fukushima, which used similar "Probability Risk Assessment" approaches to conclude that a tsunami of that size would be extremely improbable, and therefore inconsequential. PRA is a broken approach. (0930-1-3 [Lutz, Ray])

Comment: Section 3.0 "Affected Environment" considers only the effects when everything goes well, not when the accidents happen, and THEY WILL HAPPEN. This is the lesson, more than anything else, we must accept from Fukushima, and the nuclear industry in general. No matter how unlikely the accident, they STILL WILL OCCUR, and you SHOULD consider this in the affected environmental analysis. THE ENTIRETY OF THIS SECTION MUST BE CHANGED to address the consequences of accidents, not operation without any problem. No one is concerned about non-accident operation of an ISFSI If there is no accident, there is by definition, no problem. But when there is an accident, then there is, and this is why your treatment of the effects on the environment are ALL INSUFFICIENT. (0930-2-21 [Lutz, Ray])

Comment: Section 3.14 "Waste management" only concerns EXPECTED waste when everything is going well. What happens when something happens that is out of expectation? Not addressed. (0930-3-1 [Lutz, Ray])

Comment: Page 4-77, Line 30+, you consider two design basis accidents in the hypothetical DTS. You did not consider unusual and unexpected events, like partial meltdown inside a canister due to failure of cladding around high-burnup fuel pellets, a problem that has been described as a concern. At this point, we assert that there are simply TOO MANY UNKNOWNs and "unresolved issues" for this DGEIS to apply to any period longer than the normal decommissioning period. As more information is learned, if a DTS is actually ever designed and constructed, if we get statistics about how well the fuel lasts inside canisters, etc. etc. then it may be possible, IN ABOUT ANOTHER 50 YEARS to speculate about the subsequent 100. Until then, your optimism is far too apparent, and again a sign that the NRC has gone so far astray that it does not even realize that it is lost. (0930-3-7 [Lutz, Ray])

Comment: Page 4-78, you consider a "loss of containment event" but constrain it to filters that are inoperable. Why not assume the entire DTS fails and radiation is emitted? Then what? There is no containment around the DTS, in the design you have conceptualized. Ridiculous. STANDARDS FOR DRY/WET TRANSFER MUST BE IMPROVED. (0930-3-8 [Lutz, Ray])

Comment: The risks known and unknown of widespread accidental contamination to large population centers in and of themselves have never been disclosed and are instead minimized by a long program of secrecy. (0935-6 [Uhls, Agnes])

Comment: Having to shut down reactors while in the peak energy need of the hottest days of summer adds to the unreliability and safety issues of storing nuclear waste in fuel pools. Water is needed in case of accident to prevent nuclear power cores and waste pools from overheating and melting, releasing enormous amounts of radioactivity into the air. We learned from Fukushima that that water has gotten contaminated and is still releasing into the Pacific Ocean over 2 years after the initiation of the triple meltdowns. (0938-9 [Sondheim, Steven])

Comment: For spent fuel storage risk, Exelon recommends that the NRC use existing information to the extent possible, and bolster it with new analyses only as necessary. Exelon does not consider it necessary to utilize "worst case" assumptions and believes that the NRC should focus on explaining how data on past events informs the NRC on the likelihood and impacts of future events. For example, the NRC has appropriately cited NUREG-1864, "A Pilot Probabilistic Risk Assessment of a Dry Cask Storage System at a Nuclear Power Plant," dated March 2007 in support of statements made about the low risk associated with dry cask storage. These statements could be further strengthened by also citing an independent Probabilistic Risk Assessment (PRA) study conducted by the Electric Power Research Institute (EPRI) (i.e., EPRI Document 1009691, "Probabilistic Risk Assessment (PRA) of Bolted Storage Casks: Updated

Quantification and Analysis Report," dated Nov 2004), which also supports the conclusion that the risks are low. EPRI confirmed low risk for bolted storage systems. Exelon, along with the industry, agrees with the NRC that the low risks calculated by these studies were evident during the Mineral, Virginia and Fukushima earthquakes, neither of which resulted in significant damage to dry cask storage systems or release of radionuclides. (0942-4 [Helker, David P.]

Comment: The aerial photos attached from 1972 flooding beg the question what if HLW was on site / what will be the contingency. To elevate them against flood, is to tee them up for tourists. (0945-4 [Keegan, Michael J.]

Comment: The Draft GEIS claims that impact of a severe accident would be small. Such a conclusion cannot be supported by logic or experience. A severe accident would release deadly radioactivity into the environment. Every release of manmade radioactive matter into the environment to date has had serious and long-lasting impacts on humans and other living things within the area affected. (0951-3 [Commenters, Multiple])

Comment: Increasingly extreme weather as well as earthquakes and volcanic activity in new areas makes minimizing the "low probability of an accident" an insult to anyone, anywhere, who has suffered any of the results of these natural accidents, many of which have been powerful enough already to change the shape of seashores and the earth's tilt on its axis. This sounds like the pap released by the Oil industry who would also like us to believe that further "accidents" and spills won't happen with drilling or fracturing! If we trust this viewpoint, we are living in a fools' paradise. (1000-1 [VanWicklen, Betty J.]

36. Comments Concerning Security and Terrorism

Comment: Now, we're not allowed to talk about -- or we don't want to talk about terrorism, we can't get into detail about what size of airplanes can crash into a dry cask safely, but that is not what they are designed to do. They are just designed to keep the little rods held safely and to let somebody walk by them because they shield the radiation, the gamma rays, and so on. But we're talking about delaying this -- the permanent repository. But, meanwhile, this is when the worst fuel is -- when the fuel is the absolute most dangerous because of all the fission products that are inside. (0030-4-3 [Hoffman, Ace])

Comment: Let me focus the rest of my comments on one of the key elements that I wanted to deal with in the generic EIS, and that is the issue of terrorist attacks. I find that the statement totally understates the risk of terrorist and sabotage. The mechanism that NRC uses to define risk is, let's multiply what the consequences are times the probability of occurrence. They do admit the consequences are significant in their statements. They also say that they would be destabilizing. Well, I think those are kind of internally jargon or code words for significant yes, permanent, yes, if an accident happens. Destabilizing, that just totally understates the reality of how many deaths would occur if a single spent fuel fire, or Zirconium clad fire, or other dispersal from an attack or some other event, be it natural or manmade occurs. The tables that are presented in the appendices that describe these just totally understate those impacts. The probabilities are totally understated. We know that terrorist attacks happen in our world. They happen anywhere, anytime and anyplace that a terrorist wished to make them happen. If we look at 9/11 as an example, the situation could have been enormous in its impacts. In fact, 9/11 was small. We don't want to admit that but it was small. The potential of those same multi-tiered attacks at three locations simultaneously could have wiped out all of New York City and much of New England, if they had merely decided to put one of those planes and attack the spent fuel

pools at Indian Point. They didn't do that. They chose politically, targets that were chosen for other reasons, to just prove that they could attack the government, they could attack the airline industry, and they could attack a financial symbol. (0045-6-9 [Andrews, Richard])

Comment: I will focus my comments at this time on the dangers of terrorist attacks or inside sabotage which have been summarily dismissed as improbable by the NRC. The EIS states that it has only reluctantly considered a terrorist attack threat because of the 9th Circuit court decision. This points to the arrogance or possible ignorance seemingly rampant at NRC to seek to deny the realities of our world. There is no nuclear installation in the world that is truly secure from terrorists, and particularly not nuclear power plants. Had those who attacked multiple targets on the same day of September 11, 2001 chosen to hit multiple nuclear plants, the losses of life would have measured in the hundreds of thousands, the environmental destruction would have affected thousands of square miles, the land that would be uninhabitable would be even larger due to permanent radioactive contamination. Terrorists could have hit the spent fuel pools without any possibility of prevention, then or now. They simply chose to make their statement elsewhere. (0059-5 [Andrews, Richard])

Comment: The NRC assigns truly understated probabilities to terrorist attacks, simply denying the truth. They apparently do this so they can argue that the risks are low using their flawed formula that risk is the product of consequences times probability. I believe this to be a deceitful representation of risk, and not applicable to high consequence risk. NRC admits casually perhaps callously that a terror attack could be "significant and destabilizing". Is destabilizing a euphemism for immediate deaths and lingering slow deaths of huge numbers of people? Is "significant" NRC code speak for destroying the agricultural lands and businesses within areas encompassing hundreds or thousands of square miles. The NRC argues that nuclear power plants are ((generally) not located near major population centers this is a flat out lie. Just take a look at the map for these locations, nearly all are very close to major metropolitan areas. Had the 9/11 terror attacks chosen to fly into Indian Point, or Millstone or any of the many reactors around Chicago, the death count would be extremely high, likely in the hundreds of thousands, far greater than acknowledged by NRC in its flimsy and undocumented risk analysis in the GEIS. (0059-7 [Andrews, Richard])

Comment: NEPA and the Appeals Court require NRC to study the environmental consequences, not the environmental risk. NRCs logic regarding the environmental impact of a terrorist attack on a spent fuel pool having anything to do with probability of occurrence entirely ignores the need to evaluate what the consequences would be should such an attack occur. Thus NRC fails to satisfy the intent of NEPA. The GEIS states: The NRC finds that even though the environmental consequences of a successful attack on a spent fuel pool beyond the licensed life for operation of a reactor are large, the very low probability of a successful attack ensures that the environmental risk is SMALL. AND in regard to spent fuel pool fires; As a result, the NRC finds that the 1996 and 2013 License Renewal GEIS conclusion that the probability-weighted consequences of atmospheric releases, fallout onto open bodies of water, releases to groundwater, and societal and economic impacts of spent fuel pool fires are SMALL is applicable for a spent fuel pool fire during the continued storage timeframe. (0089-15 [Shaw, Sally])

Comment: Another thing about airplane strikes. When any government declares a no fly zone for a particular area, like around a nuclear power plant, this decree assumes that a plane is in working order. If for any reason after takeoff, the plane becomes inoperable what then? The fact is, that a plane crashes every several days somewhere around the world. Currently, there around fifty cask storage sites in the United States. Either on, or close to a nuclear plant. From a

terrorist point of view, that's fifty targets. From a security point of view, that's fifty places to guard. All that need be done is to place all of the casks in one area, and guard it carefully. (0100-18 [Behling, Steve])

Comment: As of this year, 2013, Nuclear Regulatory Commission is going to upgrade the weapons the security guards use to protect the spent fuel storage sites at power plants. A new rule to be published in the Federal Register changes a 2011 regulation giving security guards high caliber fully automatic weapons. Even though the private security at the sites are already armed. Initial cost would be around forty million dollars No one stated what a long term maintenance cost would be. The NRC hopes this action will stop terror attacks towards nuclear plants. Of the 65 operating power reactor sites, 53 store spent fuel in casks on site. (0100-29 [Behling, Steve])

Comment: You want us to believe another, expletive deleted, probabilistic risk assessment, PRA, which assures that a high-level rad waste pool can't be drained by an aircraft -- I'm sorry, it assures us that a high-level rad waste pool can't be drained by an aircraft carrying C4. I live near a, bleep, Mark 1 reactor that's on a flight path for a major airport. There's no airspace restrictions. Even a partial drain down is likely to result in an inextinguishable, filthy, bleep, uranium fire. The only thing between a 747 and the spent fuel pool is a thin sheet metal roof. It's not safe now and I have no confidence that it will remain safe until it has thoroughly decayed about a half a million years. Sorry, but for me there's no reason for me to believe your PRAs. (0112-11-5 [Agnew, David])

Comment: And then I asked them what are you going to do about a terrorist attack? Well, we have a barbed wire fence and three guards. And so the next question was what are you going to do if a plane filled with fuel leaves Logan Airport and goes right directly into nuclear power plant, what would you do? And you know what the response was, "Listen, lady, things like that don't happen so just don't worry about it. It's not an issue. Don't spend your time thinking about that." So all of us -- I want to tell you that planes do not go into any buildings. Planes don't do those things. We know better. The nuclear power plant was so sure, don't worry about it, don't worry about it. (0112-29-2 [Roman, Margo])

Comment: The spent fuels are attractive targets for terrorists. We love that in Vermont. Fly right over and go to Indian Point on the way. (0112-7-5 [Sachs, Leslie Sullivan])

Comment: Why isn't the storage of nuclear waste, military and commercial, as secret as the Manhattan Project? Isn't it a matter of national security that we put all this deadly waste in a few inland caverns as soon as possible and do so without informing our enemies and without any public debate? (0190-1 [Phelan, Steven] [Phelan, Walter])

Comment: Furthermore, all storage sites are potential targets for terrorists who want to launch or detonate a nitrogen explosive, effectively creating a dirty bomb. The subsequent air and water pollution could cripple Florida's tourist industry and freeze snowbirds in their tracks. Removing the waste will not spare an operating reactor from terrorist attack, but it would reduce the problem of recovery and the extent of the damage. Every power plant will be safer from its own accident if the waste is carried to a secret national depository, more or less immediately. There it can be retrieved whenever Bill Gates and his foundation have figured out a way to make more energy out of it and reduce its toxicity. The more sites for waste, the more danger. Why not make one broader rule to say that the military will take control of the commercial waste and find a few safe inland caves and salt mines, like their own site near Carlsbad, NM, in the interest of national security. (0190-5 [Phelan, Steven] [Phelan, Walter])

Comment: [A] terroristic attack on a nuclear storage site would be disastrous to the United States. (0205-10 [Lyons, Laura])

Comment: Storage casks and pools are not only expensive to build, but they are expensive to maintain as well due to the necessity to constantly guard them from terrorism. (0205-11 [Lyons, Laura])

Comment: These pools can also present a target for terrorism or danger in the event of a natural disaster (Kintisch, 2011). (0205-8 [Lyons, Laura])

Comment: Protect fuel pools: Irradiated fuel must be kept in pools for several years before it can be stored in a dry facility. The pools must be protected to withstand an attack by air, land, or water from a force at least equal in size and coordination to the 9/11 attacks. The security improvements must be approved by a panel of experts independent of the nuclear industry and the Nuclear Regulatory Commission. (0222-17 [Zeller, Lou])

Comment: There is no safe or effective way to neutralize radioactive waste, it lasts for tens of thousands of years, polluting our essential resources and land for untold generations, and the toxic waste which is often mismanaged, is a NATIONAL SECURITY THREAT--as any terrorist (foreign or domestic) can use that material to make dirty bombs which would be devastating. SAY NO, to nuclear. (0241-1 [Nixon, Kerry])

Comment: In 300 years, our land will be littered with high-level waste that is no longer theft-proof, as the shorter-lived isotopes disappear, leaving purer and purer plutonium waste. This is a nightmare for those of us who are concerned with the growing nuclear weapons proliferation risk we leave to the world that we don't even know who will be left to govern. (0246-11-3 [Dubois, Gwen L])

Comment: It is also a lot harder to get at, as someone else pointed out. By the time the fuel starts to be not so dangerous to get near, it becomes a proliferation threat. So, at all times, it is not a good idea to have anything to do with this stuff. (0246-29-11 [Hoffman, Ace])

Comment: I hope that you don't mind me straying a bit, but my problem with the radioactive fuel and what have you is that this GEIS, draft Generic Environmental Impact Statement, doesn't go into reality. There is a reality out there. It may not be in a GEIS but there is a reality. For instance reality raises its ugly head, like there is a man who operates -- who is an operator at a nuclear power plant. He headed south when he was caught trying to hijack and perhaps even kill another citizen. His coconspirator, another coworker, is also up for charges. In other words, what I am saying on that issue is that we look at these people and these people are often very, very good people working nuclear power plants, but we forget that there are people who do bad things. (0246-6-1 [Lewis, Marvin])

Comment: And nuclear radioactive waste is a lovely target for terrorists who can use it to make a so-called dirty bomb, just with conventional explosives and to disperse radioactive waste and make an area a real problem. And that is something we forget. We forget completely about that. And it is pretty much close to what has happened already and we forget all about that. In fact, if you don't believe it has almost happened already, please go to the people in Boston and ask them if it has almost happened already with terrorists. (0246-6-2 [Lewis, Marvin])

Comment: These aboveground spent pools are not guarded well, and many South Carolina residents are gravely concerned about attacks from terrorists, like a bomb, a plane, or anything that could easily set these aboveground pools on fire. (0250-20-5 [Cooper, Elaine])

Comment: With respect to potential acts of sabotage or terrorism, many analyses of highly improbable sabotage or accident occurrences have shown that such events are most unlikely to result in dry used fuel system containment boundary breaches because of their rugged designs. For terrorist-induced, beyond design-basis events, only those involving high energy density devices or a specific type of military weapon have any real opportunity of compromising dry used fuel system integrity. The probability of system breach is still vanishingly small, since reasonable proximity to the package and time consuming precise placement of such weapons must be achieved for perfect impact condition which is commonly called zero obliquity. Substantial testing and analyses show that radioactive material release from such an attack would be extremely limited. Used fuel that might be released would be of such a small quantity and it would be very localized to around the system. The fraction of contents that would be released would be trivial. What this means is that any resulting exposures would be far below, and I say far below the unregulated doses to the public received from dozens of non-nuclear industries year after year, decade after decade. (0250-27-3 [Pennington, Charlie])

Comment: Spent fuel pools are targets for terrorists, and moving the waste to interim storage would create hundreds of new waste sites, the mobile waste sites, plus trucks and trains and boats, whatever; ships, and not to mention new targets. (0250-29-3 [Rivard, Betsey])

Comment: The last 20 years we have been using depleted uranium, artillery, and tank rounds in a part of the world where we are despised. Let's take a 10 to 20-foot piece of steel pipe of a matching diameter or caliber. Let's improvise a breach in it. Let's put one of those depleted uranium rounds in there with a charge. Let's have an improvised firing mechanism, and you have created an improvised recoilless rifle. And it can penetrate any steel and concrete building or shipping cask because that is what those rounds were made to do. So there is the security. (0250-46-6 [Stein, Ed])

Comment: Opponents of nuclear energy paint a picture of piles of glowing waste sitting out in the open poisoning our air-or implying that they are easy terrorist targets. All this hyperbolic hot air just obscures the fact that there has never been a single incident where spent fuel storage has been compromised by any outside individual or group. It has been safely stored for decades and I believe the NRC and the owners of nuclear plants can and will keep it that way. (0275-3 [Wolf, Tom])

Comment: I am deeply concerned about the possibility of someone deciding it would be interesting to see what would happen if an airplane was flown into a nuclear facility. I don't believe it is a matter of IF... But more a matter of WHEN and even more importantly is WHERE does this tragic event occur. According to a report by Robert Alvarez entitled "Reducing the hazards of high-level radioactive waste in Southern California" published by Friends of the Earth ...If an airplane was successful in starting a spent fuel pool fire in one of the two cooling pools at San Onofre that burned only 30% of the pool's current contents ... The radioactive release from this event would be comparable to 10 Chernobyl accidents. The Generic Environmental Impact Study estimates the largest number of Early fatalities to be 191 people for a spent fuel accident. Latent Fatalities are estimated to be 20,000 to 27,000 people. These data points have been taken from an NRC document NUREG-1738 published in January 2001. Before September 11th, 2001, I might add. Clearly there is a huge difference of opinion as to what could happen based upon the probability of the event occurring. I believe the NRC is very aware of the

possibility of a catastrophic event occurring from a spent fuel pool fire. But they are unwilling to entertain the fact that this possibility is anything but extremely remote. I don't understand how they can arrive at that conclusion based upon the fact that the Draft Generic Environmental Impact Statement contains the following passage: "The NRC has determined that the probability of a successful terrorist attack on a spent fuel pool, although numerically indeterminate, is low." There is no basis to include the last two words in the Draft Environmental Impact Statement. The two words "is low" should be omitted from the Generic Environmental Impact Statement and the NRC needs to stop using probability risk analysis when addressing the issue of terrorism in the Generic Environmental Impact Statement. Just in case my logic went too fast for some of the audience, let me restate that if something is truly "numerically indeterminate" it is not possible to attach a number to. So if the probability of a successful terrorist attack is truly "numerically indeterminate" then no numeric probability can be assigned to the event. Without a numeric probability for the occurrence of a potentially catastrophic event, it is not appropriate to apply probability risk analysis to determine the risk and potential impact of a terrorist attack on a spent fuel pool. This is mathematically hocus-pocus that is endangering the public's safety. By allowing the NRC to choose an arbitrarily low probability of a terrorist event makes the risk of even a catastrophic event seem tolerable. Hence the loss of 191 Early Fatalities and 20,000 to 26,000 Latent Fatalities. The problem here is that you are not only playing with people's safety and possible loss of life, which is a horrific disgrace to mankind ... The potential severity of 10 Chernobyls will impact the entire Northern Hemisphere ... It is reasonable to assume that a piece of land, five times the size of New Jersey, will be turned into uninhabitable wasteland and if such an event happens in Southern California... The event will very severely impact the entire world economy. One last thing is for sure, if someone does figure out how to fly a large aircraft into a spent fuel pool and start a spent fuel pool fire, the damage it will do to the nuclear industry will be on par with the damage done to the surrounding environment. If you value your jobs you need to tackle the terrorist issue head on[.] (0279-1 [Morgal, Richard])

Comment: Please accept this comment on NUREG 2157, the Waste Confidence Generic Environmental Impact Statement, as follows. On page 4-85 of NUREG 2157 there is a reference to physical protection criteria as defined in 10 CFR 73.1 Purpose and Scope for the 'Physical Protection of Plants and Materials.' I would point out that 10 CFR 73.1 omits airborne attacks, which would likely be the method of choice for any attacks in this century. The land-or-waterborne attacks that are defined in 10 CFR 73.1 for the scope or protection are the preferred methods of the 20th century. Please update the scope of the defined threats to include airborne attacks by drone, commandeered airliner, model airplane, helicopter, light aircraft (as kamikaze) and/or model helicopter. Unless you make just such a change to 10 CFR 73.1, NUREG 2157 is totally irrelevant to its intended purpose. (0316-1 [Donnelly, Dennis])

Comment: I'm deeply concerned about the possibility of someone deciding it would be interesting to see what would happen if a large airplane were flown into a nuclear facility. I don't believe it is a matter of if, but more a matter of when. But even more importantly is where does this tragic event occur? San Onofre is my biggest concern. (0325-22-1 [Morgal, Richard])

Comment: I don't understand how they can arrive at this conclusion based on the fact that the Draft Environmental Impact Statement contains the following passage. "The NRC has determined that the probability of a successful terrorist attack on a spent fuel pool, although numerically indeterminate, the probability is low." Is low? If it's numerically indeterminate, how can it be low? There's no basis to include the last two words of this passage in the Draft Environmental Impact report. The two words "is low" should be omitted from the Generic Environmental Impact Statement, and the NRC needs to stop using probability risk analysis when addressing the issue of terrorism in the Generic Environmental Impact Statement. I think

that it's a game that's being played, and we're all being subjected to a much larger risk, that when it happens and we see it on television like the 9/11 towers that came down, everybody in this room that's saying it's safe, it's not a problem, don't worry about it, is suddenly going to go whoa, wow, this is dangerous stuff. But until then, we're just going to have to wait. (0325-22-3 [Morgal, Richard])

Comment: Why don't you put the dry cask storage inside the domes instead of blowing them up? Why don't you put them inside the domes, leave the -- so when it gets hit with a missile, we know that the whole place is not protected against high explosives. We know bunker buster bombs go through 20 feet of reinforced steel. This place is not safe. It was never designed to be safe from terrorist attack. And there's a million ways terrorists could attack this plant. So, that is not dealt with in this report either. (0325-31-6 [Johnson, Roger])

Comment: We had a seminar last month where we had our own experts come in. One of them told us that a shaped charge missile or weapon can go through three feet of steel. A dry cask is three feet of concrete and maybe two inches of steel. These are vulnerable. A 747 is a very large airplane. If you put one next to a dry cask, it will dwarf it. The turbine shafts on those four jets are going to go right through those dry casks. (0325-7-4 [Hoffman, Ace])

Comment: On Roman numeral page 44 it says that the impact of terrorism would be small. This is a lie. If that pool was drained at Diablo Canyon we would have a Fukushima type incident here. (0326-56-5 [Homick, Nick])

Comment: [Y]ou can look at TVA's records at the NRC, security is very bad at these sites. We have, of course we're a nuclear area in Tennessee and we've had cases where little old ladies in tennis shoes literally have cut their way through fences and gotten into high-security areas because the security has been so bad at ORNL. Well, this is also true at TVA. TVA has tried contract security, and it's tried staff-based security, and neither one has worked consistently. Every 18 or 24 months they find that their security system is broken, and people are using drugs, people are letting their friends in to look around, and so on. So the idea that you can keep aboveground storage secure has not proven out, in fact, here in the Tennessee Valley. (0329-12-10 [Paddock, Brian])

Comment: Saying that there is a risk of a terrorist attack, although the consequences would be high that the probability is so low that the consequence or the environmental consequence or whatever you call it would be small, risk is small, well, that's crazy. That's absurd. We have already had two planes that went into the twin towers. And that was only like what, 2001, 12 years ago. And apparently they thought that they were going to or, they were planning on going to Indian Point, but they thought it would be too well protected against them. So that in itself, this is insane. (0329-32-6 [Seeley, Linda])

Comment: The U.S. government, intelligence and security experts have identified nuclear power plants to be terrorist targets. (0341-1-17 [Mermelstein, Richard])

Comment: Even putting everything noted above aside, there is one astonishing omission that renders the entire GEIS fatally flawed: The GEIS completely fails to look at cyber.¹³ [footnote 13 text: In fact, we found only one mention of the word "cyber" in the entire GEIS.] The GEIS it ignores cybersafety issues, cybersecurity issues, complications that can result from interactions between computer networks. This area is scopic and critical. Were space and copyright law not at issue, we would insert the complete contents of the book America the Vulnerable by Joel Brenner, former head of counterintelligence for the director of National Intelligence here.

Somebody at the NRC should read it, with special attention to the chapter "Dancing in the Dark" about vulnerabilities to nuclear power installations and the grid in general.¹⁴ [footnote 14 text: Incidentally, aside from being informative, the book is a terrific read. (Brenner)] The NRC also needs to review the government findings on the Davis-Besse boric acid corrosion fiasco with attention to the fact that the same nuclear operator was implicated in setting off the East Coast and Canada blackout of 2003, and recall that Davis-Besse turned out to also be infected with the malicious virus known as the Slammer worm. Connect some dots and add in a storm like Sandy. (0341-2-15 [Mermelstein, Richard])

Comment: At Pilgrim, nearly 3300 bundles of irradiated fuel are stored in an attic pool designed for 880. The NRC's probabilistic risk assessment (PRA) assures us that a high level radwaste pool can't be drained by an aircraft carrying C4. The PNPS in Plymouth is a Mark 1 reactor that's on a flight path for a major airport - and there are no airspace restrictions. Even a partial drain down is likely to result in an inextinguishable uranium and plutonium fire. The only thing between a 747 and the SFP is a thin sheet metal roof. It's not safe now, and claiming that it will remain safe until 2092 is only wishful thinking. (0348-8 [Agnew, David] [Roscoe, Lee])

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Comment: National security - Prolonged dry cask storage at the plant sites provides the additional concern that the casks are situated in conspicuous view to terrorist planners. The June 2, 2006, ruling of the U.S. Court of Appeals for the Ninth Circuit in *San Luis Obispo Mothers v. NRC*, 449 F.3d 1016 (9th Cir., 2006), lends substantial credence to the proposition that onsite dry cask storage might lead to or increase the risk of a terrorist attack because (1) the presence of the casks would increase the probability of a terrorist attack on the plant, and (2) the casks themselves would be a primary target for a terrorist attack. (0355-6 [Skov, Jeff])

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Comment: The environmental impact statement should assess the radiological risk arising from a range of conventional accidents or attacks, including those conducted by terrorists. (0377-5-12 [Cuthbert, Lewis])

Comment: Other reasons aside, it is not a good idea to concentrate such a large amount of waste in one place especially if it is stored above ground. This makes it a target for aerial and surface terrorism and creates the potential for a huge accident with widespread contamination of the air, land and water. (0410-23 [Nelson, Dennis])

Comment: Security and safety are closely intertwined and both need to be addressed in the GEIS. For example, the threat of sabotage of a commercial nuclear power site from terrorists, or others with ill intent, are real risks. The environmental impact of such sabotage needs to be considered in the GEIS. Various scenarios need to be considered such as explosion, flood, drought, fire. (0417-3 [Clark, Terrence])

Comment: Terrorism is a risk for environmental and adverse health effects. This is minimized and not thoroughly considered in the draft EIS. 5.) Security never is 100% (0417-7 [Clark, Terrence])

Comment: You want us to believe another EXPLETIVE probabilistic risk assessment (PRA) which assures us that a high level radwaste pool can't be drained by an aircraft carrying C4. I live near a EXPLETIVE Mark 1 reactor that's on a flight path for a major airport - and there are no airspace restrictions. Even a partial drain down is likely to result in an inextinguishable filthy EXPLETIVE uranium and plutonium fire. The only thing between a 747 and the SFP is a thin sheet metal roof. It's not safe now, and I have no confidence that it will remain safe until it has thoroughly decayed (about half-million years). Sorry, but there is no reason for me to believe your PRAs. (0419-5 [Agnew, David])

Comment: The nation's rad-waste sites are sitting ducks for backpacking terrorists, and irradiating people at airports will do nothing to stop such an attack. Those who keep our nation's population under this sword of Damocles deserve jail time. (0441-1 [Baker, Helen])

Comment: What about terrorism as a threat? Before 911 the thought that people could bring down huge buildings by flying planes into them was unthinkable - or should I say of "low probability"? What about Fukushima, Chernobyl, Bhopal and Love Canal? If we have learned anything from these past "low probability" incidents is that the unlikely happens far too often and is deathly devastating. (0443-3 [Sabo, Betty])

Comment: Terrorist actions are simply not readily definable by probabilities, being random in nature, and unpredictable, particularly identifying emotional instability of potential actors. Statistical probability values of historical occurrences are not valid predictors for terrorist action, unlike probabilities of such things as home fires, football injuries, or auto accidents. There are very limited measurable factors that may help define probability are such things as terrorism: stimulations to hate and revenge from foreign interventions and wars and repression, and possibly opportunity analysis of means, time and place windows when terror actions will have the greatest impact on the intended target, or the resulting social and economic impacts. But overall, predictability of terrorism is nearly impossible. (0447-1-11 [Andrews, Richard])

Comment: The EIS states that it has only reluctantly considered a terrorist attack threat because of the 9th Circuit court decision. This points to the arrogance or possible ignorance seemingly rampant at NRC to seek to deny the realities of our world where terrorist methods have heavily replaced conventional wars. There is no nuclear installation in the world that is truly secure from terrorists, and particularly not nuclear power plants, and spent fuel or radiological waste facilities. Had those who attacked multiple targets on the same day of September 11, 2001 chosen to hit spent fuel facilities at multiple nuclear plants with the same aircrafts, the losses of life would have measured in the hundreds of thousands, perhaps millions, the environmental destruction would have affected many thousands of square miles, the lands, lakes, and oceans that would be uninhabitable or otherwise unusable would be even larger due to permanent radioactive contamination, and enormous part of our nation's economic industrial of huge cities and agricultural lands could have been destroyed. Terrorists could have

hit the spent fuel pools without any possibility of prevention, then or now. The tools of such possible attacks were readily available then, and remain so now. The 9/11 terrorists simply chose to make their statement elsewhere. Gordon R. Thompson provides a much more comprehensive analysis and elucidation of these threats than the NRC acknowledges (Gordon R. Thompson, comments on NRCs Draft Consequences Study, Aug 2013). You should heed his advise and comments. (0447-1-13 [Andrews, Richard])

Comment: The NRC assigns truly understated probabilities to terrorist attacks, simply denying the truth. In numerous tables and text in the DGEIS, the risks are stated as LOW. They apparently do this so they can argue that the risks are low using their flawed formula that risk is the product of consequences times probability. I believe this to be a deceitful representation of risk, and not applicable to high consequence risk. NRC admits in the DGEIS casually perhaps callously that a terror attack could be "significant and destabilizing". Is "destabilizing" a euphemism for immediate deaths and lingering slow deaths of huge numbers of people? Is "significant" NRC code speak for destroying the agricultural lands and businesses and making uninhabitable areas encompassing hundreds or thousands of square miles from a single terrorist attack or spent fuel accident. The NRC argues that nuclear power plants are ((generally) not located near major population centersthis is a flat out lie or gross misrepresentation. Just take a look at the map for these nuclear power plant locations, nearly all are very close to major metropolitan areas. Waste Confidence is not provided by the flawed and misleading arguments of the NRC in the DGEIS. (0447-1-15 [Andrews, Richard])

Comment: Had the 9/11 terrorist attackers chosen to fly aircraft into Indian Point, or Millstone or any of the many reactors near major cities such as around Chicago, Atlanta, Miami, Baltimore, or many other major cities, the near term fatalities and lifetime excess cancer death counts would be extremely high, likely in the hundreds of thousands for any single event, far greater than acknowledged by NRC in its undocumented risk and consequence analysis presented in the DGEIS. Others have postulated and reviewed consequences of various modes of terrorist attacks on spent nuclear fuel facilities, including large and small aircraft, artillery with bunker penetrating shaped charges, truck delivery of explosives, and other scenarios. I will not review those in this paper, but encourage the NRC to heed these documents (see various papers of Gordon Thompson, Robert Alvarez et al, prior risk assessment NUREG documents, e.g. Sailor et al 1987 NUREG-4982 and Collins and Hubbard 2001 NUREG-1738, and the National Research Council report on spent fuel). (0447-1-22 [Andrews, Richard])

Comment: flawed assignment of low probability of potential terrorist attacks or inside sabotage on facilities handling and storing spent nuclear fuel, and (3) flawed and understating misrepresentation of the catastrophic consequences of terrorist attacks and accidents involving pool storage of spent nuclear fuel (0447-1-6 [Andrews, Richard])

Comment: Further, the analysis dismissed the possibility of "an identifiable threat to nuclear activities" such as terrorism: Increased storage of aged spent fuel at either reactor or away-from-reactor sites has little relative safeguards significance. This conclusion is based upon the staff's consideration of: (1) the absence of any information confirming an identifiable threat to nuclear activities, (2) the physical characteristics and conditions of storage (which include specific security provisions) of aged spent fuel, and (3) the magnitude of the estimated consequences of certain postulated sabotage events. Id. at ES-7. Id. at ES-7 (emphasis added); NUREG-0575 has never been updated or supplemented.¹² [footnote 12 text: 12 In *Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 372 (1989) the Court held that NEPA "impose[s] a duty on all federal agencies to prepare supplements to either draft or final EISs if there "are significant new circumstances or information relevant to environmental concerns and

bearing on the proposed action or its impacts;" citing CEQ Regulations. The new and significant information since NUREG-0575 includes, no date for a permanent waste repository, compelling evidence that terrorism is a credible threat to spent fuel stored at nuclear reactors, the accident at Fukushima, the recognition of the greater possibility of more devastating earthquakes for sites in the upper Midwest and the Northeast, the use of high burnup fuel with its special problems for fuel rod integrity and residual heat, to mention only a few.] (0473-7-3 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Independent Studies of the Hazards of Spent Fuel Pool Storage: In 2003, Congress directed the National Academy of Sciences ("NAS") to conduct a study of spent nuclear fuel storage at commercial reactor sites, including the "safety and security advantages, if any, of dry cask storage versus wet pool storage at reactor sites." Conference Report to Accompany H.R. 2754, Making Appropriations For Energy And Water Development For The Fiscal Year Ending September 30, 2004, And For Other Purposes, Title IV, 108th Congress 1st Session, H.R. 108-357. NAS produced the report in 2006 in both a public and a non-public version. Only the public version is referenced here. Safety And Security Of Commercial Spent Nuclear Fuel Storage (Public Report), Committee on the Safety and Security of Commercial Spent Nuclear Fuel Storage Board on Radioactive Waste Management Division on Earth and Life Studies National Research Council Of The National Academies (2006) ("NAS Study"). The NAS Study concluded that The probability of terrorist attacks on spent fuel storage cannot be assessed quantitatively or comparatively. Spent fuel storage facilities cannot be dismissed as targets for such attacks because it is not possible to predict the behavior and motivations of terrorists, and because of the attractiveness of spent fuel as a terrorist target given the well known public dread of radiation. *** The committee finds that, under some conditions, a terrorist attack that partially or completely drained a spent fuel pool could lead to a propagating zirconium cladding fire and the release of large quantities of radioactive materials to the environment. *** It appears to be feasible to reduce the likelihood of a zirconium cladding fire following a loss-of-pool-coolant event using readily implemented measures. The following measures appear to have particular merit: Reconfiguring the spent fuel in the pools (i.e., redistribution of high decay-heat assemblies so that they are surrounded by low decay-heat assemblies) to more evenly distribute decay-heat loads and enhance radiative heat transfer; limiting the frequency of offloads of full reactor cores into spent fuel pools, requiring longer shutdowns of the reactor before any fuel is offloaded, and providing enhanced security when such offloads must be made; and development of a redundant and diverse response system to mitigate loss-of-pool-coolant events that would be capable of operation even if the pool or overlying building were severely damaged. *** The potential vulnerabilities of spent fuel pools to terrorist attacks are plant-design specific. Therefore, specific vulnerabilities can be understood only by examining the characteristics of spent fuel storage at each plant. The previous NRC analyses and independent analyses of the safety of spent fuel stored at reactor sites, particularly the safety of such storage in spent fuel pools, is directly relevant to the task NRC should be undertaking here. (0473-8-6 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Finally, the NRC states the chances of a successful Terrorist Attack are low and the risk is small, however, a study done by the National Academy Of Science after 9/11 that has been de-classified suggests that spent fuel should be stored dry at a non reactor site specifically because of the possibility of Terrorist Attack. At first review, the NRC' s position that a successful terrorist attack is unlikely and unthinkable and creates small risk. Unfortunately, the whole 9/11 attack was unlikely and unthinkable also - it succeeded partly for that reason but also because the attackers were willing to spend an exceptional amount of resources and time to get it done and they did not have a problem with suicide or killing in general - these factors have not been properly factored into the NRC evaluation of the Terrorism issue. (0495-6 [Grigg, Richard])

Comment: Terrorist Attacks: Terrorist could attack "soft targets" such as the utility lines or generators that supply electricity to plants. This could lead to a severe nuclear power plant accident and/or a severe accident involving the spent-fuel basins. The WCGEIS needs to be revised to address these risks and impacts posed by such events in terms of a national fleet of operating reactors and spent-fuel basins. (0496-9 [Batobato, Alicia])

Comment: [R]epositories of nuclear waste must be secured against human mischief and environmental upheaval by every means at our disposal. Long-term storage of nuclear waste from medical sources and munitions must also be addressed with similar levels of vigilance. (0522-3 [Rogers, William])

Comment: The increase in nuclear materials due to operation of more nuclear power plants would undermine all efforts to increase nuclear security and prevent proliferation. (0531-2-17 [Morgan, Sally])

Comment: The US Dpt Of Homeland Security labeled nuclear power plants potential terrorist targets. (0541-5 [Justesen, Evelyn])

Comment: Since spent nuclear fuel contains large quantities of fissile material that can be used to make nuclear weapons, it also must be safeguarded to prevent theft. (0552-1-4 [Macks, Vic])

Comment: Some reactors are more likely targets than others due to their symbolic value as a target and proximity to large population centers. Pilgrim is located in America's Hometown, a symbolic target, and a successful strike would impact a large population --Boston, Providence and beyond. Likewise, Indian Point is proximate to dense population clusters, notably New York City, and very close to West Point. What serious terrorist would chose to attack Wolf Creek in Kansas over Indian Point or Pilgrim? BWR's are more susceptible to attack than PWR's due to the location of the pool outside primary containment, in the upper level of the reactor with a thin roof overhead. A small plane could easily penetrate the roof and cause a spent fuel pool fire⁶. [footnote 6 text: Environmental Impacts of Storing Spent Nuclear Fuel and High-Level Wastefrom Commercial Nuclear Reactors: A Critique of NRC's Waste Confidence Decision and Environmental Impact Determination, Gordon R. Thompson, February 6, 2009, Ch. 7 and Tables 7-2 thru 8-2.] (0556-1-25 [Lampert, Mary])

Comment: Spent fuel is building up at every reactor site in the country, stored in high-density pools that are vulnerable to attack and pose a risk of catastrophic fire. The NRC contemplates that these pools may remain in use for 60 years after operation ceases, where they will remain vulnerable to fires and attacks. Our government assumes that terrorists are not going away, either foreign or homegrown. According to the NRC, the risk of attacks need not be addressed in the GEIS because NRC security regulations ensure that reactor spent fuel pools are protected. This is not true. Reactors are not protected from an air attack. No reactor licensee in the U.S. has lowered risk by eliminating the use of high-density storage racks from fuel pools, or even lowered the density of fuel stored in pools. Thus, a serious environmental threat remains. Likewise casks are poorly defended and vulnerable to attack by airplane, vehicle bomb, perforation by shaped charge with or without incendiary device, or removal of overpack lid⁷. [footnote 7 text: Ibid at Table 7-8] (0556-1-26 [Lampert, Mary])

Comment: BWR Mark I and II reactors' spent fuel pools are located outside primary containment, elevated at the top of the reactor building with a thin and vulnerable roof overhead. They are vulnerable to an air attack even from a small aircraft, more so than a separate spent

fuel pool that is partially submerged into the ground. The vulnerability of these high-density, closed frame spent fuel pools to acts of malice is the single biggest issue that is missing from the draft GEIS. They are vulnerable to attack and pose a risk of catastrophic fire. The NRC says that these pools may remain in use for 60 years after the license expires, where they will remain vulnerable to fires. According to the NRC, the risk of attacks need not be addressed in the GEIS because NRC security regulations ensure that reactor spent fuel pools are protected. They are not. Reactors are vulnerable to air attack and readily available sophisticated weapons. No reactor licensee in the U.S. has eliminated the use of high-density storage racks from fuel pools, or even lowered the density of fuel stored in pools. Thus, a serious environmental threat remains and varies from site to site. But, although one cannot remove the threat of a malicious attack, NRC can require the fuel to be moved to dry casks and greatly reduce the environmental threat of a catastrophic fire. NRC's proposed rule fails to do so. (0556-1-32 [Lampert, Mary])

Comment: No consideration of attack: The Study ignores the potential for an attack on a pool or adjacent reactor to initiate a pool fire. NAS Study after 09/11 showed that a terrorist attack on spent fuel pools was a credible event. Yet, the probability of an attack with a substantial likelihood of success is at least equal to the probability of the severe earthquake that the Study does consider. Table IV-1²⁸ [footnote 28 text: Declaration by Dr. Gordon R. Thompson: Comments on the US NRC's *Draft Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a US Mark I Boiling Water Reactor*, August 1, 2013] [Table Submitted with Correspondence ML13354A021] Table IV-2²⁹ [footnote 29 text: Ibid] [Table Submitted with Correspondence ML13354A021] Table IV-3³⁰ [footnote 30 text: Ibid] [Table Submitted with Correspondence ML13354A021] (0556-4-3 [Lampert, Mary])

Comment: Re: NEPA; Addressing possible "accidents and acts of sabotage during continued storage of spent nuclear fuel," the NRC considered risks and "potential consequences" in the DGEIS. However, "[a]s with all NEPA analyses, the DGEIS analyzed reasonably-foreseeable events and did not consider worst-case scenarios." (78 FR 56783, Section III, A17). "Given that NEPA does not require consideration of [assumed to be] remote and speculative [occurrences and] issues, this [such] analysis has not been included in the DGEIS," with respect to the continuation of regulatory "institutional controls" during "continued storage" of spent nuclear fuel after the end of the licensed life for operations of a nuclear reactor. (78 FR 56788, Section III, B10). These points get to the "heart of the matter" of misguided risk calculations and naive assumptions embedded throughout the DGEIS; the present interpretation of NEPA obligations forms the Achilles heel of the current nuclear regulatory regime. (0603-22 [Schonberger, David])

Comment: The consequences of an intentional attack are underestimated by the probabilistic risk analysis done by the NRC. (0604-8 [Pisha, Gayla])

Comment: High levels of confidence is typical among human males with strong technical backgrounds. Yet, many aspects of the existing storage of this nation's spent nuclear fuel have been overlooked in existing studies. One of them is the effects of terrorist attacks, or an exchange of nuclear weapons in a future war. As the spent fuel is presently stored there are plenty of opportunities for wide scale dispersal of enormous quantities of radioactive elements into the atmosphere. Countries, such as Germany, have found far better ways of storing it's nuclear waste and the EIS needs to consider such options. (0610-5 [Brechtin, Vernon])

Comment: Regarding NEI's specific responses to comments made during the hearings, I take particular exception to NEI's first "correction," their description of the 1998 Aberdeen proving ground dry cask test as "not a conclusive indicator" of dry cask resiliency. America cannot afford even ONE catastrophic dry cask accident, so even ONE failure -- and that test was indeed a

failure -- is a show-stopper. A hole was successfully punched in the dry cask, using far less powerful weaponry than might be available to modern-day terrorists -- who might even be using our own weapons against us, such as A-10 Warthog anti-tank airplanes (perhaps by turning an American pilot into a terrorist while rising in the ranks of our own military), or by using a tank stolen from a local military training facility or even a National Guard station (it happened in San Diego in the 1990s). It is also possible that terrorists will acquire some other nation's high-powered weapons on the black market. The Sandia National Laboratory test NEI refers to was similarly insufficient: A "typical" anti-tank weapon is not necessarily a shaped-charge weapon, it is probably nothing more than a Rocket-Propelled Grenade or RPG, and certainly does not "typically" explode once inside a tank or dry cask (it never gets inside but can disable a tank tread, for instance). Such a weapon "typically" is not even made of so-called "depleted" uranium. Are they talking about pea-shooters or real weapons that real terrorists might use? Are they talking Molotov Cocktails or MOABs (Mother Of All Bombs, a thermobaric weapon deployed with great horror by the U.S. Military during the early stages of the Afghan war)? To say the Sandia test used a "device" (unnamed) "30 times more powerful than a typical anti-tank weapon" is evading the issue, and has no real meaning. What if a terrorist gets hold of a nuclear weapon and discharges it near the dry casks? It can happen. Regarding the "large commercial aircraft traveling low to the ground at 350 MPH" this description clearly belies that it was not tested to be able to survive a jumbo-jet intentionally flown into the facility at 500 MPH or more, and wouldn't stand a chance against a mildly-well-trained suicidal pilot flipping the big bird over on its back, pulling back on the control stick, and diving at 700 MPH or even faster directly into the facility from above. It is a "1-G" maneuver, for that matter --the passengers would barely even notice if it's done right!! And an F-16? The "Fighting Falcon" is a beautiful LITTLE jet that barely cracks the speed of sound at sea level. 21 tons maximum takeoff weight, and that drops pretty quickly as it burns fuel. Maximum speed at sea level: Mach 1.2. For the test described by NEI, I believe the F-16 body was on a pulled rail system, well below its maximum speed, and was NOT loaded with fuel (or bombs) during the test. A Boeing 747, on the other hand, weighs in at about 420 tons, so at least 20 times the inertia of an F-16 -- and nearly half that weight is fuel. Cruises at Mach 0.84. The four turbine shafts for the engines weigh, together, about as much as an F-16. (0616-8 [Hoffman, Ace])

Comment: The dismissal of terrorist attacks shows that this is not a serious report. Everyone who has read the Sandia reports knows that a truck bomb (or missile, or high explosives, etc.) outside the perimeter could have disastrous effects on fuel pools. Nuclear power plants were never designed to be fortified against such attacks, and any report which ignores this is a report not to be taken seriously. (0618-14 [Johnson, Roger])

Comment: It is an extremely inviting target for terrorists. The waste is stored in an extremely vulnerable location with free public access on all sides: it is a few hundred feet from a public beach and a few hundred feet from an important Interstate Highway. (0618-4 [Johnson, Roger])

Comment: Terrorism: Section 4.19 of the draft GEIS discusses the potential environmental impacts from acts of terrorism and sabotage at the fuel storage facilities. The document discusses the two US Court of Appeals decisions regarding the consideration of environmental impacts from terrorist attacks in NEPA analyses. The Ninth Circuit held that the NRC needed to consider these environmental impacts in its NEPA reviews. The Third Circuit upheld the NRC's position that acts of terrorism are too far removed or remote to be included in the agency's reviews. The draft GEIS further states that because some continued storage will occur within the Ninth District, "this draft GEIS discusses the environmental impacts of successful terrorist attack to comply with San Luis Obispo Mothers for Peace v. NRC." According to the draft GEIS, "the environmental impact for a successful terrorist attack, if one occurs, could be significant

and destabilizing" (page 4-84). To the Tribe, with its tribal members homes just 600 yards from the Prairie Island ISFSI, this statement is the one of the most significant in the draft GEIS. The draft GEIS later discusses various generic events that could occur during the three time periods- theft of materials, physical attacks, etc and all were found to have a low probability of occurring and therefore the environmental risk would be SMALL. This conclusion, that that the environmental risk is SMALL, should not be the end of the NRC's analysis. In the absence of a national repository or interim storage site, the NRC will eventually relicense every existing ISFSI. Current general license ISFS is will switch to a site-specific license once the reactors are decommissioned. The NRC must include an analysis of the potential environmental impacts of terrorism in all of its NEPA reviews for ISFSI licenses. This is especially important given the dry storage time periods we are discussing in the draft GEIS. Since we have no idea whether the draft GEIS will ever be updated once its final, the NRC must include an analysis of terrorist acts on every site specific ISFSI renewal. It shouldn't be up to host communities or others to expend their own resources to force the NRC to include this review in NEPA documents via litigation. Every day our society is confronted by the reality that there are people willing to give their lives to harm our nation to make political or religious statements. The terrorism analysis in the draft GEIS referenced events that occurred in recent time (i.e., September 11, 2001 attacks); we have no idea what might happen in the future, especially during the timeframes discussed in the draft GEIS (i.e., 160 years or beyond). (0619-2-2 [Mahowald, Philip R.]

Comment: Second, long term dry cask storage on site appears to be expensive and is probably not impervious to terrorist attack. Nevertheless, the presence of spent fuel rods in open to the air cooling ponds is also clearly unacceptable. One aircraft crash into such a pool, such as the crash of aircraft into the World Trade Center on 9/11-01, would create a disaster of dreadful proportions for the surrounding area. (0628-3 [Perkins, V.E.]

Comment: Discussions of terrorist attack scenarios are a waste of time if they are restricted to convenient testing options. Get real! (0640-7 [Geary, B.]

Comment: The draft GEIS assumes spent fuel pools will remain full, and therefore at risk of fire, for 60 years after reactors are decommissioned and greatly downplays fire risk based on a flawed risk assessment. The draft GEIS completely fails to take into consideration risk of fire as a result of an attack on high-density spent fuel pools. (0646-20 [Hanson, Courtney])

Comment: The Draft GEIS assumes that the impact of terrorism would be small. However, according to the National Institute of Health, an attack on a nuclear reactor could result in a "massive release of radioactive material". In the aftermath of 11 September, David Kyd, spokesman for the International Atomic Energy Agency, confirmed this view, stating: "[Reactors] are built to withstand impacts, but not that of a wide bodied passenger jet full of fuel. . . . These are vulnerable targets, and the consequences of a direct hit could be catastrophic." (0686-4 [Malboeuf, Simone])

Comment: The full article [Alvarez, R. et.al., Science and Global Security, 11:1-51, 2003] discusses some of NRC's rationale for failing to act on the risks of spent fuel pools: "No established method exists for quantitatively estimating the likelihood of a sabotage event at a nuclear facility." Given that NRC is the sole government agency authorized to deal with nuclear facilities officially, it would be incumbent upon NRC to establish this method. The draft GEIS provided an opportunity for NRC to advance an appropriate method. (0693-2-4 [Warren, Barbara])

Comment: Waste storage is vulnerable to terrorist attacks. Consider the incident in Aberdeen where a hold was punched in a dry cask. Terrorists now have access to much more powerful

weapons, such as nuclear weapons and powerful airplanes. How many such incidents does NEI consider acceptable? I suggest zero. (0705-5 [Spring, Janet])

Comment: Pages 4-84 to 4-91 Potential acts of sabotage or terrorism. NRDC Comment[:] NRC has failed to consider the environmental impacts of terrorism related to storage and transportation at both a generic and site-specific level." Notably, NRC planned to do so, at least generically, in its 2011 Report for the Long Term Storage EIS. See LTR at 13. Given the long timeframe covered by the Draft GEIS, provisions should be made for periodic updating of the terrorism and sabotage analyses to address: (1) advances in the technology of terrorism and counter-terrorism; (2) changes in population density near storage facilities and shipment routes; and (3) changes in understanding and definition of the design basis events and design basis threats. (0706-4-4 [Fettus, Geoffrey])

Comment: Regarding NEI's specific responses to comments made during the hearings, I take particular exception to NEI's first "correction," their description of the 1998 Aberdeen proving ground dry cask test as "not a conclusive indicator" of dry cask resiliency. America cannot afford even ONE catastrophic dry cask accident, so even ONE failure -- and that test was indeed a failure -- is a show-stopper. A hole was successfully punched in the dry cask, using far less powerful weaponry than might be available to modern-day terrorists -- who might even be using our own weapons against us, such as A-10 Warthog anti-tank airplanes (perhaps by turning an American pilot into a terrorist while rising in the ranks of our own military), or by using a tank stolen from a local military training facility or even a National Guard station (it happened in San Diego in the 1990s). It is also possible that terrorists will acquire some other nation's high-powered weapons on the black market. The Sandia National Laboratory test NEI refers to was similarly insufficient: A "typical" anti-tank weapon is not necessarily a shaped-charge weapon, it is probably nothing more than a Rocket-Propelled Grenade or RPG, and certainly does not "typically" explode once inside a tank or dry cask (it never gets inside but can disable a tank tread, for instance). Such a weapon "typically" is not even made of so-called "depleted" uranium. Are they talking about pea-shooters or real weapons that real terrorists might use? Are they talking Molotov Cocktails or MOABs (Mother Of All Bombs, a thermobaric weapon deployed with great horror by the U.S. Military during the early stages of the Afghan war)? To say the Sandia test used a "device" (unnamed) "30 times more powerful than a typical anti-tank weapon" is evading the issue and has no real meaning. What if a terrorist gets hold of a nuclear weapon and discharges it near the dry casks? It can happen. Regarding the "large commercial aircraft traveling low to the ground at 350 MPH" this description clearly belies that it was not tested to be able to survive a jumbo-jet intentionally flown into the facility at 500 MPH or more, and wouldn't stand a chance against a mildly-well-trained suicidal pilot flipping the big bird over on its back, pulling back on the control stick, and diving at 700 MPH or even faster directly into the facility from above. It is a "1-G" maneuver, for that matter -- the passengers would barely even notice if it's done right!! And an F-16? The "Fighting Falcon" is a beautiful LITTLE jet that barely cracks the speed of sound at sea level. 21 tons maximum takeoff weight, and that drops pretty quickly as it burns fuel. Maximum speed at sea level: Mach 1.2. For the test described by NEI, I believe the F-16 body was on a pulled rail system, well below its maximum speed, and was NOT loaded with fuel (or bombs) during the test. A Boeing 747, on the other hand, weighs in at about 420 tons, so at least 20 times the inertia of an F-16 -- and nearly half that weight is fuel. Cruises at Mach 0.84. The four turbine shafts for the engines weigh, together, about as much as an F-16. (0709-8 [Wythe Elnagar, Romi])

Comment: Malicious acts directed against the spent fuel bay could trigger such releases as well. These potential threats are exacerbated by the fact that the spent fuel bay is typically not located within the containment system, and is not reinforced against potential terrorist attacks. (0714-2-2 [Edwards, Gordon])

Comment: As summarized in the NRC's *A Short History of Nuclear Regulation 1946-2009*, NUREG/BR-0175, Revision 2 (Oct. 2010) ML102980443, the September 11 airplane attacks revealed a weakness at U.S. commercial nuclear power plants, namely that the commercial U.S. nuclear facilities were not designed to withstand aircraft crashes and that the densely packed spent fuel pools were located outside of the concrete containment shell were potentially vulnerable to sabotage. [image inserted] NUREG/BR-0175, Rev. 2, at 86; see also *id.* at 87 (discussing spent fuel pools, which are located outside of the containment shell). Consistent with its statutory responsibilities, the NRC has analyzed sabotage events in previous documents. For example, the 1996 GEIS for License Renewal Applications discussed the effects of sabotage – albeit in a pre-9/11 world. NUREG-1437, Vol. 1, at 5-18 (1996); see, e.g., NUREG-0179, *Final Environmental Statement on the Transportation of Radioactive Materials by Air and Other Modes*, (Dec. 1977) (discussing potential sabotage impacts). In 1981, NRC published NUREG/CR-1345, *Nuclear Power Plant Design Concepts for Sabotage Protection*, Vols. 1 & 2 (Jan. 1981). The Waste Confidence DGEIS contains a few brief generic phrases about the environmental impacts that could result from sabotage or terrorism. DGEIS § 4-19 (4-84 -- 4-89). The document contains conclusory statements to the effect that "the environmental impact for a successful terrorist attack, if one occurs, could be significant and destabilizing." DGEIS, at 4-84; 4-86 (consequences of sabotage could be "severe"). These statements and the remainder of § 4-19 provide no real descriptive analysis of the impacts beyond noting that the "damages could exceed \$ 70 billion" and lead to "192 early fatalities." It is not clear how these passing observations would apply to the Indian Point facilities and the New York City metropolitan area. The document implies that the Severe Accident Mitigation Alternatives analysis prepared for *reactor* accidents "provide a means for mitigating the potential consequences of a terrorist attacks," but that conclusory statement is inconsistent with New York's experience with the SAMA process in the ongoing license renewal proceeding for Indian Point – and is plainly inapplicable to spent fuel pools. Equally important, § 4-19 does not identify, discuss, and evaluate alternatives and mitigation measures. Given these omissions, the DGEIS's discussion of the environmental impacts of sabotage events does not comply with NEPA. Moreover, in its current form, the DGEIS fails to account for cumulative impacts, segments review, and does not address site-specific issues relevant to Indian Point and the New York City metropolitan area. (0718-3-5 [Sipos, John])

Comment: Fuel pools are filled beyond their designs. We have become a terrorist target. (0722-2 [Headington, Maureen])

Comment: Shock waves affecting elevated spent fuel pools need not be limited to natural seismic shock. The Murrough/ Oklahoma City Federal Building was destroyed by ground shock waves from a truck bearing low-grade explosives and parked more than 75 feet away. At Vermont Yankee, just a few years ago, an ice truck entered the security zone with no search or security challenge. It is clear that NRC has chosen to look the other way on all of these challenges to spent fuel security to the detriment of its credibility and the public's risk of health, safety and security. (0723-10 [Shadis, Raymond])

Comment: The fuel inside, if attacked by terrorists, could release large amounts of radioactivity, and so NRC requires constant guarding of the material by plant security forces. Over the centuries, as the radiation levels diminish from decay of the intermediate-lived

radionuclides such as cesium-137 and strontium-90, it will at some point become much easier and thus more attractive as weapons-usable material for theft, i.e., to obtain the plutonium inside that could be used for atomic bombs.³⁶ [footnote 36 text: It has long been accepted that that reactor-grade plutonium can be used to make nuclear explosives. It has somewhat larger percentages of the higher-numbered plutonium isotopes than plutonium produced specially for weapons states, but can produce a large nuclear yield. The primary difference is in the reliability of predicting what that yield will be; i.e., it could be 1 kiloton or 10, whereas with weapons-grade plutonium one has high confidence that the yield would be, say, 5.3 kilotons. But even that issue can be overcome by designs that employ faster insertion of reactivity. Cite sources.] Thus, need for security to protect the spent fuel will not diminish over time and arguably increases. (0738-10 [Hirsch, Daniel])

Comment: The Draft GEIS assumes that the impact of terrorism would be small. However, according to the National Institute of Health, an attack on a nuclear reactor could result in a "massive release of radioactive material." (0757-5 [Lynch, Laura])

Comment: Had the 9/11 terrorists attacked Indian Harbor, there's no telling where we'd be today. We got lucky. While I trust the Government in general, what would happen if 200 heavily armed suicidal terrorists decided to attack Indian Harbor in the middle of the night? No smart bombs will dislodge them without catastrophic consequences. (0766-2 [Poole, Jesse])

Comment: The Waste Confidence Draft EIS fails to adequately address a serious threat to nuclear spent fuel pools from terrorists as well as mentally unstable single white male war gamers without significant relationships who are likely to displace anger or who are likely to be delusional. Suspected al-Qaeda member, Sharif Mobley, accused of murder in Yemen, worked at 5 US nuclear plants, per The Sierra Club's John Muir Chapter's *Nuclear Energy: A Bad Bargain for Wisconsin* (2013). Based on the fact that the top financial priority in the US government budget in 2013 is military and war, excluding war debt, combined with too many changing and unstable socio-economic factors, rationally it is very difficult to conclude that terrorism, malicious destruction, and delusional confusion of reality for war games might go away without addressing the root of pent up anger and instability. Hopefully, the NRC receives rapidly evolving accurate intelligence information that warns of special vulnerabilities upon which the NRC can rapidly mobilize sufficient extra resources to protect safety. (0823-25 [Michetti, Susan])

Comment: Acts of maliciousness or terrorism are always possible in terms of both the external electric grid feeding to operations and storage as well as from internal operations. Sharif Mobley, suspected al-Qaeda member, worked at 5 US nuclear plants. (0823-27 [Michetti, Susan])

Comment: The NRC has also addressed common misconceptions and clarified that used nuclear fuel is well-protected from potential natural events and terrorist attacks - all made possible by a combination of strategic design and construction, multiple safety systems, ongoing surveillance and inspection, and state-of-the-art security measures. (0825-5 [Palomarez, Javier])

Comment: The Draft NUREG-2157 Section F.2.2 then equates the probability weighted consequences of a spent fuel pool to the probability weighted consequences of a severe nuclear reactor accident. Thus, a numeric probability is indirectly placed onto a numerically indeterminable probability. I would argue that the probability of a successful terrorist attack on a nuclear reactor is also numerically indeterminable. Yet with a broad-brush statement that a severe nuclear reactor accident and a spent fuel pool accident have equal probability weighted consequences, the error associated with applying a probability weighted consequence to a

successful terrorist attack on a nuclear reactor is now being applied to determine the weighted consequence of a successful terrorist attack on spent fuel pool. The probability of a successful terrorist attack on a spent fuel pool is numerically indeterminable and probability weighted consequences should not be applied to spent fuel pool fires or severe nuclear reactor accident. (0826-10 [Morgal, Rick])

Comment: It is telling that in several documents, including 10 C.F.R. § 73.1., the NRC and the nuclear power plant operator, by charter, are NOT responsible to defend our nuclear power plant spent fuel pools from large aircraft attacks. Thus, it is known that the spent fuel pools are unprotected from an aircraft attack similar to what occurred to the World Trade Center on September 11th 2001. Yet the risk "is very low" in the minds of the owners of the plants and their regulators. (0826-11 [Morgal, Rick])

Comment: A known weakness in our nation's nuclear reactor's spent fuel pools has been categorically ignored by the NRC and plant operators due to the economic costs associated with adding infrastructure that could make the success of a terrorist attack with a commercial aircraft less likely. The fact that spent fuel pools in all new nuclear power plant designs are required to be able to survive an impact from large commercial aircraft is an indication that the NRC knows our nation's legacy spent fuel pools are vulnerable to aircraft attack, yet there is no incentive to fortify our infrastructure because of economic reasons. Eight million people being affected and half of California's economy should be worth protecting from the likes of what happened on September 11, 2001. But adding the cost of protecting all the spent fuel pools in the US to the cost of nuclear power would impact the cost per kilowatt of nuclear generated electrical power. (0826-12 [Morgal, Rick])

Comment: This situation brings to mind the popular quote: "Never underestimate the power of a few committed people to change the world. Indeed it is the only thing that ever has." We all understand the above quote but in the context of an event probability being determined as "numerically indeterminate" the NRC needs to realize that it would take a relatively small group of committed people to charter a Mexican cargo plane filled with fuel and heavy machinery to fly less than 20 minutes in US airspace before crashing down into one of the San Onofre spent fuel pools. The down wind impacts of such an event would be devastating to our nation, the nuclear industry and the world. It is paramount that the NRC keep in mind that TSA improvements in commercial aircraft security due to the September 11, 2001 tragedy are not effective in stopping international plane attacks. Dirty bombs are hard to manufacture due to the difficulty in obtaining the nuclear material. But a well placed surplus cargo plane on a San Onofre Nuclear Generating Station's spent fuel pool would be the largest dirty bomb possible with the perpetrators having no need to obtain, prepare or handle any nuclear material. This very real terrorist threat should not be allowed to exist longer that is required for the fuel within the spent fuel pool to cool sufficiently to be placed in dry casks. (0826-14 [Morgal, Rick])

Comment: This situation is especially true in light of the severe consequences of a successful terrorist aircraft attack on a spent fuel pool and the numerically indeterminable probability of such an event occurring. National security issues are based upon the fact that dry cask storage systems take time to fabricate and after a first successful terrorist aircraft attack on a spent fuel pool it will take years to build and transfer all the fuel stored in spent fuel pools into dry casks. During those years of cask building, our country will be placed on red alert for potential terrorist aircraft attacks on the remaining spent fuel pools on the nation's reactor sites. (0826-19 [Morgal, Rick])

Comment: When hearing this I feel as though the NRC is in the same state of mind that the FAA was in just before September 2001 or the SEC was in before the financial crisis of 2007. Even if the TSA has been successful in preventing another event similar to the September 11th 2001 event, technology is continually making their job harder. The NRC's Draft Waste Confidence Generic Environmental Impact Statement is proposing spent nuclear waste storage system that will remain in place for 60+ years. Just in the last two years 3-D printing technology has become mainstream and now people can print a plastic gun able to pass undetected through the TSA X-ray screening systems. Now domestic US commercial aircraft have raised the risk of being hi-jacked for terrorist purposes. It's difficult to project what technology will enable people to easily do 60 years from now but it is quite possible the risk of an aircraft being acquired for terrorist purposes will increase over time and possibly quite significantly. (0826-28 [Morgal, Rick])

Comment: Section F.2.2 of the Draft NUREG-2157 describes using a Probability-Weighted Consequence to estimate the number of fatalities associated with a spent fuel pool fire. This mathematical approach to quantifying risk basically counterbalances a catastrophic event with a small probability that the event would occur. By using this type of analysis the NRC creates an illusion that few fatalities will ever transpire due to the perceived unlikelihood of a spent fuel pool fire occurring. The error in using the Probability-Weighted Consequence approach to predict fatalities associated with a Spent Fuel Fire is based upon attempting to estimate the probability of a successful terrorist attack on a spent fuel pool. In that light, Paragraph 4.19.1 of Draft NUREG-2157 states: "The NRC has determined that the probability of a successful terrorist attack on a spent fuel pool, although numerically indeterminable, is very low." The Draft NUREG-2157 Section F.2.2 then goes on to justify how the NRC determines the probability of a spent fuel fire is low based upon structural features of spent fuel pools, security measures and emergency procedures in place at the plant that would thwart a terrorist attack. (0826-9 [Morgal, Rick])

Comment: The NRC has postulated that the environmental risk of a terrorist attack on a dry spent fuel storage facility is small because the probability of such an event is miniscule.⁷⁷ [footnote 77 text: Draft GEIS Sections 4.19 and 5.19.] While that is certainly true, further assurance that the risk is small involves the consideration of the potential population exposure that might result from a highly improbable, but successful terrorist attack on a dry spent fuel storage system. During the presentations and discussions provided by industry to the Blue Ribbon Commission on America's Nuclear Future (BRC) on the safety of dry spent fuel storage, an evaluation was provided to validate the comparatively small population doses that might result from a highly improbable, successful attack on a dry storage system by terrorists. This evaluation confirmed that dry used fuel storage and transportation are among the safest of all industrial activities. As explained by the National Academy of Sciences, tens of thousands of tons of used fuel have been stored and shipped around the world in many thousands of storage and transportation packages, even traveling tens of millions of miles, without a radiation-induced injury or fatality.⁷⁸ [footnote 78 text: National Academy of Sciences (NAS), National Research Council, 2005. "Safety and security of commercial used nuclear fuel storage: Public Report," Washington, DC: National Academies Press; National Academy of Sciences (NAS), National Research Council, 2006. "Going the distance? The safe transport of used nuclear fuel and high-level radioactive waste in the United States," Washington, DC, National Academies Press.] Used fuel and radioactive material packaging have a unique characteristic among all other hazardous material packaging: the need for gamma-ray shielding. Gamma-shielding materials are dense and strong and must remain attached, even following accident conditions. This shielding provides enhanced robustness with larger structural safety margins than other packages. (0827-3-1 [Ginsberg, Ellen])

Comment: The robustness of dry cask storage systems also addresses the concern that fuel becomes less selfprotecting over time. This concern is expressed in both the proposed rule and draft GEIS, where the NRC discusses its intent to evaluate whether additional security requirements are warranted in the future.⁷⁹ [footnote 79 text: 78 Fed. Reg. 56776, 56795; GEIS Section 4.19.] This discussion overstates the potential additional security risk that might accrue over time as the fuel becomes less radioactive. Industry believes that current practices would sufficiently protect even less radioactive fuel, making additional security requirements in the future unnecessary. While it is true that, as the fuel ages over time, it will become less radioactive and, hence, less self-protecting; a more significant factor is that the physical design of the individual storage systems will continue to provide a protective barrier and offer a robust security protection system relative to any terrorist attack. The concrete over-packs are in the range of 150 tons and the welded spent fuel canisters have individual weights in the range of 25 to 50 tons. Because of the physical size, special lifting and transport systems are needed to remove a full containment package. Successful individual system attacks or diversion of a specific fuel mass from storage systems would be problematic due to the bulk of the systems, layers of packaging, and fuel handling at the ISFSI even in the unlikely event that the containment boundary could be breached. (0827-3-2 [Ginsberg, Ellen])

Comment: Extensive safety analyses and testing have been performed to conclude that casks in a licensed configuration will not release radioactive material under any credible accident conditions, and these analyses and testing have been accepted by the NRC in the package licensing process. Assumptions regarding cask "material failure," imposed by the application of conservative regulatory codes and standards, help to make a "no release" design possible. An example of conservatism in materials is stainless steel, a predominant material of choice for containment boundaries, which has about 2 orders of magnitude more energy absorption capability before failure than required by design codes. Many analyses of aircraft impacts, aviation fuel fires, aircraft attacks with explosives, and other highly improbable sabotage or accident occurrences rely on impact, thermal, or overpressure events to theorize damage. These analyses have shown that such events are very unlikely to result in dry storage or transport system containment breaches because of the robust design of the systems. This was summarized in the NAC presentation to the BRC of September 23, 2010.⁸⁰ [footnote 80 text: "Storage and Transportation of Used Fuel: Does Storage/Transportation System Hardening Enhance Safety and Security," Sept. 23, 2010.] (0827-3-3 [Ginsberg, Ellen])

Comment: Despite this rugged design, the possibility of terrorists acquiring and using very sophisticated military weaponry to destroy used fuel storage or transport systems is often raised as a scenario that could result in grave population dose consequences. The probability, however, of successful deployment of such weapons must still be viewed as vanishingly small, since reasonable proximity to the storage systems and time-consuming, precise placement or delivery of such weapons must be accomplished. Over the last three decades, substantial testing and analyses have been performed to bound releases from used fuel casks following a perfect assault. Robert Luna⁸¹ [footnote 81 text: Luna, R.E., Yoshimura, H.R., Vigil, M.G., Philbin, J.S. Lange, F., Pretzsch, G., Koch, W. Cheng, Y.S., 2001. Perspectives on used fuel cask sabotage. Proceedings of the Waste Management '01 Symposium, Feb. 25 - Mar. 1, 2001, Tucson, Arizona.] provides an excellent summary of this testing and offers an analysis of the likely respirable fission product release fractions from the used fuel system that are supported by testing. Luna has continued to research the release characteristics of used fuel storage and transport package sabotage events using military weaponry, and this research^{82, 83} [footnote 82 text: Luna, R.E., 2006. Release fractions from multi-element used fuel casks resulting from HEDD attack. Proceedings of the Waste Management '06 Symposium, Feb. 26 - Mar. 2, 2006, Tucson, Arizona.] [footnote 83 text: Luna, R.E., Yoshimura, R.H., Sorenson, K.B., 2007,

Parametric study of the release of used fuel aerosol resulting from HEDD attack. Proceedings of the 15th International Symposium on the Packaging and Transportation of Radioactive Materials, PATRAM, 2007. Oct. 21-26, 2007, Miami, Florida.] (0827-3-4 [Ginsberg, Ellen])

Comment: The research reported by Luna shows that: 1) there is a large momentum transfer from the weapon penetrator to the used fuel towards the interior of the canister or cask; 2) used fuel, with its multiple layers of radically different densities, is a good medium for stopping high energy projectiles; and 3) the separated, individual used fuel storage cells made of steel in the basket of the canister or cask system tend to limit used fuel dispersion to the environment from all but the outer row of basket cells. When compared to an event like the accident at Chernobyl, a release from a storage or transport system would result in small quantities of used fuel ejected into the proximate environment and none injected into the high atmosphere. Therefore, using the Luna research on release fractions for a terrorist attack on a used fuel storage or transportation system, in combination with the Accident Dose Assessment and Projection Technique from Radionuclide Analysis at Chernobyl (ADAPTRAC) modeling described by Pennington to calculate maximum population exposures,^{84, 85} [footnote 84 text: Pennington, C.W., 2010. A demonstration of the comparative radiological safety of commercial nuclear power generation in the USA. Int. J. Nuclear Governance, Economy and Ecology, Vol. 3, No. 1, pp.59-103.] [footnote 85 text: Pennington, C.W., 2010. Radiological safety of used fuel storage and transport. Proceedings of the 16th International Symposium on the Packaging and Transportation of Radioactive Materials, PATRAM, 2010. October 4 -8, 2010, London, UK.] a bounding CEDE for a credible terrorist sabotage attack on a used fuel storage or transportation system can be calculated. This assessment is described by Pennington and is summarized below.⁸⁶ [footnote 86 text: Pennington, C.W., 2010. A demonstration of the comparative radiological safety of commercial nuclear power generation in the USA. Int. J. Nuclear Governance, Economy and Ecology, Vol. 3, No. 1, pp.59-103.] A high-capacity used fuel storage or transport system contains less than 0.06% of the radionuclides in the Chernobyl reactor core. ADAPTRAC modeling uses the reference⁸⁷ [footnote 87 text: United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), 2000. Report of the United Nations Scientific Committee on the Effects of Atomic Radiation to the General Assembly, Annex J: Exposures and effects of the Chernobyl accident. Vienna, Austria: United Nations Publications.] 50-year, post-accident dose distribution for the long-lived radionuclides released from the event, the half-lives of the radionuclides with significant dose participation, the total involved population, and the full application of all the longlived radionuclide release, dispersal, and exposure pathway conditions that existed at Chernobyl. All the highly conservative Chernobyl conditions involving ejection into the upper atmosphere, a 40 day release period, wide dispersion, and the affected populations are retained in the ADAPTRAC model. For example, the first two plumes from the Chernobyl release continued for more than 36 hours, covering an area within a 5 km radius having a population density of almost 640 people/ km² . However, for the 45° dispersion arc of these first two plumes, the effective population density within that 5 km distance and 45° arc was more the 5,000 people/ km² . This population density is about two orders of magnitude higher than the population density surrounding U.S. nuclear dry storage facilities. The plume duration, combined with the very high population density within the early dispersion arcs, makes the Chernobyl dispersion characteristics very conservative for application of ADAPTRAC to [an] attack on a used fuel storage or transport system in the U.S. (0827-3-5 [Ginsberg, Ellen])

Comment: [Continued from Comment 827-3-5] The radionuclide release fractions applied in ADAPTRAC that result from [an] attack on a used fuel system are taken from Luna,^{88, 89} [footnote 88 text: Luna, R.E., 2006. Release fractions from multi-element used fuel casks resulting from HEDD attack. Proceedings of the Waste Management '06 Symposium, February

26 - March 2, 2006, Tucson, Arizona.] [footnote 89 text: Luna, R.E., Yoshimura, R.H., Sorenson, K.B., 2007. Parametric study of the release of used fuel aerosol resulting from HEDD attack. Proceedings of the 15th International Symposium on the Packaging and Transportation of Radioactive Materials, PATRAM, 2007. October 21 - 26, 2007, Miami, Florida.] but are increased by a factor of 6 due to the assumption of using a very modern, used fuel storage or transportation system with a 100 psig pressurized canister for the used fuel, based on discussions with Mr. Luna regarding likely outcomes for such pressurized systems. The used fuel released and ejected from the system, mostly located in close proximity to the breached cask, would be in the range of several kilograms (kg), with longer-lived fission product radioactivity, including cesium-137 (¹³⁷Cs), likely less than 10,000 curies (Ci) and in the range of 1,000 - 4,000 (Ci). Because there are low population densities around U.S. at-reactor dry used fuel storage facilities, the involved population would be much, much less than 500,000 people. For such a credible but low probability sabotage event, the population receiving significantly elevated doses would likely be site workers, and the peak 50-year total effective dose equivalent (TEDE) would be well under 1 cSv. Members of the public living around the dry storage facility that might receive a 50-year TEDE in the range of 1 -3 mSv would number far less than 100,000. These doses and affected populations are well below those resulting from non-nuclear industries every year. (0827-3-6 [Ginsberg, Ellen])

Comment: Perhaps the largest danger presented by the establishment of some 69 NWO sites in 34 states (Page 2-14 line 10) is that these become potential terrorist or wartime targets. An attack with a conventional missile will not just take out an area much larger than the NWO itself. The dry cask storage systems, and certainly the fuel pools, are NOT hardened against such attacks, and it is doubtful that there is any ultimate hardening approach short of a deep geologic repository. The fact that the NWO installations DIFFER substantially from a deep geologic repository in this regard must also mean that there must be some serious risk that is now included. YOU NEED TO DESCRIBE THIS RISK AND DIFFERENTIATE THIS OPTION WITH THE PERMANENT GEOLOGIC REPOSITORY OPTION. (0836-20 [Davis, Anonymous])

Comment: We disagree that you can conclude that the IMPACTS of Accidents or Sabotage or Terrorism are all SMALL. I know you want this to be the case, but it is not, and if you continue to assert this, I don't know how you can sleep at night. The reason the deep geologic repositories are proposed is to avoid these dangers. THIS MUST BE SPELLED OUT. (0836-23 [Davis, Anonymous])

Comment: Page 2-16, Lines 17-18. You say that the NRC issued orders to ISFSI licensees etc. based on 9/11 attacks, and that the details are withheld from the public. But can you reveal how these orders were reviewed by other parties to ensure that they are adequate? If there was no review, this does not help us be confident that you are doing your job, given the fact that rarely do you push safety over profits. WHO REVIEWED THIS? (0836-39 [Davis, Anonymous])

Comment: Page 4-84 "The environmental impact for a successful terrorist attack, if one occurs, could be significant and destabilizing." We agree with this statement, it is probably one of the few things you have said that were admitting the truth in this document. However, then you go on to say that because the probability is so low, we don't have to worry about a thing. If we used this method for dealing with risk that you use, then we would not have any defense department at all. They do not determine whether to create a defense only if the probability says that it might happen using PRA, and you must not use it to allow permanent ISFSIs. (0836-58 [Davis, Anonymous])

Comment: Page 4-85, Line 15-16, "The NRC has determined that the probability of a successful terrorist attack on a spent fuel pool, although numerically indeterminable, is very low." That's probably what they said about the attack on the World Trade Center by 19 hijackers. Very low probability. And even lower probability that the towers would completely fall to the ground. But it happened anyway. So we object to the notion that you know that the probability is so low that we can disregard this risk. First you say you have no clue as to the probability, and yet you say it is low and therefore inconsequential. THIS IS THE MOST SIGNIFICANT THREAT POSED BY SITING 69 NWOs AROUND THE COUNTRY, resulting in 69 targets for conventional missiles that will result in a massive radioactive release, just like a "dirty bomb". I DON'T THINK THE PENTAGON WILL LIKE THIS IDEA, or at least I hope they still have some people there who still realize real risk when they see it. (0836-59 [Davis, Anonymous])

Comment: Page 4-85 Lines 24-30. Changing procedures and adding training, improving security through access authorization, etc. are of no consequence when considering the possibility of a missile launched from North Korea, or a shoulder-launched missile directed at a fuel pool from well outside the secure perimeter of the power plant.. It is very distressing to learn how easily the NRC disregards these serious national security concerns. (0836-60 [Davis, Anonymous])

Comment: Page 4-88 Lines 19-23. Adding new rules will not defend against serious wartime attacks. Our country was attacked in WWII and it can happen again. We do not want 69 NWOs around that will be targets, esp. if these are in densely populated areas, which most are. (0836-61 [Davis, Anonymous])

Comment: Page 4-88 Lines 24-26, another ridiculous statement: "The NRC has determined that the measures described above, coupled with the robust nature of dry cask storage systems, make the probability of a successful terrorist attack, although numerically indeterminable, very low." Really? How do you figure that out. First, we do NOT know the likelihood of a war or terrorist attack over a 100 year period. So please, stop it with the jokes, will you? This only makes the NRC look pretty naive, to be sure. The trouble with your calculations is that a terrorist attack in 100 years is probably a certainty. A world war, probably also will happen. If it is a conventional war, then these NWOs will be targets. We can't let that happen. Period. (0836-62 [Davis, Anonymous])

Comment: In Section 4.19.1, paragraph 1, the NRC takes credit during potential attacks on spent fuel pools for the presence of emergency procedures and "Severe Accident Mitigation Alternatives guidelines" in mitigating the potential consequences of terrorist attacks (see page 4-85, lines 20-23). While operating reactors have these procedures and guidelines and can apply them to an attack against the spent fuel pool, reactors that are permanently shutdown often scale back their EP programs and are granted exemptions to NRC requirements. Therefore, it is not clear that this GEIS statement applies to all power reactor spent fuel pools. Additionally, for the sole wet pool ISFSI licensed under Part 72, these types of procedures and guidelines would not be required by Part 72. Accordingly, the NRC should clarify in the final EIS whether these conclusions are applicable to all spent fuel pools. And if not, what are the impacts of this information. (0841-7 [Corrino, G])

Comment: In Section 4.19.2, paragraph 3, the NRC states that the potential for theft and diversion of spent fuel from an ISFSI is not credible based upon three reasons (see page 4-87, lines 26-32). However, this is limited in the DGEIS to "light water reactor spent fuel" stored in an ISFSI. But, not all ISFSIs store light water reactor spent fuel. Consequently, to be complete, the

NRC should characterize in the final EIS whether the potential for theft and diversion is not credible for both light water reactor spent fuel and non-light water reactor spent fuel. If such scenarios become credible during the long term storage or indefinite storage time periods, then the NRC should also evaluate revising Table 4-2's entry for Sabotage or Terrorism to reflect potential for increased impacts. (0841-8 [Corrino, G])

Comment: In Section 4.19.2, paragraphs 6 and 7, the NRC speaks of additional security requirements being necessary as the spent fuel ages and its radiation level (i.e., the amount of self-protection) drops (see page 4-88, lines 19 - 26). However, the NRC has not addressed in Section 4.19.2 any increased security risks due to the operation of a Dry Transfer System (DTS) at the ISFSI. In Section 2.1.4 of the DGEIS, the NRC assumes the presence of a DTS to transfer fuel from one cask to another, when the cask lifetime is up in 100 years. At that point, self-protection would be greatly diminished; and potentially may not be relied upon. Secondly, a DTS may be needed much sooner to transfer spent fuel from an existing storage cask, that is not certified for transportation purposes, to a dual purpose storage and transportation cask. Thirdly, the NRC has not characterized the security hazards from a DTS due to theft and diversion in Section 4.19. Consequently, the NRC should characterize the theft and diversion risk from the use of a DTS in Section 4.19 over the range of potential times of use. Also, as noted in the above comment. This issue may affect the conclusion in parts of Table 4-2. Conforming changes may also be necessary in Section 5.19; and elsewhere. (0841-9 [Corrino, G])

Comment: Not safe & you can't make it safe no matter how many planes your fly into your cement casks; remember 9/11. (0862-2 [Thompson, Tammy])

Comment: Although I think that, as a society, we place too much emphasis on terrorism in the "post-9-11 world", it is nevertheless true that spent fuel pools are more attractive to terrorists than hardened on-site dry-cask storage; that simply adds to the advantage of changing our current system that is inherently less risky. (0864-11 [Gellert, Sally Jane])

Comment: The potential for a terrorist attack against the wet storage pools, dry storage and/or transportation between the reactor and such facilities is another example of a set of issues not appropriate for generic analysis. Terrorism is a potential issue for such shipments, no matter the probability of an attack. Low-probability, high-consequence attacks could happen and the characteristics of an attack will depend on the physical constraints of the facility, the geography of the transportation routes and such variables as the training and expertise of the local first responder community to address any radiological issue that arises. A radiological emergency could range from the inconsequential to a significant radiological release and first responders will need training, expertise and equipment to address such contingencies. The consequences of an attack are not similar to a run-of-the-mill accident and would vary depending on wind patterns, the presence of fire, the size/location of the breach to the cask and many other variables. Pre-existing methodologies and computer programs exist for analysis of these variables but they require site specific knowledge and inputs on the unique characteristics of the local conditions to offer useful data when the analyses are run (Ballard 1997, Halstead and Ballard 1997a). (0867-3-16 [Griffin, William])

Comment: The draft GEIS significantly under-estimates the probability of an attack-induced pool fire. That probability cannot be determined quantitatively. In light of human history, observation of the contemporary world, and consideration of possible societal trends, a prudent decision maker would conclude that a successful attack on a reactor or spent-fuel-storage facility in the United States over the coming decades is as likely to occur as are major national

challenges that are planned for, such as severe natural disasters or engagement in wars. Thompson Declaration, pars. VI-10, X-35. (0897-6-17 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Dr. Thompson also testified that the cumulative frequency of successful attacks on ISFSIs could be substantial and that the consequences of a successful attack could be severe. Thompson Declaration, Section XI. (0897-7-3 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The Draft GEIS assumes that the impact of terrorism would be small. However, according to the National Institute of Health, an attack on a nuclear reactor could result in a "massive release of radioactive material". In the aftermath of 11 September, David Kyd, spokesman for the International Atomic Energy Agency, confirmed this view, stating: "[Reactors] are built to withstand impacts, but not that of a wide bodied passenger jet full of fuel. ...These are vulnerable targets, and the consequences of a direct hit could be catastrophic." (0908-4 [Mikkelsen, Sara])

Comment: The draft GEIS assumes that spent fuel will be stored initially in pools and subsequently in dry casks. The potential for a pool fire has been mentioned above. There is also a potential for a "cask fire". Such an event could occur if a malevolent actor gains access to a dry cask containing spent fuel and attacks the cask in a manner that produces a self-propagating reaction between air and zircaloy fuel cladding. (0916-1-1 [Curran, Diane] [Thompson, Gordon R.])

Comment: (VI-10) The documents listed in paragraphs VI-7 and VI-8, the numerous citations within those documents, and the tables and figures identified in paragraph VI-9, provide a thoroughly documented basis for the following conclusions: 1. A reactor, spent-fuel-storage facility, or other nuclear facility in the United States could be attacked by a State or by a non-State actor. 2. A non-State actor could acquire the capability to execute an attack that releases to the environment a large amount of radioactive material from a reactor core or from stored spent fuel. 3. Storage of spent fuel at high density in a pool adjacent to an operating reactor is advantageous to an attacker, because this arrangement would help the attacker to obtain a large, radioactive release from the reactor and the pool. 4. The amount of radioactive material that would be released by an attack could exceed the amount that would be released by an accident. 5. NRC requires licensees to implement only a "light" defense of a nuclear facility, namely a defense that is designed to resist attacks within the lower end of the spectrum of severity of potential attacks. 6. NRC does not require any defense against attack from the air, although a non-State actor could execute such an attack. 7. Licensees routinely lobby NRC to reduce the scale of threat against which licensees are required to mount a defense. 8. Measures deployed by licensees to mitigate the effects of potential accidents would be ineffective in many scenarios of potential attack. 9. The probability of a successful attack cannot be estimated by statistical methods or by analytic arts such as probabilistic risk assessment. 10. In light of human history, observation of the contemporary world, and consideration of possible societal trends, a prudent decision maker would conclude that a successful attack on a reactor or spent-fuel-storage facility in the United States over the coming decades is as likely to occur as are major national challenges that are planned for, such as severe natural disasters or engagement in wars. 11. Options are available to reduce radiological risk arising from potential attacks. 12. The attack-related risk of storing spent fuel could be dramatically reduced by reequipping spent-fuel pools with low-density, open-frame racks, and by otherwise storing spent fuel in protected dry casks. 13. Requiring licensees to implement options that substantially reduce the attack-related risk at nuclear facilities would enhance protective deterrence as a national strategy, with substantial benefits. (0916-1-13 [Curran, Diane] [Thompson, Gordon R.])

Comment: (X-35) As discussed in paragraph VI-11, above, the draft GEIS asserts that the probability of an attack-induced pool fire is “very low”. In Section VI, however, I present evidence to the contrary. In my judgment, a prudent decision maker would conclude from this evidence that a successful attack on a reactor or spent-fuel-storage facility in the United States over the coming decades is as likely to occur as are major national challenges that are planned for, such as severe natural disasters or engagement in wars. (X-36) Here, I expand slightly upon the discussion in Section VI, while being careful to not disclose information that would assist a potential attacker. First, consider a potential situation in which a malevolent actor creates a cascading sequence of incidents that includes a radioactive release from a reactor. Given such a situation, the radiation field created by the reactor release, and other influences, could preclude mitigating actions needed to keep nearby pools in a safe state. (X-37) In paragraphs VIII-19 through VIII-22, above, I draw from analysis by Morris et al to discuss a potential situation in which a large aircraft strikes a reactor. That event could be a malevolent act. I show that the aircraft impact could be part of a cascading sequence of incidents that includes a pool fire. Since the attacks of 11 September 2001 in New York and Washington, acquisition of a large aircraft by a malevolent actor has become more difficult. Also, precise aiming of a large aircraft at low altitude is difficult. However, a malevolent actor has other options. That actor might, for example, employ a comparatively small aircraft equipped with explosive devices. (X-38) Now, consider a situation in which a malevolent actor has direct access to a pool. NUREG-0575 postulated such a situation, as discussed in paragraphs VI-2 through VI-6, above. The malevolent acts postulated in NUREG-0575 are summarized in Table VI-1. In the Mode 4 case, adversaries are assumed to temporarily take command of a spent-fuel pool while deploying an explosive device that could breach the floor of the pool. In that situation, as a slight adjustment of the Mode 4 case, the adversaries could use the explosive device to breach a wall of the pool, causing rapid drainage of water. The adversaries could ensure that some residual water is present. The exposed portion of the fuel would begin to heat up. Without prompt implementation of mitigating actions, a pool fire could follow. The adversaries could, in various ways, hinder or preclude mitigating actions. (0916-2-18 [Curran, Diane] [Thompson, Gordon R.]

Comment: (X-39) NRC proffers two, mutually inconsistent narratives about the threat of an attack on a spent-fuel pool. In one narrative, the pools are safe and secure, and no further action is needed to reduce the risk of a pool fire. In the other narrative, information about the potential for a pool fire must remain secret, because that information could be useful to an adversary.¹²⁰ [footnote 120 text: NRC’s consequence study mentions “security assessments” that were completed in 2006-2008, and further states that the results of these studies are not publicly available because they contain “sensitive information that could be useful to an adversary”. (See: Barto et al, 2013b, page 14.)] Both narratives cannot be true. Apparently, NRC recognizes that the pools are vulnerable to attack, but believes that hiding that vulnerability under a veil of secrecy will eliminate the potential for attack. That belief is imprudent. Non-State adversaries of the United States have repeatedly demonstrated a level of technical knowledge such that they could readily understand the mechanisms underlying a pool fire, without recourse to NRC’s secret studies. Thus, NRC’s secrecy does not provide protection. Instead, it denies US citizens a full accounting of the risk of a pool fire. (0916-2-19 [Curran, Diane] [Thompson, Gordon R.]

Comment: (X-3) In paragraph VI-2, above, I note that NRC explicitly considered the impacts of malevolent acts in its 1979 GEIS on Handling and Storage of Spent Light Water Power Reactor Fuel, which was designated NUREG-0575.⁸⁴ [footnote 84 text: NRC, 1979.] Potential malevolent acts were described in Appendix J of that document. NUREG-0575 is not cited in Sections 4.18 and 4.19 and Appendix F of the draft GEIS. That omission is significant because the malevolent

acts postulated in Appendix J of NUREG-0575 could, with slight adjustment, readily initiate a pool fire. I discuss that matter below. (0916-2-4 [Curran, Diane] [Thompson, Gordon R.]

Comment: (XI-9) The first step in assessing potential consequences of an attack-induced cask fire is to determine the inventory of radioactive material that is in the cask and available for release. Here, I focus on the radio-isotope Cs-137. I consider, as an illustrative example, a cask holding 32 PWR fuel assemblies. With reasonable assumptions, one can readily calculate that the cask contains 67 PBq (i.e., 1.8 MCi) of Cs-137.¹⁴¹ [footnote 141 text: Assumptions in the calculation are: (i) there are 32 PWR spent fuel assemblies in the cask; (ii) each fuel assembly has a mass of 0.45 Mg HM; (iii) the fuel has a burnup of 50 GWt-days per Mg HM; (iv) the fuel is aged 10 years after discharge from a reactor; and (v) 1 GWt-day of fission energy yields 1.17×10^{14} Bq of Cs-137.] (XI-10) A successful attack on an ISFSI, in which attackers expended an effort roughly the same as the effort needed to successfully attack a spent-fuel pool and cause a pool fire, could cause a cask fire in one or perhaps two casks. For illustration, let us assume that two casks would experience a fire and the fractional release of Cs-137 to the atmosphere would be 50%. In that case, the total atmospheric release from two typical casks holding 32 PWR fuel assemblies per cask would contain 67 PBq of Cs-137. That would be a substantial release, with a magnitude between the Fukushima release (36 PBq) and the Chernobyl release (85 PBq), as shown in Table V-1. (XI-11) Section X, above, discusses the consequences of atmospheric releases of various amounts of Cs-137. For example, as discussed in paragraph X-42, release of 330 PBq of Cs-137 could lead to severe consequences including long-term displacement of 4.1 million people. Also, as discussed in paragraphs X-46 through X-48, release of 100 PBq of Cs-137 could create economic damage of about \$1 trillion in the “base” case and \$8 trillion in the “high” case. In addition, there would be severe consequences of a social and political nature. (XI-12) Thus, it is clear that a release of 67 PBq of Cs-137 during a cask-fire incident could lead to severe consequences. Yet, a pool fire could lead to a much larger release, with correspondingly greater consequences. For example, as noted in paragraph X-42, each of the two pools at the Peach Bottom site now contains about 2,180 PBq of Cs-137. The fractional release of Cs-137 during a pool fire could be substantial, potentially exceeding 50%. At Peach Bottom, where two pools are in close proximity, an attack on one pool could ultimately lead to fires in both pools. Thus, a pool-fire release exceeding 2,000 PBq of Cs-137 is entirely credible. (0916-3-11 [Curran, Diane] [Thompson, Gordon R.]

Comment: (XI-13) The effort needed to successfully attack an ISFSI and produce an atmospheric release of 67 PBq of Cs-137 could be roughly the same as the effort needed to successfully attack a spent-fuel pool and produce a pool fire. However, the pool-fire release could be much larger than 67 PBq of Cs-137. As discussed above, at Peach Bottom a pool-fire release could exceed 2,000 PBq of Cs-137. Informed attackers would be aware of this discrepancy in potential outcomes. Accordingly, they would tend to target a pool rather than an ISFSI, other factors being equal. If the ISFSI were provided with enhanced protection, the comparative attractiveness of the ISFSI as a target would be even lower. Section XII, below, discusses some options for providing ISFSIs with enhanced protection. (0916-3-12 [Curran, Diane] [Thompson, Gordon R.]

Comment: (XI-14) At present, pools and ISFSIs coexist in the United States. Thus, given the comparative attractiveness of pools and ISFSIs as targets, a successful attack on a pool is currently more likely than a successful attack on an ISFSI. However, the draft GEIS contemplates a future in which there would be ISFSIs and no pools. That situation could continue into the indefinite future. Diminution of radioactive decay heat in spent fuel over time would be irrelevant to the creation of a cask fire. The risk environment could become more adverse over time. For example, security measures at ISFSIs could degrade over time. Also, an

increased propensity for violent conflict could find expression through attacks on ISFSIs. Thus, the frequency of successful attacks on ISFSIs could be much greater in the future than it is today. (XI-15) The findings set forth in Section XI, up to this point, support three conclusions about the environmental impact of attacks on ISFSIs. Here, I use the creation of one or more cask fires as an indicator of the success of an attack on an ISFSI. (XI-16) The first conclusion is as follows. As discussed in paragraph VI-11, above, the draft GEIS asserts that the environmental impact of attacks on ISFSIs is SMALL. However, the cumulative frequency of successful attacks on ISFSIs could be substantial. Also, the consequences of a successful attack could be severe. Therefore, the environmental impact of attacks on ISFSIs is not SMALL. Instead, it is LARGE. Thus, the draft GEIS substantially under-estimates the environmental impact of attacks on ISFSIs. Also, the draft GEIS ignores the possibility that the risk environment will become more adverse in the future. In addition, the draft GEIS uses a flawed definition of risk – the arithmetic definition. Moreover, application of the arithmetic definition is additionally flawed in this instance because the indicators that are multiplied together are nebulous. (XI-17) The second conclusion is as follows. While pools and ISFSIs coexist, as is true today, the cumulative frequency of successful attacks on pools is likely to exceed the cumulative frequency of successful attacks on ISFSIs. However, the draft GEIS contemplates a future in which there would be ISFSIs and no pools. In that case, the cumulative frequency of successful attacks on ISFSIs could be comparable to the currently-applicable cumulative frequency of successful attacks on pools, if there were no change in the risk environment. Whether or not pools coexist with ISFSIs in the future, the risk environment could become more adverse, leading to an increase in the cumulative frequency of successful attacks on ISFSIs. (0916-3-13 [Curran, Diane] [Thompson, Gordon R.]

Comment: The draft GEIS significantly under-estimates the probability of an attack-induced pool fire. That probability cannot be determined quantitatively. My qualitative assessment is provided in Conclusion #3, above. (0916-3-21 [Curran, Diane] [Thompson, Gordon R.]

Comment: (X-61) The draft GEIS further asserts that the environmental impact of attack-induced pool fires is SMALL.¹³⁸ [footnote 138 text: NRC, 2013b, Table 4-2 (page 4-91).] However, from the discussions in Section VI and paragraphs X-35 through X-39, above, it is clear that the cumulative frequency of attack-induced pool fires could be substantial. Also, NRC's consequence study shows that the consequences of a pool fire could be severe, with outcomes such as the long-term displacement of 4.1 million people. IRSN's analysis shows that outcomes could include economic damage measured in trillions of dollars. Therefore, the environmental impact of attack-induced pool fires is not SMALL. Instead, it is LARGE. Thus, the draft GEIS substantially under-estimates the environmental impact of attack-induced pool fires. Also, the draft GEIS ignores the possibility that the risk environment will become more adverse in the future. In addition, the draft GEIS uses a flawed definition of risk – the arithmetic definition. Moreover, application of the arithmetic definition is additionally flawed in this instance because the indicators that are multiplied together are nebulous. (0916-3-6 [Curran, Diane] [Thompson, Gordon R.]

Comment: (XI-1) The draft GEIS assumes that spent fuel will be stored initially in pools and subsequently in dry casks. A group of dry casks will constitute an ISFSI. During cask storage there is a potential for a "cask fire". That event could occur if a malevolent actor gains access to a dry cask containing spent fuel and attacks the cask in a manner that produces a self-propagating reaction between air and zircaloy fuel cladding, leading to a substantial atmospheric release of radio-isotopes including Cs-137. An accident could conceivably cause a cask fire at a storage facility, but I do not consider that possibility here. The draft GEIS does not consider the occurrence of a cask fire caused by either accident or attack. (0916-3-7 [Curran, Diane] [Thompson, Gordon R.]

Comment: (XI-2) In the Thompson scoping declaration, I outlined the potential for an attack-induced cask fire.¹³⁹ [footnote 139 text: Thompson, 2013b, paragraphs VII-15 through VII-16 and VIII-14 through VIII-18.] I first discussed a potential precursor to a cask fire – a reasonably foreseeable attack that would penetrate a cask, damage fuel inside the cask, and cause a release of radioactive material to the atmosphere. The feasibility of such an attack has been demonstrated in tests whose findings have been openly published. In my judgment, an attacker could, with a few additional steps, readily initiate a cask fire. NRC has not conceded that an attacker could take these additional steps and initiate a cask fire. (XI-3) The difference between my position and that of NRC could be resolved by commissioning an independent “Red Team” of persons who have relevant experience in practice and research. That team could conduct tests at a national laboratory or military base, to determine how readily a cask fire could be initiated. The tests could involve the use of tracer materials, thereby contributing to estimation of the radioactive release that could result from a cask fire. The general findings of the tests should be published, but some details of the tests may not be appropriate for publication. Until such tests are done, NRC will not be able to complete an adequate GEIS on the environmental impacts of storing spent fuel. (0916-3-8 [Curran, Diane] [Thompson, Gordon R.]

Comment: (XI-5) The effort needed to successfully attack an ISFSI and produce a cask fire could be roughly the same as the effort needed to successfully attack a spent-fuel pool and produce a pool fire. Let us examine the implications of that finding during a future period when pools and ISFSIs coexist. As discussed in paragraph VI-10 and elsewhere in this declaration, there is persuasive evidence that an attack-induced pool fire is as likely to occur as are major national challenges that are planned for, such as severe natural disasters or engagement in wars. An identical statement could be made about a cask fire, if two provisos were satisfied. The first proviso is that attackers would be able to achieve roughly the same outcomes by attacking a pool or an ISFSI. If that proviso were not satisfied, and the attack on the ISFSI would achieve a lower outcome, the attackers would have a reduced incentive to attack the ISFSI. The second proviso is that the casks sit on concrete pads in the open air without additional protection, which is current practice. If that proviso were not satisfied, and additional protection was provided, the attackers would have to expend greater effort to achieve the same outcome, which would reduce their incentive to attack. (XI-6) These provisos show how probability and impacts are interrelated. If the expected outcome of an attack on an ISFSI would be smaller than the outcome of an attack on a pool, other factors being equal, then a malevolent actor would be less likely to attack the ISFSI. The probability of the attack would decrease even further if the casks in the ISFSI were provided with additional protection against attack. Thus, either decreasing the expected outcome of an attack, or increasing the effort required to achieve a given outcome, would decrease the probability of attack. In the context of national security, that effect is encompassed within the concept of protective deterrence. Implementation of that concept could benefit the nation. Accordingly, the Thompson scoping declaration made the following recommendation:¹⁴⁰ [footnote 140 text: Thompson, 2013b, Section IX and Section X.] “Recommendation #22: In assessing the overall impacts of storing SNF or HLW, the proposed EIS [i.e., the draft GEIS] should consider the implications of alternative storage options for a national strategy of protective deterrence.” (0916-3-9 [Curran, Diane] [Thompson, Gordon R.]

Comment: NRC has not analyzed the security risks of such nuclear weapons usable substances as Pu-239 becoming ever more available, over time, in on-site or away-from-reactor dry cask storage - another showstopper shortcoming of this DGEIS, NRC's woefully inadequate treatment of nuclear weapons (as well as dirty bomb) proliferation risks. (0919-2-7 [Kamps, Kevin])

Comment: At lines 12-14 on Page 2-16, NRC states: "Following the terrorist attacks on September 11, 2001, the NRC issued Orders to ISFSI licensees to require certain compensatory measures. For example, on May 23, 2002, the NRC issued an Order to GEH Morris wet storage ISFSI (NRC 2002b)." But in August or September 2002, while traveling through Morris, IL, I saw with my own eyes that the GE Morris ISFSI was "wide open" to a potential attack. Although anti-car bomb concrete "Jersey" barriers had indeed been installed, they had been parted open, wide enough to allow a vehicle to drive through. And although a law enforcement squad car was parked there, its door was wide open, revealing that the car was in fact unoccupied. I witnessed this obvious security breach while just happening to pass by, which does not instill confidence in the security status of the GE Morris ISFSI. (0919-3-15 [Kamps, Kevin])

Comment: At Page 2-26, NRC admits, re: "Activities at At-Reactor ISFSIs," that there is but "limited physical and continuous electronic surveillance." Thus, ISFSI security leaves a lot to be desired! This is certainly the case at the Big Rock Point ISFSI in northwestern MI, the Palisades ISFSIs in southwestern MI, and many other sites! But security is not the only risk being neglected. So is safety. Even such basic safeguards as radiation monitors, temperature monitors, and pressure monitors are not required on ISFSIs, remarkably. At a site like Big Rock Point, MI, this is all the more alarming. NRC has permitted once every two week walk by inspections. This means a problem could be underway for two weeks, and Entergy Nuclear could well not even know about it! (0919-3-19 [Kamps, Kevin])

Comment: At line 18, NRC states "Groundwater wells could be installed for potable water use or aboveground storage tanks could be erected for potable water and water for fires and the batch plant." Re: fires at an ISFSI, would fire fighting water help or hurt, in terms of a zirconium fire, once initiated, as in a dry cask, a risk that Dr. Gordon Thompson, expert witness on behalf of dozens of environmental groups, has identified in this proceeding. (0919-4-7 [Kamps, Kevin])

Comment: At Page 3-5, line 30 and following, NRC states "At GEH Morris, an away-from-reactor spent fuel pool storage facility; fewer than 20 full-time employees monitor and maintain the spent fuel at the site (NRC 2004)." Fewer than 20 people, manage 772 tons of irradiated nuclear fuel at GE Morris? What about the security and safety risks of 772 tons of irradiated fuel, stored in an age-degraded facility upwind of Chicago? What if a 9/11-scale attack were launched at GE Morris, involving 19 attackers as took part in the 9/11 attacks? How many of those 20 GE Morris are actually on shift at any given time? How many of those 20 are security guards? As I described above, driving past GE Morris in September 2002, I found GE Morris's truck bomb barrier wide open, and its security squad car not only open, but unmanned. The sight did not instill confidence. (0919-5-9 [Kamps, Kevin])

Comment: On Page 4-31, NRC states "Normal operation of an ISFSI does not require water for cooling and the facility would produce minimal gaseous or liquid effluents."--But, if the ISFSI is attacked, as Dr. Gordon Thompson has commented, or involved in an accident, or simply leaks over time, then disastrous levels of hazardous radioactive gases and liquids could escape out into the environment. (0919-7-19 [Kamps, Kevin])

Comment: Protect fuel pools: Irradiated fuel must be kept in pools for several years before it can be stored in a dry facility. The pools must be protected to withstand an attack by air, land, or water from a force at least equal in size and coordination to the 9/11 attacks. The security improvements must be approved by a panel of experts independent of the nuclear industry and the Nuclear Regulatory Commission. (0927-8 [Kamps, Kevin])

Comment: Perhaps the largest danger presented by the establishment of some 69 NWO sites in 34 states (Page 2-14 line 10) is that these become potential terrorist or wartime targets. An attack with a conventional missile will not just take out an area much larger than the NWO itself. The dry cask storage systems, and certainly the fuel pools, are NOT hardened against such attacks, and it is doubtful that there is any ultimate hardening approach short of a deep geologic repository. The fact that the NWO installations DIFFER substantially from a deep geologic repository in this regard must also mean that there must be some serious risk that is now included. YOU NEED TO DESCRIBE THIS RISK AND DIFFERENTIATE THIS OPTION WITH THE PERMANENT GEOLOGIC REPOSITORY OPTION. (0930-1-13 [Lutz, Ray])

Comment: We disagree that you can conclude that the IMPACTS of Accidents or Sabotage or Terrorism are all SMALL. I know you want this to be the case, but it is not, and if you continue to assert this, I don't know how you can sleep at night. The reason the deep geologic repositories are proposed is to avoid these dangers. THIS MUST BE SPELLED OUT. (0930-1-16 [Lutz, Ray])

Comment: Page 2-16, Lines 17-18. You say that the NRC issued orders to ISFSI licensees etc. based on 6 9/11 attacks, and that the details are withheld from the public. But can you reveal how these orders were reviewed by other parties to ensure that they are adequate? If there was no review, this does not help us be confident that you are doing your job, given the fact that rarely do you push safety over profits. WHO REVIEWED THIS? (0930-2-13 [Lutz, Ray])

Comment: Page 4-84 "The environmental impact for a successful terrorist attack, if one occurs, could be significant and destabilizing." We agree with this statement, it is probably one of the few things you have said that were admitting the truth in this document. However, then you go on to say that because the probability is so low, we don't have to worry about a thing. If we used this method for dealing with risk that you use, then we would not have any defense department at all. They do not determine whether to create a defense only if the probability says that it might happen using PRA, and you must not use it to allow permanent ISFSIs. (0930-3-10 [Lutz, Ray])

Comment: Page 4-85, Line 15-16, "The NRC has determined that the probability of a successful terrorist attack on a spent fuel pool, although numerically indeterminable, is very low." That's probably what they said about the attack on the World Trade Center by 19 hijackers. Very low probability. And even lower probability that the towers would completely fall to the ground. But it happened anyway. So we object to the notion that you know that the probability is so low that we can disregard this risk. First you say you have no clue as to the probability, and yet you say it is low and therefore inconsequential. THIS IS THE MOST SIGNIFICANT THREAT POSED BY SITING 69 NWOs AROUND THE COUNTRY, resulting in 69 targets for conventional missiles that will result in a massive radioactive release, just like a "dirty bomb". I DON'T THINK THE PENTAGON WILL LIKE THIS IDEA, or at least I hope they still have some people there who still realize real risk when they see it. (0930-3-11 [Lutz, Ray])

Comment: Page 4-85 Lines 24-30. Changing procedures and adding training, improving security through access authorization, etc. are of no consequence when considering the possibility of a missile launched from North Korea, or a shoulder-launched missile directed at a fuel pool from well outside the secure perimeter of the power plant.. It is very distressing to learn how easily the NRC disregards these serious national security concerns. (0930-3-12 [Lutz, Ray])

Comment: Page 4-88 Lines 19-23. Adding new rules will not defend against serious wartime attacks. Our country was attacked in WWII and it can happen again. We do not want 69 NWOs around that will be targets, esp. if these are in densely populated areas, which most are. (0930-3-13 [Lutz, Ray])

Comment: Page 4-88 Lines 24-26, another ridiculous statement: "The NRC has determined that the measures described above, coupled with the robust nature of dry cask storage systems, make the probability of a successful terrorist attack, although numerically indeterminable, very low." Really? How do you figure that out. First, we do NOT know the likelihood of a war or terrorist attack over a 100 year period. So please, stop it with the jokes, will you? This only makes the NRC look pretty naive, to be sure. The trouble with your calculations is that a terrorist attack in 100 years is probably a certainty. A world war, probably also will happen. If it is a conventional war, then these NWOs will be targets. We can't let that happen. Period. (0930-3-14 [Lutz, Ray])

Comment: The document sidesteps the key issue... These NWOs are not as safe as a deep geologic repository due to the obvious risk of terrorist or wartime attack. THIS ISSUE CANNOT BE LEFT OUT. And if you are honest, you will decide that there is no way we can continue to license new plants and extend the licenses of old plants, particularly those with Mark-I containments, which have fuel pools above grade and much easier to attack and cause a problem than one that is built at ground level. (0930-3-20 [Lutz, Ray])

Comment: Along with this recognition came one with the Pentagon study saying PNPS was in the top ten highest at risk for terrorist attack. Its vulnerability is UN questioned first, because of its location in the flight path of one of the country's busiest airports-----the site of the take off of the 2001 terrorist air attack on NYC Trade Towers. The roof of the plant is where the spent fuel pool is located, filled to its maximum and outside the containment walls. It is especially vulnerable to attack because the protection is merely a thin tin rook likened to a tin roof as found at a Home Depot. The fact that it is within 50 miles of large, economically important cities with millions and millions of residents, adds to its consideration as a target. (0933-7 [Anonymous, Janet])

Comment: The Draft GEIS assumes that the impact of terrorism would be small. However, according to the National Institute of Health, an attack on a nuclear reactor could result in a "massive release of radioactive material". In the aftermath of 11 September, David Kyd, spokesman for the International Atomic Energy Agency, confirmed this view, stating: "[Reactors] are built to withstand impacts, but not that of a wide bodied passenger jet full of fuel. . . . These are vulnerable targets, and the consequences of a direct hit could be catastrophic." (0951-4 [Commenters, Multiple])

Comment: I think the on site storage is a very significant terrorist target with major impacts if attacked. On site storage needs to be fully examined and a much safer storage facility constructed that will not endanger our communities near nuclear plants. (0982-1 [Sieling, Jerry and Jean])

Comment: In addition to all conceivable and not-yet-conceived-of accidents, intentional sabotage must also be taken into account. Intentional damage intended to spread radiation is a potential terrorist agenda and may as likely or more likely than accident. Dispersed storage presents a multiplicity of potential targets. (1007-2 [Diamond, Jim])

Comment: All waste should be managed with an eye to security against both accident and intention. (1007-5 [Diamond, Jim])

37. Comments Concerning the Feasibility of Geologic Disposal

Comment: In my opinion, disposal of nuclear/radioactive waste cannot be made safely unless it is buried in lead-lined containers, deep underground in an area far from ANY location where it could possibly effect people or wildlife, and not on national or state park or wilderness lands[.] (0006-1 [Van Wicklen, Betty J.])

Comment: This should have been anticipated and solved prior to the development of any nuclear reactors - the NRC knew the half-life of the fuel rods, and their dimensions. They also knew the projected life of the rods and the projected life of the reactors. Who is asleep at the switch? (0006-3 [Van Wicklen, Betty J.])

Comment: Extension of continued storage in these facilities should be minimized, not extended further, as proposed. Permanent waste storage will continue to be put off if there is an ever lengthening of the allowable plant storage period. Safe waste disposal must be available and allotted before a plant is licensed to operate, not after some period of operation. (0026-1 [Campbell, Mary])

Comment: My comment: For the present, leave the waste where it is in dry cask storage. Do not transport over roads and highways, ships or trains. Be still with it! Next, gather leading scientists, ngo representatives, statesmen/women to discuss over a long period of time if there is and what would be a 'permanent' storage solution. (0028-1 [Craig, Anne])

Comment: It is high time to rethink nuclear waste storage. Keep the waste on site in dry cask storage. Organize a long term and serious study to see if there is a 'long term' storage solution and stop making the waste! (0029-1 [Craig, Tom])

Comment: in its analysis, the Commission projects that, based on international experience, 25 to 30 years is a reasonable estimate using a consent-based process as recommended by the President's Blue Ribbon Commission. I believe the NRC fails -- excuse me --25 to 30 years is a reasonable estimate to site, characterize, construct, license, and open a geologic repository using a consent-based process, as recommended by that Blue Ribbon Commission. I believe the NRC fails to consider key factors in its analysis, factors that are peculiar to the United States. These factors may render NRC's projected timeframe overly optimistic. (0030-1-2 [Kotra, Janet])

Comment: [W]hile I agree that today there exists a much stronger technical basis for confidence in geologic disposal, the current rulemaking fails to take into account whether there exists sufficient social and political bases for continued confidence that such disposal will be realized in the United States and what these inadequacies portend or imply for the rulemaking. (0030-1-3 [Kotra, Janet])

Comment: [I]f a community in the United States is to step forward and to consent to host a repository, or even, for that matter, a centralized interim storage facility, such a community must trust in the integrity of political and regulatory systems with which it is to consent. Members of such a community are effectively entering into a contract on behalf of the safety of their citizens, and especially, in the case of a repository, the safety of their future generations. The Nuclear Waste Policy Act that led to selecting Yucca Mountain is such a statutory framework enacted by

Congress which set forth a process for developing not one but two repositories. This process was to be implemented by the executive branch and licensed and overseen by an independent Nuclear Regulatory Commission. Any prospective host community today will have to confront the sober reality that the U.S. Government failed to implement its own nuclear waste law. Absent an executive branch willing to carry out a nuclear waste law enacted by Congress, and overseen by a safety regulator perceived as truly independent by that host community, how could any community have confidence going forward that this or any other nuclear waste law will in fact be honored or implemented? And I have to say that in reading this proposed rule no attempt has been made in this proposal to address the impact of this breakdown in the U.S. public's ability to rely on its government and on NRC itself to comply with the nation's own nuclear waste laws, especially in light of the recent ruling of the U.S. Court of Appeals, District of Columbia Circuit. (0030-1-5 [Kotra, Janet])

Comment: [A]fter all that has happened since 1999, should NRC still have confidence in waste disposal? Since 1984, the Commission has expressed, and later affirmed, its confidence that deep geologic disposal is feasible. Nothing has emerged to lessen NRC's confidence in the technical feasibility of repository disposal. That much is not in dispute. As this rulemaking notes, much more scientific and engineering experience and evidence has emerged to reinforce the Commission's initial findings. And I have to add that a lot of the confidence has been contributed to, quite ably, by NRC scientists and engineers and their colleagues at the Center for Nuclear Waste Regulatory Analysis in San Antonio. Also among the reasons for greater confidence are the findings and recommendations of the Blue Ribbon Commission for America's Nuclear Future, which endorsed disposal in deep geologic repositories when selected using a consent-based process. (0030-1-6 [Kotra, Janet])

Comment: I think it's worth noting that more than 35 years ago the 2nd Circuit Court of Appeals in *NRDC v. NRC* confirmed that halting reactor licensing until definitive findings on repository safety are reached, it is simply not required by the Atomic Energy Act. (0030-16-4 [Bonanno, Jerry])

Comment: The history of how we arrived at this point is well summarized in the documents that we're here to comment on and going back to the passage of the Nuclear Waste Policy Act, which initially mandated that the Department of Energy site or come up with recommendations for siting two repositories in this country for the permanent disposal of nuclear waste. And over a few years it became clear that that was too hot of a political potato for the nation to manage and the law was revised to require the siting of one repository and cap the amount of waste that could be stored in that repository until a second one could be sited. And then a few years later when it became more clear that that was going to be such a heavy political lift, you know, the requirement for DOE recommending a second repository site was stripped entirely. And so we were left with one proposed site, Yucca Mountain, capped at a capacity of 70,000 metric tons of nuclear waste. And that's been the process where we've been stuck until it became clear that the Department of Energy needed to withdraw its application for a license because the facility was too controversial, would not have the political support necessary, and there were massive technical problems with the site. So we arrive at 2010 and the Federal court case that's filed that ultimately went out and forced the NRC to withdraw the Waste Confidence rule as it was revised after the demise of Yucca Mountain. We're, you know, 60 years into the nuclear experiment and we've not been able to site a single repository in this country to store nuclear waste. (0030-17-5 [Judson, Tim])

Comment: And with respect to, you know, the statutory limit on the capacity of even the first repository at this point of 70,000 tons, according to the generic environmental impact statement

that amount of waste is already being stored at reactors across the country. So we've already filled the first repository before it's even been built. And so now going forward with the licenses the NRC has already issued, based on the estimate in the GEIS that we generate 2,000 metric tons of spent fuel every year in this country going forward, we've essentially already filled the second repository if its to be built to the same capacity. So all the licenses that would be issued going forward would be essentially for what we must presume at this point would be a third repository, and the Nuclear Waste Policy Act has never even contemplated building a third repository, even though we know if we generate that waste we're going to need to do something with it. (0030-17-6 [Judson, Tim])

Comment: Since 1982 the Government has amassed a nuclear waste fund of \$30 billion for money collected from customers of nuclear electricity. It is time to use that money for its purpose, the review of the Yucca Mountain repository license application, which would certainly address a lot of the concerns raised here today. The country has already spent upwards of \$10 billion in Yucca Mountain and the American people deserve to see the results of the independent objective safety review performed by the NRC. As President Obama himself pointed out at the beginning of his first term of office, regulatory decisions should be based on sound science, not politics. We heard a little bit about the physical limitation on the repository. In fact, Yucca Mountain has a statutory ceiling of 70,000 metric tons, but that is not a physical ceiling. In fact, I think there's been some work done showing that it could easily accommodate 140,000 metric tons. (0030-23-10 [Blee, David])

Comment: While long-term storage of used fuel is safe and feasible, it is not an appropriate permanent solution. Ultimately, the United States must dispose of used fuel or its recycling byproducts. Fortunately there is an international scientific consensus that geological disposal of used fuel is feasible and safe. The United States is fortunate to have a variety of sites suitable for underground end placement of used fuel in a manner that will isolate it from the environment while its radioactivity decays away. Countries such as Finland, Sweden, and France are making good progress towards geological disposal. (0030-23-8 [Blee, David])

Comment: I've listened to everything today and I think that "confidence" is a word that's been bandied around a lot, but I for one have really no confidence in the ability of our Government to maintain radioactive waste in a safe way. And all the experience that I've had in my long life has shown me that this is actually true. Not only have we not been able to contain nuclear waste from bomb testing, we've not been able to contain the waste from reactors. (0030-24-1 [Nelson, Dennis])

Comment: I want to start by talking about money. I think that what we are all looking for is a cheap solution to a very complicated problem. I would like to recommend, for example, that we wrap our nuclear waste in gold or iridium, iridium because a metallurgist suggested it would be good, and gold because I think that obviously would be good because of its secure properties, it's strong, it's -- instead, we are using lead and steel and cement. (0030-4-1 [Hoffman, Ace])

Comment: And maybe they don't understand what is going on here, which would suggest that you haven't done your job of reaching out to the public, so that they understand what's going on here in this meeting today, because right now that fuel is 100 times or 1,000 times more dangerous than it is going to be when you finally decide to put it someplace safe. And I think right now is the time to make sure that it's someplace safe, and there is no place that is going to take it. (0030-4-7 [Hoffman, Ace])

Comment: The fact that we have been making it for 60 years or more, and we have no place to put it and no prospect, and that you are talking about going 100 years into the future before we actually have some place to put this material, and whether that is even going to be, those are all geologic bets, whether whatever we decide, whatever deep ground deposit we put these materials into, in terms of geologic time, thousands of years, tens of thousands of years, there is no real certainty that you are not going to have some geologic shift, and the material that we thought was safely removed from the environment will then become exposed in some unexpected manner. (0030-5-5 [Safer, Don])

Comment: We do think that the international consensus on geologic disposal will someday reach our government and it will build a repository. (0030-6-10 [McCullum, Rod])

Comment: Thirdly, you cannot say that nuclear waste can be safely stored. Plutonium will be dangerous for 240,000 years. Who will be around during this time range to guarantee its safety? What monstrous situation are we leaving for future generations? I have a grandson. I tell him that when he makes a mess he should clean it up. Are we telling future generations that they must clean up our messes? What is the cost? How many lives? (0035-5 [Fulton, Doris])

Comment: Take action to protect our communities from nuclear waste! (0039-1 [Littlejohn, Nick])

Comment: Our Federal Government does not know how to keep the doors open and the lights on. We are lacking in confidence in the larger picture as well, about the Federal Government or any agency of the Federal Government, to be able to sustainably and competently manage these issues. (0045-1-5 [English, Becky])

Comment: I want to make one thing perfectly clear. I am not confident that the NRC will be able to site a permanent repository within 25 to 30 years. (0045-11-3 [March, Leslie])

Comment: While long-term storage of used fuel is safe and feasible for extended periods it is not a permanent solution. Ultimately, the United States must dispose of used fuel for its recycling byproducts. Fortunately, there is an international scientific consensus that geological disposal of used fuel is feasible and safe. I visited the Onkalo spent fuel repository, the world's first deep geological repository located in Finland, and have high confidence in the multiple release barriers at minimal impacts to humans and the environment. (0045-15-1 [Sandos, Theann])

Comment: Simply stated, the NRC is correct, in concluded that it is feasible to have a mined geologic repository available within 60 years after the licensed operating life of a nuclear power plant. There are no technical barriers to achieving this result, nor are there any financial barriers given the current and growing balance in the nuclear waste fund. (0045-2-2 [Green, Michael])

Comment: The NRC is correct in concluding that it is feasible to have a mined geological repository available within 60 years after the licensed operating life of a nuclear power plant. There are no technical obstacles to achieving this, nor are there any financial obstacles, given that the Nuclear Waste Fund now has a balance of more than \$26 Billion Dollars. (0045-5-1 [Cannon, Tom])

Comment: There is a strong international scientific consensus that geological disposal is the best solution to permanently isolate spent nuclear fuel from the public and the environment. Studies by the National Academy of Science, and the International Atomic Energy Agency have confirmed this conclusion. In fact, the International Atomic Energy Agency concluded in 2003

that the geological disposal is the generally accepted solution in practically all countries faced with the issue. Sweden and Finland are developing geological disposal facilities and are expecting to begin disposal of their spent fuel by the early 2020s. France is making significant progress. They have selected and characterized the geological region and are now working to identify a specific site. Belgium, China, and the United Kingdom, plan to start geological disposal by 2050 or earlier. (0045-5-2 [Cannon, Tom])

Comment: We have the technology to develop a geological repository for spent nuclear fuel, and we have the money to do so. The only thing blocking the United States from building a geological repository is political decision-making. (0045-5-5 [Cannon, Tom])

Comment: [W]hen I look at internationally what's going on, because all countries that have nuclear power are confronting this issue of storage, transportation, handling, terrorist attacks and ultimately the permanent, safe, long-term disposal of nuclear waste, and what I find deficient in the current EIS is the lack of real sort of summary review documentation identifying this real progress that's going on in other countries. In a few years they'll probably be opening repositories in several European countries. In ten years there will be several different types of repository concepts that are going forward in terms of licensing. That kind of progress really should be reflected in this whole idea of 60 years being a short term, really. In six years we're probably looking at high confidence that there will be these kind of successful, licensed, under-regulatory-review repositories. And I think that theme should be more closely represented in the EIS. (0045-7-1 [Apted, Michael])

Comment: Currently I serve as a technical expert for the regulatory authorities in both Finland and Sweden. Construction license applications for geologic repositories have been issued, they're under current review. I think, Finland, the current schedule is a decision, yes or no, by sometime late in 2014, in Sweden, the schedule now is sometime in 2015. So these decisions on showing that there can be a successful and robustly safe closure of the nuclear fuel cycle are coming soon, not 60 years but in a few years. And I think that perspective, again, should be built in and brought into this EIS. Now in addition to Sweden and Finland, France, Switzerland they're a few years behind. Somewhere in about the next five to ten years they'll also be bringing new and different repository concepts to their regulatory authorities. Again, looking to show and demonstrate a safe closure of the fuel cycle. I think, again, some sort of appreciation of looking outside the borders of the United States. A few weeks ago in Canada, for example, they're looking at regulatory licensing, public commentary review of these deep disposal of intermediate and low level waste at the Bruce site in Canada. This kind of progress really needs to be brought forward into this idea of confidence. (0045-7-2 [Apted, Michael])

Comment: Other nations, Canada, as I mentioned, U.K., Japan, Russia, China, all are also heavily invested in progress and developing new ideas, new concepts for safe, long term -- and by long term I mean out to a million years -- safe, permanent disposal of this highly radioactive material. And so again, this kind of progress, the NRC has bilateral agreements with many of the regulatory agencies around the world. It would be useful if they used those bilateral connections to bring in that kind of information to be reflected in this EIS report. (0045-7-3 [Apted, Michael])

Comment: [M]y view is that really there is high confidence as of today that there will be demonstrated safe, long-term, permanent geologic disposal of spent nuclear fuel, high level waste that's arising from the nuclear industry and nuclear weapons programs. This kind of information really ought to be reflected more in the report as it stands today. (0045-7-4 [Apted, Michael])

Comment: Tonight we're talking about waste confidence. And in my home, if, for instance, we have plastic bottles, and if we had to recycle those, we recycle plastic bottles when we get them. It's fantastic. But this isn't exactly plastic. (0045-8-2 [Bartlett, Bill])

Comment: If the NRC and the Nuclear Power industry could not burry spent nuclear fuel at Yucca Mountain during the last 56 years. How long might it take to find a place to burry it if it is not safe under Yucca Mt. for any period of time according to Sn Harry Reid? (0050-1 [Waterman, Charles])

Comment: For my entire life, the government has been promising the benefits of nuclear technology, but all we really have to show is a legacy of broken and false promises, laying all the problems on our children. When I grew up in Kansas in the 1950s the AEC was planning for nuclear waste disposal in Kansas salt mines. That never happened. Nor has anything since. (0059-15 [Andrews, Richard])

Comment: Since 1998 the US has been delinquent in supplying a location for final disposal of nuclear spent fuel that the federal government promised when nuclear reactors were being built in the late 1960's. There is currently no place being prepared to take the US nuclear spent fuel. When President Obama shut down Yucca Mountain after nearly 30 years of preparing the site to be a final geologic deposit for all of our nuclear waste for the entire country, America became a deadly accident waiting to happen at 104 reactors. But SONGS sits with everyday a potential to destroy as in Fukushima the land from Oceanside to Laguna Beach, shut down forever. The nuclear reactors built in the 1960's were never built to store the waste on site. No state is willing to accept the nuclear waste. The NRC is now wrongly requiring that the waste is safest being stored on site. These old plants were not designed for that. What other plan is possible? (0063-10 [Magda, Marni])

Comment: The United States has searched for a way to dispose of spent fuel for over five decades. At this point, there are no specific nuclear waste storage proposals that would solve this problem in the foreseeable future. Even if a seemingly suitable storage scheme for high-level radioactive waste were conceived, it could take decades to plan and implement. The closing of the Yucca Mountain facility in Nevada in 2010 demonstrated that planned facilities may never open, even after billions have been spent on development. Simply put, the safe disposal of nuclear plant waste is a problem that may never be solved. (0064-3 [Skud, Bruce])

Comment: Putting aside the formidable technical challenges of locating a proper geologic site, governors and legislatures vigorously oppose siting a national waste repository in their states. The reason for their relentless opposition is that their constituents, including the business community, however open to nuclear power they might be, do not want a national nuclear waste repository in their own backyard under any circumstance. (0064-4 [Skud, Bruce])

Comment: Where might that secure location be? The US has yet to find any permanent site for storage of spent fuel rods. (0086-4 [Lewis, Carol])

Comment: The U.S. has searched for a way to dispose of spent fuel for five decades. It has become an intractable problem. The closing of the Yucca Mountain facility demonstrated that planned facilities may never open even after billions of dollars has been spent. Putting aside the formidable challenges of locating a geological site, governors and legislatures vigorously oppose the siting of a national repository in their states. The reason for their opposition is that their constituents, including the business community, are adamant that they do not want a repository in their own backyard under any circumstance. Let's be realistic, the fact that there is

federal jurisdiction over the siting of a national repository means nothing. There's no question a national repository would create new and horrible safety problems. (0112-10-3 [Skud, Bruce])

Comment: The fact that that has been going on for 50-plus years, 60 years and it can't come to fruition gives us no confidence that any type facility could ever be built by our government. And so anything that needs to look at needs to take that into consideration. It might be possible for private enterprises to build such a facility, but they're not going to do it on, you know, without some financial support. Based on past performance that I can't see how anybody would have any confidence at all that such a facility could be built by our government. (0112-17-3 [Stamm, Steve])

Comment: [N]obody is more interested in seeing used nuclear fuel leave the reactor sites that it's currently stored at than I am. The reason for this is the last 15 years of my career I have been working for the Nuclear Energy Institute. I currently work as director of used fuel programs there towards this very goal, towards moving used fuel to safe geological disposal. I continue to work towards it because I know we'll get there. I know because in Sweden and in Finland they're within a decade of safely disposing of their used nuclear fuel in geological repositories already under development. I know France is not far behind. And I can't imagine that our country would ever come in too far behind France in anything. (0112-25-1 [McCullum, Rod])

Comment: I'm going to concentrate on the timeline for geological repository since this is what I study. There are a variety of policy implications on this repository's construction, but it is evident that a timeline, though complicated, is actually achievable. My recent lecture on the history of nuclear waste there at MIT was met with some challenges because of its title. I called it the search for Tartarus, i.e., it could be called the search for hell. Some may recognize that nuclear waste repository may be a very difficult place to site. But I recognized it as a place that is absolutely findable if you have Godly intentions. (0112-26-1 [Brinton, Samuel])

Comment: In 1957 the National Academies of Science established that a geological repository was the preferred system for the permanent storage of nuclear waste. Now, I wasn't around in 1957 nor was I around in 1970 when we tried to site the very first geological repository. I was raised on farms in Kansas and I am proud to say that the very first repository was tried to be sited in my home state there in Lions, Kansas. This did not work out well. There were technical challenges. And I've studied how horribly the government mangled its issues trying to site a repository in Lions, Kansas. And I can see a lot of shaking heads. I recognize that challenge. We didn't do it right. But we can do it right in the future. (0112-26-2 [Brinton, Samuel])

Comment: In 1982 the National Nuclear Waste Policy Act began the site characterizations of a variety of geological formations. And during 1987, the year I was born, a political maneuvering destroyed that process. Geological repositories exist. In 1979 when my mother was evacuated from the school next to Three-Mile Island the Congress also authorized the Waste Isolation Pilot Project. We have to recognize that these geological repositories exist and that they are also being constructed. This is applicable because the permanent solution is feasible. Let students like myself have the time to study these challenges. And with enough political action it will be able to move forward. (0112-26-3 [Brinton, Samuel])

Comment: Long-term storage is available and students like myself are ready to take the technical capabilities of geological repositories as the next challenge. (0112-26-4 [Brinton, Samuel])

Comment: And one of the other things about the repository, it's a nice word for putting this poison that's going to murder gazillions of people, they call it no nukes. We call it the dump if they were going to put all this stuff in the Great Lakes that would have affected the water of 42 billion people, ho-hum. (0112-30-5 [Parks, Sheila])

Comment: I've been involved in this issue really not by choice approximately 30 years now. I was a kid when I started. And there was a plan to site a high-level nuclear waste dump here in the northeast, the Eastern repository. And looking over some of the documents tonight I realized some of the terminology hasn't changed at all. That's interesting. So it's eating up a huge part of my life. There are things I would rather been doing and still today there are things I would rather be doing. (0112-31-1 [Johanson, Birgit])

Comment: I also want to say that I was moved and I appreciated Gregory Jaczko, the former Chairman of the NRC said pretty much what amounts to a death bed conversion although he didn't die, but he saw other people dying. And he came out and said that these plants are inherently unsafe. And I am sure that he would say that much that we know about long-term storage is their solutions are unsafe. And we can't go forward pretending that we have solutions in order to just let the clock run out for these companies. (0112-34-6 [Chichester, Ben])

Comment: [W]e've [Seacoast Anti-Pollution League] been raising these issues of what to do with the waste all that time for four decades now and still no solution. This is really a bizarre situation. It feels like we're watching endless reruns of a bad movie. This past procrastination is finally catching up with the NRC and with the nuclear industry and we really need a serious investigation of these issues. (0112-5-1 [Bogen, Doug])

Comment: The waste storage issue which we are here to discuss tonight is the result of years of gridlock in Washington, DC and the federal government's failure to follow through on its promise to create a national repository for used nuclear fuel. Although we would like to see a resolution to the fuel storage issue, it likely won't be over for quite some time, nor will it affect whether the U.S. Nuclear Regulatory Commission approves license renewal for Indian Point. (0119-3 [Mooney, William])

Comment: I guess better-late-than-never, but what a sad commentary on the responsibility that the NRC feels for its mission. Obviously nuclear waste has been one of the defining problems with nuclear energy technology since its beginning, but in my opinion the attitude that "we'll just deal with that later" seems to have been the approach for decades. (0126-1 [Houston, Ann E.])

Comment: Even IF successfully removed, WHERE WILL THEY PUT THE REACTIVE MATERIALS? THERE IS NO PLACE ON EARTH SAFE AND SECURE (and NO NO NO don't DON'T send them into space!!!) (0133-2 [Sunflower, Susan])

Comment: The truth is that there is no real plan to isolate high level radioactive materials effectively for the amount of time really necessary to protect public health and safety. (0136-10 [Shaw, Gary])

Comment: When NRC says it has a viable waste management plan with public health and safety as the preeminent concern, we must look at that in the light of NRC's record. When NRC talks about "lessons learned" what they are in fact saying is "glad that unexpected bad day didn't happen here." (0136-7 [Shaw, Gary])

Comment: As a physicist and engineer, I know the used nuclear fuel can be safely stored. I know that because the US Federal Government is today storing highly radioactive nuclear fuel material in the US' own Waste Isolation Pilot Project in New Mexico. This project, known as WIPP, has been licensed by the US Government. It is used by the US Department of Energy for the long term underground storage of transuranic actinides thousands of feet underground in a "salt dome" formation. Safe underground geological disposal is being done today, by the US Government. (0138-5 [Cook, Dr. Andrew G.]

Comment: By why do I say the used fuel will be safely stored with confidence? Let's consider a long term geological storage site. Here is what must happen for anything to get into our environment. First water must penetrate thousands of feet into the rock in a location where water has not been present for millions of years. Assuming water can even get there, through the rock, the water has to dissolve the inch thick stainless steel canisters that contain the nuclear fuel, then if the water has to dissolve the zirconium metal cladding around the fuel, and finally that water has to dissolve the fuel itself, which is a hard ceramic, just like this coffee cup I am holding. Water does not dissolve ceramics. However, if all of that occurs the water now may contain a small fraction of the radioactive materials. Let's consider what must happen next. Somehow the water has to get back out of the ceramic, past the zirconium, past the stainless steel canister and now the greatest challenge of all, penetrate the rock and get back thousands of feet, up against gravity to the surface. What happens when water carries something and starts to migrate? Those things in it precipitate out of solution. You can see that natural phenomena here on my handkerchief. I spilled some coffee. You can see that the coffee precipitated out in a ring on my handkerchief, while the water continued outwards. How far did the coffee get - two inches. The same will happen to the fission products. They will precipitate out of solution and form crystals, just as happened at Oklo within feet of the point of origin. They will never make it the thousands of feet UP through solid rock to the surface aquifers. Of course we may want to recover that fuel. Why? Because it represents the OPEC oil equivalent of energy for the US in terms of the energy it still contains. It could be used by our grandchildren and great grandchildren and their children down on the line as one of our great energy resource legacies. (0138-7 [Cook, Dr. Andrew G.]

Comment: Nuclear waste is still a problem without a solution, even after 20 years and billions of dollars spent to locate a viable site. Waste confidence is anything but a solution to inspire confidence since allowing nuclear plants to continue to produce waste with no scientifically proven solution for safely disposing of it exists. (0139-1 [Hodik, Barbara J.]

Comment: It is important that the NRC admit that there is no safe, permanent repository, and that 70,000 tons of accumulated nuclear waste may be permanently stored at reactor sites. (0143-1 [Arauz, Jorge])

Comment: In the US: According to the Government Accountability Office The amount of spent fuel stored on-site at commercial nuclear reactors will increase by 2,000 metric tons per year, doubling to about 140,000 metric tons -- before it can be moved off-site, because storage or disposal facilities may take decades to develop. In examining centralized storage or permanent disposal options, GAO found that new facilities may take from 15 to 40 years before they are ready to begin accepting spent fuel. Once an off-site facility is available, it will take several more decades to ship spent fuel to that facility. (0145-3 [Sorensen, Laura])

Comment: Federal law has only authorized the siting of one nuclear waste repository. As of 2010, nuclear power plants had already generated 70,000 tons of spent fuel, enough to fill that repository. That means a second repository would have to be built to hold all the waste nuclear

reactors are continuing to generate, but there is no plan or Act of Congress on the table for where to do it. (0147-3 [Fallon, Gloria])

Comment: As you are aware, the president appointed a commission to examine nuclear waste management issues. The report suggested finding two or three alternative sites using a consent-based process. It is MEA's [Multicultural Education Alliance's] understanding that legislation is pending in the Senate to begin the process of selecting alternative sites. We believe we have the technology to develop a geologic repository for spent nuclear fuel, and we have the money to do so. The only thing blocking the United States from building a geologic repository is political decision-making. (0150-2 [Rivera, Wendy])

Comment: I do feel that there needs to be progress on locating a Federal Depository to help ease some of the concerns that some of the American citizens may have regarding the long term storage of spent fuel. (0153-3 [Capurso, Thomas])

Comment: I understand that storage of spent nuclear waste is a major environmental problem as well as security problem. I urge you to not look at our country's desert areas as "wastelands" and thus garbage dumps for nuclear waste. The deserts are very fragile ecosystems which need to be cared for, not trashed. (0161-1 [Rose, Melene])

Comment: We need to find a way to stop polluting with this waste. Yucca Mountain isn't the answer, there are fault lines running under and an organic farm nearby. Please do all you can to work on these problems. Thank you for taking comments. (0162-2 [Ramsey, Betty])

Comment: Currently, there are no available offsite locations to store high-level nuclear waste from those facilities or even an ongoing process to identify such a site. (0163-1-6 [Schneiderman, Eric])

Comment: As for disposal of spent fuel, the President's own Blue Ribbon Commission recognized that a geologic repository is still the best method of disposal. Sweden and Finland are both already developing geological disposal facilities, which frankly should be an embarrassment to the country that pioneered commercial use of nuclear energy and built such large undertakings as the Hoover Dam. (0163-11-4 [Gutherman, Brian])

Comment: Someone asked me a while ago, when you post -- and they asked me to ask you, when you put a warning sign on these long-term casks, what language is it going to be in? Because do you think the people that find these casks in 500 years will be speaking English? (0163-13-3 [Jaffee, Ellen])

Comment: There's no viable option for long-term storage. People have talked about that over and over. (0163-21-2 [Elie, Marilyn])

Comment: Not only that. I want to express right now the fact that it's not only wrong to pass this off to somebody else, it's also very anti-Democratic. Nevada didn't want it and who does? Who wants to become the national high-level radiated dump for the entire country? Are there citizens in this country besides those who can't say no, besides those who are poor, besides those who are Native American, besides those who are people of color that would say that? And where is our responsibility, our moral responsibility to take care of our own mess? (0163-21-4 [Elie, Marilyn])

Comment: And the problem is what about long-term storage? What happens to this stuff when however many, 1200 generations -- well, how about even the fourth generation, let alone the

1200, okay. If we choose not to deal with that seriously by putting it off, which is what this GEIS does, it puts the problem off. If we continue to deny, we compound the problem and we become morally sick. And it is a great regret and a matter of great sadness for me that our country is in the midst of doing that. (0163-23-2 [Fullerton, Dan])

Comment: We're here today because the production of nuclear waste and the absence of adequate plans on how to store it safely for 250,000 years threatens the health and the lives of everyone's grandchildren. (0163-28-1 [Cypser, Betty])

Comment: I was born in 1979 and that's the year the NRC started writing the first version of its Waste Confidence Rule, so for my entire lifetime this rule has been used by the NRC to dodge hard questions about the legacy of the dangerous radioactive waste building up at our reactors...I'm now 34 and tens of thousands more tons of nuclear waste have been generated since 1979, but in all this time, we've not come any closer to a solution. In fact, with the cancellation of the Yucca Mountain project, we may be farther away than ever, and we have more radioactive waste problem than ever. I have to tell you, no offense to the people in the room who have been fighting this issue for a long time, but it makes me pretty mad that previous generations decided it was fine to create piles of deadly toxic waste without a plan. (0163-34-2 [Azulay, Jessica])

Comment: And it comes down to what's real and what's imaginary. What's imaginary is gridlock in Washington. Gridlock in Washington is something that we create as humans, as citizens and it means nothing. (0163-35-1 [Shaw, Jeanne])

Comment: You can't go burying this stuff anywhere in the world and expect to get away with it. Just because they're doing it in Finland doesn't mean we can do it here. It doesn't even mean they can do it there. They just are. Hello. It's the world. The earth is not static. The earth moves constantly, and I mean constantly. Everything in the world is going to what we now think of as hell or heaven and that's real. And that's not theological, so what are you going to do with nuclear waste? It's not anything you can do with. (0163-35-5 [Shaw, Jeanne])

Comment: There's a lot -- there's been a lot of focus on the issue of repository availability in these public meetings and there's understandably a lot of frustration regarding the politically motivated delays in siting and constructing a geologic repository in the United States. It's worth noting that the NRC's role in a Federal repository program is distinct from the agency's consideration of repository availability when it licensed commercial nuclear power reactors. Focusing on the NRC's role in the Federal repository program, it's important to understand that the NRC is not responsible for siting, constructing, or operating a geologic repository for used nuclear fuel. Under the current legal framework, that responsibility falls squarely with the Department of Energy. Instead as the D.C. Circuit recently reiterated, the law requires that the NRC review DOE's application, make a decision about whether the proposed repository can be constructed and operated safely. (0163-38-1 [Bonanno, Jerry])

Comment: Setting aside decisions regarding the licensing of specific repositories, the relevant question in this proceeding is what, if anything, is the NRC obligated to conclude with respect to repository safety when licensing commercial power reactors. For the past 35 years, the Commission has characterized the necessary finding as reasonable assurance that methods of safe permanent disposal can be available when necessary. This reasonable assurance finding does not equate to a definitive finding on the safety of a specific repository. In a 1978 decision called NRDC versus NRC, Second Circuit Court of Appeals clarified that halting reactor licensing until definitive findings on repository safety are reached is not required by the Atomic

Energy Act. In that decision the court recognized that Congress enacted a framework that calls for development of a repository and parallel with the development of commercial nuclear power in the United States. It's equally clear that uncertainty caused by the political and social resistance to the development of a repository might justify examination of extremely unlikely scenarios such as in a repository scenario in order to satisfy NEPA. But it's not the NRC's role to resolve such uncertainty or cure such resistance. In fact, the same decision -- in the same decision, the Second Circuit concluded that resolution of such political and social resistance to the development of a geologic repository must come from a legislative branch of government, not the NRC. The primacy of a legislative branch in setting national nuclear energy policy was also stressed by the U.S. Supreme Court in its 1978 decision *Vermont Yankee versus NRDC*. So absent a clear scientific or technical barrier to achieving safe geologic disposal or continued storage or a drastic change in the Federal Used Fuel Policy completely abdicating the government's responsibility to dispose of used fuel in position of a broad open ended moratorium on licensing commercial power reactors by the NRC would raise serious separation of powers issues. (0163-38-2 [Bonanno, Jerry])

Comment: "The waste storage issue which we are here to discuss tonight is the result of years of gridlock in Washington, D.C. and the Federal Government's failure to follow through on its promise to create a national repository for used nuclear fuel. Although we would like to see a resolution to the fuel storage issue, it likely won't be over for quite some time nor will it affect whether the U.S. Nuclear Regulatory Commission approves the license renewal for Indian Point." (0163-4-3 [Thomas, Richard])

Comment: And it's kind of like we're having this long meeting to determine "Gee, is it safe to drink the arsenic," you know. You know, is it safe to jump off a ten-story building? Well, we're at story number five. Everything is cool, right, why worry? It's safe, you know, it's that kind of thinking. So I'm just going to touch on a few points to emphasize a few points that other speakers have made so well. (0163-41-1 [Kidney, Barbara A.])

Comment: The denial process, you know, Daniel Fullerton, I think, touched on that. By trade I am a psychologist, so I think I'm somewhat, you know, equipped to deal with the issue of denial and dysfunctionality, as in, "Well, sure, I drink five quarts of vodka today, but I'm not an alcoholic. Come on, you know." (0163-41-2 [Kidney, Barbara A.])

Comment: I don't -- I don't think anybody has figured that out, and the one thing that I think I can maybe add to this conversation is, two people spoke about the program in Finland. And there is a wonderful movie whose name I can't remember now, but I'm going to -- Here to Eternity, right. Sorry, Into Eternity, and it is about the program in Finland Onkalo. It is a -- I'm going to send that to this email and I really hope that everybody involved in anything at the NRC watches it, because what is really impressive about it is that on the one hand, if you could think of the ideal way of doing this, Finland of course is relatively remote and certainly not extremely densely populated, and they have picked a site that is as much in the middle of nowhere as you could possibly imagine. I believe the geology is such that the rock base is very firm. They are going incredibly far down. This is all shown beautifully in the film, and yet despite all of that, the risks and the problem of beginning to deal with what is going to happen in 1,000 years, 2,000, there are lots of very interesting problems, and they would be more interesting if they weren't endangering the entire planet. One of the people asked the -- I think it was Darcy, what language are the signs going to say? Well, they are dealing with that. They're even dealing with the question of should there be signs. What would it mean to people if they say, you know, don't go, this is very dangerous. Some people might react and think oh, there's something there that I -- anyway, so Onkalo, the Into Eternity film shows both sort of what the best-case scenario of

best minds trying to deal with the storage and despite all that, the fact that it is far from inadequate -- far from adequate. (0163-47-2 [Segal, Elizabeth])

Comment: We need to stop the farce that we can find safe geological storage for nuclear waste for 250,000 years. (0163-48-3 [Meyer, Bill])

Comment: How can we trust NRC when we see all of these flaws in their assumptions? The point I would like to make here is that the system for long-term mined geological storage has failed. We see that through Yucca Mountain, through the salt caverns in Kansas[.] (0163-48-7 [Meyer, Bill])

Comment: The first one is that when necessary there will be permanent waste disposal. That is absolutely impossible as I have stated already. We're just burning dollars rather than moving forward in anything meaningful. Yucca Mountain, salt mines in Kansas, many different things have been proven unsatisfactory and un-geologically safe. (0163-7-6 [Shapiro, Susan])

Comment: The Federal Government has spent the last three decades trying to decide where to put the more than 70,000 tons of spent fuel from our nation's power plants. The Waste Confidence Rule, although a good first step in the right direction, is not the solution the Federal Government promised us. Further, it has no bearing on the continued operation or license renewal of the U.S. nuclear power plants, including Indian Point. (0163-8-1 [Milone, Deb])

Comment: With regards to nuclear waste management in our country, it is suffice to say that we need a long term plan for nuclear waste storage. However, I want to point out that should the NRC's determination fall in favor of long-term storage facility, I have confidence in the industry's ability ensure that the waste is managed in a safe and efficient manner and that the human is considered in this process. (0176-2 [Stringfellow, Paris])

Comment: The safe and long term storage of nuclear waste is an intractable challenge. I don't envy the work you have in front of you. (0177-1 [Craig, Anne])

Comment: As for disposal of spent fuel, the president's own Blue Ribbon Commission recognized that a geologic repository is still the best method of disposal. Sweden and Finland are both already developing geologic disposal facilities which, frankly, should be an embarrassment to this country that was once a leader in this area but has since relinquished that position because of political dysfunction. Geologic disposal remains a well understood, technically viable option for the United States to pursue for disposal of spent nuclear fuel. We just need politicians with the courage to move forward, and a regulator that will follow the law in this area. (0181-3 [Waters, Christine])

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Comment: Members of the Nuclear Regulatory Commission, let me begin by stating that there is no confidence in the prospect that there is or will ever be an adequate solution to the

permanent storage of high-level nuclear waste. No public confidence, no judicial confidence, no regulatory confidence, no industrial confidence. Every thoughtful, sane and intelligent person within this room and outside this room knows through common sense that it is impossible to guarantee the containment of anything for hundreds of thousands of years, much less corrosive, hot and deadly spent nuclear fuel rods containing plutonium 239. Plutonium 239 has a half-life of 24,110 years and is among the deadliest, most carcinogenic substances known to humankind. (0187-1 [Friedman, Avram])

Comment: As we consider the EIS proposal, remember there is nothing to as likely become as permanent as a temporary solution. Is there any likelihood that with political realities a permanent longterm solution can be achieved? (0189-7 [Patrie, MD, MPH, Lewis E.])

Comment: The policy forced the cancellation of the GESMO hearings. Carter created a moratorium on nuclear plant orders that lasted almost four decades. His legacy created the impasse the nation still finds itself in: rewriting its Waste Confidence Rule in light of Sen. Harry Reid's personal agenda. It is the Rule that is the obvious target of activist groups who use nuclear power as their pet issue. The parallel? In 2008, a new President found himself indebted to Sen. Harry Reid. All Reid asked President Obama to do was to let him defund Yucca Mountain. Then Reid barely won re-election in Nevada and became Majority Leader. Sen. Reid stopped the NRC review of the Yucca Mountain Safety Analysis Report. Five years later we are in EIS hearings about a well-established process, the storage of used nuclear reactor fuel. This simple issue has succeeded in creating more delay and confusion on the way to finalizing NRC's Waste Confidence Rule. (0191-2 [Rossin, A. David])

Comment: I understand in these 30+ years, a number of these nuclear plants have accumulated in excess, spent fuel rods. While safety may have improved in these last 15 years concerning the engineering of the plants themselves, no engineer has offered a real world, long term, answer to the waste. (0204-2 [Stein, Tami])

Comment: The new rule also asserts that a mined geologic repository will be available within the next 60 years for long-term nuclear waste storage. Although Yucca Mountain in Nevada is ideal for long-term storage and stands as one of the safest places in the country to store nuclear wastes ("Nuclear waste can't," 2013), the Obama administration shut down plans for the location in 2010 after spending about \$10 billion on the project. Without the Yucca repository, which has been targeted as the planned location for a national repository for decades, the United States does not have another potential location. Furthermore, there has been a long debate over where to host the national repository and the final deadline for a long-term repository has been extended multiple times (Wald, 2013). If the Yucca repository is not even option, this deadline may be extended even further -- which could present problems for the nuclear waste currently being stored on-site. Ed Burke, chairman of the waste management committee in Aiken, South Carolina, was quoted as saying, "the department's decision not to make it [Yucca Mountain] the permanent repository suggests the next effort to find a permanent site will be even more lengthy and costly?" (Carr, 2013). A new repository site would have to satisfy many requirements in order to be considered even a possibility. Factors such as seismic activity, groundwater flow, surrounding earth composition, and location of major cities and landmarks are all considered for potential sites (Jonsson, 2012). The required testing and monitoring of the site could take years or even decades. With this in mind, extending the sixty year deadline does not seem improbable. (0205-12 [Lyons, Laura])

Comment: [T]he possibility of a new repository being selected is, to say the least, uncertain. (0205-17 [Lyons, Laura])

Comment: Secondly, it is not certain that a new nuclear waste repository will be found in the next sixty years. (0205-4 [Lyons, Laura])

Comment: It should be becoming clear by now that the "bury it and forget about it" approach to dealing with high level nuclear waste cannot be safely engineered. (0208-7 [Robinson, Herb])

Comment: And that we can't be confident there will be a way to dispose of high-level nuclear waste. That story might change in the next 10 to 20 years, but right now, the confidence just isn't there. Remember, the wisdom to understand what we don't know is the most important part of the problem. (0208-9 [Robinson, Herb])

Comment: In the 1984 Decision, the Commission made five findings. However, significant changes have been made to the findings but the Commission failed to provide convincing explanations. For instance, "[t]he Commission finds reasonable assurance that one or more mined geologic repositories for commercial high-level radioactive waste and spent nuclear fuel will be available by the years 2007-2009" was changed into "[t]he Commission finds reasonable assurance that at least one mined geologic repository will be available within the first quarter of the twenty-first century", and, again, was revised as "[t]he Commission finds reasonable assurance that sufficient mined geologic repository capacity will be available to dispose of the commercial high-level radioactive waste and spent nuclear fuel generated by any reactor when necessary." However, the Commission admitted in the discussion section that a national consensus for the site of a repository will not likely to be reached. The reality is there will not be one in the foreseeable future. (0210-1 [Individual, Anonymous])

Comment: Moreover, the time length of continued spent nuclear fuel storage was revised many times without sufficient support. Originally, the Commission stated, "spent nuclear fuel generated in any reactor can be safely stored at least 30 years beyond the expiration of that reactor's operating license." Later it was changed into "at least 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor;" the added brackets indicate another 20 or 40 years. Finally it was replaced by "at least 60 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor;" the added brackets indicate an additional 30 or 60 years for Generation III reactors. In summary, the time scale has been changed from about 30 years to up to 300 years. The Commission should provide sufficient evidence to support why we can extend the continued storage period up to 300 years, given that the nuclear waste disposal procedure has not changed much. (0210-2 [Individual, Anonymous])

Comment: I want it to be known that my absence does not mean that I consent to living with a nuclear waste dump well into the foreseeable future. Raising 2 young kids at a time when the Fukushima nuclear power plant situation is nowhere under control, I take nuclear waste very serious. My children deserve to grow up in an area with no Radioactive waste hazards. It is important to have this extremely vulnerable nuclear waste moved away from here as soon as it is reasonably safe to do so. (0217-1 [Vanderwoerd, Jennifer])

Comment: If as believed, a deep geologic repository is feasible and considered the most promising or if the technical reprocessing of spent nuclear material has potential, complete the technology and establish the facility before generating undue quantities of nuclear waste. (0219-10 [Olmstead, Stan])

Comment: The NRC's Victor Dricks says there's just no other place to ship the waste to, so it must remain in place. If that's true, it is a pitiful excuse for both logic and leadership. Had no one

thought of this problem previously? Is that possible? Again, if this is true, it suggests horrible things about the great minds of our society, perhaps our society as a whole. Are we really that stupid? If so, why not start designing one-way manned spacecraft from now on? Let's get our astronauts to Mars -- we don't have to think about how we're going to get them back until they get there. (0220-2 [Degher, Darius])

Comment: No Dump Site for Nuclear Waste. Under the Nuclear Waste Policy Act of 1982, commercial nuclear power reactor waste disposal is limited to no more than 63,000 metric tons at the nation's first nuclear dump site. Additional waste is prohibited at such a location, and a second waste site would be required to dispose of waste in excess of that figure. The NWPA prohibits: "... the emplacement in the first repository of a quantity of spent fuel containing in excess of 70,000 metric tons of heavy metal or a quantity of solidified high-level radioactive waste resulting from the reprocessing of such a quantity of spent fuel until such time as a second repository is in operation ...". The 70,000 metric tons would be 90% commercial nuclear reactor waste, the balance of 10%, or 7000 metric tons, would be waste from nuclear weapons production and nuclear energy research. Therefore, only 63,000 metric tons of commercial irradiated nuclear fuel could be disposed until a second national waste dump becomes available. According to the U.S. Department of Energy's Office of Civilian Radioactive Waste Management, a total of 63,000 metric tons of commercial irradiated nuclear fuel was reached in 2010. So the existing, operating commercial nuclear power reactors have effectively filled the nation's first waste site and are now well into the second. Within the next twenty years, over 80,000 metric tons of irradiated nuclear fuel will have been generated at commercial nuclear reactors in the U.S. This was known well before the NRC's last review of waste confidence in 1999.¹³ [footnote 13 text: U.S. Nuclear Waste Technical Review Board "Disposal and Storage of Spent Nuclear Fuel: Finding the Right Balance," (March 1996)] In fact, the DOE predicted that there would be over 105,000 metric tons of commercial irradiated nuclear fuel by the year 2046. Although the NRC's standard license extension is for 20 years, the DOE's assessment was based on license extensions of only 10 years. Further, DOE's estimate included no new commercial nuclear reactors in the U.S. Therefore, the high-level nuclear waste generated by existing reactors is well on the way to filling twice over a mined geologic repository which the NRC has assumed will be "available when necessary." (0222-11 [Zeller, Lou])

Comment: During the 1980's, I observed the fruitless search to locate a site for a waste repository 20 miles from my home. The history of the Nuclear Waste Policy Act of 1982 as amended in 1987 does not lend confidence in the ability to locate a repository. The US Department of Energy's Office of Civilian Radioactive Waste Management's methodology and conclusions were inadequate to the task. Recently, the President's Blue Ribbon Commission outlined a site search using a warmed over DOE approach. Further, the fundamental environmental justice issues of a volunteer waste site have not been addressed. The Commission should entertain no false confidence in the ability to find a national waste site. (0222-14 [Zeller, Lou])

Comment: The old Waste Confidence Rule merely presumed that waste stored at reactors would go to a waste dump someday, but the government's quest for a permanent waste dump is not only as doubtful as ever, it is a political hot potato and a questionable ethical proposition. (0222-21 [Zeller, Lou])

Comment: The new NRC waste rule has no basis and is contrary to the law. According to the NRC Staff Requirements Memo, SECY-13-0061, the new waste confidence rule will be also be based on an assumption about the availability of a dump site for nuclear waste as follows: 10 CFR 51.23 would be revised to provide the Commission's generic determination on continued

storage of spent nuclear fuel. The proposed amendments would state that the Commission has concluded that the analysis in NUREG-2157, "Waste Confidence Generic Environmental Impact Statement" (DGEIS) generically supports the environmental impacts of continued storage of spent nuclear fuel beyond the licensed life for operation of a reactor; and supports the Commission's determinations that it is feasible to safely store spent nuclear fuel beyond the licensed life for operation of a reactor and to have a mined geologic repository within 60 years following the licensed life for operation of a reactor. To support this assumption, the Waste Confidence Generic Environmental Impact Statement, NUREG-2157, states: [T]he activities of European countries support the technical feasibility of a deep geologic repository. In late 2012, a Finnish nuclear-waste-management company (Posiva) submitted a construction licence application for a geological repository for spent fuel to Finland's Radiation and Nuclear Safety Authority. However, when investigated by our staff, all three "Latest publications" posted to the Posiva website via the following links were unavailable. 6 .They are: 29.10.2013 I Workreport 2013-23 Human Intruder Dose Assessment for Deep Geological Disposal; 29.10.2013 I Workreport 2012-102 Studies on Reference Mires: 1. Lastensuo and Pesansuo in 2010-2011; 29.10.2013 I Workreport 2012-101 Studies of Quaternary Deposits in Investigation Trench OL-TK19 on the Olkiluoto Study Site, Eurajoki, SW Finland. The proposed waste confidence rule appears to be going down the same path as the one it is supposed to replace; i.e., specious claims based on unsupported assumptions. This is not only incongruous; it is contrary to the order of the appellate court. With limited time to justify its predetermined conclusions, the Commission has produced a flawed draft generic EIS and a similarly flawed draft rule. (0222-4 [Zeller, Lou])

Comment: Any place that lets a nuclear reactor be built should be prepared to store the waste safely forever on site. (0226-2 [Garden, Claire])

Comment: My second point is that we in the public are not naive about the siting of a nuclear waste dump. If we site one, it will encourage the nuclear industry to feel free to produce more and more waste as it will itself to do so. (0237-2 [Cullen, Noreen])

Comment: Instead of these assumptions, the NRC should draft a new GEIS to examine: --the probability that a geologic repository will be successfully sited, --the probability that a successfully sited repository will actually contain radiation, --the degree to which a repository may leak radiation, and --the public health and environmental consequences that may occur if a repository is not sited or if it ineffectively contains radioactivity. (0238-2 [Greene, David])

Comment: It is important for the Federal Government to put in place a program to safely dispose of these spent fuel assemblies. (0244-1-3 [Tulenko, James])

Comment: The NRC is correct in concluding that it is feasible to have a mined geologic depository available within 60 years after the licensed operating life of a nuclear power plant. There are no technical obstacles to achieving this, nor are there any financial obstacles given that the Nuclear Waste Fund now has a balance of more than 26 billion. (0244-12-2 [Ratchford, James])

Comment: There is strong scientific -- there is strong international scientific consensus that geologic disposal is the best solution to permanently isolate spent nuclear fuel from the public and the environment. Studies by the National Academy of Scientists and the International Atomic Energy Agency have confirmed this conclusion. In fact, the IAEA concluded in 2003 that geologic disposal is the generally accepted solution in practically all countries faced with the issue. Sweden and Finland are developing geologic -- geologic disposal facilities and are

expected to begin disposal of their spent fuel by the early 2020s. France is making significant progress. They have selected and characterized a geologic region and are now working to identify a specific site. Belgium, China, and the United Kingdom plan to start geologic disposal by 2050 or earlier. (0244-12-3 [Ratchford, James])

Comment: We have the technology to develop a geologic repository for spent nuclear fuel, and we have the money to do so. The only thing blocking the U.S. from building a geologic repository is political decision-making. The analysis contained in the Draft Waste Confidence Generic Environmental Impact Statement supports what the industry has long known. If necessary, used nuclear fuel can continue to be stored in a safe, environmentally sound manner for a long period while we wait for the political process to reach agreement on a disposal solution. (0244-12-6 [Ratchford, James])

Comment: No one knows when that [the eruption of super volcano in Yellowstone National Park] will happen, but it's coming, and it could be tomorrow or it could be in 5000 years. We don't know, but nuclear power -- nuclear spent fuel rods stay radioactive for 250,000 years from what I understand. So we talk about time. The time nuclear power's been going on has only been a few seconds of a tick on a clock compared to the time that the planet's been around, and we've really got to think about those things. (0244-13-6 [Wilson, Greg])

Comment: While nuclear energy is a vital part of our state's electricity portfolio and economy, we recognize the need to address issues related to transportation and safe storage of spent nuclear fuel. It's the Federal Government's statutory responsibility to remove used nuclear fuel from nuclear energy facilities -- this is pursuant to Federal law, and was to have started in 1998, 15 years ago. But so far the Federal Government is yet to remove one spent nuclear fuel assembly. (0244-2-2 [Knowles, Berdell])

Comment: Well, of course the GESMO hearings were canceled by Jimmy Carter's Order, and he created a moratorium on nuclear plant orders that has lasted almost four decades -- that lasted almost four decades. His legacy created the impasse that the nation finds itself in, rewriting its Waste Confidence Rule in light of Senator Harry Reid's personal agenda. It is the rule that is the obvious target of activist groups who use nuclear power as their pet issue. The parallel? In 2008 a new President found himself indebted to Senator Harry Reid. All Reid asked President Obama to do was to let him defund Yucca Mountain. Senator Reid stopped the NRC review of the Yucca Mountain Safety Analysis Report. Five years later here we are in hearings about a well-established process, the storage of nuclear fuel. The simple issue has succeeded in creating more delay and confusion on the Waste Confidence Rule. (0244-4-4 [Rossin, A. David])

Comment: Certainly I think most of us would prefer that the U.S. Department of Energy had complied and would comply with its statutory obligations to take possession of that fuel, but in the absence of that, as the group the students pointed out, it is not a limiting factor. It has not been a limiting factor to the operation of the five reactors in the state for five decades. It's not a limiting factor to the continued operation of them. And, it is not a limiting factor to the development of additional nuclear generation that's currently being proposed in this state. (0244-9-4 [Paul, Jerry])

Comment: The cycle of making waste that we can't dispose of is insanity. There is already enough waste for one Yucca, now we're working on two. We should follow the lead of recent events and bury it. (0245-14-7 [Kurz, Carol])

Comment: I say this because reactors are licensed to operate for 40 years and then they are going to retire. The NRC has allowed reactors to operate up to 60 years and possibly 80. That means it will be 140 years or longer before we figure out where that stuff is going. (0245-19-9 [Smith, Ed])

Comment: In conclusion we certainly hope that the Federal government will meet its long overdue obligation and will soon figure out a solution to long-term storage of spent nuclear fuel. But until then, we are happy that the industry and its Federal and State regulators have determined a strategy that works on many levels, the most important of those is our safety. (0245-2-3 [Wolf, Tom])

Comment: Furthermore, NRC is correct in concluding that it is feasible to have a mined geological repository available in 60 years after the license operating life of a nuclear power plant and the analysis of a short-term impact in the GEIS. There should be no technical obstacles to achieving this, nor are there any financial obstacles given that the nuclear waste fund now has a balance of more than \$26 billion. Despite delays in the process because of political and legal maneuvers, progress is being made in establishing a permanent repository. NRC is resuming the licensing proceedings with the Yucca Mountain application which will further inform efforts in developing a geological repository. Legislation is pending in the Senate to begin the process of selecting alternate sites using a consent-based approach consistent with the recommendations of the Blue Ribbon Commission. This progress supports the conclusion of the draft GEIS. We have the technology to develop a geological repository for spent nuclear fuel. And we have the money to do so. (0245-20-4 [Dunlap, Jeff])

Comment: The only thing blocking the United States from building a geological repository is political decision-making. (0245-20-5 [Dunlap, Jeff])

Comment: Can you believe that we are supposed to believe that nuclear power plants can continue producing waste without an adequate plan for its disposal? This toxic radioactive waste, we're supposed to go along on this gamble, on this grand experiment, that an industry can produce waste in a way when it doesn't know how it's going to handle it. (0245-22-2 [Headington, Vince])

Comment: In the original waste confidence, the decision was published and the NRC believed and assured us that a repository would be available in just 24-25 years into the future. Soon, the belief receded to a repository available 41 years after the Waste Confidence Decision was first articulated. Now, the NRC assures us that a suitable repository will be available when necessary, a term which I took to mean repository availability prior to onsite storage failure. That's just in time, JIT, just in time inventory management. I've always understood that term to be a euphemism for almost too late. (0245-24-3 [Conn, Corey])

Comment: We should locate a geological spent fuel storage repository based on rigid scientific criteria. Maximum efforts should be made to thoroughly investigate the least-damaging location for a permanent repository, and preferably one that allows for retrievable storage. The Blue Ribbon Commission proposed heavy reliance on a consent-based approach, but that reliance may not lead to the safest long-term solution. While local consent is important, that consent should be based on scientific knowledge rather than on improperly perceived opportunity to obtain money, jobs, and other items. (0245-29-5 [Shineflug, Marilyn])

Comment: Illinois is not a waste dump. We don't want any more high-level radioactive waste coming to, or through, Illinois. Nuclear waste is still a problem without a solution. No technology

has been proven capable of containing radioactive waste for the hundreds of thousands of years necessary to protect the environment. Debates continue over whether it is even possible to do so. And unfortunately, the United States has failed even to identify the vital site for nuclear waste repository despite millions of dollars and the Federal mandate to do so. (0245-37-1 [Bilenko, Stephanie])

Comment: The nuclear industry and the Nuclear Regulatory Commission, formerly the Atomic Energy Commission, have had nearly 60 years to come up with a permanent solution for nuclear waste, especially spent nuclear fuel generated by nuclear power plants. I've been involved in nuclear issues to a greater or lesser extent for more than half that time. Some 34 or 35 years ago, I was in a meeting similar to this one. But whether it was called by Commonwealth Edison or an agency set up to oversee and regulate it, I cannot remember. One person commented, made mention of all the methods he knew under consideration for long-term disposal of high-level nuclear waste: shoot it into space, bury it in salt mines, et cetera. Someone from either the NRC or ComEd responded that we have high hopes currently for the VDH concept. A year or so later, I received from the NRC a large book addressing the concerns about high-level nuclear waste. This was in the wake of the accident at Three Mile Island, and I assume that every citizen intervening in a licensing procedure or otherwise involved in the nuclear issue received such a copy. Therein I discovered exactly what VDH meant, a very deep hole. The industry and its watchdog have tried to convince the public for half a century that a solution is on the horizon. They have used jargon and acronyms to sound more authoritative and knowledgeable on the subject than they really are. (0245-42-1 [Rorem, Bridget])

Comment: At this time, there are no facilities for permanent storage of high-level radioactive waste. Since the only way radioactive wastes finally become harmless is through decay, which for some isotopes containing high-level waste can take hundreds and thousands of years. The waste must be stored when we have adequate protection for various point in times, but at this time there are no facilities for permanent storage. That actually comes from the NRC website. So, the industry folks and the politicians who spoke tonight and who stand to personally gain from nuclear power through their paychecks and other issues are talking about the next 50 to 100 years. And even that they cannot predict what is the future as Fukushima has taught us. (0245-43-2 [Michaud, Debra])

Comment: How could anyone have even allowed one reactor to be built with no end plan for waste? Your recommendations are not a solution. There is still no end plan. Interim means indefinite, that's not a plan, except to stockpile in facilities beyond the capacity for which they were built. (0245-6-6 [Headington, Maureen])

Comment: But about the confidence in the Nuclear Regulatory Commission and their ability to safely store spent nuclear fuel following the licensed life of every operator, or of every reactor, excuse me, and 60 years from now, them finding a safe geological repository really is laughable. (0245-7-2 [Chamberlain, Lora])

Comment: Even if we step back and assume that the engineers had the perfect solution both from a long-term and a short-term solution, which I do not have that confidence, even if we assume that, the reality is for any of this to work, we've got to have the policy makers and the funding to pay for this. And I don't think that any of us can say that we have the confidence in our government to put the amount of money behind this that really is going to take to address these issues that are in front of us. And that's really one of my biggest concerns with this is simply that we don't have the policies in place and we won't in the future to address this issue. (0245-8-4 [Fox, Rick])

Comment: Nuclear power plants were never intended to be permanent storage sites for spent fuel. Since 1983, we have paid more than \$29 billion into the nuclear waste fund, yet no permanent storage site has been built. As a result, 13 percent of our nation's spent nuclear fuel remains in temporary storage in Illinois power plants. It's time to open Yucca Mountain or similar long-term storage facilities. (0245-9-3 [Peck, Jerry])

Comment: On the question of long-term repository or centralized storage feasibility, solutions are technically and financially feasible. And, as noted in the Generic Environmental Impact Statement, are being implemented in countries worldwide. This is yet another example of how our international counterparts continue to pass us by in facing the challenges of our modern world. What is lacking here in the U.S. is the societal and political gumption to take ownership of our problems and solve them. (0246-10-4 [Bennett, Nathan])

Comment: Now, as I close, it is unfortunate that the leaders of today continue to kick the can down the road for a myriad of national issues, climate change and nuclear waste policy among them. While this may be flagrantly reckless and a willful abdication of responsibility, it is, nonetheless, the sociopolitical environment of this moment in history. However, as the urgency of these problems continues to mount, my generation will have to confront these issues. We simply don't have a choice. This is why individuals such as myself and others in this room chose this calling. And I have full faith and confidence that we will rise to these challenges. (0246-10-6 [Bennett, Nathan])

Comment: Nuclear waste is a problem without a solution and we really do not have an answer. So, to some extent, the overall premise of how do we move forward is certainly a big challenge. We, obviously, have not identified a centralized repository site and there isn't a clear path to identify one and certainly not a path to identify the likely need for more than one, given the volume of our existing waste. (0246-13-1 [O'Leary, David])

Comment: To me, putting it in the ground is like adding dynamite to the interior of the earth. This sets us up for internal pollution, as well as external pollution, but it is from the normal operation of nuclear plants which emit hundreds of thousands of curies of radioactive gases and elements into the environment every day. This is commonly known as burning the candle at both ends. (0246-15-4 [Minniss, Regina])

Comment: Basically, there was an assumption made decades ago that we would have safe storage and that we would be able to deal with very toxic radioactive waste in the future, but that future has never materialized and it likely will never materialize. Therefore, that assumption upon which everything else has been based has no validity anymore. And because that has no validity, we cannot have confidence that there will ever be any safe storage for any of this nuclear waste that we are creating. (0246-16-2 [Michetti, Susan])

Comment: And any confidence statements that this is going to appear in the future are using the same assumptions that have caused us to be in this very precarious situation that we are in without a place to store any of this waste. (0246-16-4 [Michetti, Susan])

Comment: [We should be looking to] find a permanent repository for spent fuel, rather than imposing some new regulations. (0246-18-6 [Karbowsky, Brad])

Comment: As nuclear energy has progressed through the decades, each generation of enthusiastic nuclear engineers and physicists have promised they would solve the problem of nuclear waste. The problem has not been solved yet. We keep producing more nuclear waste,

as well as new generations of young enthusiastic nuclear engineers who both hope that theirs will be the generation to solve the nuclear waste problem. Nuclear waste is not a sociopolitical problem. It is a problem of science. I hope these young engineers do solve the nuclear waste problem and I hope they stop making more nuclear waste in the interim and focus all their enthusiasm toward a science-based solution and stop the double speak about wanting to find a repository and wanting to reprocess the nuclear fuel. (0246-25-1 [Snyder, Gail])

Comment: A permanent deep, geologic repository that is selected using the best science possible is what is needed to protect us from the over 70,000 tons of nuclear waste that already exists in this country. (0246-25-2 [Snyder, Gail])

Comment: [T]he young man [Diego Garcia], the engineer, and the man from NEIS [Rod McCullum, Nuclear Energy Institute] made comments about us trusting them and them learning to find a solution, which it is obvious there is not a solution yet and there has never been one. And I don't think we should base Waste Confidence on a possible learning curve to find out one. In fact, I'm sure we shouldn't. (0246-26-1 [Sondheim, Steven])

Comment: The second thing is that I have been looking at the coal ash problem around the country lately. For 100 years, we have had a coal ash, a coal waste problem. It is not like radioactive waste but it has its dangers. It has its health problems. And the coal industry has not taken full responsibility for it. They have dumped it in pools, in piles. There have been spills. They still don't even have a way to handle that and they have reneged on their responsibility to fully take care of it. And I see a parallel or even worse situation with nuclear waste. We have nothing that can be done with it at the moment. We are piling it up. We are busting at the seams, especially in the pools. There is no way we should have any Waste Confidence until we know exactly what we are going to do with it. So, I think a generic decision should be no waste confidence. (0246-26-2 [Sondheim, Steven])

Comment: Earlier we heard the NRC say that there is a really brief history of Waste Confidence. And the really brief history of Waste Confidence is 65 years of failure. (0246-29-1 [Hoffman, Ace])

Comment: All containments, even if they were made of gold, they would be inadequate for the lengths of time we are trying to keep this stuff. Hence, the decision that a geological repository is necessary because we really don't have any confidence in any other solution. (0246-29-4 [Hoffman, Ace])

Comment: And so Waste Confidence should not be, as Paul [Michalak, NRC] initially stated earlier, "a small part of the licensing procedure." Instead, it should be a pass/fail. And so far, they have failed. You can't build a house without a sewer. The house would be unlivable soon, the quote from some nuclear physicist in Japan after Fukushima. (0246-29-5 [Hoffman, Ace])

Comment: We [Decommissioning Plant Coalition] are certainly aware, and we are sure that the NRC staff and the Commission are as well, that after the publication of the Rule and the Generic Environmental Impact Statement there would still be a great deal of work to do regarding the nation's used fuel and reactor-generated GTCC management program. The NRC will still be responsible for ensuring that its regulatory programs and policies do not foster indefinite on-site storage and we look forward earnestly to work with you in that regard. (0246-4-3 [Callahan, Mike])

Comment: [T]he judge, effectively we are saying hey, reality does have to raise its head. And that he has made a ruling against the NRC with the radioactive waste. Namely, he was trying to, I feel, force reality into the way radioactive waste is looked at by the NRC. (0246-6-3 [Lewis, Marvin])

Comment: Right now, we don't have a place to put a permanent geological repository and we just can't say, according to the Court, oh, we feel confident that it will be there when we need it. According to the Court, you need more basis, as the lawyers say, basis to say hey, a geological repository will be there when we need it. And the Court said that in a ruling and it still has not answered in two-and-a-half inches of paperwork in the GEIS. (0246-6-4 [Lewis, Marvin])

Comment: Radioactive cleanup is a very misleading phrase. It suggests to ordinary people that we can somehow get rid of radioactive contamination. But we cannot do so, at least not in any absolute terms. All we can do is move the contamination from one place to another. (0246-9-5 [Lewison, Linda])

Comment: Governments and their electorates have been misled by the nuclear industry into believing false notions about nuclear waste. They don't know how to clean up and dispose of nuclear waste, except in a temporary and superficial manner, as other people have already referred to here. Why am I mentioning that at this point? Because we can't take a snapshot of one moment in time without ignoring that these changes take place in radioactive elements at the very basic scientific level, at the subatomic level. (0246-9-6 [Lewison, Linda])

Comment: The residents of the City of St. Charles are concerned about any issue that may potentially impact public safety and the storage and transportation of these materials has been discussed for some time. We believe that it is time to move forward and implement solutions that will ensure their secure storage until such time as the hazard is mitigated. (0247-1 [Rogina, Raymond])

Comment: Finally, there is no place for it to go. There is no approved long-term storage facility. (0249-12 [Dugdale, Jane])

Comment: So this radioactive waste has been made every day of my life. We have nothing to do with it except for letting it pile up. It's piling up where it was made, and if you move it, it's just going to pile up there too. That is all we have for an answer right now. (0250-2-2 [Olson, Mary])

Comment: In closing, folks from all walks of life, race, and age, without hesitation signed our petition at the South Carolina Sierra Club booth at the State Fair; all extremely concerned about nuclear spent fuel piling up onsite above ground in spent nuclear pools with no permanent storage. No, South Carolina does not have confidence in waste, the production of it, the piling up of it in nuclear spent fuel pools and the lack of permanent storage. (0250-20-6 [Cooper, Elaine])

Comment: I brought this cup because today I was in the hospitality room, and they had wonderful food there, but they had no place to put the waste, just like the nuclear waste here. We have no place to put this. Nobody wants it, no state really wants it unless you're getting paid a lot of money, and then some people who have the power to make decisions will go for that. I'm just urging you to listen carefully to everything people say and do what's right when you make your decision for that. And I have one final thing. As a famous person in Russia took their shoe and pounded and said, "Please, do what's right." (0250-22-5 [Hands, Tara])

Comment: There's a few facts that we can all see real clearly. Our society started generating nuclear waste back about in the early 1940s. Let's put 1945 on it as a date. That's when we

dropped atomic bombs on Japan, and we were generating nuclear waste at that time. So, we've known for almost 70 years now that we've got a problem with what are we going to do with all this waste material, all this radioactive crap that we keep generating? In that 70 years, we are no closer to a solution. These papers that these people come out with saying well, we've got a solution on the way, you know. Trust us. Yes, trust me. We've got a solution. Within 60 years they say we will have a permanent repository for these 200,000 year waste products. I don't believe it. You've had 70 years to come up with it so far, and you ain't anywhere near a solution. Yes, what makes me believe that you're going to have a solution in the next 60 years? I don't believe it. I don't trust you, and when you come up with a real solution that the American people can believe in, then we might consider letting you create some more dangerous nuclear materials. But until then, stop the madness, let's not have any more of this junk. One thing we do do with it, since we don't have anywhere else to put it, we put it into bullets and bombs and we drop it on Kosovo, Iraq, Afghanistan, and those people don't want our nuclear waste. (0250-23-3 [Ashe, Kenneth])

Comment: There are no technical barriers to achieving this result, nor are there any financial barriers given the current and growing balance of the Nuclear Waste Fund which contains over \$26 billion to date and continues to grow. (0250-25-4 [Wellwood, Jay])

Comment: These spent fuel rods contain a million times more radiation than they did going into the reactor. We have 80,000 tons of the stuff. If we had continued to build Yucca Mountain it would not be adequate at this time because we have more waste than Yucca Mountain would hold. (0250-29-6 [Rivard, Betsey])

Comment: Are we -- as we consider the Environmental Impact Statement proposed, remember, there's nothing as likely to become permanent as a temporary solution. (0250-30-6 [Patrie, Lewis E.])

Comment: Let me begin by stating that it's hard for me to believe that there's any confidence in the prospect that there is or ever will be an adequate solution to the permanent storage of high-level nuclear waste. I don't see how there could ever be public confidence, judicial confidence, regulatory confidence, industrial confidence, scientific confidence. I don't see how any thoughtful, sane, intelligent person within this room, or outside this room knows intuitively -- doesn't know intuitively that it's impossible to guarantee the monitoring and containment of anything for hundreds of thousands of years, much less corrosive, hot and deadly spent nuclear fuel rods containing plutonium-239-- plutonium-239, with a half-life of 24,110 years, and among the deadliest, most carcinogenic substances known to humankind. (0250-33-1 [Friedman, Avram])

Comment: I say it can be safely stored for the following reason. It is being safely stored under U.S. license by the United States Department of Energy at the Waste Isolation Pilot Project in New Mexico, 2,000 feet underground, actinides are being stored in a salt dome right now as licensed by the United States Government. (0250-35-3 [Cook, Andrew])

Comment: Also, I will say it will be safely stored for the following reason. If you make a dry storage facility underground, water would have to come down through thousands of feet of rock where it's never been, penetrate through stainless steel, come through zirconium, and then try to dissolve a ceramic like this cup, a ceramic like this cup, water doesn't dissolve it. (0250-35-5 [Cook, Andrew])

Comment: Other countries, such as France, Finland, and Sweden have solved this problem and are putting geological repositories in place. (0250-37-3 [Barilla, Frank])

Comment: And just by living in that area and watching Plant Vogtle as they're building two new reactors, it makes you wonder some time, when with all the spent fuel they already have there, that they're going to build two more reactors and put some more spent fuel there, and where is it going? Where are they going to store it at? (0250-38-1 [Howard, Claude])

Comment: However, I do feel that there are a couple of points that were made that deserve to be reiterated that everyone here can share. The first one is, all of us agree there is a huge problem with nuclear waste. I've heard the number 70,000 and 80,000 tons used today. The number I had before I came here was 70,000. That is a significant amount of waste, and we do not have a great long-term plan about how to deal with this. It is not part of the short-term solution provided in the Environmental Impact Statement we have before us. I think we can also agree that we need a plan. Even if you decide to end all nuclear immediately, or keep nuclear going forever, this is a problem we're going to face, and we will need a solution for it. So, what do you do? (0250-43-2 [Causey, Lee])

Comment: According to the Government Accountability Office, the amount of spent storage fuel onsite at commercial nuclear reactors will increase by 2,000 metric tons a year, doubling to about 140 metric tons before it can be moved offsite because storage at disposal facilities may take decades to develop. Then with the centralized and permanent disposal, 15 to 40 years before they get ready for that. We are kicking the can down the road. As a grandma, I'm pleading for the 6,000 generations that will be stuck with this horrible handmade substance. Do you ever sit down and think about the children of Fukushima? I do. I sit there and cry. I can't imagine being the mother of any of these children that are affected by it, so when industry stands up here and tells me it's safe, and industry of the United States built those reactors, it really makes me angry. It's hurtful, and it's embarrassing. So, anyway, I say to you, you should try sitting down and contemplating these kids, try crying. It brings a little blood up to your brain. Maybe that will open your mind. (0250-45-3 [Sorenson, Laura])

Comment: We have a responsibility to the future. That's why we're here tonight. All of us agree that this waste must be safely protected from the atmosphere, from the biosphere, basically forever. This is a very serious proposition. (0250-5-2 [Safer, Don])

Comment: And, even if we stored it deep underground, that is the environment, too. And that stuff has a way of coming to the surface. And some of these elements are hazardous for millions of years. And the geology changes over that period of time. And we don't know what is going to happen to those areas that we're storing it in. So we need to keep it on the surface, where we can keep an eye on it and try to maintain it as best we can. (0250-50-5 [Blevins, Eric])

Comment: I encourage the regulator and our government as a whole to resolve the Waste Confidence remanding promptly and, further, to fulfill statutory federal obligations to relieve individual states of its unnecessary burden and establish a staff and secure permanent repository for the nation's inventory of spent fuel. (0250-56-4 [Murphy, William])

Comment: While onsite storage is a safe option, more permanent options, such as a geologic disposal, are necessary. (0250-57-4 [Jones, Lauren])

Comment: It is certain that the storage of used nuclear fuel is an issue that the industry needs to address. However, it is not an insurmountable handicap. Countries such as France and Finland have been successfully dealing with the byproducts of nuclear generation for decades with fuel recycling, onsite storage, and the development of geologic repositories. The

technology, the professionals, and the support of the industry as a whole exist to put into action a strategy for the disposition of used nuclear fuel. (0250-58-3 [Cagnetta, Matt])

Comment: As soon as Washington begins to care more about the welfare of this country than its elections, we can begin to tackle realistic timelines for solving used nuclear fuel disposal issues with existing technology and personnel. (0250-58-6 [Cagnetta, Matt])

Comment: The U.S. government committed via the Nuclear Waste Policy Act of 1982 to have a national repository for nuclear waste operational by '98. However, the U.S. has consistently missed critical milestones for solving the nuclear waste storage problem. American taxpayers have paid the nuclear waste fund over \$32 billion. Yet, the United States has failed the American people and the world in the matter of nuclear waste. (0250-63-3 [Kasher, Brian])

Comment: It is our understanding that the NRC looks favorably at the granite in the North Carolina mountains as a potential storage site. And that is completely unacceptable. And we will do everything in our power to prevent that from being a solution to this nuclear waste issue. (0250-64-4 [Gupton, William])

Comment: The bottom line is that science has not found a safe way to store nuclear waste. It hasn't found a facility that can hold the amount of waste we have for the amount of time that we need to safeguard it. (0250-66-5 [Hanson, Courtney])

Comment: Geologic repositories can be done safely because they are being done safely in France, Finland, among many other others. We have a logical, safe solution on paper. We have simply temporarily lacked the political will to enact it. (0250-70-4 [James, Andrew])

Comment: Despite more than 30 years of anticipation, there is no permanent off-site waste storage facility for radio-active nuclear waste. There will be none in the foreseeable future. (0252-1 [Golden, Leon] [Goldin, Martha])

Comment: Furthermore, the ephemeral permanent storage place is not likely to materialize during our, our children's and our grandchildren's lives, if ever. (0252-4 [Golden, Leon] [Goldin, Martha])

Comment: While nuclear energy is a vital part of our state's electricity portfolio and economy, I recognize the need to address the transportation, storage and disposal of used nuclear fuel. I also recognize that it is the federal government's statutory responsibility to remove used fuel from nuclear energy facilities. This has been federal law for 15 years now and the federal government has yet to move a single used fuel assembly. (0253-4 [Avilla, Karen])

Comment: I was told it would be taken care of (Yucca Mt.). What do you plan to do with the waste material from this plant that last for so many years & looks like it will remain at Diablo??? (0254-2 [Denneen, Bill])

Comment: I want to make it known that I am part of the ever-expanding list of people who vigorously support the need for re-evaluating policy and practices regarding nuclear power plants and the threats posed by their radioactive waste storage. I affirm my support for comments by Mothers for Peace of San Luis Obispo in their call for a less perilous, more well-considered/science-based handling of the problems of radioactive nuclear waste. For those of us who live in the shadow of these poisonous waste stations, it is vitally important that the NRC act as if their loved ones have nuclear power plants-with overcrowded, unprotected spent fuel pools-looming in their neighborhoods. (0256-1 [Harkins, Lynne])

Comment: The GNAC typically comments only on the technical aspects of a proposed action. However, the public opposition to consolidated or interim spent fuel storage compels us to comment on the societal considerations at play. The predominant problem with spent fuel storage is one of public relations. (0262-11 [Patterson, Karen])

Comment: [W]e certainly hope that the federal government will meet its long overdue obligation and will soon figure out the solution to long term storage of spent nuclear fuel. But until then, we are happy that the industry and its federal regulator have determined a short-term strategy that works on many levels ---the most important of those is our safety. (0275-5 [Wolf, Tom])

Comment: The NRC was to find a permanent, leak tight site for spent fuel. With Yucca off the map, and our nuclear waste growing past 70,000 tons, a federal court ruled in 2012 the NRC could not proceed with new licenses or extensions until they completed an environmental study to show the environmental and health effects over time if spent fuel was not stored in a repository. (0276-4 [Kurz, Carol])

Comment: This cycle of making waste we can't dispose of is insanity. There's already enough waste for one Yucca, now we're working on two. We should follow the lead of the Swedes and the Fins and bury it. (0276-8 [Kurz, Carol])

Comment: Since 1998 the US has been delinquent in supplying a location for final disposal of nuclear spent fuel that the federal government promised when nuclear reactors were being built in the late 1960's. There is currently no place being prepared to take the US nuclear spent fuel. When President Obama shut down Yucca Mountain after nearly 30 years of preparing the site to be a final geologic deposit for all of our nuclear waste for the entire country, America became a deadly accident waiting to happen at 104 reactors. But SONGS sits with everyday a potential to destroy as in Fukushima the land from Oceanside to Laguna Beach, shut down forever. The nuclear reactors built in the 1960's were never built to store the waste on site. No state is willing to accept the nuclear waste. The NRC is now wrongly requiring that the waste is safest being stored on site. These old plants were not designed for that. What other plan is possible? (0280-10 [Magda, Marni])

Comment: Commercial nuclear reactors have been "regulated" by the AEC and now the NRC, since 1954. Almost 60 years have passed, and there is still no solution to the fundamental problem of what to do with the deadly radioactive waste. (0287-1 [Swanson, Jane])

Comment: The problem now is that we are running out of room to store this awful stuff. The U.S. government had promised to find a permanent repository by 1998, and tried to get Yucca Mountain. But that didn't work out. Also, it is not as safe a location as people first thought it was. In fact, it may be that there is no such thing as a safe, permanent repository for all this nuclear waste. And that's because it is radioactive for so long. (0293-4 [Lewis, Sherry])

Comment: Remember that the nuclear danger lasts thousands of years. We do not know what to do with nuclear waste. Protect us and future generations from disaster! (0302-2 [Light, Lillian])

Comment: The geology of the earth is not stable enough to find a repository which will be stable for the length of time needed to spend the radioactive isotopes in the waste. (0310-2 [Oster, Phyllis])

Comment: While cask storage is safe, it would be far better if the federal storage of spent fuel progressed forward. The federal government has failed to fulfill its promise to accept the nations spent fuel and has led to this program of long term on-site storage. (0313-2 [Waage, Edward])

Comment: In accordance with the Nuclear Waste Policy Act of 1982, it is the responsibility of the federal government to secure permanent disposal for spent nuclear fuel. As this task has not yet been completed, the City of San Clemente wants to ensure the health and safety of its residents living in close proximity to the San Onofre Nuclear Generating Station (SONGS) until the spent nuclear fuel can be safely transported out of the area. (0315-1 [Brown, Tim])

Comment: NRC must abandon its Waste Confidence policy and stop using it to license nuclear power plants, because there is no scientifically proven solution for safely disposing of nuclear waste. (0319-1 [Nichols, John])

Comment: The U.S. has failed even to identify a viable site for a nuclear waste repository despite two decades, billions of dollars, and a federal mandate to do so. (0319-5 [Nichols, John])

Comment: And this is a really serious problem-- that we've found ourselves in a situation where it's not really safe to store the waste onsite and it's not really safe to transport it. And we're left in this quandary where a difficult situation has to be addressed as openly and transparently as possible. (0325-1-1 [Headrick, Gary])

Comment: I think we're all a little bit under qualified and searching for answers, and it's no longer acceptable to just have the easy answer of okay, well, we have that waste but it'll be okay someday. When we get there, don't worry about it. We're working on it. That's just not a responsible response. It's reckless. And we need to come together over this issue, and it's not adversarial at all. We have good people like Greg Warnick. I have a good relationship with our onsite inspector. And I know his heart is in the right place, but the system is not working the way it should. And there's no reason we should have waste stored onsite any longer than possible. We're here to basically say you've got to move that stuff off the site away from these people, away from the earthquake hazards, tsunamis, human error, you name it, terrorism. There are so many problems that could really destroy Southern California and beyond that we have to take this problem seriously, take it urgently, get real answers to the questions, and I think transparency is going to be key. (0325-1-2 [Headrick, Gary])

Comment: We all have to put our minds together, work together, and do the right thing. So, there's a lot of details, there's a lot of good thinking going on to resolve this issue, but it's not going to be resolved by kicking the problem down the road. We have a limited time before our dry cask storage or pools are vulnerable to disastrous result, and we've got to move on this fast. So, you're going to hear a lot of other good comments from people in the coalition and the audience, and I appreciate the time to address this. (0325-1-4 [Headrick, Gary])

Comment: While nuclear energy is a vital part of our state's electricity energy portfolio and our economy, we do recognize that there is a need to address the transportation, storage, and disposal of used energy nuclear fuel. It is the Federal government's statutory responsibility to remove the used fuel from nuclear energy facilities. Under Federal law this has gone on for over a decade, but so far we have not seen the Federal government act. (0325-13-5 [Wicks, Tonja])

Comment: The student group believes that the NRC now has the resources and will at its disposal to properly address used nuclear fuel, that the pace and diligence of scientific rigor, which the NRC has been addressing used fuel, has been commendable and in the best interest

of local affected communities and the people of the United States alike. (0325-17-4 [Pearson, Jeremy])

Comment: The student group also believes that any inflation, beyond that which the NRC has concluded in its Draft Generic Environmental Impact Statement or political hastening of the movement of used fuel, together with enactment of the NWAA or similar legislation founded on such assertions prior to a consent base and scientific approach being properly and duly followed, may result in future less-than-effective solution scenarios, similar to that of Yucca Mountain, and may serve to erode and undermine public confidence in communities that are interested in hosting used nuclear fuel and nuclear waste in interim storage or final repository facilities, as well as instill irrational and non-productive fear in those communities that now have used nuclear fuel. (0325-17-5 [Pearson, Jeremy])

Comment: Now, the scenario I would like to be in favor of is restart San Onofre because it's a significant economic value. It was a stabilizing source for the power in Southern California, and it operated with a zero carbon footprint. But that decision is past, and now that forced us into looking for the safe storage of spent fuel rods. And that plan must be put in place before a site cleanup plan can be finalized. This is actually a national problem across the United States, not just for San Onofre alone. (0325-26-2 [Hannaman, Bill])

Comment: Tonight the NRC has explained why they wish Californians to be confident in their proposed waste policy, but even the NRC's hypothesis and prediction is uncertain. We will leave highly radioactive waste fuel assemblies, whether in pool or casks, on a seismically vulnerable coast for your defined short period of 60 years, long-term period of 160 years, or your indefinite term when we'll all be dead. (0325-3-2 [Becker, Rochelle])

Comment: In 2011, the Blue Ribbon Commission on Nuclear Waste recommended a new single-purpose organization to develop a focused integrated program for transportation, storage, and disposal of nuclear waste, yet the NRC appears ready to decide each of those issues in isolation; a decision that could only result in additional cost to California and utility rate payers. (0325-3-3 [Becker, Rochelle])

Comment: You know, a friend of mine says well, let's get some lawyers and then the lawyers will force the Nuclear Regulatory Commission to do the right thing. Well, it's not the Nuclear Regulatory Commission that's going to do the right thing. It's not the lawyers. They can't figure out a way to make nuclear waste safe. Lawyers can't do it. Administrators can't do it. Politicians can't do it. I'm proposing that we have a new Manhattan Project, a project that's going to take care of nuclear waste, and at the same time deal with global warming, some kind of way that we can work towards life on this planet, and not towards more. Let's liberate our energies, and our politicians, and our money towards survival for the next seventh generation. (0325-33-7 [Zigler, Randy])

Comment: I'd like you to know that in the Proposed Rule back in 1979 the NRC states that they would not continue to license reactors if they didn't have reasonable confidence that the waste can and will in due course be disposed of safely. 1984 same Proposed Rule, it says the Commission finds reasonable assurance that one -- I'm sorry. It says that yes, they find reasonable assurance that one or more mined geologic repositories for commercial high-level radioactive waste and spent nuclear fuel will be available by the years 2007 to 2009. We're at 2013, almost 2014 and neither of those statements have even come close to fruition. (0325-34-1 [Waller, Viviane])

Comment: I call on the Federal government to follow through on its obligations to provide a national solution to the permanent storage of spent nuclear fuel, including high-burnup fuel, including mixed oxide fuel. And under Federal law, this was to have started 15 years ago, but so far the Federal government has not moved a single fuel rod. (0325-4-2 [Quinn, Ted])

Comment: After fighting San Onofre for 20 years, I had to put up with an awful lot of people telling me the waste solution is going to be Yucca Mountain. Of course, right now they've just today reopened some of the Yucca Mountain plan, but it's not very likely, and there are a lot of scientific problems. Science. It wasn't politics, it was science that is stopping Yucca Mountain. (0325-7-1 [Hoffman, Ace])

Comment: So, we need to get rid of this waste, and until we closed San Onofre, I don't think anyone here was really very good at thinking about what to do with the waste, but now we've got a room full of people who are very concerned about it. (0325-7-3 [Hoffman, Ace])

Comment: This is no way to run a country. This is no way to run a problem that is the biggest problem this country has ever faced. It's bigger than World War II. We have to get rid of this waste. And, of course, there's nowhere to put it, so we have to think really hard about what we're going to do. (0325-7-7 [Hoffman, Ace])

Comment: We have nuclear waste that can't be stored safely, and can't be moved safely. We have no solutions for it. How can we possibly have any confidence in the waste-- nuclear waste policy that this agency proposes? (0325-9-2 [Reson, Myla])

Comment: Well, I think we all agree, all of us have agreed, that the lack of a permanent disposal policy by the Federal government is a terrible burden on our community. (0326-1-1 [Hill, Adam])

Comment: I don't think anyone here is too keen about having spent fuel stored at Diablo Canyon. That being said, the Department of Energy is the agency that needs to take ownership of this issue. (0326-11-1 [Bean, Judith])

Comment: I support all of you in petitioning our government representatives for finally accepting responsibility for the long-term storage of the nuclear fuel that powers all of our lives. (0326-17-3 [See, Daniel])

Comment: I now believe it's time for the Federal government to step up and promised --what they promised all of us and provide a permanent storage facility for the used fuel. (0326-27-2 [Devitt, Andrea])

Comment: In that same regard, I fear the possibility that we may not be able to come up with a viable solution for the long-term storage and disposable of spent fuel, even if we give ourselves 60 years to figure it out. What cost might that prove to be to our children's children? I respectfully submit that the U.S. NRC reconsider Proposal Rule 10 in that we have a mined geologic repository before the end of the licensed life for operation of any reactor. (0326-33-4 [London, Rick])

Comment: It's informative to hear everybody's views tonight, and I'm glad that I came, and as we look about addressing this challenge; you know, I think we can either choose to live in the problem or choose to live in the solution, and I think the solution in this situation is abundantly clear, and that's that the Federal government needs to establish a permanent disposal facility, and that is it. Period. Once that decision has been made, I think we can go on and continue to live our daily lives. (0326-37-4 [Rethmeier, Blain])

Comment: In the business world, if you're being asked to have confidence in something, to invest in something, you have an opportunity to look at the track record. What's the track record here of the NRC and a long-term repository? After the first reactor was opened in Shippingport in 1955, over a half a century ago, we were promised a high-level waste storage. That did not happen. Now we're being asked again to have confidence that maybe within another 60 years we'll get a break. We'll get brakes applied to this nuclear car. I think fool me once, shame on you, fool me twice, shame on me. (0326-4-1 [Brown, Jerry])

Comment: And so on to the topic of Waste Confidence. As I was preparing, you know, reading through the documents for this meeting, and looking at the history of Waste Confidence issues, it's pretty obvious that the United States has been dealing with this issue since before I was born, and I have two children now, and they're going to be dealing with it if we don't do something about it now, and that's why we're all here. My oldest son is now four. When he gets into a challenging situation, he closes his eyes, and I don't blame him, he's four years old, right? Sometimes I want to do that, too. But when you look at all of the misinformation and the political agendas that have hindered a long-term solution for the storage of nuclear fuel through the years, it seems that we, the people, and we, the government, have been closing our eyes at this difficult issue. And in doing so, we're really handicapping our future generations and leaving our issues for them to deal with later. And as I read more about the history, I see that a lot of these issues are really political and not technical, and that's frustrating. I have a vision for my children, you know, I want them to grow up in a society where we deal with our problems instead of leaving them for the next guy. (0326-41-2 [Zaitz, Kristin])

Comment: The problem now is that we are running out of room to store this awful stuff. The U.S. government has promised to find a permanent repository by 1998 and tried to get Yucca Mountain, but that didn't work out; also, it is not as safe a location as people first thought it was. In fact, it may be that there is no such thing as a safe, permanent repository for all this nuclear waste, and that's because it is radioactive for so long. (0326-44-3 [Lewis, Sherry])

Comment: I think where we would all agree is in the fact that the long-term storage needs to be addressed and that the government, Federal government, has a real responsibility to accept the obligation to provide long-term storage and a long-term strategy that can take advantage of the economies of scale of a national initiative. (0326-49-2 [Connor, Vicki])

Comment: We were lied to when we were told that the toxic nuclear waste storage would be offsite, that there would be a safe permanent storage in the very near future. That was over 30 years ago, as stated in the Nuclear Waste Policy Act of 1982. We were lied to and we still have no confidence in the NRC judgment. (0326-53-3 [McGibney, Patrick])

Comment: And I would hope that all of us, including the NRC, would have the ability to put pressure on the Federal government to follow through with their permanent storage facility plans for all nuclear waste. (0326-60-5 [Spooner, Rena])

Comment: Also, I went to a recent forum on radioactive waste and likely changed my mind about the need for a geologic repository, as compared to any other way to deal with the rad waste. However, making--- no more radioactive waste should be made before they establish the geologic repository. And obviously Yucca Mountain isn't the proper spot, because it's in an active volcanic area and had, I think it was a 5.6 quake on the Ghost Dance faults in the last 10 or 15 years. (0326-63-3 [Campbell, Bruce])

Comment: I've heard that there might be a need for two geologic repositories due to the huge increase in the burning of high-burnup fuel. (0326-63-4 [Campbell, Bruce])

Comment: Commercial nuclear reactors have been regulated, "regulated", by the AEC and now the NRC since 1954. Almost 60 years have passed and there is still no solution to the fundamental problem of what to do with the deadly radioactive waste. (0326-8-1 [Swanson, Jane])

Comment: What if there's never a permanent repository for permanent waste? Oh, you say, it's obviously safe and fine just where it is, right? It's fine. For how long? A hundred years? Three-hundred years? Forever? But don't worry, you people who live near nuclear reactors, we're sure that there will be an underground final repository when it's needed. We say it's needed now, but we know that that's ludicrous because there's nowhere to put it. (0326-9-2 [Seeley, Linda])

Comment: And I think, you know, at this point, this form of -- this way of storing this waste probably is the best that's available. At some point, if the Federal government would get their act together and create a repository that would be the next best thing, but at this point, this is, the technology indicates, the research indicates, that this is probably the best way of storing this material. And I can say having personally, first of all, living in Ottawa County my whole life, and also dealing as a Commissioner with the NRC and the utility that they are constantly -- the NRC is overseeing the utility. Big Brother is watching, and I, for one, as the Board of Commissioners, we support the NRC in their efforts in this process as far as the waste, and dealing with the waste. (0327-1-1 [Sass, Jim])

Comment: It's unconscionable that despite the Federal Court ruling of no confidence, the NRC continues to arbitrarily and capriciously pretend that there is a storage disposal solution for the existing 70,000 metric tons of high-level radioactive waste generated by continued operation of commercial reactors. (0327-11-4 [Kline, Connie])

Comment: Since each reactor produces 2,000 metric tons of radioactive waste a year, by 2050 there will be 150,000 metric tons sitting on the least suitable sites possible. (0327-11-5 [Kline, Connie])

Comment: Now, when this whole game began, perhaps there were hopes that there would one day be a resolution to what to do with the waste. Seventy-one years have passed as of this week and they still do not know what to do with the first cupful of radioactive waste. (0327-2-4 [Keegan, Michael])

Comment: I lived in Port Clinton when Davis-Besse was being built, and I knew engineers and laborers who worked during the construction phase and the startup. I'm intimately aware of the ongoing problems of Davis-Besse, beginning when the reactor was started up initially and it did not go as expected right through to include what to do with the nuclear waste that's been generated all these years. We were assured that we'd have a national repository for all this nuclear waste when the plant was being planned. These promises have turned into lies. We are no closer to finding somewhere to put all this radioactive waste than we ever have been. (0327-25-3 [Crow, Valerie])

Comment: The solution seems to be storing it right where it is, and that option certainly isn't without a whole new set of problems, especially when the casks were substandard, as some at Davis-Besse -- as one at Davis-Besse -- was, and it was only one of 13 other plants that had dry cask issues. And storage onsite is not a solution. It's kicking a very dangerous can down the road. (0327-25-4 [Crow, Valerie])

Comment: [M]y confidence in the NRC has significantly decreased since it has become a political, not a technical, organization. And by political, the example that I give is the previous chairman who is no longer there, thank you, is a political appointment with the idea -- by a president and by the consent of Harry Reid from Nevada -- that they didn't want Yucca Mountain. And so there's nothing wrong with Yucca Mountain, from a technical point of view. It's only a political point of view that that thing has stopped. And, hopefully, it will get restarted when the politics changes. The NRC should go back to their idea of citizens first and not the politicians first. (0327-36-2 [Lamberger, Paul])

Comment: I don't have to tell you that in June of 2012 the Federal courts handed down a ruling that required you to take some, take the time to reconsider your efforts to continue to license and relicense nukes based on the fact that there's been a concern that for all these years there has not been, nor will there ever probably be, a repository suitable for the disposal of high-level radioactive waste. (0327-39-3 [Izant, Carol])

Comment: Members of the NRC with the help of the rest of us must quickly begin the process of adequately isolating the inventory of irradiated fuel rods. Because we do not have the capability of forecasting geologic changes over millions of years, radioactive waste must not be put in inaccessible places, certainly not at this time. (0327-4-4 [Marida, Patricia])

Comment: Apparently, it is not an NRC problem but a public problem now, what to do with spent nuclear waste. I'm appalled by this meeting. Where are the experts in this situation? Are there not people who knew what to do with spent nuclear waste? Our lives, our environment, our world was entrusted to you, the nuclear industry, over the protest of those worried about such matters 40 years ago. How long do we have to figure it out? Forty years? It's not been long enough for the experts, and now it's in our backyard, literally. (0327-42-6 [Faris, Kelly])

Comment: How can we be confident when we have these myths on one hand, and on the other hand we have a reality where we have 70,000 tons of the most radioactive material on the planet that already exists in temporary storage with no permanent repository in sight, and with 56 years of commercial nuclear electricity generation already past. The fact is that reactor site fuel pools, dry cask storage, interim away-from-reactor storage facilities are nothing more than a radioactive shell game designed to manage the thinnest membrane of time that these wastes will be radioactive compared with the longevity of our human created institutions and technological creations. (0327-7-2 [Gunter, Keith])

Comment: In the past 56 years, the U.S. Government, the nuclear industry, and the world's scientific establishment has examined every possible disposal option imaginable, including deep geologic disposal in salt, shale, volcanic tuff, crystalline granite, and even possibly in Antarctica. Seabed disposal has been discussed and rejected. Outer space disposal was discussed until January the 28th, 1986 when space shuttle Challenger blew up over Florida and all such ridiculous conversation came to a halt. (0327-7-3 [Gunter, Keith])

Comment: Now we have a problem with Canada. There's this big, huge nuclear waste depository where they're going to bury it near Lake Huron, seal it up in an underground chamber. There is just some really ridiculous answers to what to do with nuclear waste, and I don't think anybody's got a solution yet. (0327-8-3 [Barnes, Kathryn])

Comment: We all know there is no good final solution to the problem of creating nuclear waste that must be isolated from the environment and all living things for millions of years. If we ever come to a decision on a deep underground depository, that would mean thousands of

shipments moving through towns and cities, endangering populations in the likelihood of accidents. Highways, railways, and water courses would have to be militarized, and shipments would have to be secretive to prevent terrorism. Even if a suitable place could be found, it would be decades before any waste would be interred, and we're producing this waste at more than 2,000 tons per year. We already have well over 70,000 tons of nuclear waste. (0327-9-1 [McArdle, Ed])

Comment: Our nation's Nuclear Waste Policy Act is a complete failure. The defects of the Nuclear Waste Policy Act were first exposed when the 1998 deadline for the removing of nuclear waste to a permanent repository came and went. More than 15 years later, that's still the law of the land, but now it's simply being ignored. (0328-1-6 [Johnson, Ron])

Comment: As a Mdewakanton Dakota, we use the term seven generations to refer to a length of time and the success of generations of our people who can be affected by our actions today, but nuclear waste is more than a seven generation problem. Some of the most dangerous and toxic substances known to mankind, spent nuclear fuel, must be isolated from the environment for tens of thousands of years. (0328-1-8 [Johnson, Ron])

Comment: What I need as a citizen is for the GEIS to create some minimum standards and criterion for long-range at-reactor and indeterminate reactor site storage. I need this GEIS to create a foundation to support the utilities and not avoiding long-range planning, but to do long range planning specifying what technologies, what casks, what facility design, what funding will be in place to insure responsible nuclear waste management; to direct -- to facilitate the ability to support utilities in creating long-term storage fund assurance. (0328-12-4 [Eide-Tollefson, Kristen])

Comment: I grew up playing with a Geiger counter. My father designed part of the Elk River Demonstration Plant. It's not there anymore, it's a garbage burner now, go from one bad to another bad. But he also designed the solar for the zoo, so there's hope there. But we didn't agree on much, but one thing that me and dear old dad did agree on was they really had no plan for what to do with nuclear waste. And he recognized back in the early '60s that they hadn't a clue. Well, still don't have a clue, you don't know what to do. And there are only so many ways, people have done it very eloquently, but there really are so many ways to say that this is bullshit. It's what it is. It's backwards engineered. (0328-14-2 [Overland, Carol])

Comment: Since the plant started operations in 1973, there has not been one used fuel assembly that has left the city's boundaries. Every single spent fuel rod or fuel rod assembly is located either in the spent fuel pool or the casks stored next to the power plant. As of today, there are approximately 40 casks that store spent fuel assemblies, and it is anticipated at the end of the plant's operations there will be well over 100 casks that will store the spent fuel assemblies and any additional waste from decommissioning that cannot be properly disposed of. The continued storage of spent fuel outside the Prairie Island Plant is not something the city or even Xcel bargained for, and they will continue to remain there despite the best efforts of many people without any plausible plan for removal. This is a far-reaching effect that is literally impossible to quantify. It impacts the city and the citizens on every level, and will continue to do so until these casks are removed and the land is restored to its natural habitat. To continue storage now and after operations will have a chilling effect on the city and its long-term urban planning and growth. (0328-2-3 [Rauterkus, Ralph])

Comment: Radioactive waste in the form of spent fuel is a dangerous long-term problem. The D.C. Circuit Court decision we've been discussing here this evening described it as follows.

"Even though it is no longer useful for nuclear power, spent nuclear fuel poses a dangerous long-term health and environmental risk. It will remain dangerous for time spans seemingly beyond human comprehension." The growing volume of spent nuclear fuel which may reach 150,000 metric tons by the year 2050 is a serious problem. It is clear that no one really knows what to do with the waste. That's the dilemma that the NRC finds itself in, the hole that you've dug yourself in. "The delay in finding a permanent repository," said the Circuit Court again, "has required plants to expand storage pools, and to pack spent nuclear fuel more densely within them. The lack of progress on a permanent repository has caused considerable uncertainty regarding the environmental effects of temporary spent nuclear fuel storage and the reasonableness of continuing to license and relicense nuclear reactors." (0328-4-3 [Taylor, Wallace])

Comment: In addition, the Blue Ribbon Commission on America's Nuclear Future has said that we may already be at a point where more than one permanent repository is necessary. If we keep making more nuclear waste, how many repositories are we going to need that we'll never have a place for, and can never solve the problem. (0328-4-4 [Taylor, Wallace])

Comment: We have the technology to safely develop a geologic repository for used nuclear fuel and we have the money to do so. The only thing blocking the United States from building a geologic repository is the political will to move ahead. (0328-5-10 [Pickens, Terry])

Comment: A schedule needs to be established and then adhered to leading to the removal of used nuclear fuel from commercial nuclear power plants in a reasonable period of time. (0328-5-12 [Pickens, Terry])

Comment: Until the Federal government fulfills its obligation to remove the used fuel from our plant sites, we are committed to responsibly operating used fuel storage facilities safely and to ensuring we have adequate funds to decommission our plants, and to safely maintain our storage facilities for as long as used fuel remains at our site. (0328-5-13 [Pickens, Terry])

Comment: We believe that the United States must effectively, efficiently, and safely manage the byproducts associated with the use of nuclear energy, and the Federal action is long overdue. The Federal government is required by contract and law to remove used fuel from our plant sites in Minnesota, and we are committed to working with the Prairie Island Indian Community, the cities of Red Wing and Monticello, the counties of Goodhue, Sherburne, and Wright, and our State and Federal legislators and regulators to see that this is accomplished. Having confidence that the Federal government will live up to its commitment to safely manage and dispose of used nuclear fuel generated at commercial nuclear power plants is essential to our energy security. (0328-5-2 [Pickens, Terry])

Comment: The NRC correctly concluded that it is feasible to have a mined geologic repository available within 60 years after the licensed operating life of a nuclear power plant. There are no technical obstacles to achieving this, nor are there any financial obstacles. Xcel Energy's customers have paid more than \$400 million into the Nuclear Waste Fund, and along with payments from customers of other U.S. nuclear power plants, have accrued a balance in the Nuclear Waste Fund of more than \$26 billion. (0328-5-3 [Pickens, Terry])

Comment: There is strong international scientific consensus that geologic disposal is the best solution to permanently isolate used nuclear fuel from the public and the environment. Studies by the National Academy of Sciences and the International Atomic Energy Agency have confirmed this conclusion. (0328-5-4 [Pickens, Terry])

Comment: Sweden and Finland are developing geologic disposal facilities, and are expected to begin disposal of their used fuel by the early 2020s. France has selected and characterized a geologic region and is working to identify a site. Belgium, China, and the United Kingdom plan to start geologic disposal by 2050. The United States made significant progress towards geologic disposal. The Department of Energy documented its safety case in a license application and Final Environmental Impact Statement submitted to the Nuclear Regulatory Commission in 2008. (0328-5-5 [Pickens, Terry])

Comment: President Obama then appointed a Blue Ribbon Commission to examine nuclear waste management issues. The BERC concluded that a deep geologic repository is the scientifically preferred approach, and it recommended finding two or three alternative sites using a consent-based process. Legislation is pending in the United States Senate to begin the process of selecting alternative sites. (0328-5-7 [Pickens, Terry])

Comment: The Nuclear Regulatory Commission's Waste Confidence principles were struck down by a Federal court, as has been discussed, because there is no foreseeable solution for long-term radioactive waste storage that would meet three necessary requirements; namely, that it be scientifically sound, environmentally responsible, and publicly acceptable. Even the shorter term programs now in place for radioactive waste fail to protect the public, and fail to offer the requisite confidence that would justify continued generation of reactor waste. (0328-9-2 [LaForge, John])

Comment: And I've said this before, but the industry promised us to provide solutions in the future if we put our trust in them, and I think that's great that they're looking for solutions. But there can be no confidence until we have a solution and not only a proposed solution but an identified and tested solution. On that basis alone, there could be no waste confidence. (0329-14-4 [Sondheim, Steven])

Comment: Geological repositories for storing the waste, I don't believe we should be discussing this either because we know now that geology is not something that remains stable. It is unpredictable. Plate tectonics are constantly moving. We may be thinking or you guys may be thinking that you're storing waste into infinity, but things are occurring everyday underground that would make all people understand that putting it into a repository, no matter what state you think you could dump it in, is putting not just the state at risk but the entire country because there's nothing that we can predict anymore, as we're seeing with the super storms and climate changes and earthquakes happening everywhere. I mean, there's been no end in sight. (0329-15-4 [Star, Priscilla])

Comment: [W]e have some of the most amazing minds in the world working on this problem [what to do with the waste]. But the problem is we're not working on it together. And we're not starting from the roots. And the roots come from the Mother Earth. And it comes from the power that we extracted from her. And only the original people that know her well as a citizen to take the time to put everything aside because this is the only thing that is important to the survival of my daughter and myself on this planet right now. And I think we all know that in this room or wherever we are on this planet. We all know that. (0329-19-1 [Vandel, Niki])

Comment: Instead of assuming that spent fuel can be stored safely forever, the NRC should examine the probability that a repository will be successfully sited, the probability that a successfully sited repository will actually contain radiation, the degree to which a repository may leak radiation, and the public health and environmental consequences that may occur if a repository is not sited or if it effectively contains radioactivity. You know, these things are very

likely. The fact that we have not been able to come up with anything so far makes me really question our ability to do so. But, you know, we have to keep trying. But I have no confidence that the current Draft Environmental Impact Statement, the current plans for disposal of the nuclear waste we already have are adequate, safe, or sufficient. (0329-28-6 [Wilansky, Laura])

Comment: [W]e have to put all of our time and energy and greatest minds to dealing with the waste that we have now because we have no adequate safe method to deal with it. (0329-4-6 [Messer, Diane])

Comment: Storing radioactive waste in fuel pools and dry casks for an indefinite period of time, is no answer. We The People -- the American people -- count on our federal agencies to protect us. So protect us! Do your job. (0332-2 [Parks, Eric])

Comment: The costs of failure in cases of putative low-probability events, such as occurred in Fukushima, are too high for us to permit current ad hoc waste management methods to be accepted as justification for construction of more nuclear plants. I am not against developing more nuclear capacity per se, but it should not be done without a bullet-proof system for managing all nuclear waste; this has evaded all attempts thus far, and will never be developed if plant construction is permitted before its completion. (0333-3 [Balke, Karl])

Comment: The NRC should not express confidence in the safety of radioactive waste--rather, it should immediately and aggressively pursue safer storage options for this waste. Relying on a low probability of a catastrophe is a recipe for disaster. (0335-1 [Ehrlich, Jeremy])

Comment: The Nuclear Regulatory Commission's "waste confidence" principle was properly struck down by a federal court because, some 60 years into the commercial atomic age, it is patently obvious that there is no foreseeable "solution" for long-term radioactive waste storage that would attain three necessary and basic goals: scientifically-defensible, environmentally-responsible, and publicly-acceptable. (0336-2 [Lish, Christopher])

Comment: Not only is there no long-term solution for atomic waste in hand or on the horizon, the shorter-term programs now in place are inadequate from a public safety standpoint, and do not offer the requisite confidence to allow continued generation of radioactive waste. (0336-3 [Lish, Christopher])

Comment: This new proposed rule is only perpetuating the inevitable, putting off the proper storage of spent fuel and allowing nuclear reactor facilities to continue waster generation without adequate permanent repositories. (0339-2 [Wilmott, Emily])

Comment: I generally agree that all storage of spent nuclear fuel is generic in nature but with such a potent and powerful substance such as spent nuclear fuel and it's safe storage for what could possibly be longer than planned, all things should be considered. Hopefully we can find long term storage in the near future, but no one knows what the future has in plan for us. (0340-1 [Case, Ed])

Comment: The buildup of hundreds of tons of nuclear waste at sites throughout the nation - some 70,000 tons of high-level spent fuel plus even larger quantities of other nuclear waste product - is a serious problem that absolutely must be dealt with. It is a problem created by many men of good will, but insufficient foresight. Whether due to hubris or excessive confidence, ton after ton of nuclear waste has been generated and now we must deal with the toxic mess we have made. (0341-1-2 [Mermelstein, Richard])

Comment: I am concerned about the future of Duxbury Ma, 10 miles from the Pilgrim Plant. The plant's location near sea level and the recent safety issues are concerns. Also Plymouth never thought the city would become a waste depository. We need better plans and oversight. (0342-1 [Landgren, Nancy])

Comment: The promise of a repository for spent fuel, made 50 years ago was never fulfilled. The problems with such an undertaking have prevented this possibility. Now the "Waste Confidence" document alludes to the future storage possibility within 60 more years. (0344-1 [Heald, Deborah])

Comment: In seventy years of producing nuclear weapons and nuclear energy we have found no way to dispose of the resultant radioactive waste that will not threaten life on earth. There is no permanent waste repository. The Yucca Mountain team consisted of the best people we have with unlimited resources, yet they failed. They didn't fail due to incompetent management, they failed because they were given an impossible task. (0348-1 [Agnew, David] [Roscoe, Lee])

Comment: [T]he Department of Energy has a responsibility to make good on its commitment to receive and safely store the spent fuel for the long term. By doing so, locally stored spent fuel could be safely removed to a single or regional locations controlled by and protected by our national government. Please don't let the anarchists and un-informed anti-energy environmentalists block safe energy production and economic progress. (0350-2 [Martz, Robert])

Comment: In seventy years of producing nuclear weapons and nuclear energy we have found no way to dispose of the resultant radioactive waste that will not threaten life on earth. There is no permanent waste repository. The Yucca Mountain team consisted of the best people we have with unlimited resources, yet they failed. They didn't fail due to incompetent management, they failed because they were given an impossible task. (0352-1 [Roscoe, Lee])

Comment: The NRC must now admit that no safe, permanent repository exists, and that 70,000 tons of accumulated nuclear waste may be permanently stored at reactor sites. The NRC must now thoroughly review Environmental Impacts of onsite storage, and consider safer alternatives to nuclear when licensing decisions come up. In response, the NRC is holding public hearings around the country to garner input on nuclear waste storage and licensing. (0357-1 [Daily, G. Allen])

Comment: 1. Our community was first told that "spent fuel waste" would be stored on-site for no longer than 5 years and no more than 540 assemblies. Today, 40 years later, we are asked to endure the storage of more than 4,400 assemblies for an indefinite period of time! (0358-3 [Schumann, Klaus])

Comment: We have no proven technology for safe storage of radioactive waste, and no national repository. (0368-2 [Mattox, Judy])

Comment: It is however, the Department of Energy's responsibility to make good on its commitment to receive and safely store the spent fuel for the long term. (0372-2 [Salas, Peggy])

Comment: Many are the hazards of nuclear power. Among the most intractable difficulties to resolve is the long-term storage of spent fuel rods. In seventy years of producing nuclear weapons and nuclear energy we have found no way to dispose of the resultant radioactive waste that will not threaten life on earth. There is no permanent waste repository. The Yucca Mountain team consisted of the best people we have with unlimited resources, yet they failed.

They didn't fail due to incompetent management, they failed because they were given an impossible task. (0373-1 [O'Malley, Brian])

Comment: U.S. Conference of Mayors Resolution June, 2012: The U.S. Conference of Mayors called on DOE to focus on storage of radioactive waste on-site, as the best opportunity for communities to avoid further health and environmental impacts from waste from nuclear facilities (0377-2-18 [Cuthbert, Lewis])

Comment: EPRI is pleased to provide the attached bibliography of EPRI publications that provide information and analysis related to NRC's Waste Confidence GEIS. EPRI requests that the relevant NRC Waste Confidence staff review the EPRI publications for potential use in preparing the final Waste Confidence GEIS. *Geologic Disposal of Used Fuel and HLW EPRI Review of Geologic Disposal for Used Fuel and High Level Radioactive Waste: Volume IV—Lessons Learned*. EPRI, Palo Alto, CA: 2010. 1021057.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001021057>

The effective termination of the Yucca Mountain program by the U.S. Administration in 2009 has further delayed the construction and operation of a permanent disposal facility for used fuel and high level radioactive waste (HLW) in the United States. In concert with this decision, the President directed the Energy Secretary to establish the Blue Ribbon Commission on America's Nuclear Future to review and provide recommendations on options for managing used fuel and HLW. EPRI is uniquely positioned to provide an independent scientific and technical perspective on used fuel and HLW management as well as related impacts of alternate nuclear fuel cycles. While there are, in fact, numerous options for managing the wastes associated with the nuclear fuel cycle, all waste management and fuel cycle alternatives eventually require permanent disposal for some form and amount of long-lived radioactive material. The disposal of used fuel and HLW is often mischaracterized as an intractable problem. To the contrary, there exists today an international consensus on the appropriateness and capability of deep geologic disposal to provide long-term isolation of used fuel and HLW from the biosphere. This consensus has emerged from more than five decades of scientific study and peer-review, technical and regulatory developments, and site selection and characterization. This report, *Lessons Learned*, is the final volume of a four-volume series, entitled *EPRI Review of Geologic Disposal for Used Fuel and High Level Radioactive Waste*, which surveys and evaluates past, present, and planned disposal options gleaned from a half-century of geologic disposal efforts in the United States and abroad. EPRI's review of technical and nontechnical elements deemed critical for successful implementation of a repository program has identified a number of lessons learned in the following areas: 1) laws, regulations, and institutional and financial arrangements; 2) site screening, selection, and characterization; 3) repository design concepts; 4) independent peer review and advisory bodies; and 5) stakeholder and public involvement. (0379-13 [Kessler, John])

Comment: *EPRI Review of Geologic Disposal for Used Fuel and High Level Radioactive Waste: Volume III—Review of National Repository Programs*. EPRI, Palo Alto, CA: 2010. 1021614.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001021614>;

Most nations pursuing a permanent disposal path for used fuel and HLW are now considering or implementing a deep geologic disposal program. These programs represent a collective source of experience and knowledge that may prove useful for informing the development of a post-Yucca-Mountain disposal strategy and program in the United States. This report reviews and summarizes the approach, developments, and status of national deep geologic disposal programs in a number of countries. *EPRI Review of Geologic Disposal for Used Fuel and High Level Radioactive Waste: Volume II--U.S. Regulations for Geologic Disposal*. EPRI, Palo Alto,

CA: 2010. 1021384.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001021384>;

This report reviews the development and evolution of U.S. standards, regulations, and siting guidelines for the disposal of used fuel and HLW. The report also highlights important elements and aspects of the U.S. regulatory framework that play a critical role in the development, design, and licensing of a geologic repository for used fuel and HLW and that could inform revision of existing regulations or development of new ones. *EPRI Review of Geologic Disposal for Used Fuel and High Level Radioactive Waste: Volume I—The U.S. Site Selection Process Prior to the Nuclear Waste Policy Amendments Act*. EPRI, Palo Alto, CA: 2010. 1021056.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001021056>;

This report reviews the nuanced history of the process for screening, selecting, and characterizing suitable sites for hosting a permanent deep geologic repository. The report also highlights important elements and aspects of U.S. site selection efforts predating the 1987 Amendment of the NWPA, which effectively ended site selection and moved the United States into exclusive site-specific characterization. *EPRI Yucca Mountain Total System Performance Assessment Code (IMARC) Version 10: Model Description and Analyses*. EPRI, Palo Alto, CA: 2009. 1018712.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001018712>;

This report summarizes EPRI's repository performance assessment code, Integrated Multiple Assumptions and Release Code (IMARC) Version 10, beginning with an overview of the code, followed by detailed descriptions of individual IMARC components, including linkages, testing, and benchmarking. Major IMARC features, events and processes (FEPs) are also described, with emphasis on climate change; net infiltration; focusing of unsaturated zone groundwater flow; groundwater percolation into repository drifts; degradation of drip shields, cladding, and waste packages; waste form dissolution; radionuclide transport through the drifts, unsaturated zone, and saturated zone; and multiple exposure pathways in the biosphere. The report also describes how combinations of embedded numerical sub-models are coupled with stand-alone analyses and lookup tables to evaluate annual radiological doses to the RMEI. Results from selected IMARC 10 analyses and sensitivity studies are presented. (0379-14 [Kessler, John])

Comment: EPRI is pleased to provide the attached bibliography of EPRI publications that provide information and analysis related to NRC's Waste Confidence GEIS. EPRI requests that the relevant NRC Waste Confidence staff review the EPRI publications for potential use in preparing the final Waste Confidence GEIS.

Occupational Risk Consequences of the Department of Energy's Approach to Repository Design, Performance Assessment and Operation in the Yucca Mountain License Application.

EPRI, Palo Alto, CA: 2008. 1018058.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001018058>

This report reviewed the DOE-proposed approach to Yucca Mountain repository design, performance assessment, and operation and identifies elements that may have the potential to increase occupational health risks of nuclear and non-nuclear workers relative to those that would be encountered if the DOE had taken a more realistic approach in its 2008 license application.

Feasibility of Direct Disposal of Dual-Purpose Canisters in a High-Level Waste Repository.

EPRI, Palo Alto, CA: 2008. 1018051.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001018051>

This report evaluates the feasibility and consequences of direct disposal of dual-purpose canisters (DPCs) in a deep geologic repository with respect to long-term performance of the Yucca Mountain repository system.

Feasibility of Direct Disposal of Dual-Purpose Canisters in a High-Level Waste Repository: Options for Assuring Criticality Control. EPRI, Palo Alto, CA: 2008. 1016629.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001016629>
The report presents calculated nuclear reactivities of two dual-purpose spent-fuel canisters to assess the feasibility, with respect to criticality control, of direct disposal of such canisters in a permanent geologic repository without the need for repackaging. Results show that criticality safety cannot always be unequivocally demonstrated through burnup credit alone, except by taking into account a sufficiently large number of neutron-absorbing fission products and reasonable values for biases and uncertainties. However, criticality control for direct disposal can be significantly enhanced with the inclusion of used burnable absorber rods in spent-fuel assemblies and loading patterns that minimize reactivity. (0379-15 [Kessler, John])

Comment: *Program on Technology Innovation: Room at the Mountain: Analysis of the Maximum Disposal Capacity for Commercial Spent Nuclear Fuel in a Yucca Mountain Repository.* EPRI, Palo Alto, CA: 2007. 1015046.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001015046>;
Projected expansion of nuclear power beyond the year 2014 will result in the need for commercial spent nuclear fuel (CSNF) management options in addition to the currently legislated CSNF storage capacity at the proposed Yucca Mountain geological repository. At present, 70,000 MTHM of storage capacity has been authorized, with a projection that 63,000 MTHM would be used for CSNF. This report extends preliminary analyses of the maximum physical capacity of the Yucca Mountain repository, presented in EPRI report 1013523. EPRI is confident that at least four times the current CSNF limit (~260,000 MTHM) and possibly upwards of nine times the limit (~570,000 MTHM) could be emplaced with additional site characterization. *Yucca Mountain Licensing Standard Options for Very Long Time Frames: Technical Bases for the Standard and Compliance Assessments.* EPRI, Palo Alto, CA: 2005. 1011754.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001011754>;
In the existing U.S. Environmental Protection Agency (EPA) and Nuclear Regulatory Commission (NRC) regulations governing the spent nuclear fuel and high-level radioactive waste site at Yucca Mountain, Nevada, the time period of compliance was set at 10,000 years. Recently, a Court ordered that EPA and NRC either revise the regulation on this topic to be "based upon and consistent with" recommendations made by a panel of the National Academy of Sciences, who recommended a time period of compliance out to as long as one million years, or seek congressional relief. This report summarizes the technical issues related to establishing a meaningful, reasonable, and implementable standard for such a long time period of compliance assuming no congressional action is taken. The report also makes a set of recommendations. (0379-16 [Kessler, John])

Comment: I am astounded by the stoic indifference to the obvious fact that after all these years there is no safe solution to the problem of what to do with the nuclear waste we've been accumulating. (0381-2 [Fasten, Susan])

Comment: The Department of Energy has a responsibility to make good on its commitment to receive and safely store the spent fuel for the long term. By doing so, locally store spent fuel could be safely removed to a single or regional locations controlled by and protected by the federal government. (0383-3 [Mordaunt, Brandon] [Mordaunt, Laura] [Mordaunt, Philip])

Comment: However, the Department of Energy has a responsibility to make good on its commitment to receive and safely store the spent fuel could be safely removed to a single or regional locations controlled by and protected by our national government. (0384-2 [Tannler, Sandra])

Comment: I do also think that it is very important for the Department of Energy to fulfill their commitment to receive and safely store spent nuclear fuel for the long run. The great work with on-site storage is much appreciated, but we will not be where we should be as a nation until the long term storage of nuclear fuel is available. Thank you for reading and please keep up the pressure on long term spent fuel storage. (0385-2 [Buckingham, Jeffrey])

Comment: [T]he Department of Energy has a responsibility to make good on its commitment to receive and safely store the spent fuel for the long term. By doing so, locally stored spent fuel could be safely removed to a single or regional locations controlled by and protected by our national government. (0386-2 [Thompson, Lydia])

Comment: While I am convinced that current storage systems at Diablo Canyon are acceptable, I urge the Department of Energy to find solutions to the long term spent fuel storage issue. The DOE must continue its efforts to educate the public about nuclear energy and storage, and support the President's Blue Ribbon Commission recommendations for development of a workable long term storage solution. (0388-3 [Cox, David])

Comment: [T]he Department of Energy has a responsibility to make good on its commitment to receive and safely store the spent fuel for the long term. By doing so, locally stored spent fuel could be safely removed to a single or regional locations controlled by and protected by our national government. (0391-2 [Trahey, Linda])

Comment: There is presently no safe way to transport, store or dispose of high-level radioactive waste, and it is unlikely that there will be in the foreseeable future. (0402-2 [Gross, Cheryl])

Comment: It is repeatedly obvious that there is no foreseeable solution for long-term radioactive waste storage that would attain environmental and public health basic goals. There are no solutions for atomic waste. (0403-1 [Brown, Deborah])

Comment: Yucca mountain leaks. The Finnish repository has been trying to figure out how to tell generations a million years out that they are encountering a nuclear hot spot when no written language or pictographic glyphs have been found in human history from that long ago. Nuke waste is a horrific burden on our children's children (0405-4 [Dugan, Pat])

Comment: I would like to see the Department of Energy take the responsibility to make good on its commitment to receive and safely store the spent fuel for the long term. (0408-2 [Watson, Jeannette])

Comment: The NRC should realize that the government has subsidized the nuclear industry and is partly responsible for the problem of the build up of nuclear waste. No solution is yet available for the safe disposal of this highly toxic substance. (0416-2 [Barnes, Kathryn])

Comment: Dr.Mary Sinclair said the only solution is to monitor it in safe, above -ground containers until it loses its toxicity. The deadly waste can be toxic for hundreds of thousands of years, so we should realize it is a long term problem with no short term solutions. (0416-4 [Barnes, Kathryn])

Comment: There is no scientifically proven solution for safely disposing of nuclear waste. (0417-8 [Clark, Terrence])

Comment: I am very appreciative of the opportunity to share my thoughts on the important topic of waste confidence and its relationship to the new "consent-based" siting approach for nuclear waste management facilities for interim storage and on a permanent geologic repository. The idea of local communities forming partnerships with implementers under the auspices of national governments appears to be gaining traction in countries opting for voluntary siting. Some version of this idea can be found in Sweden, the UK and Canada. The only catch here is that there must be a community that has the infrastructure, the real estate, a knowledgeable workforce, and educated citizens that understand both science and risk. I'm not sure that this community exists. (0421-2 [Clemons, Victoria])

Comment: In the UK, as well as in Canada the nuclear waste leadership role was removed from scientists and engineers, and the leadership was temporarily placed in the hands of very prominent individuals who developed new, radically different, policy proposals that took social aspects seriously and used social science as their tool. (0421-3 [Clemons, Victoria])

Comment: At this time I would also like to add that when discussing a permanent facility there are...in fact...TWO...quite different aspects to consider for storage of nuclear waste in a Geological Repository. The first is providing a place where nuclear waste can be securely stored and monitored in a safe and retrievable fashion ... and the second aspect is abandoning those wastes, closing and sealing the underground facility that will, at some point be, forever after, unmonitored, unmanned, unregulated and eternally beyond human control. (0421-5 [Clemons, Victoria])

Comment: Experience with Yucca Mountain indicates that there can be no confidence that geological storage can ever be available. Yucca Mountain became mired in scientific misconduct and lost the confidence of the neighboring communities. Any alternative site may well face the same fate. Regaining the confidence of the neighboring communities is essentially impossible once faith has been broken, so every proposed site will end up socially impossible. The NRC does not regulate the Department of Energy and thus can not guarantee that scientific misconduct or some other form of corruption will not wreck confidence in another site. The NRC does not regulate Congress and thus can not guarantee that legislative fiat will not wreck confidence in an objective and fair process. Because confidence is so contingent on such outside factors which are essentially social in nature, the NRC itself can have no confidence in the availability of geological storage at any time in the future. (0422-2 [Dudley, Chris])

Comment: Arjun Makhijani comments: "A worst-case event on the surface, especially in a sensitive area like San Onofre, is an order of magnitude more severe than worst case in deep geologic storage. Our goal should be to store waste in a way where the worst-case is not catastrophic. For that reason, we need a deep geological repository. We have done a terrible job on a national repository in this country. We need to work on a repository. All other solutions are much less adequate." Within the environmental community a level of unease has arisen from the sense that as isolated storage proved difficult to site, the GEIS exercise was undertaken to present on-site storage as equally safe and appropriate, thereby reducing or removing any sense of urgency in siting a remote geologic repository. (0431-13 [Pascall, Glenn] [Watland, George])

Comment: Given the total context, the GEIS approach is at best a default position in response to the difficulty of siting a national repository. More fundamentally, the EIS process appears unsuited to assessing the realities of managing long-term nuclear waste storage generally, and specifically in an era of high burn-up fuel use. Our bottom line conclusion: There remains no alternative but to continue the hard and necessary work of work "creating a safe, long-term

solution for managing and disposing of the nation's spent nuclear fuel and high-level radioactive waste," in the words of the NRC's Blue Ribbon Commission, which reported in January 2012. The BRC report recommends "immediate efforts to commence development of at least one geologic disposal facility and at least one consolidated storage facility, as well as efforts to prepare for the eventual large-scale transport of spent nuclear fuel and high-level waste from current storage sites to those facilities." (0431-15 [Pascall, Glenn] [Watland, George])

Comment: We recognize that development of this GEIS was undertaken as a required response to the June 8, 2012 finding of the U.S. Court of Appeals., D.C. Circuit, : that the NRC needed to more fully address impacts in two areas: in failing to secure permanent disposal for spent nuclear fuel and potential spent fuel pool leaks and spent fuel pool fires. Regarding permanent disposal, the NRC definition of Waste Confidence in NUREG 2157 reads as follows: Waste Confidence applies to the storage of spent fuel after the end of the licensed life of a nuclear reactor and before disposal in a permanent repository. The Waste Confidence criterion applies to an interim phase in a complete cycle of nuclear fuel storage. Thus, lack of a permanent repository as the end point makes development of an adequate Waste Confidence policy vastly more difficult and perhaps conceptually impossible. (0431-3 [Pascall, Glenn] [Watland, George])

Comment: We recognize that the current lack of a repository arises not from NRC policy, which We recognize to be supportive, but primarily from difficulties in gaining political and public approval for even a single repository site. Sierra Club policy on geologic storage at one or more remote and isolated sites was adopted by its Board of Directors on May 5, 1984. The policy statement begins, To reduce the grave and unacceptable risks posed by the existing and continued production of high-level nuclear waste without a demonstrated means of final disposition, the Sierra Club supports federal assumption of responsibility for the long-term, least hazardous isolation of spent nuclear fuel and high-level wastes. (0431-4 [Pascall, Glenn] [Watland, George])

Comment: From what I gather, there is no practical solution in sight for a permanent secure storage solution. (0436-2 [Patrick, Kay])

Comment: The most serious unresolved problem is the absence of any repository for the waste. Presently, since the Yucca Mountain site was rejected, there is no place for the spent fuel to be stored. (0437-2 [Kinnaird, Eleanor])

Comment: The NRC must accept that truth and act accordingly - not gloss over the fact that there is no foreseeable "solution" for long-term radioactive waste storage. (0443-6 [Sabo, Betty])

Comment: Even though the NRC has failed to solve where & how to store the waste from US nuclear reactors, they NRC has said they hope there will be a solution in the future. This citizen does not believe the NRC & suggests the NRC must do more than pre-suppose a solution will be found. The NRC has had DECADES to come up with their solution for storing nuclear reactor waste, yet has not offered a legitimate solution for this waste. And the nuclear reactors in America continue to create nuclear waste with no solution on where or how to store this highly toxic material. (0446-1 [Krause, Laurel])

Comment: What has the NRC been doing with their research staff? Do they not regard the need for a safe way to store nuclear reactor waste as important or imperative? Who's in charge at the NRC in this area? (0446-3 [Krause, Laurel])

Comment: unwarranted and unwise deference to the Blue Ribbon Commission by accepting the extreme delays in resolving the final deep geologic disposal of spent nuclear fuel and high level wastes (0447-1-7 [Andrews, Richard])

Comment: Promptly work with all other involved agencies to promptly site, build and commission into operation final deep geologic repositories for SNF and other radioactive wastes, within a time frame not to exceed 10 years from the present (0447-2-14 [Andrews, Richard])

Comment: For my entire life, the federal government has been promising the benefits of nuclear technology, but all we really have to show is piles of studies, massive wastes of public funds, a legacy of broken and false promises, while laying all the radioactive waste problems on our children and grandchildren. When I grew up in Kansas in the 1950s the AEC was planning for nuclear waste disposal in Kansas salt mines. That never happened. Nor has anything to resolve this radioactive waste disposal since. (0447-2-17 [Andrews, Richard])

Comment: The only legitimate reply to the courts should have been that NRC has no confidence that waste repositories will ever be available, and that continued on site storage of dangerous high level and spent fuel at reactor sites should be promptly eliminated to reduce the dangers to the public and the environment. (0447-2-2 [Andrews, Richard])

Comment: A totally different plan for the prompt and final disposal of all spent nuclear fuel and other radioactive wastes must be proposed that is accomplished in no more than ten years. I remind the NRC that the entire development and use of the first atomic weapons occurred in a shorter time frame, less than 4 to 5 years. Surely, with the political will and dedication, the NRC and associated federal agencies can perform within a similar time span. (0447-2-7 [Andrews, Richard])

Comment: It is not realistic to expect the federal government to provide a safe repository for nuclear fuel anytime soon. (0450-3 [Bast, Nancy])

Comment: Consequently, even if all of the nuclear waste which has accumulated until now is placed in hardened dry cask storage as soon as possible, there still will remain the problem of locating and building a permanent National Storage Site. (0454-8 [Waldstein, Joe])

Comment: I am writing to encourage the federal government to uphold their obligation of providing a national repository for used nuclear fuel currently being stored at Diablo Power Plant in San Luis Obispo County. It is currently being managed and safely stored by PG&E but nevertheless I have concerns as does much of the local community. PG & E has been a good steward of the property and I am most appreciative of the economic impact on the area and support Diablo's relicensing. (0457-1 [Burkhead, Elizabeth])

Comment: The storing of nuclear waste is a federal responsibility and the federal government needs to fulfill its obligation to remove the spent fuel. I will be looking to hearing more as to how this process will proceed. (0457-2 [Burkhead, Elizabeth])

Comment: There is strong international scientific consensus that geologic disposal is the best solution to permanently isolate spent nuclear fuel from the public and the environment. Studies by the National Academy of Sciences and the IAEA have confirmed this conclusion. (0461-2 [Pan, Arthur])

Comment: NRC also references international experience when deciding on what is a reasonable timeframe for finding a permanent repository - but there is no repository anywhere, in any country, and therefore no relevant international experience to draw from, and the DGEIS does not clarify what timeframes exactly it found reasonable by comparison. Of the fourteen other nuclear power-generating countries, only a handful intend to use direct disposal like the United States does, including Canada, Finland, Sweden, Spain, and South Korea. Of those, only one - Finland - has selected a repository location and begun construction. Sweden has a confirmed location, but because it was a volunteered location, Sweden's experience is inapplicable to the timeline analysis done by the NRC. Spain is still conducting research on deep disposal and has not selected a location, and South Korea is looking only at interim storage right now, starting in 2016.²¹ [footnote 21 text: World Nuclear Association, "Radioactive Waste Management" (updated Apr. 2012), available at <http://www.world-nuclear.org/info/Nuclear-Fuel-Cycle/Nuclear-Wastes/Radioactive-Waste-Management/> (last accessed Sept. 16, 2013).] Given this limited pool of comparison points, and the fact that no country at all has achieved direct disposal yet, the timeframe laid out by the NRC cannot be characterized as reasonable by comparison to international experience. Moreover, even if other countries had had more success, their experience would not be a basis for concluding that no spent fuel will remain in U.S. pools after 60 years post-licensed life. (0473-12-15 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: There is really no good option for storing nuclear waste for the tens of thousands of years required. (0477-4 [Tache, Jan])

Comment: The Federal Government must act in association with the Energy Companies to secure all spent fuel into permanent (dry cask in Yucca Mtn) storage. (0480-1 [Arnold, James])

Comment: Final deposit geological disposal dry storage casks no matter what the cost must be used for San Onofre spent fuel. We must get it out of here NOW! Not in 2 years, 5 years, 30 years, 60 years. Everyday we are playing Russian Roulette with Southern California's future. (0481-3 [Magda, Marni])

Comment: No nuclear waste should not continue to be stored at San Onofre.....The biggest mistake made was having no place to store nuclear waste and that was a known fact from the get go (0486-1 [Bourgeois, Paula])

Comment: I also feel that long term storage is needed once the isotopes have decayed to a level where the materials are safe to handle and transport without constant immersion in a cooling pond. I feel a deep repository such as Yucca Mountain is the ideal solution. (0488-2 [Watkins, Conor])

Comment: Today no safe and secure national nuclear waste geological repository exists, nor can nuclear fission be safely reversed engineered. (0490-1 [Chin, Rebecca])

Comment: The NRC and federal government failed to design a safe and secure nuclear waste solution, as promised by 1998. The United States has over 72,000 tons of high level radioactive toxic waste which must be stored for tens of thousands of years. (0490-2 [Chin, Rebecca])

Comment: The NRC's "waste confidence" principle was properly struck down by a federal court because, some 60 years into the commercial atomic age, it is patently obvious that there is no foreseeable "solution" for long-term radioactive waste storage that would attain three

necessary and basic goals: scientifically-defensible, environmentally-responsible and publicly-acceptable. (0491-1 [Commenters, Multiple])

Comment: Chairman McFarlane in a answer to questions by Representative Shumkus at a House Energy and Conservation Subcommittee meeting on or about 12/12/2013 stated that many actions and inactions had to await the will and financing of the Congress. I point out that when the Nation is thrown into a sequestration at the whim of one party that there is not much confidence that any safety is assured. That is exactly what has happened recently. I point out that the confidence that the NUREG 2157 and the Waste Confidence rulemaking hangs by a thread on the whims of the Congress. The present DGEIS makes little or no discussion on the appropriate and timely funding of radwaste management from the viewpoint of politics. Will the glaring omission of politics in the funding of safety for radioactive wastes be repaired before the NUREG 2157 issues? (0502-1 [Lewis, Marvin])

Comment: The Western Interstate Energy Board (WIEB) High-Level Radioactive Waste (HLRW) Committee appreciates the opportunity to review and comment on NRC's Waste Confidence Generic Environmental Impact Statement (GEIS) and Proposed Rule. We appreciate NRC's effort to provide opportunity for public input as it formulates its response to the June 2012 D.C. Circuit Court decision. We also appreciate that NRC cannot itself resolve the nation's issue regarding permanent disposal of commercial spent nuclear fuel (SNF); it can only regulate commercial utilities while other federal government branches and agencies attempt to resolve the issue--hopefully following the very sound recommendations made by the Blue Ribbon Commission on America's Nuclear Future (BRC) in January 2012. (0505-1 [Williams, Jim])

Comment: There needs to be an immediate placement of all dry casked fuel into long term storage, preferably at Yucca Mtn. No site is a proven contender for safe storage of spent fuel, however, the public would be better protected if we put all fuel that can be dry casked into that storage and sequester it in a geologically stable area. (0514-5 [Fahey, John])

Comment: You are urged to locate, study, and approve a storage area for spent nuclear fuel in the U.S. (0515-1 [Stennes, Nancy])

Comment: Find a way to store low level and high level nuclear waste on a permanent basis (nearly impossible in principle, since humans only live for 70-80 years or so). Find a safe storage area ASAP. Build it. Use it. (0515-5 [Stennes, Nancy])

Comment: We currently have no technically viable solution for safe, long-term storage (or disposal) of nuclear waste that has accumulated from 60(+) years of commercial nuclear power production -- and from other sources. (0522-1 [Rogers, William])

Comment: Because no Government knows how to handle the spent fuel "hot potato" in the long term, the problem has not even begun to be addressed. There is no good long term solution, but we do have a good short term solution[.] (0529-1 [Claybourne, Ana])

Comment: The new DGEIS means that extended on site spent fuel storage has the potential to become the default means of disposal, which is unacceptable from an environmental and social standpoint. (0531-1-12 [Morgan, Sally])

Comment: The new DGEIS means that extended on site spent fuel storage has the potential to become the default means of disposal, which is unacceptable from an environmental and social standpoint. (0531-2-12 [Morgan, Sally])

Comment: Despite two decades, billions of dollars and a federal mandate to do so, there is still no federal nuclear waste depository. Even if there was a federal repository, as of 2010, nuclear plants had already generated enough spent fuel to fill that repository. We would need a second, and there is no plan or Act of Congress on the table to address the issue. (0531-2-14 [Morgan, Sally])

Comment: If a community in the United State is to step forward and consent to host a repository [or even a centralized interim storage facility] that community must trust in the integrity of political and regulatory systems with which they are to consent. They are in effect entering into a contract on behalf of the safety of their citizens and, especially, in the case of the repository, the safety of their future generations. The Nuclear Waste Policy Act, as amended, that led eventually to selecting Yucca Mountain is such a statutory framework, enacted by Congress. It set forth a process for developing two repositories. This process was to be implemented by the Executive Branch and licensed and overseen by an independent Nuclear Regulatory Commission. Any prospective host community, today, will have to confront soberly the reality that the U.S. Government failed to implement its own nuclear waste law. Absent an Executive Branch willing to carry out a nuclear waste law enacted by the U.S. Congress, and overseen by a safety regulator, perceived as truly independent, how can any community going forward have confidence that this, or any other statutorily mandated path to a repository disposal solution, will, in fact, be honored and implemented? No attempt has been made in this proposal to address the impact of this breakdown in the public's ability to rely on its government or on NRC itself to comply with the Nation's own nuclear waste laws, especially in light of the recent ruling of the U.S. Court of Appeals., D.C Circuit. (0532-16 [Kotra, Janet])

Comment: It is important to recall, however, that the Commission also founded its confidence, both in 1984 and again in 1990, on confidence in the existence of a statutory framework enacted by a bipartisan U.S. Congress, setting forth a process for a path towards for the development of two geologic repositories. (0532-18 [Kotra, Janet])

Comment: Deep geologic disposal of spent nuclear fuel in an underground repository is widely agreed to be the best technical way to provide for that safety and security. It is still National Policy. It is still the Law of the Land. It is time the Commission awoke from its long slumber of disgrace and disregard of its responsibility as Independent Safety Authority in Chief and did its job. (0532-5 [Kotra, Janet])

Comment: The Commission is correct that there exists today a stronger technical basis for confidence in geological disposal. However, the Commission has failed to consider whether there exists sufficient social and political bases for continued confidence that such disposal can be realized and what those inadequacies imply for this rulemaking. Since 1984, the Commission has expressed, and later affirmed, its confidence that deep geologic disposal is feasible. Nothing since has emerged to lessen the NRC's confidence in the technical feasibility of repository disposal. That much is not in dispute. As this rulemaking notes, considerable additional scientific and engineering experience and evidence has reinforced the Commission's initial finding to this effect-much of it contributed quite ably by NRC scientists and engineers and their colleagues at the CNWRA. Also among the reasons for greater confidence are findings and recommendations by the President's Blue Ribbon Commission for America's Nuclear Future, which endorsed disposal in deep geologic repositories when selected using a consent-based process. (0532-7 [Kotra, Janet])

Comment: [First in 1984]"The passage of the Act provides evidence of a strong national commitment to the solution of the radioactive waste management problem." And [then in 1990] "Congress has aggressively demonstrated in both the NWPA of 1982 and the NWPAA of 1987 that is committed to an orderly progression of the repository program and a resolution of the radioactive waste disposal problem." This statutorily mandated process was to be implemented by the Executive Branch and licensed and overseen by an independent Nuclear Regulatory Commission. At no time during the Commission's deliberations leading to the original Waste Confidence Decision in 1984, its update in 1990, or its deferral in 1999, did the respective Commissions involved contemplate that the process laid out in statute would become corrupted and unworkable. Nor did the Commission anticipate that a subsequent Commission would later be unable or unwilling to carry out its statutory obligations as laid out in law. And sadly, no prior Commission could possibly have anticipated that a future chairman of a once revered independent safety regulator would subvert the Nation's Nuclear Waste Law and resign from the Commission in disgrace. (0532-8 [Kotra, Janet])

Comment: Yet, as documented in the recent ruling of the second highest Court in the land, this is precisely what has transpired. Surely, now, the Commission must, at a minimum, consider whether, in the absence of an Executive Branch willing to carry out a Nuclear Waste Law enacted by the U.S. Congress, there can exist any confidence that this or any other statutorily mandated path to a repository disposal solution, will, in fact, be realized. Therefore, because of these developments, the Commission should acknowledge that while it has solid confidence in the technical feasibility of deep repository disposal there exist little or no grounds for confidence in the social and political process necessary for it to be realized, pending new, comprehensive action by the Congress. (0532-9 [Kotra, Janet])

Comment: Spent fuel should be maintained such that it may be retrieved for future use as a potential resource. (0534-3 [Vetter, Richard])

Comment: No safe and secure national nuclear waste geological repository exists, nor can nuclear fission be safely reverse engineered. (0537-1 [Commenters, Multiple])

Comment: The federal government has failed to provide safe and secure nuclear waste solutions, as promised by 1998. Today the U.S. has over 72,000 tons of high level radioactive toxic waste which must be stored for tens of thousands of years. (0537-2 [Commenters, Multiple])

Comment: I am grateful we have a source of energy that supplies so much electricity locally with such a low environmental impact. It is my wish however that we invest more into research and development and eventually find a permanent solution to the nuclear waste issue rather than have on-site storage. (0538-2 [Kaul, Michelle])

Comment: I support the call by the Sierra Club for the NRC to create a safe, long-term solution for managing and disposing of the nation's spent nuclear fuel and high level radioactive waste. (0540-2 [Watland, George])

Comment: The Sierra Club's bottom line conclusion: There remains no alternative but to continue the hard and necessary work of "creating a safe, long-term solution for managing and disposing of the nation's spent nuclear fuel and high level radioactive waste," in the words of the Nuclear Regulatory Commission's Blue Ribbon Commission, which reported in January 2012. (0540-8 [Watland, George])

Comment: Countries like Finland face this very dangerous problem by creating underground storage carved out of solid rock. (0541-3 [Justesen, Evelyn])

Comment: Rule Package, FR 56794, first column towards bottom. The conclusion that repository disposal is feasible within 60 years after reactor operating life is correct, but the best reason for that conclusion should be added. The Yucca Mountain license application and NRC staff review of that application have shown a safe repository to be technically feasible. (0544-17 [Enriquez, Elizabeth])

Comment: GEIS Section 1.1, p. 1-3, lines 5-18. This is a discussion of the court cases that led to the ruling that an EIS was needed to address the effects of failing to secure permanent disposal. It is noted that the law suits were filed "in response to the 2010 [waste confidence] rulemaking." In essence, the Court said that not ever having a geologic repository is a reasonable possibility that must be addressed in an EIS because the NWPA defined path to a geologic repository is not currently available. The lawsuits that led to the 2010 waste confidence rule being overturned would likely have never been filed had NRC not made the unilateral decision to terminate Yucca Mountain licensing. In the interest of openness and transparency, the GEIS should recognize the fact that the Court of Appeals DC Circuit has now ruled that the unilateral actions directed by the former NRC chairman to suspend the Yucca Mountain licensing process were illegal. A writ of mandamus has been issued ordering NRC to restart the licensing process; and NRC has publicly stated it intends to complete and release the final Yucca Mountain Safety Evaluation Report. It is revisionist history to not recognize NRC's actions that led to the most recent waste confidence law suits and the eventual court ruling remanding the 2010 waste confidence rule. (0544-22 [Enriquez, Elizabeth])

Comment: On July 5, 1977 the Nuclear Regulatory Commission denied a petition of the Natural Resources Defense Council to conduct a rule making proceeding to determine whether radioactive wastes could be generated in nuclear power reactors and subsequently disposed of without undue risk to public health and safety.¹ [footnote 1 text: U.S. Nuclear Regulatory Commission. 1977. Natural Resources Defense Council: Denial of Petition for Rulemaking. Federal Register vol. 42, no. 128, p. 34391, et seq. July 5, 1977] The Commission stated in its denial that, as a matter of policy, it " ... would not continue to license reactors if it did not have reasonable confidence that the wastes could and would in due course be disposed of safely." Not long thereafter, the State of Minnesota and the New England Coalition on Nuclear Pollution challenged license amendments that permitted expansion of the capacity of spent fuel storage pools at the Prairie Island and Vermont Yankee nuclear power plants, respectively. In *Minnesota v. Nuclear Regulatory Commission*² [footnote 2 text: U.S. Court of Appeals for the District of Columbia Circuit. 1979. *Minnesota v. Nuclear Regulatory Commission*. No 78-1269. May 23, 1979], the U.S. Court of Appeals for the District of Columbia Circuit in 1979 rejected a ruling of the Atomic Safety and Licensing Appeal Board that under the National Environmental Policy Act, the requirement for a reasonable probability that when the plants' licenses expired an alternative means of disposing of the nuclear wasters would be available, found that such a finding was satisfied by a previous policy determination by the full Commission stating that alternative spent fuel repositories should be presumed to be available when needed. In rejecting this ruling, the Court of Appeals found that this policy statement did not suffice as the finding required under the National Environmental Policy Act, and directed the Commission to consider the question anew, in either an adjudicatory or informal proceeding. The Court of Appeals specified that the questions to be resolved in such a proceeding are (1) whether an alternative fuel disposal technology is reasonably likely to be developed by the expiration date of the plants' licenses, or if not (emphasis added), (2) whether there is reasonable assurance that the fuel can

be stored safely in the plants' spent fuel pools until an alternative technology is reasonably predicted to become available. (0544-3 [Enriquez, Elizabeth])

Comment: GEIS Section B.2.1, p. B-3, lines 30-36 states, "The NRC's review did not identify any issues that would challenge the feasibility of geological disposal." This is based on the analysis contained in Technical Evaluation Reports issued by NRC regarding Yucca Mountain Repository in the areas of safety before and after permanent closure. It should be noted that NRC is now under a writ of mandamus to restart the Yucca Mountain licensing process and NRC announced it will complete the Yucca Mountain Safety Evaluation Report. This GEIS should make a stronger statement about the safety of geologic disposal based on its Yucca Mountain review and if the Yucca Mountain Safety Evaluation Report is available at the time of this Final GEIS, it should be referenced instead of the Technical Evaluation Reports. (0544-31 [Enriquez, Elizabeth])

Comment: While it is agreed that the Yucca Mountain license application and NRC's review showed no technical or safety reasons that a repository could not be developed, the argument that the public support for the feasibility of geologic disposal can be drawn from the experience gained in the review of the Yucca Mountain license application is preposterous. Political actions to prevent the Nuclear Regulatory Commission staff from publishing their regulatory findings serves instead as an omen portending failure should any other repository program get near to the goal of demonstrating that a repository can be developed safely. The recent announcement that NRC will complete the Yucca Mountain Safety Evaluation Report does not change the fact that political manipulation occurred and the restart of the Yucca Mountain licensing process was forced by a court ordered writ of mandamus. (0544-32 [Enriquez, Elizabeth])

Comment: In a concurring opinion, Judge Tamm emphasized that the findings ordered by the court are required by the National Environmental Policy Act and the Atomic Energy Act, and that if the Commission determined that an alternative means of spent fuel disposal is not reasonably expected to be available when the plants' operating licenses expire, the question is then whether the use of spent fuel pools is an acceptable disposal method over an indefinite period of time. The order of the points made by Judge Tamm is significant. The question of whether the use of spent fuel pools was an acceptable method over an indefinite period would only be relevant after the Commission had determined that an alternative means of spent fuel disposal was not reasonably expected to be available when the plants' operating licenses expired. In Judge Tamm's words: "I write separately to emphasize my belief that section 102(2)(C) of the National Environmental Policy Act of 1969 and section 103(d) of the Atomic Energy Act of 1954, mandate the determination that the Commission identified in this case. In addition, if the Commission determines it is not reasonably probable that an offsite waste disposal solution will be available when the licenses of the plants in question expire, it then must determine whether it is reasonably probable that the spent fuel can be stored safely onsite for an indefinite period. Answers to these inquiries are essential for adequate consideration of the safety and environmental standards of the relevant statutes." The original Waste Confidence Decision and the first two updates shared an attribute that made them meaningful as a response to the Natural Resources Defense Council petition and the Minnesota lawsuit; it could be said that the Federal Government at least endeavored to be responsive to the situation that led to the petition and lawsuit. As long as there was a meaningful commitment to disposal, plagued as it was by inefficiency and missteps, a defensible argument could be made that there was evidence of a solution pathway. With the third update of the Waste Confidence Decision in 2010 along with NRC's illegal unilateral action to terminate the Yucca Mountain licensing process, that commitment and evidence was erased. (0544-4 [Enriquez, Elizabeth])

Comment: Technical Feasibility vs Repository Availability Appendix B of the GEIS purportedly addresses two relevant topics from earlier versions of Waste Confidence decisions: the technical feasibility of a repository and availability of repository capacity. The discussion on Technical Feasibility of a Repository suggests that there is scientific consensus that safe geologic disposal is achievable with currently available technology, that it is viable, and that acceptable sites can be identified. Unfortunately, none of those arguments is a sufficient basis for a defensible demonstration that disposal capability will be available in the United States on a schedule consistent with reasonably short storage periods following reactor license termination. Arguments about siting repository facilities in other countries are of little relevance in the United States' situation. Local communities in foreign countries have autonomy in opting to participate in repository development. In the United States the willingness of local communities appears to be overridden by State primacy, and to date, no state has shown willingness to even be considered for repository siting. Further, the stringency of the U.S. regulatory structure is not comparable to that of other countries. (0544-6 [Enriquez, Elizabeth])

Comment: The 2010 NRC waste confidence rule was remanded by the Court of Appeals for the DC Circuit in 2012 primarily because the NRC's analysis leading to that rule did not evaluate the environmental effects of failing to secure permanent disposal. The lack of a permanent disposal option is the direct result of the heads of the NRC and Department of Energy (DOE) taking steps to terminate the Yucca Mountain Repository despite the requirement to continue the program under Federal law in the Nuclear Waste Policy Act (NWPA). In essence, the Court said that not ever having a geologic repository is a reasonable possibility that must be addressed in an EIS because there is no certainty to the NWPA defined path to a geologic repository. The lawsuits that led to the 2010 waste confidence rule being overturned would likely have never been filed had NRC not made the unilateral decision to terminate Yucca Mountain licensing. (0544-7 [Enriquez, Elizabeth])

Comment: Our society is moving in a dark direction when, rather than using our resources to make our mechanized industrial complex of energy and manufacturing safer for all of us, we are following a path to the bottom... profit and mediocrity take the place of common sense and safety for all of our lives. The easiest road seems to be to maintain status quo, even when common sense tells us that it will not lead to our best results in the long-term. This road is supported and fed by those who are most vested in the shorter-term outcomes, without concern for the long-term ones. The more difficult road is that which takes the most short-term resources to form, because it looks at the long-term outcome and forms its basis therein. The easy road is the road to oblivion over time. We are now seeing the consequences of taking the easy road for generations; in skyrocketing cancer and disease rates in our country; in super storms that are just beginning to reveal the onset of symptoms of climate change that scientific consensus is overwhelming that is man-made; in vesting our collective focus on economic profit-motives over protection and safety considerations, that result in all-of-theaforementioned consequences. It is time that our mode of corporate, legislative, regulatory, and social behavior put priorities where we all know that they must reside: --Safety of human life first; --Safety of human social interaction next; --Safety of human economics next. In other words, all the money in the world will not accomodate a wish for millions of unhealthy lives into healthy lives. (0546-1 [Pace, Gregory])

Comment: The NRC should redouble efforts with other federal agencies and Congress to develop a permanent spent fuel repository. (0548-4 [Gibson, Bruce])

Comment: Finally, as you are certainly aware, a nationwide solution for permanent spent fuel storage has been delayed for far too long. The permits for DCPD did not imagine that the

indefinite storage of spent fuel onsite -and such storage is an obvious added risk to residents of this county. We would again urge the NRC to accelerate work with other federal agencies and Congress to advance a permanent solution. (0548-9 [Gibson, Bruce])

Comment: Additionally there is strong international scientific consensus that geologic disposal is the best solution to permanently isolate spent nuclear fuel from the public and the environment. Studies by the National Academy of Sciences and the International Atomic Energy Agency have confirmed this conclusion (0549-2 [Williams, Robert])

Comment: That solution cannot be abandonment in a deep underground dump. (0552-1-12 [Macks, Vic])

Comment: No storage facility has yet been designed that can contain radioactive waste for such periods of time. (0552-1-3 [Macks, Vic])

Comment: No technology has yet been proven capable of containing radioactive waste for the hundreds, thousands, or millions of years necessary to protect people and the environment. We have no experience, beyond 70 years with how highly radioactive spent fuel rods will behave. The U.S. has failed even to identify a viable site for a nuclear waste repository despite two decades, billions of dollars, and a federal mandate to do so. (0552-1-7 [Macks, Vic])

Comment: Notwithstanding, our nation must also pursue an agreed-upon site for permanent disposal. (0555-5 [Contreras, Raquel])

Comment: For over three decades, the NRC has assumed that an offsite permanent repository would be available for licensees to send their spent fuel at the end of the reactor's operations. The assumption has never had any factual basis, and history has proved it was flatly wrong. Nonetheless, the faulty assumption has been embedded in NRC rules, effectively preventing state officials and the public from litigating spent fuel issues in licensing proceedings. In 2012, the D.C. Circuit Court ruled that NRC could no longer presume the existence of a repository and must do an EIS to address the impacts on public health and safety if spent fuel is not deposited in a repository. (0556-1-2 [Lampert, Mary])

Comment: NRC should go back to the drawing-board with a new EIS. Instead of assuming that spent fuel can be stored safely forever, NRC should examine the problem, and provide a proper analysis regarding:

- The probability that a repository for spent fuel will be successfully sited.
- The probability that a successfully sited repository will actually contain radiation and the consequences if it does not.
- The real public health and environmental consequences that may occur if a repository is not sited and storage remains on site, using: site specific analyses; credible and supported assumptions; and PRA using quantitative factors, supplemented by qualitative factors, and a consequence code updated from lessons learned at Fukushima. (0556-3-8 [Lampert, Mary])

Comment: Having said that, it is incumbent upon the Department of Energy to find and implement long term solutions for spent fuel storage. The public needs to be educated on the issue of safe storage of nuclear fuel waste. The DOE needs to support the President's Blue Ribbon Commission recommendations for development of a long-term storage solution. Diablo Canyon is a critical asset in our regions electrical grid and needs to have the long term spent fuel storage system resolved for its longer term viability. (0557-2 [Johnson, Ray])

Comment: While the NRC may hope that a permanent repository for spent nuclear fuel is operational in 60 years, given the history and status of Yucca Mountain, notwithstanding directives of Congress, that belief is not universally held. (0558-3 [Strell, Ethan])

Comment: The Savannah River Site (SRS), located near Aiken, South Carolina, is a Department of Energy facility that historically produced tritium, plutonium, and other nuclear materials. Past disposal practices at the SRS resulted in significant site contamination, and the SRS was placed on the Environmental Protection Agency's National Priorities List in 1989. Site investigations identified contamination in groundwater, sediments and surface water that included arsenic, cadmium, lead, mercury, plutonium, radium, and tritium, among others. Multiple groundwater plumes were discovered, and remediation will take decades to complete. To avoid the risk of similar contamination due to at-reactor or away-from-reactor storage of radioactive spent nuclear fuel, DNR urges the approval and construction of a permanent, geologic repository such as the proposed Yucca Mountain Repository in Nye County, Nevada. (0560-2 [Vejdani, Vivianne])

Comment: Frankly, I can't think of many WORSE places to store nuclear waste than most of the places we are currently storing it nationally: Invariably near population centers, because that's where the energy was/is produced. (0562-10 [Hoffman, Ace])

Comment: Geologic storage, if we choose that route, will not be easy and will not be risk free. And we're nowhere near it at this point. (0562-5 [Hoffman, Ace])

Comment: You are urged to locate, study, and approve a storage area for spent nuclear fuel in the U.S. (0566-1 [Tocornal, John])

Comment: Find a way to store low level and high level nuclear waste on a permanent basis (nearly impossible in principle, since humans only live for 70-80 years or so). Find a safe storage area ASAP. Build it. Use it. (0566-6 [Tocornal, John])

Comment: Nuclear fuel has been stored at reactor sites in the United States for many years and it can remain there for many more years; however, I believe Congress should act to address a permanent storage facility or consider recycling options in a more appropriate and permanent way. (0568-1 [Michael, Edward])

Comment: I would love for you to locate, study, and approve a storage area for spent nuclear fuel in the U.S. which is NOT located adjacent to an operating nuclear generating facility. Since this technology was initially developed for the military, it makes sense to locate it on a military reservation, downwind of the USA, inland, but near the East Coast. (0569-1 [Hulstrunk, Matt])

Comment: The nuclear waste problem cannot be solved by our present technology. We should therefore scrap nuclear energy technology and focus our attention to figuring out a way to safely store the existing nuclear waste (oxymoron). (0572-1 [Fisher, Peter])

Comment: [T]he Department of Energy has a responsibility to make good on its commitment to receive and safely store the spent fuel for the long term. By doing so, locally stored spent fuel could be safely removed to a single or regional locations controlled by and protected by our national government. (0574-2 [French, Walter])

Comment: We have multiple nuclear power sites in the USA, not having a depository for spent fuel reflects negligent management. Let's make this right. Our children's lives are on the line. California is earthquake country, this is a disaster waiting to happen. (0583-2 [Connoy, Gina])

Comment: No one wants spent fuel storage. Why in heaven & hell's names was there no SAFE TRANSPORT & STORAGE established before now when it becomes so critical. (0594-1 [Individual, Anonymous])

Comment: While nuclear energy is a vital part of our state's electricity portfolio and economy, we recognize the need to address the transportation, storage and disposal of used nuclear fuel. It is the federal government's statutory responsibility to remove used fuel from nuclear energy facilities. Under federal law, this was to have started in 1998-15 years ago-but so far, the federal government has not moved a single used fuel assembly. (0598-5 [Wicks, Tonja])

Comment: Additionally there is strong international scientific consensus that geologic disposal is the best solution to permanently isolate spent nuclear fuel from the public and the environment. Studies by the National Academy of Sciences and the International Atomic Energy Agency have confirmed this conclusion. (0601-2 [Manfredi, Timonhy])

Comment: Section 1. The City of San Clemente formally requests the creation of a repository to provide safe storage of nuclear waste. Section 2. Once complete the City of San Clemente requests that the spent fuel rods stored onsite at SONGS be prioritized for relocation to the repository as soon as it is safe to do so, in light of a) the geographic conditions unique to SONGS, b) the dense population surrounding SONGS, and c) the fact that SONGS is being decommissioned. (0605-2 [Baade, Joanne])

Comment: Now is when public safety should be paramount. (0609-6 [Leon, Vicki])

Comment: In June 2012, the U.S. Court of Appeals for the D.C. Circuit vacated the NRC's 2010 Waste Confidence Decision and Temporary Storage Rule and remanded them to the agency for study of the environmental impacts of storing spent fuel indefinitely if no permanent nuclear waste repository is licensed or if licensing of a repository is substantially delayed. Spent nuclear fuel remains highly dangerous for prolonged periods. It has long-lived radioactive materials in it that can seriously contaminate the environment and harm public health if released. Additionally, spent nuclear fuel contains plutonium-239, a radiotoxic element that can be used to make nuclear weapons if separated from the other materials in the fuel. Plutonium-239 has a half-life of over 24,000 years. The development of nuclear power has gone on in this country for at least six decades with the federal government promising that it would soon find a permanent repository for the highly radioactive waste produced by the reactors. It has repeatedly failed to live up to that promise, putting production ahead of disposal issues. The confidence, that has been shown in the past, has not proved to be very trustworthy. Therefore many more years needs to be devoted to looking into securing this nation's spent nuclear fuel waste stream. (0610-4 [Breachin, Vernon])

Comment: The NRC has failed to fully examine: --the probability or improbability that a geologic repository will be successfully sited for storage of spent fuel including high burn up fuel; (0611-10 [Shapiro, Susan])

Comment: [The NRC has failed to fully examine] the probability or improbability a repository may leak radiation (0611-11 [Shapiro, Susan])

Comment: Burial is the only allowed method of disposal of nuclear waste, yet burial for geological reasons untenable. Since Reagan's Executive Order the only permitted method of disposal of radioactive waste has been geologic burial. However to date no safe and secure burial systems have been indentified, developed and constructed by the NRC. Yucca Mountain in Nevada failed because it was found to be geologically unsound for 10,000 years. Current NRC Commissioner Allison McFarland's own study found that Yucca Mountain was to unstable and porous to contain radioactive waste. The Court's held storing 1000's of tons of radioactive waste underground for 100's of year was not safe to human health, and our drinking water supplies. Prior attempts at geological burial have also failed. The Salt mines in Kansas were also found to also be geologically unsound due to prior oil, gas and coal mining drilling making the ground unstable. Imagine what fracking has done to de-stabilize the ground through out the United States today. (0611-26 [Shapiro, Susan])

Comment: Human knowledge is limited, we do not know and cannot know the results of 100's or 1000's of years fission from nuclear waste will have on any containment structures. Yet, to date no safe burial location has been or can be identified because there is no place on earth that is geological stable enough to sequester radiation for hundred of thousands years. Already billions of taxpayer dollars have been wasted on failed attempts to find a national repository. The NRC must accept the reality that geological repository is not a sustainable option. There is not now or nor will there ever be safe burial ground for large quantities of radioactive waste. (0611-28 [Shapiro, Susan])

Comment: The situation in the state of Illinois is such that we have the largest number of reactors with no real solution to the issue of nuclear power plant waste, except to store it at site. With the failure of the federal government to have sane foreign policy or domestic policy, these large masses of spent nuclear waste are NOT SAFE. This is not a question of the soundness of design of the cask that the spent nuclear waste is stored in. It's a question of the fact that it is there at all. (0612-3 [Takarabe, Tamae])

Comment: I find it very difficult to believe anyone can, in good conscience, state that we can safely continue to create nuclear energy at Diablo Nuclear Power Plant when there is no known safe way to dispose of such dangerous waste material. (0613-1 [Blake, Elisabeth])

Comment: Our town shares the same zip code as San Onofre, and now you want us to share the nuclear waste, possibly forever. When the plant was built, you promised that the waste would never remain here, and now you are reneging on that promise. (0618-2 [Johnson, Roger])

Comment: The Tribe has a number of concerns regarding the draft GEIS. And, for reasons we articulate below, we have grave concerns that the conclusions made in the draft GEIS will become the default policy of the United States government-that spent nuclear fuel can safely stored on-site indefinitely-and that there will be no reason to enforce current law (i.e., the Nuclear Waste Policy Act) or pursue new legislation (i.e., recommendations of the Blue Ribbon Commission) that would require the removal of spent nuclear fuel from Prairie Island. (0619-1-1 [Mahowald, Philip R.])

Comment: When nuclear power plants were originally constructed, it was understood by the public and host communities that the plants would operate for 40 years and then, following decommissioning, the site would be released for some other purpose. Under the NRC's short-term scenario, the PINGP and its ISFSI will have been on Prairie Island for at least 121 years, with one license renewal, or 141 years with two renewals. Under the NRC's longer-term scenario, the timeframe would be 221 or 241 years. This was not what was contemplated when

PIN GP Units 1 and 2 were approved, or when the ISFSI was approved. Because the plant is built and the ISFSI is constructed there is nothing host communities can do. (0619-1-11 [Mahowald, Philip R.]

Comment: The draft GEIS optimistically states that the NRC believes that a repository could be available by the end of the short-term (60 years) because the DOE has expressed its intention to provide repository space by 2048. The 2048 date was included in the DOE's strategy to implement the BRC's 2012 recommendations. There is nothing to suggest that the DOE will meet this goal; legislation that could implement the BRC/DOE's recommendations is stalled in the Senate with no companion version in the House. (0619-1-12 [Mahowald, Philip R.]

Comment: We remain frustrated and discouraged that the "temporary" storage facility has become permanent storage. The PINGP ISFSI license will be renewed repeatedly during the longterm and indefinite storage terms, because to deny a license renewal application is, in effect, the same as approving the license renewal application. Denying the application does nothing. The waste stays on site. (0619-1-6 [Mahowald, Philip R.]

Comment: That it is also feasible to have a mined geological repository within 60 years of a reactor's post-operational period repeats the same "confidence" expressed decades ago that a safe and secure repository/dump for the waste then on hand and for the foreseeable future would exist. (0620-3 [Rivera, Evelyn])

Comment: In 1977 my first child was born. At about that same time I began reading about nuclear power plants and nuclear energy in particular. I was horrified then. Particularly about the spent fuel and how or where it was ever going to be safely stored. But I read that even though the technology hadn't been invented then to take care of the waste, research was ongoing and scientists were sure to develop a solution soon. (0625-1 [Mandrell, Rebecca])

Comment: Well, nothing has been developed to store this waste safely and it appears there can never be a safe answer. (0625-3 [Mandrell, Rebecca])

Comment: First, Citizens like me have no confidence that spent nuclear fuel can be safely stored, short of finishing Yucca Mountain and sending it there. (0628-1 [Perkins, V.E.]

Comment: [T]he obstacles to any state (like Nevada) accepting a geologic depository will never disappear. Unless Congress passes legislation FORCING Nevada to accept a permanent depository, (which does not seem too likely), it will not do so. (0628-5 [Perkins, V.E.]

Comment: The only responsible solution is to bury this waste in a geologically safe repository below ground. Finland and Sweden are doing this. We almost did it at Yucca. However, that site had geological and political complications making it a poor choice. The search must continue for a safe site. (0633-2 [Kurz, Carol])

Comment: How irresponsible we have been in creating nuclear waste without having a means of its safe disposal. Perhaps once northern Japan becomes too dangerous for human occupation, it could be used for worldwide nuclear waste disposal. I have no confidence that you will come up with a better idea. (0635-2 [Bernhoft, Eric])

Comment: I am not a scientist but can grasp that we cannot take shortcuts with waste. I suggest continued study with experts, communities, agencies, legislators and all other

stakeholders involved in transparent process to address the waste legacy that will plague generations. (0636-5 [Bluestein, Bonnie])

Comment: But we must first raise again the primary statement in our December 31, 2012 letter commenting on the scoping process for the Waste Confidence Environmental Impact Statement that the Commission must, as its first principle, continue to hold to its long-established tenant that it does not endorse the indefinite on-site storage of Spent Nuclear Fuel (and Greater-Than-Class-C Waste -SNF/GTCC). (0637-2 [Norton, Wayne])

Comment: The Commission and staff should remember that after publication of the rule and GEIS, it will still be responsible for ensuring that its future regulatory programs and policies do not foster indefinite on-site storage, either intentionally or unintentionally. We are aware that the Commission does not set national policy. It must be careful not to do so passively by ignoring its role in setting safety policy and standards for the nation's nuclear licensees and contractors. In this vein, the U.S. government, currently represented by the Department of Energy, is the contractor that is obligated to remove the material from licensee ISFSIs. The Department is long in default of its obligations. The Commission must ensure that its own safety and security policies do not encourage future default into an indefinite timeframe. Such future defaults act to the detriment of the Commission's stated intention. We continue to encourage the Commission and staff to embark upon an analysis and statement of the best practices for storage while we wait for the federal government to fulfill its obligations to your licensees as well as the nation's ratepayers and taxpayers. (0637-5 [Norton, Wayne])

Comment: Of course public safety is not on the NEI's radar, but it needs to be at the center of the waste issue. (0640-9 [Geary, B.])

Comment: Notwithstanding, our nation must also pursue an agreed-upon site for permanent disposal. (0642-5 [Picking, Brian])

Comment: Intelligent people have already spent many hours and millions of U.S. taxpayer monies proving that current U.S. temporary storage of spent nuclear fuel is safe. We must not continue to waste tax monies on continued studies for political reasons. (0644-1 [Chunglo, Steve])

Comment: The 1984 first "Waste Confidence" decision, asserting that safe geologic disposal is technically feasible, that a repository would be available, and the following \$10 Billion U.S. dollar expenditure for mining and testing of the Yucca Mountain repository were all a very successful use of tax and utility funds. We need to get the Yucca Mountain Repository back on track, approve the license, complete the site, and move the spent fuel to the repository. The U.S. needs to quit squandering Tax and Utility funds on political grandstanding which has taken our country technically backwards, and get back to becoming a world leader in the complete nuclear fuel cycle which we lost in the 1970s. (0644-2 [Chunglo, Steve])

Comment: APV strongly disagrees with the NRC's plan for "indefinite storage" at reactor sites. It is ridiculous to ask the public to believe that these deadly materials, many with radioactive half-lives that make them dangerous hundreds of thousands of years into the future, can be left lying around without a serious plan for their ultimate disposal. (0648-5 [Price, Scott])

Comment: Put public safety ahead of industry profits; prevent the NRC from allowing nuclear waste to be stored on site indefinitely. Nuclear waste is forever. (0650-1 [Crowley, Lawrence])

Comment: The reality of being close to safe SNF storage plan has been a con job from day one. (0652-3 [Maurer, William])

Comment: Face it, the current nuclear reactor sites are and will continue to be de facto nuclear waste dump sites for an indeterminable period of time into the future. The NRC, DOE and nuclear energy industry need to man up and tell the truth....you're no closer to having a realistically safe storage plan for the long term (100 + years) or the indefinite term, than you were 50 years ago. (0652-5 [Maurer, William])

Comment: It is time to stop the nuclear waste con and make it a national priority to find real solutions to stop this ticking time bomb before it is too late. (0660-5 [Headrick, Gary])

Comment: Make it a national priority to come up with real solutions to long term nuclear waste storage[.] (0660-6 [Headrick, Gary])

Comment: The repository should be designed to permit ongoing monitoring of containers to prevent leaks into our land, water and air and designed for retrieval and repackaging if leaks occur. Replaceable filters will be used to capture radioactive gas. Ongoing radiation monitors will be used on site as well as a citizens monitoring network in the surrounding communities. A system to deter wildlife will be in place powered by a renewable energy system. Site will be well marked to deter visitors and explanation of site posted in all languages. Site will be well guarded. Site may include separation of dry cask storage waste from liquid/ transuranic wastes to promote easier monitoring and replacement of containers. Repository will not be sited until all nuclear power plants are closed and the generation of nuclear waste at commercial facilities ceases. Time line for this is five years. (0662-9 [McClintock, Francene])

Comment: Why can't it be more than adequately wrapped and packaged to insure safe shipping, protecting it from accidents of any kind. kind, shipped. Then to be stored underground in New Mexico with the rest of the Nuclear Waste. (0664-1 [BojeLebs, Nannette])

Comment: NRC Chairman, Allison Macfarlane, recently expressed in an interview - "I encourage countries embarking on nuclear power to make sure that they have a plan for disposal, before they turn on a reactor!" So ever-mindful of ENVIRONMENTAL JUSTICE, the D.O.E. or our state MUST locate a suitable remote repository for this waste when it's SAFE to transport away from San Onofre. (0665-5 [van Thillo, Grace])

Comment: When our organization was formed over 44 years ago, in response to plans to construct a nuclear plant on the NH Seacoast, we were told confidently that the nuclear industry could handle this waste and that the government would come up with a permanent solution to isolate it for tens of thousands of years. The NRC's "waste confidence" principle was properly struck down by a federal court because, some 60 years into the commercial atomic age, it is patently obvious that there is no foreseeable "solution" for long-term radioactive waste storage that is scientifically defensible, environmentally responsible and publicly acceptable. (0680-1 [Bogen, Doug])

Comment: [T]he Department of Energy has a responsibility to make good on its commitment to receive and safely store the spent fuel for the long term. By doing so, locally stored spent fuel could be safely removed to a single or regional locations controlled by AND protected by our national government until a cost effective way of recycling portions of the stored fuel can be determined and realized. (0682-3 [Adam, Peter])

Comment: [T]he Department of Energy has a responsibility to make good on its commitment to receive and safely store the spent fuel for the long term. By doing so, locally stored spent fuel could be safely removed to a single or regional locations controlled by AND protected by our national government until a cost effective way of recycling portions of the stored fuel can be determined and realized. (0683-3 [Nelson, Bob])

Comment: It is also important to note that the Waste Confidence Decision and Rule depends on a finding that *disposal* capacity will be available. Measurable progress is being made in several countries toward development of a repository as a prudent and viable long term strategy for spent fuel and high-level waste management. A repository is currently prescribed by the Nuclear Waste Policy Act. Deep geologic repositories have been accepted for decades by international experts as a cornerstone of any spent fuel management paradigm. (0685-9 [Davis, Ed])

Comment: It is commonly known that there is no place in the US that currently can provide for the long term storage of the nuclear waste the ancestors of future generations are creating today. The first and only such repository in the world is Onkalo, Finland. The planning for Onkalo began in 1994 and excavation began in 2004. The projected completion of phase 4, the encapsulation and burial of areas filled with spent fuel is projected to begin around 2020. The estimated cost of this project is about 818 million Euros. The State Nuclear Waste Management Fund has currently saved approximately 1.4 billion Euros from charges paid by customers for generated electricity. This cost should be paid for by the industry owners, before profits are distributed to shareholders and not charged to the users of electricity. It is a cost of production that should not be paid for by the government, but the businesses who created the expense. Onkalo is expected to accept canisters of spent fuel for about 100 yrs; around 2120. At that time, the site will be buried and the access tunnel sealed, for Eternity. In 2012, The Royal Institute of Technology in Stockholm Sweden published research suggesting that the copper capsules designed to hold the fuel rods are not as corrosion safe as they were claimed to be. Remedies for this are being studied. Already the world's only repository is needing to be upgraded. Released in 2010, the documentary film INTO ETERNITY's director Michael Madson interviews the Onkalo experts for answers to important questions: How much waste will there be to store? How do you know it can be safely stored for 1000. 100,000 yrs? How long can we keep creating nuclear waste? Can we guarantee even when we store it in bedrock that the earth will remain stable? Can we insure future generations won't disturb Onkalo? Why should we be afraid of human intrusion into Onkalo? Is it possible another Ice Age might occur? What if the knowledge of the existence of Onkalo is lost? Will there ever be another world war like the two in the 20th century that might disturb this site? How many of these sites will the world need? How much will the total cost be? Who should pay these costs? The answers to these questions are critical and need to be taken seriously in making the decision about not continuing the mistakes of the past - the development of nuclear power for providing electricity. Please view this film right away and become educated. When asked if the designers and scientists working on Onkalo had a message for the future generations- their response was: Stay Away; You should not have come to this place; Create a better world for the future." (0686-14 [Malboeuf, Simone])

Comment: The notion that the Federal Government should build/fund a repository for the waste products of this industry that has been highly profitable to shareholders over the past 60 years at least, is wrong. We, the tax payers, are the ones funding the government. This means we, the electricity users, would be funding the costs of the largest expense for the owners/shareholders of the nuclear power industry. That is the oldest trick in the book. You create the mess. You clean it up. Only, you really can't in this scenario. The mess is too big to

be cleaned up. In addition, the idea that this waste should be buried in the Earth is dangerous. We cannot predict what seismic or other "natural disasters" are in store for the Earth in the future. We can only react to them to the best of our ability. What would be the consequence of a nuclear explosion deep within the bedrock of the earth? Nobody knows, not even the smartest and wisest "scientists", though they may be asked to suggest the probability that nothing bad would happen. If paid enough money, people may say anything which may then be promoted as the "truth". What we do to the Earth, we do to ourselves and our future generations. The Earth is a living organism. How much abuse can its environment take before it reacts in self defense? (0686-17 [Malboeuf, Simone])

Comment: Instead of assuming that spent fuel can be stored safely forever, NRC should examine: --the probability that a repository will be successfully sited --the probability that a successfully sited repository will actually contain radiation --the degree to which a repository may leak radiation, and --the public health and environmental consequences that may occur if a repository is not sited or it ineffectively contains radioactivity. (0687-7 [Wilansky, Laura])

Comment: Radioactive waste in the form of spent fuel is a dangerous long-term problem. As the court described it in *New York v. NRC*, supra, at 474: After four to six years of use in a reactor, nuclear fuel rods can no longer efficiently produce energy and are considered "spent nuclear fuel" ("SNF"). Blue Ribbon Commission on America's Nuclear Future, Report to the Secretary of Energy 10-11 (2012). Fuel rods are thermally hot when removed from reactors and emit great amounts of radiation --enough to be fatal in minutes to someone in the immediate vicinity. Id. Therefore, the rods are transferred to racks within deep, water-filled pools for cooling and to protect workers from radiation. After the fuel has cooled, it may be transferred to dry storage, which consists of large concrete and steel "casks." Most SNF, however, will remain in spent-fuel pools until a permanent disposal solution is available. Id. at 11. Even though it is no longer useful for nuclear power, SNF poses a dangerous, long-term health and environmental risk. It will remain dangerous "for time spans seemingly beyond human comprehension." *Nuclear Energy Inst., Inc. v. EPA*, 373 F.3d 1251, 1258 (D.C. Cir. 2004)(per curiam). Determining how to dispose of the growing volume of SNF, which may reach 150,000 metric tons by the year 2050, is a serious problem. See, Blue Ribbon Commission, supra, at 14. And it is clear that no one really knows what to do with that waste. Again, quoting from *New York v. NRC*, supra, at 474: The delay [in finding a permanent repository] has required plants to expand storage pools and to pack SNF more densely within them. The lack of progress on a permanent repository has caused considerable uncertainty regarding the environmental effects of temporary SNF storage and the reasonableness of continuing to license and relicense nuclear reactors. (emphasis added). (0688-6 [Taylor, Wallace])

Comment: In addition, the Blue Ribbon Commission on America's Nuclear Future has said that we may already be at a point where more than one permanent repository is necessary. As noted in *New York v. NRC*, at this point there is no possibility of finding even one permanent repository in sight. Thus, as we continue to make more spent fuel, the problem becomes worse. (0688-7 [Taylor, Wallace])

Comment: The federal government devotes inordinate amounts of time, money and energy to fighting (and eventually paying) legitimate damage claims by utilities, shutting down ongoing licensing reviews (i.e., Yucca Mountain), and addressing regulatory issues like Waste Confidence. Such efforts would be completely unnecessary if the federal government would simply do its job with respect to used fuel management, as called for by the law. (0689-4 [Boyd, David])

Comment: Strong, bipartisan support remains for carrying out the provisions of the NWPA as passed by Congress decades ago, and your input about NRC funding needs would be valued and helpful in making more timely progress. Such actions will go a long way toward giving our members, other stakeholders, and the public the assurance that the federal government will make good on its obligation. (0689-6 [Boyd, David])

Comment: The Federal government to the detriment and harm of citizens throughout the United States has postponed finding a permanent waste removal site for nuclear waste from its nuclear reactor plants and the Hanford Nuclear reservation where nuclear bombs were produced. (0690-1 [Eisman, Val])

Comment: This country must resolve the issue of where to put our existing waste and fuel pools most empty their rods before we see a Fukushima happen in this country. (0690-7 [Eisman, Val])

Comment: These issues include that there is currently no scientifically demonstrated method nor licensed long term nuclear waste management repository for tens of thousands of metric tons of high-level nuclear waste in the United States[.] (0691-2 [Gunter, Paul])

Comment: There is no public or scientifically demonstrated confidence in a likely permanent repository, or repositories, operable in the foreseeable future that can confidently withstand the tens of thousands of years that radioactive waste will be hazardous. (0691-7 [Gunter, Paul])

Comment: •The NRC's errant efforts allowed petitioners in *New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012) to argue in their opening brief that "over fifty years after beginning the search for a repository, the United States is no further along in finding [a] permanent disposal solution for nuclear waste than it was in the 1970s." The D.C. Circuit Court in its June 8, 2012, ruling in that case went so far as to declare that "[t]he Commission apparently has no long-term plan other than hoping for a geologic repository." It was that June 8, 2012, ruling, decided against the NRC, that precipitated this waste confidence rulemaking. The NRC's actions and inactions provided the National Association of Regulatory Utility Commissioners (NARUC) with powerful ammunition in its successful action against the DOE seeking to discontinue utility payments into the Nuclear Waste Fund (NWF). Absent NRC's enforcement of its own Licensing Board's denial¹⁶ [footnote 16 text: LBP-10-11 dated June 29, 2010; available in ADAMS (<http://adams.nrc.gov/wba/>) at Accession Number ML101800299.] of the DOE motion to withdraw the Yucca Mountain application- creating a fiction that the NWPA had somehow been repealed and therefore that Yucca Mountain was no longer "[a]pprov[ed] . . . for the development of a repository for the disposal of high-level radioactive waste and spent nuclear fuel,"¹⁷ [footnote 17 text: Public Law 107-200.]-the Secretary of Energy was reduced to presenting "an enormous range of possible costs" as a basis for arguing that utility payments into the NWF should continue. In its ruling, dated November 19, 2013, the D.C. Circuit Court held that the Secretary's "presentation reminds us of the lawyer's song in the musical, 'Chicago,' - 'Give them the old razzle dazzle.'" Had the NRC abided by the NWPA, this entire, expensive, time-consuming litigation would have been avoided. (0692-7 [Skov, Jeff])

Comment: •The US stated preference for highly radioactive waste to be safely disposed in a geological repository. •Enough nuclear spent fuel at present, 70,000 tons, to fill a Yucca Mountain sized repository. •No geological repository anywhere in sight and by the time we identify and approve a single one, we will need two repositories. This estimate is based only on the existing reactors and no new ones producing more waste. (0693-1-4 [Warren, Barbara])

Comment: •Original licensing decisions reflected reactor lifetimes of 40 years. Operating for double that time increases the amount of spent fuel generated and stored on-site. •Over 50 years ago, government promoted nuclear energy by assuring the public that nuclear waste was an easy problem to solve. Instead the public has been forced to accept ever increasing inventories of nuclear waste as the government's default position after failing to site a repository. (0693-3-5 [Warren, Barbara])

Comment: •In just 26 years, the NRC changed its predictions of interim on-site storage from a maximum of 70 years to 240+years +, including indefinitely. (0693-3-6 [Warren, Barbara])

Comment: •A repository is not yet sited and approved and yet we have enough waste today to fill a repository the size of the Yucca Mountain proposal, 70,000 tons. By 2050 even with no new nuclear reactors, we will need 2 repositories. (0693-3-7 [Warren, Barbara])

Comment: The truth is that we do NOT have any viable technology for "safely" storing "spent" fuel. (0695-1 [Fast, Wendy])

Comment: The United State's current stockpile of nuclear waste, about 80,000 tons, will remain toxic for thousands of years and scientists have not found a storage facility that will be able to house the amount of waste we have let alone for the amount of time it will need to be safeguarded from the risks of both natural disasters and outside attacks. (0700-1 [Women's Action for New Direction, Georgia])

Comment: Due to Plate Tectonics a Permanent Indefinite Storage Site does not exist on the Planet. (0701-2 [Wilson, Greg])

Comment: A related concern is that the DGEIS and proposed rule accommodates a default position that would result in the stranding of Spent Nuclear Fuel (SNF) at nuclear plants or Independent Spent Fuel Storage Installations (ISFSI) at scores of locations in dozens of states on a permanent basis. Such an outcome would contradict national policy and commitments as set forth in the Nuclear Waste Policy Act of 1982, 42 USC 10101 et seq., and the Standard Contracts entered into between the U.S. Department of Energy (DOE) and our nation's nuclear utilities,³ [footnote 3 text: 10 C.F.R. Part 961 - Standard Contract for Disposal of Spent Nuclear Fuel And/or High-Level Radioactive Waste.] pursuant to which our nation's utility ratepayers have now paid more than \$37 billion to cover the costs of fees charged under the Standard Contract for a permanent repository for the safe and proper disposal of SNF. (0704-3 [Callen, Ronald C.] [Keskey, Donald L.]

Comment: The history of the nuclear waste repository program is replete with failures and demonstrates, as the DC Circuit found, there should be no assurance there will be sufficient mined geologic repository capacity. 1. The first failed efforts. In 1957-1958, the Atomic Energy Commission (AEC) conducted the first site specific study of the disposal of high-level radioactive waste in salt at Hutchinson, Kansas. Between 1961 and 1963, the AEC conducted experiments at the Cary salt mine at Lyons, Kansas. In 1970 the AEC, along with the Kansas governor, announced tentative selection of the Cary salt mine for a demonstration high-level waste repository. Opposition, primarily by the Kansas Geological Survey, and concerns over conditions in the mine, the presence of numerous oil and gas well in the vicinity, and the fact that there was solution mining at an operating adjacent salt mine operated by American Salt Company forced the AEC to abandoned the site by 1972. Following the demise of the Lyons repository effort, the AEC announced in 1972 that it intended to develop a 100-year Retrievable Surface Storage Facility (RSSF). This proposal was opposed by the Environmental Protection

Agency (EPA) and others because in their view it would divert attention and resources from efforts to find a permanent means of geologic disposal. As a consequence of this opposition the Energy Research and Development Agency (ERDA) gave up its plans for a RSSF in 1975. Between 1975 and 1982, ERDA and the DOE continued to search for potential repository sites in various rock types in the states of Michigan, Ohio, New York, Utah, Texas, Louisiana, Mississippi, Washington, and Nevada. Various degrees of resistance from state and local representatives combined with geological and technical problems stalled efforts to find a repository site. In 1976 President Gerald Ford halted the reprocessing of commercial nuclear fuel. In the following year President Jimmy Carter reinforced the ban on commercial reprocessing and tried to halt the development of commercial breeder reactor development. These actions reinforced the need for prompt development of a geologic repository. In 1977 ERDA also announced that it would accept custody of commercial spent fuel and store it at Away From Reactor (AFR) storage facilities. It never happened. (0706-4-15 [Fettus, Geoffrey])

Comment: 2. The IRG Process[.] In the mid-1970s it became clear that commercial spent fuel reprocessing was uneconomical, environmentally unsound, and represented a serious proliferation risk. President Gerald Ford refused to subsidize the completion of the Barnwell reprocessing plant, and then President Jimmy Carter pulled the plug on reprocessing. The actions by Presidents Ford and Carter gave a new urgency to finding a site suitable for geologic disposal of both spent fuel and high-level radioactive waste. In the late 1970s President Carter initiated an Interagency Review Group (IRG) process to solve once and for all the nuclear waste problem in the United States. The IRG process involved numerous scientists, extensive public involvement, and a consultation and concurrence role for the states. The outcome of the IRG effort was a two-track program. The DOE was tasked with the responsibility for identifying the best repository site in the country, and the EPA and the NRC were tasked with developing nuclear waste disposal criteria against which the selection and development of the final repository site would be judged. 3. The Nuclear Waste Policy Act[.] In 1982, Congress enacted the NWPA, which embodied in law the principal recommendations that grew out of the IRG process, including a commitment to geologic disposal, two repositories, and characterization of three sites before final selection of the first repository. The NWPA established a comprehensive program for the disposal of spent nuclear fuel and high-level radioactive waste (HLW) from the nation's commercial reactors and nuclear weapons complex. At the time the NWPA was passed nearly 25 years ago, the U.S. Government enjoyed fairly widespread support from within the Congress, the environmental community and state governments for the site selection and development process proposed by the IRG. Now, decades later, the U.S. Government has little, if any, support from the State of Nevada, and virtually no public support from the environment and public health community for the proposed Yucca Mountain project. (0706-4-16 [Fettus, Geoffrey])

Comment: 4. What else went wrong? A whole host of things, but suffice to say that over the last twenty years, a substantial segment of the environmental community believes the process of developing, licensing, and setting environmental and oversight standards for the proposed repository have been, and continue to be rigged or dramatically weakened to ensure the licensability of the site rather than provide safety for the length of time the waste is dangerous. The site selection process and the radiation standards are examples that illuminate this perspective and conclusively demonstrate that the NRC has no basis for finding reasonable assurance that sufficient mined geologic repository capacity can reasonably be expected to be available at any time, even within 50-60 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of any reactor to dispose of the commercial high-level nuclear waste and spent fuel originating in such reactor and generated up to that time. a. Site Selection[.] First, DOE and then the Congress corrupted the site selection process.

The original strategy contemplated DOE choosing the best four or five geologic media, then selecting a best candidate site in each media alternative, then narrowing the choices to the best three alternatives, and then picking a preferred site for the first of two repositories. Site selection guidelines were strongly criticized as DOE was accused of selecting sites that they had previously planned to pick. In May of 1986 DOE announced that it was abandoning a search for a second repository, and it had narrowed the candidate sites from nine to three, leaving in the mix the Hanford Reservation in Washington (in basalt), Deaf Smith Co., Texas (in bedded salt), and Yucca Mountain in Nevada (in unsaturated volcanic tuff). All equity in the site selection process was lost in 1987, when the Congress, confronted with a potentially huge cost of characterizing three sites, amended the NWPA of 1982, directing DOE to abandon the two-repository strategy and to develop only the Yucca Mountain site. At the time, Yucca Mountain was DOE's preferred site. The abandonment of the NWPA site selection process led directly to the loss of support from the State of Nevada, diminished Congressional support (except to ensure that the proposed Yucca site remains the sole site), and less meaningful public support for the Yucca Mountain project. The situation has only deteriorated since that time. (0706-4-17 [Fettus, Geoffrey])

Comment: b. Radiation Standards[.] The second track of the process has, if possible, fared worse. Section 121 of the NWPA of 1982 directs EPA to establish generally applicable standards to protect the general environment from offsite releases from radioactive materials in repositories and directs the NRC to issue technical requirements and criteria. Unfortunately, it has been clear for years that the projected failures of the geologic isolation at Yucca Mountain are the determining factor in EPA's standards. EPA repeatedly issued standards that are concerned more with licensing the site than establishing protective standards. EPA's original 1985 standards were vacated in part because the EPA had failed to fulfill its separate duty under the Safe Drinking Water Act, 42 U.S.C. §300h, to assure that underground sources of water will not be "endangered" by any underground injection. *Natural Resources Defense Council v. Environmental Protection Agency* (NRDC v. EPA), 824 F.2d 1258 (1st Cir. 1987). EPA's second attempt to at setting standards that allow for a projected failure of geological isolation was again vacated, this time by the United States Court of Appeals for the D.C. Circuit. The D.C. Circuit found that EPA's Yucca Mountain rule (and the corresponding NRC standard), which ended its period required compliance with the terms of those rules at 10,000 years was not "based upon or consistent with" the recommendations of the National Academy of Sciences ("NAS") as required by the 1992 Energy Policy Act and therefore must be vacated. *Nuclear Energy Institute, Inc. v. EPA*, 373 F.3d 1251 (2004). Giving significant deference to the agency, the D.C. Circuit did not vacate EPA's strangely configured compliance boundary for the Yucca Mountain site. See Appendix A to these comments for a map of EPA's compliance boundary (inside the oddly drawn line, the repository need not protect water quality and radiation can leak in any amount). The dramatically irregular line that represents the point of compliance has little precedent in the realm of environmental protection, and its shape is perhaps more reminiscent of gerrymandered political districts. Rather than promulgate protective groundwater standards, EPA pieced together a "controlled area" that both anticipates and allows for a plume of radioactive contamination that will spread several miles from the repository toward existing farming communities that depend solely on groundwater and perhaps through future communities closer to the site. EPA's next proposed and revised rule, issued in 2005, retained the 15 millirem/year and groundwater standards for the first 10,000 years, but then establishes 350 millirem/year standard for the period after 10,000 years and does away with the groundwater standard entirely. This two-tiered standard failed to comply with the law and fails to protect public health, especially if the repository's engineered barriers were to fail earlier than DOE predicts. On October 15, 2008, EPA published the final version of its revised Yucca Mountain rule in the Federal Register ("2008 Yucca Mountain rule," 73 Fed. Reg. 61255-

61289). The 2008 Yucca Mountain rule's two-tiered individual protection annual dose standard establishes an initial 15 millirem first-tier limit, but weakens that limit to 100 millirem in the period after 10,000 years, when EPA projects peak dose to occur. Peak dose could occur significantly earlier if engineered barriers fail earlier than DOE and EPA have projected. (0706-4-18 [Fettus, Geoffrey])

Comment: The final status of EPA's most recent two-tiered rule remains fundamentally uncertain. In an action pending in the District of Columbia Circuit (*State of Nevada v. Environmental Protection Agency*, No. 08-1327, consolidated with No. 08-1345), Nevada has challenged EPA's 2008 Yucca Mountain rule as once again failing to honor EPA's statutory duty to protect public health and safety, and to proceed consistently with the National Academy of Science's recommendations. (0706-4-19 [Fettus, Geoffrey])

Comment: Even more troubling, any continued confidence in a reasonable assurance of a repository being available 50 or 60 years after license expiration of any commercial reactor is contingent entirely upon Congress revising (1) the current law that limits the United States to one repository, the proposed Yucca Mountain site[.] (0706-4-20 [Fettus, Geoffrey])

Comment: [T]he spent fuel and high-level waste stored at this one repository will be limited to 70,000 metric tons of heavy metal equivalent. Therefore, the current, and only repository under review in this country, could not even accommodate all of the spent fuel from existing reactors without new legislation, much less spent fuel from any new reactors that might be built. A second repository would also require new legislation and, as the proposals acknowledge, such a situation would almost certainly require new NRC regulations. Moreover, the NRC has failed to analyze the impact on future repository requirements of this proposed decision which would potentially place no limits on the total inventory of spent fuel generated by existing and future reactors. (0706-4-21 [Fettus, Geoffrey])

Comment: Appendix B is the closest NRC comes to addressing its responsibilities under the AEA. But the NRC's assertion its "underlying conclusions regarding the technical feasibility for continued storage and repository availability... continue to undergird its environmental analysis" has little merit. See Draft GEIS at B-1. NRC asserts repository capacity will be available to dispose of spent fuel. *Id.* at B-2. The last few years alone should be enough to persuade NRC not to put such deep faith or confidence in the availability of a repository and we recommend close scrutiny of Appendix A to these comments. We are far from a publicly accepted process of developing repositories, much a publicly accepted site. Further, generalizations about the technical feasibility of "a" repository do not answer the question of whether repository capacity will be sufficient to accommodate the spent fuel that will be generated in the future by reactors that have not yet been licensed or re-licensed. And the technical feasibility of some repository provides no comfort or guarantee there will be a repository with sufficient capacity available at the necessary time. Thus, the D.C. Circuit directed NRC to comply with NEPA in *New York et al.* In Appendix A to this set of comments, we detail the sad history of failure in attempts to develop repository and storage sites. (0706-4-5 [Fettus, Geoffrey])

Comment: Such a story should ensure the agency commits to do the work necessary to both develop better storage options and do a substantially better job of analyzing the environmental impacts of potentially permanent surface spent fuel storage. (0706-4-6 [Fettus, Geoffrey])

Comment: [T]he US District Court of Appeals threw out the NRC's Confidence Decision on June 8, 2012. The NRC must now admit that no safe, permanent repository exists, and that 70,000 tons of accumulated nuclear waste may be permanently stored at reactor sites. The

NRC must now thoroughly review Environmental Impacts of onsite storage, and consider safer alternatives to nuclear when licensing decisions come up. Given that the court has verified that no permanent, safe storage solution is likely to be found[.] (0707-2 [Werner, Shahla M.]

Comment: The second point I have to make is that radioactive "cleanup" is a misleading expression. It suggests to the listener that we can somehow get rid of radioactive "contamination." But we cannot do so, at least not in any absolute terms. All we can do is move the radioactive contamination from one place to another and find a place to isolate and manage it for a quarter of a million years. Governments and their electorates have been misled by the nuclear industry into believing false notions about radioactive waste. (0708-5 [Lewison, Linda])

Comment: This December 2013 marks 71 years since the first generation of high level nuclear waste and the world still does not know what to do with the very first cupful. (0713-1 [Keegan, Michael J.]

Comment: After 71 years what is known is that there is no good solution. We are left with the lesser of evils. All solutions are temporary and there is no disposal. Simply you can't get rid of it. (0713-3 [Keegan, Michael J.]

Comment: The Jig is up. There may have been a day, several decades ago when it was thought that there would one day be a solution. What is now known is that there is no solution, just bad options with costs which will be borne by thousands of generations to come. This entire process is the next level of the Confidence Game. (0713-5 [Keegan, Michael J.]

Comment: Since the California Commission Report there have been at least two additional failed attempts to locate a geologic repository – one in the Northeast and one in the Southwest (the Yucca Mountain project). There is still, to this day, not a single example of an operational repository for the "disposal" of irradiated nuclear fuel anywhere in the world. (0714-1-11 [Edwards, Gordon])

Comment: The safe permanent disposal of nuclear waste is a dubious concept with no precise scientific meaning. In other words, there are no measurable or scientifically verifiable criteria that will determine whether "safe permanent disposal" has or has not been accomplished. No matter how much scientific effort goes into the preparatory work, or into the post-closure assessment, science has no way of guaranteeing that the containment will not subsequently fail over hundreds of thousands or even millions of years. To dispose of something permanently is to get rid of it "once and for all", but we do not know how to get rid of irradiated nuclear fuel. We only know how to repackage it and relocate it. No doubt we can relocate it to a geologic repository excavated for that purpose, but there is no scientific principle that allows us to determine whether or not it will stay where we put it. Geology is not a predictive science, and human intervention cannot be excluded. (0714-1-12 [Edwards, Gordon])

Comment: Science has confirmed that some geological formations have remained stable for hundreds of millions or even billions of years. But it is impossible to emplace irradiated nuclear fuel in an undisturbed geological formation without first disturbing it. And there is no technology available to restore a disturbed geological formation to its original integrity. (0714-1-13 [Edwards, Gordon])

Comment: Moreover the nuclear wastes themselves are not inert, but active – thermally active, chemically active, and radioactive. Even the possibility of accidental criticality in the underground repository cannot be completely ruled out. Once these active materials have been emplaced in an excavated cavity where the surrounding geological stress field has been

permanently disrupted, these nuclear wastes will embark upon a history all their own – unobserved and uncontrolled by human society. Science is ill-equipped to predict the long-term behavior of such extraordinary materials in a man-made repository under such unprecedented conditions. In fact there are no scientific principles that allow us to test whether or not such predictions are even in the right ballpark when extended over periods of hundreds of thousands of years. Current mathematical knowledge is inadequate to provide bounding estimates for the accumulated computational errors arising from billions of iterative calculations, which can in some unusual circumstances be larger than the numerical answers themselves. (0714-1-14 [Edwards, Gordon])

Comment: But we do not have the ability to wait for tens or hundreds of millennia to see if the predictions of our mathematical models correspond to the actual long-term behavior of the nuclear wastes within a geologic repository, so we are ultimately basing assurances of safety on the unverified hypotheses that are embodied in the mathematical programs. This is a sophisticated form of wishful thinking – a technological "Hail Mary". (0714-1-15 [Edwards, Gordon])

Comment: In a 1978 paper published by the US Geological Survey, Circular 779, entitled "Geologic Disposal of High-Level Radioactive Wastes— an Earth-Science Perspective", the authors point out that even after a million years of storage, the radiotoxicity of the then-projected inventory of irradiated nuclear fuel from US power plants is extraordinarily high. As a hypothetical measuring mechanism, the authors point out that all of the water in the Great Lakes basin would be required to dilute the radioactive contents of the irradiated nuclear fuel to the maximum level of radioactive contamination that is legally allowed for drinking water. Of course we all understand that this hypothetical scenario is not going to happen, but it is a reminder that even 99.99 percent perfect containment of this material is just not good enough. (0714-1-16 [Edwards, Gordon])

Comment: From the earliest days of nuclear power, nuclear proponents have asserted with the utmost confidence that the safe permanent disposal of nuclear waste is not a technical problem, but a public relations problem. The assertion is partly true, at least from the point of view of the nuclear industry, as failure to find a solution to the nuclear waste problem is a major environmental, political and economic obstacle to the expansion of the industry, and is therefore a threat to the continued existence of nuclear power as a commercial energy source. (0714-1-17 [Edwards, Gordon])

Comment: For the NRC has also fallen under the spell of accepting this unverifiable assumption that a safe permanent disposal method exists in the form of a deep underground geologic repository, as if it were a scientifically demonstrated fact. This assumption has distorted the NRC rulemaking function to such an extent that in 2012 a court of law has ordered NRC to review its rules regarding the storage of irradiated nuclear fuel, specifically challenging the NRC notion that a safe permanent disposal method in the form of a geologic repository will become available in the next few decades. In its current efforts to meet the court's challenge, NRC has failed to consider that the industry's fundamental assumption that a solution to the waste problem exists may be incorrect, and to elaborate a set of policies based on that possibility. (0714-1-19 [Edwards, Gordon])

Comment: CCNR [Canadian Coalition for Nuclear Responsibility] considers it irresponsible for NRC to assume that any method exists or will exist for the safe permanent disposal of irradiated nuclear fuel without a precise and verifiable scientific definition of the word "disposal" – complete with detailed scientific criteria for determining when "safe permanent disposal" has been accomplished, and accompanying methodologies for verifying whether those criteria have

or have not been met. Any other approach amounts to drawing the target after the dart has been thrown. (0714-1-2 [Edwards, Gordon])

Comment: And yet, to date --- seventy-one years later --- no site or technology has been discovered that can be guaranteed to be permanent enough to isolate even the first cupful of those long-lived radioactive wastes. As far as anyone has determined, the brilliant minds that carried us into the Atomic Age were never asked if they could get us out. (0715-3 [Drey, Kay])

Comment: Nowhere is the dangerous "compartmentalization" of radioactive waste issues more evident than in political attempts to continue waste manufacture absent a disposal facility. This process has been handed a long-needed opportunity by the 2012 Court decision for the NRC and the industry to take responsibility for truly solving the high-level radioactive waste (HLRW) disposal issue. (0716-7 [Kraft, Dave])

Comment: With little prospect of a central repository or disposal site for decades to come, spent nuclear fuel continues to accumulate at nuclear plants around the country. Currently, there is an inventory of approximately 69,000 metric tons of spent fuel from commercial nuclear plants, the majority of which is being stored in pools at those plants, and this inventory is growing at a rate of 2,000 to 2,400 metric tons per year.⁷⁸ [footnote 78 text: Blue Ribbon Commission on America's Nuclear Future, Disposal Subcommittee, Draft Report to the Full Commission, at 2 (June 1, 2011). Even if the Yucca Mountain disposal site had been licensed and constructed, it could not hold more than 70,000 metric tons of waste.] The Blue Ribbon Commission concluded, "Simply put, it will take years to more than a decade to open one or more consolidated storage facilities and even longer to open one or more disposal facilities. This means that storage of substantial quantities of spent fuel at operating reactor sites can be expected to continue for some time."⁸¹ [footnote 81 text: *Blue Ribbon Commission Report* at 44.] The reality of the situation, demonstrated by these developments, is that the U.S. does not have a comprehensive policy for the removal and disposal of spent nuclear fuel from reactor sites (such as Indian Point), and is far from establishing one. (0718-2-3 [Sipos, John])

Comment: This response provides nothing more than continued insistence that spent radioactive fuel is stored safely. The fundamental requirements of safe storage -- 1) it is scientifically defensible, 2) environmentally responsible and 3) publicly acceptable -- are not yet met 60 years into the "nuclear age", nor is there an actionable plan for meeting these requirements any time soon. (0719-2 [Hibbard, Angela])

Comment: What, for example, could possibly have been the scientific or technical basis for assuming that Yucca Mountain or some other repository would be up and running in the 20th century? Or, now in the 21st century? NRC has not done a technical or licensing review. (0723-2 [Shadis, Raymond])

Comment: Please spend any extra energy and defence federal monies on finding a way to neutralize the concentrated toxicity of spent nuclear fuel as well as finding safer ways to utilize existing energy without creating toxic residuals. (0728-3 [Anonymous, Anonymous])

Comment: Make it a national priority to come up with real solutions to long term nuclear waste storage[.] (0728-4 [Anonymous, Anonymous])

Comment: Why do we continue to produce this waste with ,nuclear power plants,when we haven't found a safe solution in over 50 years and probably will not ever really find a good one. .This waste will be dangerous for hundreds to thousands of years and there is no guarantee that

it can be guarded properly for all those years and that there will not be an earth upheaval that will dislodge it.. (0729-1 [Wolpoff, Deborah])

Comment: I am writing today to express my concern that we finally begin the long put off job of determining the safest way to store our nuclear waste. (0733-2 [Vanderlan, Kelly])

Comment: It is NOT feasible for this highly radioactive material to be safely stored FOREVER. Nor can we expect to find a geologic repository -- Yucca Mountain turned out to be completely wrong -- geologically -- and furthermore, are you suggesting we turn the planet into a radioactive dump? (0734-2 [Hisasue, Carole])

Comment: The problem of what to do with the extraordinarily dangerous and long-lived wastes produced by nuclear fission has perplexed society since the first reactor wastes were produced on December 2, 1942, the day an atomic "pile," composed of graphite and uranium slugs, went critical in a converted squash court at the University of Chicago. More than seventy years later, despite repeated protestations of confidence by regulators that a solution would soon be found, we still have no method for disposing of the high-level wastes (HLW) produced by nuclear power plants, each enormously larger than that first device for releasing the power of the atom. And more nuclear waste is produced every day. (0738-1 [Hirsch, Daniel])

Comment: Perhaps no issue raises more serious questions of inter-generational ethics than whether we should continue to create such extraordinarily hazardous wastes without a solution to their safe disposal. The plutonium-239 in HLW, for example, is one of the most toxic substances on earth; a few millionths of an ounce if inhaled will cause cancer with virtual 100% statistical certainty. Yet we must find a way to successfully isolate from the environment *hundreds of metric tons* of plutonium for its hazardous life—about *half a million years*. (0738-2 [Hirsch, Daniel])

Comment: The NRC, in its proposed new Waste Confidence Rule, puts forward several draft findings. One is that a geological repository is "feasible" within 60 years of the end of the licensed period, with any renewals, of existing reactors. That, of course, is a far cry from being confident that that will happen. It is feasible that one will win the lottery, but not likely, not something one should count on. The evidence put forward by NRC to support this finding is not very robust. After recounting some of the history, in this country and abroad, where plans for opening repositories have repeatedly failed and been put off, NRC then identifies new hoped-for opening dates and says because such dates have been put forward, they are thus feasible. It is a circular argument without foundation. Indeed, the actual data identified—continued failure of all nations with nuclear power plants to open even a single high level waste disposal site—suggest quite clearly the difficulty in having confidence that such a facility will in fact open here in the next decades. (0738-8 [Hirsch, Daniel])

Comment: Make it a national priority to come up with real solutions to long term nuclear waste storage[.] (0741-1 [Giese, Mark M.])

Comment: I am a resident of Laguna Niguel and live quite close to the recently decommissioned San Onofre plant. I am very concerned about the spent fuel rods stored on site and the lack of a plan to adequately and permanently store these contaminated fuel rods. Please, in the interest of public safety, prioritize the prompt removal and permanent storage of these materials. (0742-1 [Burchfield Rhodes, Valerie])

Comment: When SONGS was originally put into service (circa 1965), what was then the Atomic Energy Commission asserted that all nuclear waste would be removed within 30 years (circa 1995) and the contour of the land would be restored to its natural condition. In 2013, we have a what appears to be a permanent nuclear waste dump in San Onofre. You believe the representations of the US Government have any credibility at all? Remove the waste--as promised! (0743-1 [Metcalf, Michael])

Comment: Regardless, the Federal Government, specifically the Department of Energy must be proactive in finding a solution to the long term spent fuel storage issue. This is what they promised the residents of this county and they need to follow through with that promise. PG&E has done their job and continues to do so with transparency and has shown their dedication to this community. I urge the Department of Energy to do the same. (0753-3 [Devitt, Andrea])

Comment: It is time to make it a national priority to find real solutions to stop this ticking time bomb before it is too late. (0757-11 [Lynch, Laura])

Comment: I believe the NRC must [m]ake it a national priority to come up with real solutions to long term nuclear waste storage[.] (0757-12 [Lynch, Laura])

Comment: In June of 2012, in a lawsuit brought by New York state the U.S. Court of Appeals threw out NRC's Waste Storage Rules saying the commission failed to fully evaluate risks associated with its regulations on the storage of spent fuel. The U.S. Court of Appeals ruled that the NRC's conclusion that permanent storage will be available in the future when it's needed didn't account for how its absence could affect the environment now. The commission also failed to fully assess the dangers of storing spent fuel onsite for 60 years after a nuclear plant's license expires, the court said. "The commission's evaluation of the risks of spent nuclear fuel is deficient," Chief Judge David Sentelle wrote for the three-judge panel. Spent fuel "poses a dangerous long-term health and environmental risk." (0757-9 [Lynch, Laura])

Comment: It is time that we deal with the nuclear waste problem. Storing waste in sites such as San Onofre, on a fault line in the way of a possible sunami, is not a solution. (0758-1 [Kuchnia, Margaret])

Comment: I feel it is very important to dispose of nuclear waste in as safe a manner as possible. Please take steps to protect the masses from this very real threat. (0761-1 [Madden, Donna])

Comment: It is time for Yucca Mountain to open, and preparation made to begin receiving the Nation's nuclear waste, immediately. Of course Nevadans are going to object passionately (NIMBY!). But it's the best solution, ceramic can be used to encase before transportation to the location, to minimize the affects of an accident, in the worst case scenario. The time for action is now, before our children are left to deal with this awful legacy. (0766-1 [Poole, Jesse])

Comment: Permanent storage at Yucca Mountain MUST begin. I urge you to do all in your collective power to put that pln into reality. (0766-3 [Poole, Jesse])

Comment: There seems to be no real plan for permanently storing waste either. I would like to see the waste moved to a permanent storage facility. (0770-2 [Maher, Ed])

Comment: I am very much opposed to continuing the storage of spent fuel at the San Onofre site. It is absolutely essential that the NRC find and locate a site for the storage of all of our

spent fuel. It has been so many years since Yucca Mountain was rejected. (0771-1 [Carlton, Paul])

Comment: It is time to stop the nuclear waste con and make it a national priority to find real solutions to stop this ticking time bomb before it is too late. (0774-5 [Revilla, Oscar])

Comment: Make it a national priority to come up with real solutions to long term nuclear waste storage. (0774-6 [Revilla, Oscar])

Comment: Nuclear waste near populated areas with no removal or long term plans is unacceptable. Please move forward on containment and removal plans in a timely manner. (0781-1 [Johnson, Reed])

Comment: However, the City [Red Wing, MN], like many other host communities, is now facing a scenario that it did not, under any set of circumstances, envision: the failure of the Federal Government to honor its contractual agreement with the Company and remove the spent fuel from the PINGP to either an interim storage facility or a long-term or permanent repository. Despite any other contention or disagreement with the Company, the City stands resolute with the Company that the continued storage of spent fuel outside of the PINGP is not a workable solution. With no plan or process in place for its removal, storage, which was to be short (if at all), has become, for all practical purposes, permanent. (0783-1-1 [Harlan, Thomas])

Comment: As to where to put them, I believe scientists would be the best people to answer this question. But I think any American community would fight tooth and nail against it. Therein lies the problem. Where to put the radioactive spent fuel. Wherever is chosen, it should be guarded forever. Placing it in another country is totally unacceptable from a moral and national security perspective. (0786-3 [Dew, Jane])

Comment: Long-term solutions need to be developed for nuclear waste, to eliminate the need for long-term onsite storage of nuclear waste.. (0788-2 [Sattler, Alfred])

Comment: Make it a national priority to come up with real solutions to long term nuclear waste storage[.] (0789-1 [Salto, Don])

Comment: Get this waste out safely. (0790-1 [Richardson, Carlos])

Comment: The Commission should then turn its attention to dealing with the massive amounts of radioactive wastes. This will demand a thorough and thoughtful review of all options for containment of these wastes as well as a warning system that will notify future generations of its fatal toxicity. (0792-3 [Soto, Carol])

Comment: A military style method, as used by the Defense Department for decommissioned nuclear bomb waste in New Mexico deep caverns, is a type of storage that this material needs. Where or how this can be achieved without unnecessary risk I cannot say. But the idea that no attempt will be made to pursue that, and instead it will sit near the city of San Clemente for scores of years is not right. (0793-3 [Sauerheber, Richard])

Comment: Please, please put public safety ahead of industry profits . Find a permanent Place for storage of all this spent nuclear fuel! (0797-1 [Hennessy, Diane])

Comment: Creating dangerous spent radioactive fuel rods and having no real way to move them out of this highly populated area was misjudgement and irresponsible on the NRC's part. Since this garbage is so potent and dangerous[.] (0807-1 [Krimsky, Pam])

Comment: [T]he Department of Energy has a responsibility to make good on its commitment to receive and safely store the spent fuel for the long term. By doing so, locally stored spent fuel could be safely removed to a single or regional location controlled and protected by our national government. (0812-2 [Souza, Celine])

Comment: The toxic waste from Diablo Canyon is too dangerous to be transported anywhere and too long lasting to be considered "safe" in any way! In 30 years no solution has yet been found - its hard to believe these plants ever came into existence in the first place! So many of my friends and neighbors have no confidence in the NRC. Most of us feel that no matter what we say you will do exactly as you please. Please, I beg you, don't let this be an exercise in futility. (0814-1 [Foley, Nancy])

Comment: I have referenced so-called LLRW (considered by the NRC to be less dangerous than spent fuel) above, and there are lessons to be learned from 10CFR61 regarding minimum site suitability requirements, particularly from the NRC Office of Nuclear Material and Safeguards's document "Regulating the Disposal of LLRW A Guide to the NRC's 10CFR61" which contains "Common sense siting requirements which address the natural characteristics of the site and other factors. NRC views the siting requirements as minimum...whether or not engineering enhancements are used. The requirements are primarily directed at aspects to avoided." In this document, the NRC expressed "concerns about storage, including onsite storage, becoming defacto disposal; distraction of reactor management from the safe operation of the reactor ...and the potential for package and waste disintegration." It further states, "There is no way to guarantee that any disposal facility, for any waste, will not release... radioactivity. No structure or site can be guaranteed to contain ... radioactive waste in perpetuity (given the fact) that facilities deteriorate and human institutions may not maintain complete control." (0819-16 [Kline, Connie])

Comment: What is Adaptive Phased Management? Adaptive Phased Management is both a technical method and a management system, with an emphasis on adaptability. Technically, it is centralized containment and isolation of used nuclear fuel in a deep geological repository. The management system involves realistic, manageable phases - each marked by explicit decision points with continuing participation by interested Canadians. It is flexible, allowing for go, no-go decisions at each stage to take advantage of new knowledge or changing societal priorities. Adaptive Phased Management provides an option for shallow underground storage at the central site if some or all of the used fuel needs to be moved before the deep repository is available. It also provides for continuous monitoring throughout implementation and for retrievability for an extended period. (0820-16 [Eide-Tollefson, Kristen])

Comment: Timely federal removal of the waste to a permanent geological repository was, & continues to be, a first condition of support for continued operations in Minnesota. (0820-4 [Eide-Tollefson, Kristen])

Comment: This does not address the overall waste problem of storage and disposal, and it adds to the safety problem and increases the time span. A safe solution has not been found by any nation or the nuclear industry during 65 years of hopeful thinking that doesn't match reality. No solution for the waste exists. All the numerous solutions studied have been found insufficient

for safety. At this point, there is more than adequate justification to conclude that a safe solution for the waste is impossible. (0823-16 [Michetti, Susan])

Comment: The Physical World requires physical world measurements to determine its actual physical properties and safety. Actual physical safety can not be rationally determined by non-specific "generic" conceptualization which introduces distortions that are unreliable, undependable, and untrustworthy from which to claim any public health or environmental "safety." The reality of the physical impossibility of storing this waste for thousands and millions of years is being avoided by flawed rules and insufficient oversight. Wishful thinking that a solution will appear is unacceptable, given the efforts of the last 65 years to identify an actual solution have been without promise, including Yucca Mountain. (0823-56 [Michetti, Susan])

Comment: Moving forward also requires transparency that long-term unknown solutions have the potential to be unsolvable, particularly after 65 years of searching. No place exists for wishful thinking in scientific assessments. (0823-72 [Michetti, Susan])

Comment: Unfortunately, we live under irrational governmental decision-making. In terms of the nuclear industries, these irrational times stem originally from the lack of scientific knowledge and technology to adequately and sufficiently deal with the radioactive waste problem at a harmless end point identifiable prior to generation of lethal waste. Continued irrationality is occurring because governmental decision-makers used a flawed assumption for approximately the last 65 years: they believed inaccurately that the nuclear waste solution so blindly desired would "definitely" appear over time, but that did not happen. (0823-79 [Michetti, Susan])

Comment: Moreover, consideration of a licensing moratorium is not compelled by the AEA. In *NRDC v. NRC*, the Second Circuit explicitly addressed whether operating licenses can be issued in the absence of a definitive agency determination that high-level waste could be permanently disposed of safely.³⁷ [footnote 37 text: 582 F.2d 166 (2d. Cir. 1978).] The Court quoted remarks by Representative Holifield (Chairman of the Special Subcommittee (of the Joint Committee on Atomic Energy) on Radiation) at a hearing on radioactive waste disposal: "from the very beginnings of commercial nuclear power the Congress was aware of the absence of a permanent waste disposal facility, but decided to proceed with power plant licensing."³⁸ [footnote 38 text: *Id.* at 170. The Court also pointed to the enactment of the Energy Reorganization Act of 1974 as further evidence that a moratorium on nuclear power reactor licensing pending an affirmative determination on safe, permanent disposal was not required. It noted that through the Energy Reorganization Act, Congress gave the NRC the authority to review the Department of Energy's future projects regarding long-term storage of high-level waste. *Id.* at 174.] As the Court noted, Congress was (and is) fully aware of the NRC's regulatory scheme, in which the safety of interim storage of spent fuel is determined separately from the safety of a permanent disposal facility.³⁹ [footnote 39 text: *Id.* at 174.] The Court reasoned that if the Commission had interpreted the AEA to require an affirmative determination regarding the feasibility of safe, permanent disposal of high-level waste, no commercial production or utilization facilities would be in operation.⁴⁰ [footnote 40 text: *Id.* at 171.] Ultimately, the Second Circuit found that "Congress did not intend such a condition."⁴¹ [footnote 41 text: *Id.*] Thus, the Court ruled that reactor licensing did not need to be suspended pending the availability of a waste repository. This decision, and the supporting reasoning, continues to hold today. Congress clearly established a separate scheme for waste disposal in the Nuclear Waste Policy Act, and has clearly not objected to reactor licensing actions (and license renewal decisions), notwithstanding the termination of the Yucca Mountain project or implementation of a new program. Moreover, the Secretary of the DOE continues to recognize

and agree to satisfy the government's obligation to provide for disposal of used fuel and high level waste. (0827-1-11 [Ginsberg, Ellen])

Comment: The Conclusions in the SOC articulate that, based on operating experience, technical studies, and physical characteristics of spent fuel pools and dry cask storage systems: (1) a geologic repository is technically "feasible,"¹⁰⁸ [footnote 108 text: 78 *Fed. Reg.* at 56,793.] (2) it is reasonable to assume the availability of a repository within 60 years beyond the licensed life of a reactor (i.e., within the short-term timeframe),¹⁰⁹ [footnote 109 text: *Id.* at 56,794.] and (3) a regulatory framework exists to support a conclusion that spent fuel can be safely stored for at least 60 years beyond a reactor's operating life (the short-term timeframe).¹¹⁰ [footnote 110 text: *Id.* at 56,796.] The NRC appropriately notes that past WCD updates found that a deep geologic repository is a technically feasible means of disposal, and that additional information since past WCD updates further support this conclusion. The NRC also cites the Blue Ribbon Commission Report, experience with Yucca Mountain, and international experience to support the 60-year timeframe for repository availability. (0827-5-8 [Ginsberg, Ellen])

Comment: The NRC has never adequately addressed the question of nuclear waste storage. Dry casks are acceptable for the very short term, but there's been no viable plan for long-term storage. (0834-1 [Thabit, Nick])

Comment: Under the license terms for a given nuclear power plant, the entire plant must be decommissioned and restored to unlimited or partial use within 60 years of the end of operations. This is the underlying "contract" with the public when these plants were installed. Now, the NRC is suggesting in Section 4 that the ISFSIs can remain in operation for centuries. We believe this is WRONG for the NRC to suddenly change this contract with the public. (0836-53 [Davis, Anonymous])

Comment: Nationwide, there is now over 80,000 tons of spent nuclear fuel. No known technology exists to safely store radioactive waste and protect the environment for the period it remains hazardous. There is no known permanent nuclear waste facility in the US in which to store all the existing waste. The use of temporary storage does not create any confidence the waste will be safely or permanently stored for the period required until it is not hazardous. (0840-3 [Taylor, Tom])

Comment: Some have suggested that a permanent, deep-geological high-level radioactive waste disposal facility be built and fully operational to deal with existing waste. The possibility for this material, seeping into a molten area and together with multiple spent fuels, igniting at some point in the future, makes the option impossible to conceive of. Additionally, there is absolutely NO consensus in the scientific community on how to deal with this technology. It is beyond faulty. (0844-5 [Anonymous, Anonymous])

Comment: In geologic repository designs such as the cancelled Yucca Mountain project where the waste containers are expected to corrode over time, the prediction of how much and how fast radionuclides are transported is necessary to estimate the level of groundwater contamination. It came as a surprise to repository designers that low-solubility radionuclides such as plutonium could mobilize and move long distances underground. The cancelled Yucca Mountain repository design did not confine the waste and over time water supplies become contaminated. No community that loves their land or cares about future generations will accept a geologic repository. At the very least, siting a geologic repository will remain politically difficult to achieve. (0851-11 [Thatcher, Tami])

Comment: Commercial nuclear power in the US has generated over 68,000 metric tons heavy metal (MTHM) in spent nuclear fuel.¹ [footnote 1 text: J. C. J. Wagner et al., Categorization of Used Nuclear Fuel Inventory in Support of a Comprehensive National Nuclear Fuel Cycle Strategy, ORNL/TM-2012/308 (FCRD-FCT-2012-00232), Oak Ridge National Laboratory, Oak Ridge, Tenn., December 2012.] This spent fuel storage poses high costs, severe accident risks and technical challenges both above and below ground. Despite the common description of the volume of spent fuel from the entire US commercial nuclear fleet fitting on a football field, there is already enough fuel to fill one Yucca Mountain repository that spans miles and will contaminate the water below ground. (0851-3 [Thatcher, Tami])

Comment: Please put humanity and public safety ahead of Profits and remove deadly waste from San Onofre where it is in the heart of millions of people and in danger of being released by earthquake or a sunami or terrorist attack in one of the most populated areas of the country. (0854-1 [Prosser, Audrey])

Comment: When I learned this past year that nuclear waste at San Onofre is being cooled in pools and then stored in casks indefinitely on site I couldn't believe it. Given the dangerous nature of the fuel and the above mentioned risks, how can this be tolerated? The NRC and the federal government must take immediate steps to address this hazardous situation and move all radioactive material to a remote location as soon as it is safe to do so. This has to become the top priority and primary mission of the NRC. (0855-3 [Holloway, Patricia])

Comment: Regardless of the history of Waste Confidence Proceedings and court cases, it is evident that the NRC by itself cannot make a full, dispositive finding of Waste Confidence. The NRC's statutory authority, staff experience, and mission are well-suited to make technical findings concerning Waste Confidence; but the NRC lacks the authority, the experience, or the clout to make findings about the political activities that have engulfed Waste Confidence or that may affect waste disposal in the future. The Department Of Energy (DOE) might seem better suited to provide waste confidence than the NRC; but in the past few years, the DOE has basically stopped its high level waste program activities due to political direction from the Senate Majority Leader. (0859-1 [Haughney, Charles])

Comment: What should NRC do? The NRC has already begun to finally provide a substantial basis for a technical finding of Waste Confidence by deciding to issue the full suite of Safety Evaluations Reports (SERs) that will document the acceptability of the proposed Yucca Mountain Repository. This SER issuance will demonstrate to the public that the NRC staff has made the requisite findings of acceptability of one type of repository, that of Yucca Mountain. The surrogate Technical Evaluation Report (TER) that has already been published, although lacking the final regulatory conclusions, provides the needed technical basis for a favorable Waste Confidence finding. The TER could be usefully cited in the GEIS in this regard. (0859-2 [Haughney, Charles])

Comment: It is time to stop the nuclear waste con and make it a national priority to find real solutions to stop this ticking time bomb before it is too late. (0860-5 [Headrick, Gary])

Comment: Make it a national priority to come up with real solutions to long term nuclear waste storage (0860-6 [Headrick, Gary])

Comment: The nuclear waste from U.S. power plants is one thing. There is no place to put it. This is a world-wide problem of millennial proportions. Only hubris could give the NRC confidence that they know what to do with the waste. (0861-2 [Boudart, Jan])

Comment: It was recognized early in the development of civilian nuclear energy that the wastes generated from nuclear power plants and laboratories would require careful storage and disposal. The Nuclear Waste Policy Act of 1982 defined the framework under which a large federal repository should be developed to permanently store high level waste, and efforts continue to complete this work today. Recent court rulings¹ [footnote 1 text: United States Court of Appeals for the District of Columbia. *National Association of Regulatory Utility Commissioners v. United States Department of Energy*. No. 11-1066. (19 November, 2013)] and Congressional inquiries² [footnote 2 text: United States House of Representatives Committee on Energy and Commerce. Letter to Ernest Moniz, Secretary of Energy. (11 December 2013) Retrieved from <http://energycommerce.house.gov/sites/republicans.energycommerce.house.gov/files/letters/121113%20DOE%20Yucca%20Implementation%20Letter.pdf>] highlight the importance of finally establishing technically and politically feasible long-term plans for nuclear waste management. Updates to the Waste Confidence Rule play an important role in these long-term plans. (0863-1 [Brinton, Samuel] [Curtis, Daniel])

Comment: The nuclear engineering and geological engineering technical communities are ready to build a repository. Experts surveyed on geologic repositories for spent nuclear fuel demonstrate a consensus that the construction and safe operation of such a repository is completely technically feasible^{6, 7}. [footnote 6 text: Beckjord, Eric et al. *The Future of Nuclear Power: An Interdisciplinary MIT Study*. (2003)] [footnote 7 text: International Atomic Energy Agency. *Scientific and Technical Basis for Geological Disposal of Radioactive Wastes*. IAEA TRS 413. (2003)] Many design lessons were learned during the research and development effort at Yucca Mountain, but all issues raised were resolved before the project was arbitrarily cancelled. The failure of the United States government to provide a permanent storage facility for spent nuclear fuel has been an overwhelmingly political failure, not a technical one. (0863-4 [Brinton, Samuel] [Curtis, Daniel])

Comment: Deep geologic disposal is technically feasible, but politically difficult, and regulatory planning must account for the overwhelming uncertainty over future political developments. (0863-8 [Brinton, Samuel] [Curtis, Daniel])

Comment: From the beginning of the nuclear age, the waste byproducts of nuclear energy production have been recognized as a problem. In the Atomic Energy Act (AEA), Congress promised utilities that the Federal Government would take control of the waste and dispose of it (AEA 1954). A functioning Federal repository program capable of disposing of the waste was a precondition of the manufacture of the materials and continued production of power. Despite this mandate, no real progress has been made in development of a Federal repository program. What appeared to be progress with the Yucca Mountain project was illusory and privatized alternatives like the Private Fuel Storage (PFS) facilities have yet to materialize and may never be built. While the Yucca Mountain Program reached the licensing stage, it is not clear that the license will be granted, nor that a functioning and environmentally acceptable repository and related infrastructure can be constructed. Likewise PFS has been licensed by the NRC but it has yet to overcome judicial, social and political opposition. (0867-1-14 [Griffin, William])

Comment: Additionally, when the AEA was passed, it was assumed that there was a relatively minor technical problem of SNF which would be easily fixed. This has not occurred. For example, there has been no technical development that will actually reduce the radioactivity of these materials. The United States does not reprocess these materials either. As a result, nuclear materials production has created vast amounts of radioactively contaminated materials that continue to cost billions to remediate (Closing the Circle). The essence of radioactive

materials management in the United States is to dispose of the materials by means of a geologic repository, one that is yet to be constructed despite decades of trying. (0867-1-16 [Griffin, William])

Comment: The United States began a program to find a SNF repository in the 1970's. As part of this effort, a variety of different land forms suitable for a geologic repository were studied in a number of different geographic locations. The results were that the Federal government settled on Yucca Mountain as the sole site for a repository. Despite major legislation in 1982 and 1987 that led to the study of Yucca Mountain as the singular repository site, this choice failed by 2010 when the funding for this site was cut. During the decades long time period, there have been no fundamental technological improvements or changes to our ability to manage SNF. That is, there have been no technological breakthroughs that would reduce or modify the human health risks posed by SNF. Additionally, efforts to develop a new reprocessing system have been inconclusive (GNEP). (0867-1-18 [Griffin, William])

Comment: The NRC's failure to take a hard look at its own efforts and to address real environmental, social, economic and political concerns have so far resulted in failure. This experience should be a lesson to the agency and Commission - meaningful analysis under NEPA can provide some means to accomplish the task of siting a facility but failure to address concerns by stakeholders will likewise block or prevent the accomplishment of the desired goal - and should be integrated into its analysis of when and whether a permanent waste repository is likely to be available. However, no such analysis of the basis for the DGEIS conclusion that a waste repository is likely to be in existence within 60 years of the shutdown of the oldest reactor has been conducted (DGEIS p. xxviii). (0867-1-19 [Griffin, William])

Comment: The moving target of a repository construction date is one issue that the NRC has failed to address in the DGEIS. This may be because the issues the NRC failed to address in the DGEIS are too complex and/or that the methodologies used to analyze the waste confidence concept are too simplistic. Such complexities and analytical failures point out deficiencies in a generic approach to the whole of the waste confidence issue. In summary, there is currently no viable program to develop a repository. There is no location for a repository and siting efforts using a wide variety of techniques that continued over the last four plus decades have failed. The fundamental problem remains: What are the environmental impacts at the current wet storage waste locations if there is no repository or no reasonably foreseeable repository? (0867-2-1 [Griffin, William])

Comment: Most people were against storage of the radioactive waste at the site. Most people felt that Diablo should NOT operate until the terrible waste has a place to be stored- a safe site like Yucca Mt. was supposed to be. (0871-1 [Denneen, Bill])

Comment: Will Congress please give the NRC some teeth and make law (1) to find suitable geological storage locations[?] (0881-5 [Szymanowski, Jennifer])

Comment: Thirty years ago I was working in the Records department at Battelle Memorial Institute. We made copies of reports from universities all over the United States. The records were of studies made to try to find a place to store nuclear waste. At the time, the agency called the Office of Nuclear Isolation, was looking for places such as former salt mines or mountains which are stable as a place to store the wastes. It was thought that having the wastes, which take ages to deplete to harmless state, located in places where they would be relatively harmless. (0882-1 [Wright, Margaret Z.])

Comment: These wastes should not be stored near our lakes, rivers, or oceans where they can contaminate our water. (0882-3 [Wright, Margaret Z.])

Comment: We all know there is no good final solution to the problem of creating nuclear waste that must be isolated from the environment and all living things for millions of years. If we ever come to a decision on a deep underground depository that would mean thousands of shipments moving through towns and cities endangering populations as they pass through and the likelihood of accidents. The highways, railways and watercourses would have to be militarized and shipments would have to be secretive to prevent terrorism. Even if a suitable place could be found; it would be decades before any waste would be interred. (0883-1 [McArdle, Ed])

Comment: [T]he Department of Energy has a responsibility to make good on its commitment to receive and safely store the spent fuel for the long term. By doing so, locally stored spent fuel could be safely removed to a single or regional locations controlled by and protected by our national government. (0885-2 [Anderson, Cody])

Comment: [T]he Department of Energy has a responsibility to make good on its commitment to receive and safely store the spent fuel for the long term. By doing so, locally stored spent fuel could be safely removed to single or regional locations controlled by and protected by our national government. I believe it has a duty to do so and encourage them to live up to the commitment they made. (0886-2 [Lind, Jeff])

Comment: Instead, the DGEIS analyzes “scenarios” which assume the unavailability of repository capacity. That is a far cry from analyzing the question of whether the NRC has a technical basis for a reasonable assurance finding regarding the availability of sufficient repository capacity or an environmental risk analysis of the uncertainty surrounding such a prediction. As the Court ruled in *New York*, the NRC must evaluate the “likelihood of nonavailability” of repository capacity unless it is “remote and speculative.” 681 F.3d at 479. And a finding of technical feasibility is a far cry from a finding that sufficient repository capacity will actually be available. The sufficiency of repository capacity is a crucially important consideration in determining whether it is safe for the NRC to continue to allow the generation of spent fuel in licensing decisions. Spent fuel is a highly radioactive substance that must be isolated for many thousands of years in order to protect public health and the environment. Generalizations about the technical feasibility of “a” repository do not answer the question of whether repository capacity will be sufficient to accommodate the spent fuel that will be generated in the future by reactors that have not yet been licensed or re-licensed. As discussed in the attached Makhijani Declaration (pars. 8.4 – 8.13), “[t]he proposed rule’s assertion of the feasibility of a repository does not guarantee that there will be a repository with sufficient capacity to accommodate all the spent fuel envisioned.” In addition, the proposed rule’s failure to address the sufficiency of repository capacity is inconsistent with Congressional policy that disposal of spent fuel in a repository is the only safe means of protecting public health and the environment from spent fuel in the long run. See Section 11 of the Nuclear Waste Policy Act (“NWPA”), which establishes a national policy of disposing of spent nuclear fuel in a deep geologic repository. 42 U.S.C. § 10131 (1982).² [footnote 2 text: The NWPA also clearly distinguishes between storage and disposal. Storage is the “retention of . . . spent nuclear fuel . . . with the intent to recover such waste or fuel for subsequent use, processing, or disposal.” Section 2(25). Disposal is the “emplacement in a [deep geologic] repository . . . with no foreseeable intent of recovery, whether or not such emplacement permits the recovery of such waste.” Section 2(9), (18).] In the proposed rule, the NRC appears to assume that no reasonable assurance finding regarding repository capacity is needed because of its opinion that spent fuel can be stored safely for the long-term or perhaps indefinitely at reactor sites or

away-from reactor storage facilities. Aside from the fact that NRC's opinion is essentially unsupported (see discussion in Section VI.A below), that assumption cannot be squared with the NWPA. (0897-2-14 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Even if the NRC were to attempt to make "reasonable assurance" findings about the availability of sufficient repository capacity or the safety of extended interim storage of spent fuel as required by the Atomic Energy Act, NRC has demonstrated by its own actions that it lacks sufficient information to support such findings. (0897-2-15 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The question of feasibility of spent fuel disposal cannot be evaluated without considering the probability that a repository will safely contain radioactivity for the hundreds of thousands of years required. In order to evaluate that probability, it is necessary to evaluate the environmental impacts of disposing of spent fuel in a range of geologic media. NRC cannot simply presume that a repository is feasible. Disposal impacts are relevant because they are part of the waste confidence finding that a mined geologic repository is feasible. By definition, a "feasible" repository must meet reasonable health and safety standards. (0897-2-16 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Further, sufficient capacity at one or more such sites meeting safety criteria must be available to accommodate spent fuel from any and all commercial light water reactors that may be built. The DGEIS sets no upper limit on the amount of spent fuel to be disposed of. By failing to evaluate spent fuel disposal impacts and the sufficiency of repository capacity (if necessary at more than one site), the NRC has excluded a major part of the picture regarding the feasibility of spent fuel disposal. (0897-2-17 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In order to comply with the Court's order to analyze the uncertainty associated with its prediction of sufficient spent fuel disposal capacity, the NRC would need to analyze the environmental impacts of spent fuel disposal in an array of geologic media, with an analysis of the uncertainty regarding whether the repositories could meet federal limits for containing radioactivity and how much spent fuel they could accommodate. Makhijani Declaration, pars. 8.2-8.24. The DGEIS does not provide any information about spent fuel disposal impacts, however. Instead, the DGEIS declares spent fuel disposal impacts irrelevant to its analysis and refers the reader to Table S-3. DGEIS at 1-18. (0897-7-9 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The NRC also lacks a factual and scientific basis for a finding of confidence that spent fuel can be disposed of safely within acceptable, legally binding health and safety standards. (0898-1-10 [Curran, Diane] [Makhijani, Arjun])

Comment: As part of this analysis, the NRC should also evaluate the probability that sufficient repository capacity will be available in a timely manner so as to avoid excessive storage risks and costs. Of course, by doing so it would also be calculating the probability that sufficient repository capacity will *not* be available. In the proposed rule, the NRC fails to even address the question of repository capacity. And it only refers to "a" mined geologic repository, as if one were enough. This is a significant deficiency. As we will show, persuasive arguments can be made that two repositories may be needed if there is a resurgence of nuclear power. Appeals to repository programs in Sweden and Finland do not resolve this issue – their nuclear power programs are very small compared to the United States and therefore involve a small amount of spent fuel. (0898-1-23 [Curran, Diane] [Makhijani, Arjun])

Comment: The question of feasibility of spent fuel disposal cannot be evaluated without considering the probability that a repository will safely contain radioactivity for the hundreds of thousands of years required. And, in order to evaluate that probability, it is necessary to evaluate the environmental impacts of disposing of spent fuel in a range of geologic media. NRC cannot simply presume that a repository is feasible. Disposal impacts are relevant because they are part of the waste confidence finding that a mined geologic repository is feasible. By definition of such feasibility, such a repository must meet reasonable health and safety standards. Moreover, we note that Table S-3 at 10 CFR 51.51 is invalid for estimating high-level waste disposal impacts. Among other things, its underlying assumption of disposal in a bedded salt repository for spent fuel disposal was repudiated by the NRC itself in 2008.¹⁶ [footnote 16 text: NRC 2008a, p.59555] Therefore, the NRC must prepare a new disposal impact analysis in the context of its waste confidence decision. Further, *sufficient capacity* at one or more such sites meeting safety criteria must be available to accommodate spent fuel from any and all commercial light water reactors that may be built. The Draft GEIS sets no upper limit on the amount of spent fuel to be disposed of. By failing to evaluate spent fuel disposal impacts, the NRC has excluded a major part of the picture regarding the feasibility of spent fuel disposal. The concept of feasibility also includes cost. What will it cost to isolate spent fuel for many thousands of years? Is the cost affordable when compared with the profit that a nuclear reactor will yield? These questions must be evaluated in order to assess the feasibility of spent fuel disposal. (0898-1-7 [Curran, Diane] [Makhijani, Arjun])

Comment: The NRC's proposed finding that it is feasible to "have a mined geologic repository within 60 years following the licensed life for operation of a reactor"¹¹³ [footnote 113 text: NRC 2013b, p. 56776, italics added to both indefinite articles] is so vague and incomplete that it is essentially meaningless. It is also unsupported in a number of respects. Specifically, the proposed finding is about "a mined repository" – the indefinite article is used. Will it have enough capacity to accommodate all spent fuel from all reactors? Could it safely accommodate all types of spent fuel, including failed high burnup spent fuel? The proposed rule does not say. (0898-4-10 [Curran, Diane] [Makhijani, Arjun])

Comment: The proposed rule's assertion of the feasibility of a repository does not guarantee that there will be a repository with sufficient capacity to accommodate all the spent fuel envisioned. Moreover, the Draft GEIS proposes no upper limit to spent fuel. On the contrary, it includes reactors beyond the existing ones, including new reactor designs such as small modular reactors. The NRC's conclusion that "a" repository is feasible does not provide any assurance that spent fuel from all reactors covered by the Draft GEIS will find space in it. (0898-4-12 [Curran, Diane] [Makhijani, Arjun])

Comment: Every geologic location would have some limit to the amount of spent fuel it can hold due to considerations such as the faults running through the site, natural resources availability, etc. Yucca Mountain, for instance, had a legal limit of 70,000 metric tons (equivalent) of commercial and military waste. Proponents of disposal there argued that the technical limits could be much greater. But no one, so far as I am aware, has asserted that there was no technical limit. Such a limit was considered, for instance, in a paper by Professor Per Peterson of the University of California at Berkeley in the context of a prospective increase in nuclear reactor orders in 2003. He argued that the technical capacity of Yucca Mountain could be increased. This [analysis] suggests a minimum "technical" site capacity of approximately $75 \times 2,000 = 150,000$ MT of spent fuel, with a maximum site capacity greater by perhaps a factor of two or three. *Thus any substantial construction of new U.S. nuclear power infrastructure in the coming decades will almost certainly create a technical requirement (perhaps as soon as 2030 to 2050) either for additional repositories or for the construction of infrastructure for recycling*

spent fuel.¹¹⁵ [footnote 115 text: Peterson 2003, italics added] Thus, one of the most prominent authorities on nuclear power and nuclear waste in the United States,¹¹⁶ [footnote 116 text: Professor Peterson was a member of the Blue Ribbon Commission on America's Nuclear Future which delved into the problem of spent fuel at the behest of then Energy Secretary Steven Chu.] has opined that, in the absence of reprocessing, a second repository may be needed in the United States - and would "almost certainly" be needed in the event of a nuclear power resurgence. (0898-4-13 [Curran, Diane] [Makhijani, Arjun])

Comment: The proposed rule neither puts limits on spent fuel nor assures that there will be sufficient room to dispose of all spent fuel that may arise, including as a result of the government's own actions to promote nuclear energy. Unless there is a specific and reasonable assurance in this regard based on technical and social reality, then spent fuel may well be stranded at reactor sites essentially forever. It is also possible to envisage a case where there is one repository that is insufficient. In that case, there would be impacts both from disposal as well as impacts from indefinite storage at reactors of a part of the spent fuel inventory. (0898-4-15 [Curran, Diane] [Makhijani, Arjun])

Comment: The Draft GEIS has a section on the issue of repository technical feasibility (Section B.2.1) and one entitled "Availability of Repository Capacity" (Section B.2.2).¹¹⁸ [footnote 118 text: NRC 2013a, p. B-2 and p. B-4] These sections appeal to the international consensus that repositories are feasible, to the Waste Isolation Pilot Plant (WIPP) in New Mexico, where transuranic wastes generated by the nuclear weapons program of the Department of Energy are being disposed of, and to the Swedish and Finnish Programs. We consider each of these in turn to show that they are, singly or together, insufficient to establish feasibility in the sense that there will be a repository that will meet specified safety standards and that it will have sufficient capacity. (0898-4-16 [Curran, Diane] [Makhijani, Arjun])

Comment: We note first of all that Yucca Mountain has not been licensed. The State of Nevada raised a host of technical issues¹¹⁹ [footnote 119 text: *See U.S. Department of Energy (High-Level Waste Repository)*, LBP-09-06, 69 NRC 367, aff'd in part and rev'd in part, CLI-09-14, 69 NRC 580 (NRC 2009).] before the DOE informed the NRC that it was withdrawing its application. Yucca Mountain therefore cannot be used to assert repository feasibility, in the sense of meeting the standard that the EPA set forth in 40 CFR 197. (0898-4-17 [Curran, Diane] [Makhijani, Arjun])

Comment: The appeal to WIPP does not provide much assurance. As noted, in paragraph 3.5, the NRC itself has repudiated a salt repository for spent fuel. (0898-4-19 [Curran, Diane] [Makhijani, Arjun])

Comment: The Finnish and Swedish repository programs are more advanced than those in other countries. However, it should be noted that both these countries have very small amounts of spent fuel compared to the United States. Sweden has just ten reactors, with nuclear energy production at about eight percent of the United States. Finland has just four with production, about three percent of the United States.¹²⁰ [footnote 120 text: NRC Information Digest 2013, Appendix T] As noted in paragraph 8.5 above, even one very large repository, accommodating hundreds of thousands of tons of spent fuel may not be sufficient under a nuclear power resurgence scenario. Moreover, size matters, because the larger the repository that is needed, the more constrained the choices for locating it are likely to be. A smaller capacity at a particular site could well mean two repositories. (0898-4-20 [Curran, Diane] [Makhijani, Arjun])

Comment: Showing feasibility in the context of the U.S. power program that may expand considerably beyond the present level means showing that sufficient capacity will exist for all reactors that may be built. It is not enough to say that there will be "a" repository 60 years after the license expiry of "a" reactor. The NRC must specify the amount of spent fuel to be disposed of and show that there will be sufficient capacity to dispose of all of the spent fuel in a manner that would comply with reasonable safety standards. The Draft GEIS has not done that. (0898-4-21 [Curran, Diane] [Makhijani, Arjun])

Comment: The Draft GEIS has considered questions of technical feasibility without actually examining the impact of spent fuel disposal in a repository. This is essential for a waste confidence finding. For instance, the original waste confidence finding in 1978 was connected to Table S-3 in 10 CFR51.51. The latter assumed zero impact after repository closure because the former assumed disposal in bedded salt.¹²¹ [footnote 121 text: We note below in paragraph 8.21 that this was shown to be incorrect five years later in 1983, but it was the NRC's understanding in 1978 when the waste confidence rule was issued. The NRC's understanding today is that radiation doses to the public could be well above the zero exposure assumed in Table S-3.] We show below, in paragraph 8.22 that the NRC itself now acknowledges that radiation doses would, or at least could, be well above zero and even above the Yucca Mountain EPA standard of 100 millirem per year in 40 CFR 197. It is essential that a new waste confidence finding in regard to the feasibility of a repository be based on a contemporary understanding and actual scientifically valid estimates of radiation doses that might be expected at different sites in the United States. (0898-4-22 [Curran, Diane] [Makhijani, Arjun])

Comment: The NRC was explicit about the exclusion of repository impacts in its response to public comments on the scope of the GEIS: The NRC received comments related to spent nuclear fuel disposal. Spent nuclear fuel disposal is outside the scope of the Waste Confidence analysis, which will consider the environmental impacts of continued storage prior to ultimate disposal. The development of a national repository, the licensing of Yucca Mountain or another repository site, *environmental impacts associated with disposal in a repository*, funding issues, recycling, and other waste disposal strategies *are outside the scope of this GEIS*.¹²² [footnote 122 text: NRC Scoping 2013, p. 42; italics added] 8.16. Two of the three scenarios in the Draft GEIS involve repository disposal. It is essential at least for the NRC to demonstrate in the GEIS that one or more sites with sufficient capacity exist in the United States that would likely meet reasonable health and safety rules. (0898-4-23 [Curran, Diane] [Makhijani, Arjun])

Comment: THE DRAFT GEIS DOES NOT SUPPORT THE NRC'S PROPOSED FINDINGS REGARDING THE FEASIBILITY AND SAFETY OF DEEP GEOLOGIC DISPOSAL OF SPENT FUEL. (0898-4-9 [Curran, Diane] [Makhijani, Arjun])

Comment: The question of feasibility of spent fuel disposal is integrally related with the questions of the health and safety standards for disposal and whether any specific repository can comply with them. The Draft GEIS did not evaluate disposal impacts. By excluding them from its scope, the NRC has excluded a major part of the picture regarding the environmental impacts of the back end of the nuclear fuel cycle. (0898-5-19 [Curran, Diane] [Makhijani, Arjun])

Comment: The Draft GEIS has failed to demonstrate the feasibility of a repository in the sense of showing that there is a site in the United States that will meet safety standards with reasonable assurance. (0898-5-20 [Curran, Diane] [Makhijani, Arjun])

Comment: Nor has it demonstrated that there will be sufficient repository capacity, especially given that the Draft GEIS puts no quantitative limits on how much spent fuel can be produced under the proposed waste confidence rule. Persuasive arguments can be made that two repositories may be needed if there is a resurgence of nuclear power. Appeals to repository programs in Sweden and Finland do not resolve this issue ? their nuclear power programs are very small compared to the United States and therefore involve a small amount of spent fuel. Costs of long-term storage and disposal could run into hundreds of billions of dollars. (0898-5-30 [Curran, Diane] [Makhijani, Arjun])

Comment: [T]he Department of Energy has a responsibility to make good on its commitment to receive and safely store the spent fuel for the long term. By doing so, locally stored spent fuel could be safely removed to a single or regional locations controlled by and protected by our national government. (0909-2 [Johnson, Amber])

Comment: [T]he Department of Energy has a responsibility to make good on its commitment to receive and safely store the spent fuel for the long term. By doing so, locally stored spent fuel could be safely removed to a single or regional locations controlled by and protected by our national government. (0911-2 [Stork, Gilbert])

Comment: Power reactor Host States did not envision Long-Term or Indefinite storage of spent nuclear fuel within the State, and the Federal government must assume its responsibility for managing Spent Nuclear Fuel (SNF). The SNF must be permanently disposed of in a geologic repository as recommended by the "Blue Ribbon Commission on America's Nuclear Future" and supported by the Department of Energy. (0913-1 [Bevill, Bernard])

Comment: The indefinite period of storage at an Independent Spent Fuel Storage Installation (ISFSI), either at-reactor or away-from-reactor, accomplishes and assures the temporary storage of SNF in the absence of a permanent geologic repository, albeit less than satisfactory. (0913-3 [Bevill, Bernard])

Comment: The Federal government must insure the process for selecting a permanent disposal facility continues as proposed by the Department of Energy, and that a permanent geologic repository is developed, licensed, and becomes operational. (0913-4 [Bevill, Bernard])

Comment: (XII-6) Sweden has taken an interesting approach to ISFSI design. The Swedes have built the Clab facility, in which spent-fuel pools are located in underground caverns excavated in rock. The Clab facility has been described in a brochure published by SKB, the company that manages Sweden's radioactive waste.¹⁴² [footnote 142 text: SKB, 2006.] That brochure accompanies this declaration as Exhibit #48. One sees from the brochure that the ceiling of each cavern is 32 m below the surface. The intervening rock is granite. (XII-7) The Clab facility will probably not be replicated in the United States. It represents a comparatively expensive approach to managing spent fuel. Also, although Clab is not designed as a repository, there might be political pressure to employ such a facility as a repository if repeated efforts to build a repository were to fail. For that reason, I recommend that interim storage of spent fuel be done at the surface, to reduce the likelihood that an interim storage facility could become a repository by default. (XII-8) The German approach to ISFSI design is to store spent fuel in dry casks that are, with one exception, located within buildings at the surface.¹⁴³ [footnote 143 text: The exception is the Neckarwestheim ISFSI, which consists of two concrete-lined tunnels in the wall of a quarry.] The design of these buildings is described in a conference paper by Thomauske.¹⁴⁴ [footnote 144 text: Thomauske, 2003.] That paper accompanies this declaration as Exhibit #49. Two basic designs are used. One design is by STEAG, and the

other by WTI. Cross-sectional drawings in Thomauske's paper suggest that the STEAG design would be more robust against attack. That observation is confirmed by analyses showing that the STEAG design would be more robust against impact by a large aircraft. (0916-3-17 [Curran, Diane] [Thompson, Gordon R.])

Comment: About the proposed geologic repository for just a few Finnish reactors' irradiated nuclear fuel at Onkalo, immediately adjacent to the Olkiluoto nuclear power plant, the filmmaker interviews only Scandinavian proponents of geologic disposal, such as Finnish and Swedish industry and government officials. No anti-nuclear activists are interviewed. But even the proponents of geologic disposal cannot agree amongst themselves on a number of very basic questions, such as, should the repository be marked, to warn future generations? For, what if future generations want to mine the plutonium in order to make nuclear weapons? If the repository is to be marked as a warning against inadvertent human intrusion, how should it be marked? Current languages will evolve, and/or go extinct, long before the radioactive waste loses its hazard. But even once the gamma hazard dissipates, the nuclear weapons proliferation risk will remain for a much longer period of time - as will the alpha-particle hazard associated with such radiotoxic elements as Pu-239. (0919-2-17 [Kamps, Kevin])

Comment: On Page 1-12, in Figure 1-1, NRC assumes up to 80 years of operations at commercial reactors. That is, two 20-year license extensions, in addition to 40 years of initial operations. But how much high-level radioactive waste would that amount to, if all currently operating U.S. reactors were to continue to generate irradiated nuclear fuel for 80 years? Doesn't this conflict with DOE's assumption of 50 years of operations at commercial reactors, as assumed in its 2002 FEIS on Yucca? The DOE's Yucca FEIS, as at Table A-8 on Page A-16, assumes 105,414 Metric Tons of Heavy Metal in terms of quantities of irradiated nuclear fuel to be generated by the commercial nuclear power industry in the U.S. by 2046. Are NRC's assumptions in this DGEIS compatible with DOE's projections, or not? Wouldn't 80 years of commercial reactor operations result in significantly more irradiated nuclear fuel being generated than DOE assumed in its 2002 Yucca FEIS? (0919-3-2 [Kamps, Kevin])

Comment: Also attached are the announcement of the 2012 Chicago event, its schedule, its roster of speakers, and a 4-page fact sheet I wrote, entitled "Red Gate Woods: History's First Radioactive Dust Bin," about how we have not even figured out what to do with Fermi's first cupful of radioactive waste from 70 years ago. The same is true for commercial radioactive waste. (0924-4 [Kamps, Kevin])

Comment: A permanent repository was the basis of the growth of the nuclear industry and of course is not yet built and used. Both Republican and Democratic politicians have stated at public meetings that there never will be one built. (0933-2 [Anonymous, Janet])

Comment: There is no where safe to put the waste. All of the acrobatics to locate a "safe" storage / disposal site are a hoax - there is no safe way to handle and manage nuclear materials, and I have no confidence that one will be "found". (0936-5 [Laney, Nan S.])

Comment: I support the call by the Sierra Club for the NRC to create a safe, long-term solution for managing and disposing of the nation's spent nuclear fuel and high level radioactive waste. (0944-3 [Pascall, Glenn] [Watland, George])

Comment: The Sierra Club's bottom line conclusion: There remains no alternative but to continue the hard and necessary work of "creating a safe, long-term solution for managing and disposing of the nation's spent nuclear fuel and high level radioactive waste," in the words of the Nuclear Regulatory Commission's Blue Ribbon Commission, which reported in January 2012. (0944-9 [Pascall, Glenn] [Watland, George])

Comment: As history has taught us, temporary plans for nuclear waste are not the answer. (0946-4 [Commenters, Multiple])

Comment: However, the Department of Energy has a responsibility to make good on its commitment to receive and safely store the spent fuel for the long term. By doing so, locally stored spent fuel could be safely removed to a single or regional locations controlled by and protected by our national government. (0949-2 [Commenters, Multiple])

Comment: The Department of Energy has a responsibility to make good on its commitment to receive the spent fuel. Because it has neglected that responsibility, PG&E is supportive of the establishment of the President's Blue Ribbon Commission and its recommendations to advance a workable storage solution. (0949-4 [Commenters, Multiple])

Comment: However, the Department of Energy has a responsibility to make good on its commitment to receive and safely store the spent fuel for the long term. By doing so, locally stored spent fuel could be safely removed to a single or regional locations controlled by and protected by our national government. (0949-7 [Commenters, Multiple])

Comment: We Need YUCCA MOUNTAIN as a Storage Facility for Nuclear Waste: huge amounts of US tax money has already been spent toward this goal. (0967-1 [Kane, Lynne])

Comment: [I]s the radioactive materials national storage site in Moab up and running yet. Or are other sites being considered. (0978-1 [Martin, David])

Comment: Other countries have national rules and regulations regarding the disposal of these materials and some seem to be quite safe. (0986-1 [Wayland, Gregory])

Comment: Each year 2000 metric tons of high-level nuclear waste is generated which only adds to the 58000 tons already stockpiled at existing reactors in the US. Thus, we already have more nuclear waste than can be contained in the Yucca Mountain storage facility even if it did have funding and a license to operate which at this time it does not. (0990-1 [Schilling, Francis])

Comment: Your agency has been remiss in not having guidelines in place already. Your agency needs government oversight, not public comments. Any reactor that does not already have policies in place for retiring its waste and rods, should be handled immediately by the agency that oversees nuclear reactors, as well as their state government, with the possibility of being shut down. (0992-1 [Thaw, Karen])

Comment: Nuclear waste disposal is a mess. First, we must reactivate the Nevada disposal site. That stuff just has to go to some safe place, even if the Nevadans don't like it. (0996-1 [Donaldson, John])

Comment: As yet there is no permanent storage solution - and there is none likely in the foreseeable future, for engineering and political reasons. (0998-3 [Rosanelli, Donald])

38. Comments Concerning the Feasibility of Safe Storage and Regulatory Framework

Comment: While we are working on the solution, I am also concerned that many of our nuclear reactors have over-crowded fuel pools on site. These present safety threats to the communities and industries that surround the plants. The NRC should take immediate action to reduce the number of fuel assemblies in the water-filled pools. (0003-2 [Commenters, Multiple])

Comment: Before transferring the fuel rods to cask storage, the cask storage needs to be examined and reinforced to be able to safely store the fuel rods particularly those that qualify as high burn up fuel. Hardened on-site storage of the casks should become the choice for storage. (0003-3 [Commenters, Multiple])

Comment: Perhaps the best temporary solution would be to require every nuclear reactor location to provide for it's own waste storage on site, which would be secure from earthquake and volcanic damage (or release into any waterway through flood or tsunami) until such time as this problem can be safely resolved. (0006-4 [Van Wicklen, Betty J.])

Comment: I do NOT share the NRC's confidence in the industry's ability to solve the storage and disposal problems inherent in the use of nuclear power to generate electricity here in the US. Having seen far too many instances over the years where the Nuclear Power Industry has failed to properly maintain existing facilities, where human and mechanical failures have released radioactive materials into the environment, it is ludicrous for the NRC to tolerate the less-than-stellar performance on the part of Nuclear Power interests at their 'word', such as it has been. 'Reasonable assurances' from an industry with a record like that don't amount to a whole heck of a lot when you're planning on leveraging the futures of our children and grandchildren....assuming the inevitable mishap doesn't occur sooner than that. (0008-1 [Daly, John])

Comment: Waste from the Mix Oxide Fuel (MOX) technology should not be considered in the Environmental Impact Statement. MOX development and implementation technology has not been completed or licensed, and waste from MOX is not the same composition as uranium spent fuel. (0023-2 [Bridges, Martha])

Comment: I want to ask the NRC to consider can they definitely state with confidence that there is no danger with our current ways of dealing with radioactive waste? And I don't think so. And is there currently a safe way to store the waste? We should wait until a safe method exists, if ever. And I'm not even sure, and none of us are, that deep geological storage is safe. (0030-13-2 [Sondheim, Steven])

Comment: We anticipate that the NRC will continue to assess the adequacy of its current framework for regulating safe storage through its existing processes outside of this rulemaking. Several examples have been mentioned today, including the ongoing work on the ISFSI security rulemaking and staff's recent work on spent fuel pool safety in the Spent Fuel Pool Study. (0030-16-6 [Bonanno, Jerry])

Comment: The industry has shown over the course of decades that it is committed to the responsible, safe and secure storage techniques onsite. And we all know that onsite storage was never intended as a permanent solution, but we also know that the industry was gone to great lengths to make on-site storage a safe and secure process. These structures meet the rigorous requirements that the NRC has already laid out and the industry has invested billions of

dollars and thousands of man hours over the last few years in making these facilities safe and secure. (0030-18-3 [Curtin, Kenneth])

Comment: The truth is that all of the used nuclear fuel ever produced in the United States can be safely stored on the same amount of space required by only a handful of wind turbines. Personally, I feel that's a very small price to pay for nuclear energy which is and will continue to be our largest source of zero-carbon electricity. Furthermore, the U.S. industry has a stellar record of fuel storage and transportation. As has been mentioned, we stored over 1,000 casks safely and the fuel pools remain safe at every site across this country. Under the NRC's guidance we've completed over 3,000 successful shipments of fuel without incident. The NRC oversees many times as many shipments of radiological materials every year from medical, research, and other industrial needs. When it comes to materials management, the responsibility and professionalism shown by the nuclear industry and the NRC is beyond compare and they have shown that they are able to responsibly manage on-site fuel storage for as long as is necessary. (0030-19-3 [Cohn, Jeremy])

Comment: Spent nuclear fuel is currently being stored onsite in well-designed, well-protected facilities and storage casks. These facilities and storage casks are robust structures made out of steel linings and reinforced concrete walls that are several feet thick. Spent fuel pool are often 40 feet deep, steel lined with reinforced concrete walls and the structures are built to seismic standards to protect the pools. The dry storage casks where the fuel is moved are also robust structures made of concrete and steel. For every 10 tons of used fuel a facility uses 100 tons of concrete and steel to form a structure designed to protect the fuel. Over the 30 years nuclear energy facilities have safely and securely stored used fuel in these structures. American nuclear energy is also a highly-regulated industry with operating facilities subjected to on-site inspections by NRC staff 24 hours a day, 7 days a week, 365 days a year. (0030-20-2 [Lapiska, Evan])

Comment: The Council endorses the NRC's fundamental waste confidence conclusion that used fuel can be safely stored at reactor sites or at off-site locations in a time interval between reactor shutdown and ultimate recycling or disposal of the fuel. This conclusion is supported by many decades of safe secure on-site storage of used fuel in spent fuel pools and in dry storage systems, both in the United States and abroad. Nuclear fuel assemblies are robust, corrosion-resistant metal containers designed to maintain their integrity in the high-temperature, high-pressure, high-radiation environment of an operating nuclear reactor core. Conditions experienced by the fuel in storage are far more benign. The decay heat and radiation associated with used fuel decreases with time, and moreover used fuel requires no active cooling systems for long-term heat removal. Finally, the ability of used fuel to maintain its integrity during storage is supported by extensive experience, data, and analysis. (0030-23-6 [Blee, David])

Comment: We heard a little bit about the North Anna earthquake. In fact, what that showed is incredible robustness and integrity and excellence in design of the systems that were deployed at North Anna. (0030-23-7 [Blee, David])

Comment: But until then, our commitment, the regulatory framework, all of the things that are mentioned in the EIS, will keep these materials safe in these robust structures. (0030-6-11 [McCullum, Rod])

Comment: I just want to say a few words on behalf of the folks that I work with on a daily basis, the professional men and women out there who are responsible for managing used nuclear fuel

at our sites, who have compiled a very impressive safety record. We have loaded 1,700 dry cask storage systems with absolutely no release of radioactivity. They have been sitting on the pad, some of them, for as long as 30 years. We have done scientific studies. We have opened one up after over a decade in storage. We have looked inside. We have a tremendous base of evidence to know that these systems were steel, concrete, lead, used 100 tons of protection for every 10 tons of used nuclear fuel -- do provide outstanding protection. (0030-6-2 [McCullum, Rod])

Comment: The individuals I work with every day, they are -- I have been working for NEI for 15 years, and they are probably the biggest reason I keep coming into work every day, because I am so proud of the job they do and the experience that they provide and all of the innovation that has occurred in our industry. We have three vendors providing these casks. These vendors don't just meet regulations. They have to compete. It's like Ford and General Motors and Chrysler except it's Holtec and Transnuclear and NAC. That is, in general, the attitude of the folks I work with on a daily basis at the utilities and at the vendors. We don't just meet regulations; we exceed them. And a lot is said in this EIS about confidence in NRC's regulatory process, and that is how we will know that storage is safe. And, well, yes, the regulatory process is very strict, but it is indeed the nuclear culture that we have that is in place on all of those individuals I know and am speaking out on behalf of here today, as well as I know the ones that will come in the future because you don't get into this business unless you have that conference. (0030-6-3 [McCullum, Rod])

Comment: I think storage of the spent fuel is certainly important, and it seems to be done in a safe manner. We have had nuclear energy in this country for almost 50 years. The worst case scenario was Three Mile Island. Those safety checks and balances worked. (0030-9-2 [Guido, Jeffry])

Comment: I just wanted to be here tonight to let you all know that Sierra Club has no confidence that high level nuclear waste will be safe after nuclear reactors close. (0045-1-1 [English, Becky])

Comment: I'm also not confident that they are fully prepared to store the existing 80,000 metric tons of radioactive waste already sitting at the 104 reactors across the country. (0045-11-4 [March, Leslie])

Comment: It says here, you know, it's feasible to safely store spent nuclear fuel, follow license life of the operator of the reactor. You know, the DOE said it was feasible to build an advanced nitrous filtration plant at Hanford. And they approved a plan to build that plant that was going to cost somewhere between \$3 billion and \$4 billion, that was about ten years ago. That plant by Bechtel is, Bechtel has just turned that into a cash cow. They are currently not completed. They were supposed to be completed by 2014. The completion date has, you know, been moved up to about 2016 at this point and the cost of the thing is \$14.4 billion currently, you know, you can see what's happened there. You know, it's feasible perhaps to build the plant, but it didn't happen, you know. It didn't happen and DOE couldn't make it happen and that cost is incredibly high. That was a way of dealing with nuclear waste. (0045-12-3 [Kinsey, Bob])

Comment: If necessary, spent nuclear fuel can continue to be stored in a safe environmentally sound manner, for a long period of time, while we wait for the political process to reach agreement on a disposal solution. (0045-2-8 [Green, Michael])

Comment: Storing this stuff above ground for decades at plant sites is totally unsafe. (0050-2 [Waterman, Charles])

Comment: Show me the actual tests that prove these canisters won't leak the fission byproducts if an airplane crashes into them. (0050-3 [Waterman, Charles])

Comment: When the Nuclear Industry started terrorism was not a threat and I doubt that even then these plants would ever have received operating licenses if the intent was to store spent fuel in casks above ground at each site! (0050-4 [Waterman, Charles])

Comment: I am writing you because I am concerned about how we store all our hazardous waste, including the radioactive fuel rods from nuclear reactors. We should study and emulate the French example for using this technology. Nuclear power has been highly successful throughout France for many years. There has never been an accident or leak. (0057-1 [Lamont, Dana])

Comment: Remove all dry casks to ISFSI facilities away from populated areas of our country in dispersed arrays to make them less vulnerable to terrorists attacks, and reducing the consequences if attacked (0059-14 [Andrews, Richard])

Comment: Spent nuclear fuel is currently being stored on-site in well-designed, well-protected facilities and storage casks. These facilities and storage casks are robust structures made out of steel linings and reinforced concrete walls that are several feet thick. Spent fuel pools are often 40 feet deep, steel lined with reinforced concrete walls and the structures are built to seismic standards to protect the pools. The dry-storage casks where the fuel is moved are also robust structures made of concrete and steel. For every 10 tons of used fuel, facilities use 100 tons of concrete and steel to form a structure designed to protect the fuel. Over the last 30 years, nuclear energy facilities have safely and securely stored used fuel in these structures. American nuclear energy is also a highly regulated industry, with operating facilities subject to on-site inspections by NRC staff 24 hours a day, seven days a week, 365 days a year. (0060-2 [Lapiska, Evan])

Comment: The industry has shown over the course of decades that it is committed to responsible, safe and secure storage techniques on-site. While we all know that on-site storage was never intended as the permanent solution, we also know that industry has gone to great lengths to make on-site storage a very safe and secure process. These structures meet the rigorous requirements set by the Commission and the industry has invested billions of dollars and thousands of man hours upgrading the physical structure and overall security at nuclear facilities in recent years. (0061-3 [Kirton, Kenneth])

Comment: What exactly are the current safety standards for the spent fuel cooling pools at SONGS? What exactly are the current safety standards for the 42 dry storage casks? What back up is required today to protect the spent fuel pools from an electrical shut down of more than four hours? How many hours without cooling are the spent fuel pools safe? How far away are the back-up generators? Are they sufficient to keep all cooling pools safe for the three days of 90 mile an hour winds that our Santa Ana winds that hit Southern California each year might continue, keeping air support from the cooling pools if firestorm over ran the facility where the spent fuel pools are kept? What safety precautions exist for that circumstance? What is the safety formula for protecting the spent fuel from all disaster possibilities? Firestorm, earthquake, tsunami or terrorists? Such as the reactor domes were "adequate" against a 7.0 earthquake, and five terrorists on the ground. (0063-3 [Magda, Marni])

Comment: We were led to believe that nuclear spent fuel must wait five to seven years to be put in dry storage. No new fuel has been generated at SONGS for two years, so conceivably in

five years all spent fuel at Songs could be in dry storage. Why have only 42 dry storage casks been created in the 30 years the spent fuel has been accumulating at SONGS? Since the shutdown, the public has learned that 16 years ago a dangerous high burn fuel began to be used at SONGS. Who approved of that change? This kind of fuel is considered by the rest of the world too dangerous to use. What environmental impact did this higher burn fuel create have on the ocean? What temperatures changed or volume of ocean water used and dispersed? Who approved of this change of fuel at SONGS? What studies were demanded? Have we stored any of this more deadly spent fuel in dry storage at SONGS in the last 16 years? How? In what kind of storage? Where? Have we moved any of this more deadly high burn spent fuel from the SONGS spent fuel cooling pools? How? Where? How much of the spent fuel in cooling pools at SONGS is not high burn fuel? Is it stored in separate cooling pools from the high burn more dangerous fuel? Since this fuel is older than 16 years, could it all be in dry storage? Is all of it in dry storage? (0063-4 [Magda, Marni])

Comment: How long must the high burn fuel at SONGS remain in cooling pools before it can be stored in dry storage? How long will those dry storage casks last? How long must we wait to put the high burn fuel in final geologic disposal transportable casks? How soon could it be moved to MRS monitored, retrievable storage and how do we begin to get a California solution for MRS high burn fuel? We need it YESTERDAY. It can't wait, 2 years, let alone 20 to 60. SONGS can't keep the spent fuel where it is because of earthquake or tsunami possibilities that could create a Fukushima meltdown here any day. How can spent fuel in cooling pools be moved from Songs to a geological location that would be safe to store the fuel in new cooling pools that are away from earthquake faults, the ocean, and 8.4 million people? This must be done!!!! (0063-5 [Magda, Marni])

Comment: We need final geologic disposal casks that are transportable. Is that the NRC recommendation? We can't leave our grandchildren with the Chernobyl type mess of no money and containment needing to be redone every thirty or so years. (0063-7 [Magda, Marni])

Comment: The short- or interim-term storage of spent fuel is an escalating public safety matter because the United States has failed to identify or build a permanent national spent fuel repository. At nuclear plants across the nation, short-term storage has become defacto long-term storage, and risky wet storage pools are filling beyond their design capacity. Any doubling up on design capacity exacerbates the potential for a radioactive release. (0064-8 [Skud, Bruce])

Comment: Prevention and precaution. The EIS must also compare the variety of possible methods for storing the more than 150,000 tons of highly radioactive irradiated/spent fuel that will be created and housed at nuclear power reactors by 2050. (0072-2 [Black, Ryan])

Comment: We put the sludge from the ponds in 55 gallon drums which were then buried on site. This facility [West Valley, NY] was built on a fault and some of these drums were found in area creeks. Which begs the question just how safe are these storage sites? (0076-3 [Jensen, Phyllis])

Comment: Cooling pools were never meant to store as many dangerously radioactive "spent" rods as they are now doing. Sadly, we have no real way to safely contain these rods, since they will remain radioactively toxic for thousands of years. (0088-1 [Fast, Wendy])

Comment: And what is to be done with all the melted fuel and damaged fuel rods from the meltdowns that have actually occurred (despite NRC's misplaced confidence, probabilistic risk assessments and continued speculating that that can never happen)? According to an article

revealing failure of the concrete storage system for melted and damaged fuel from the Three Mile Island meltdown:

<http://www.platts.com/RSSFeedDetailedNews/RSSFeed/ElectricPower/6002873>; The concrete modules are "showing significant cracking and degradation," even though they were built in 1999 to last for 50 years, NRC said in the letter, [to DOE] which is dated April 7. DOE has analyzed the structural integrity of the modules, which have walls two feet thick, and determined that the problem is getting progressively worse, NRC said. NRC Staff scientists declare that a nuclear fuel fire in fuel exposed to air cannot be ruled out even in the oldest fuel. (0089-3 [Shaw, Sally])

Comment: In the report cited below, U.S.NRC NUREG-1738 Spent Fuel Pool Accidents Risks at Decommissioning Nuclear Power Plants. For Vermont Yankee (BWR), Ref. 1 states that the critical failure mode for the gross structural failure of the pool is an out-of-plane shear failure of the pool floor slab. With this failure mode, the liner will be breached and a large crack will develop through the concrete floor slab within a distance equal to the floor slab thickness from the pool walls. Possibly the entire floor will drop out, but I think that such a gross failure is unlikely. However, the concrete crack will be sufficiently large that the water in the pool will quickly drain out. (0089-4 [Shaw, Sally])

Comment: I am writing to ask that compliance of containment not be left to fuel pools for nuclear waste. This is not secure and vulnerable to terrorists, leaks and area contamination. (0092-1 [Scharin, Lisa])

Comment: It is IMMORAL and UNETHICAL to be so lax with such a dangerous fuel- especially one that can be used to annihilate so many people! I want more responsible, highly contained and monitored systems! (0092-3 [Scharin, Lisa])

Comment: As strange as this may sound, the idea for this paper was given to me by a anti-nuclear environmentalist who in describing various reasons that nuclear power plants should not be built, informed me that some of these casks have "skin temperatures" of three hundred and fifty degrees. I have never been able to confirm this exact figure. The cask manufacturers themselves however, and there are several, advertise the fact that "their casks" can typically store spent fuel safely for one hundred years, while at the same time allowing the latent heat of the fuel rods to gradually cool. (0100-1 [Behling, Steve])

Comment: These storage arrangements need to withstand earthquakes, storms, floods and terrorist acts. (0110-1 [Wolf, Ann])

Comment: Basically, I want to say very briefly about short-term storage of wet storage. Shame on the Nuclear Regulatory Commission for supporting wet storage. Wet storage is inherently less safe than dry storage because it has to be backed up by electrical generation that could fail and dry storage does not require electric generation. (0112-10-6 [Skud, Bruce])

Comment: Right now, right now we have -- we know the detail and characteristics of used nuclear fuel and how to design its containment and its protection. The record is clear from decades of operation in the U.S. and around the world. (0112-12-2 [Garcia, Diego])

Comment: However, on the other side, fuel from our reactors -- and I know some of you are not in agreement -- but fuel from our reactors is currently stored safely. Some in pools and a lot of it is in dry cask storage facilities. And the -- I think that we need to give them credit. And obviously your -- you need to voice concerns when you have them specifically and I think you've

been doing that. But while we don't have a central repository, I think it's important that we have a more than acceptable, a good system, and a safe system for storing the fuel that we have. And I think that this report goes in that direction and I think it's technically acceptable to do that and it does it. (0112-17-4 [Stamm, Steve])

Comment: According to an article revealing failure of concrete storage systems for melted and damaged fuel from the Three-Mile Island meltdown, the concrete modules are showing significant cracking and degradation even though they were built in 1999 to last for 50 years. NRC said in the letter, which is dated April 7th: "The Department of Energy has analyzed the structural integrity of the modules which have walls 2-feet thick and determined that the problem is getting progressively worse," NRC said. NRC staff scientists declared that a nuclear fuel fire and fuel exposed to air cannot be ruled out even in the oldest fuel. (0112-18-4 [Shaw, Sally])

Comment: In the U.S. NRC's NUREG-1738, spent fuel pool accident risks at decommissioning nuclear power plants, for Vermont Yankee boiling water reactor, it states that the critical failure mode for the gross structural failure of the pool is an out-of-plane shear failure of the pool floor slab. With this failure mode the liner will be breached and a large crack will develop through the concrete floor slab within a distance equal to the floor slab thickness from the pool walls. Possibly the entire floor will drop out, but I think that such a gross failure is unlikely. However, the concrete crack will be sufficiently large that the water in the pool would quickly drain out. (0112-18-5 [Shaw, Sally])

Comment: If you read the report itself, there are more other words other than generic that give me some problems. Let's look at spent fuel storage. I looked in vain because people kept saying, "Oh, the NRC has said they're all equally safe, all methods." Well, unless somebody at the NRC can point me to where that is, all I found in the NUREG was that both provide, quote, "adequate protection." What's adequate mean? One definition is barely sufficient. A second is mediocre. (0112-2-3 [Lampert, Jim])

Comment: Spent fuel is currently being stored onsite in well-designed, well-protected facilities in storage casks that are designed to avoid a wide range of threats. That's not to say, that's not to say that we don't look forward to, and are not open to, the evolution of these devices and technologies. (0112-21-1 [Morris, Kelsi])

Comment: Over the last 30 years nuclear energy facilities have safely and securely stored used fuel in these structures. American nuclear energy undergoes the most rigorous safety precautions and inspections in the world with the operating facilities subject to on-site inspections by NRC staff 24 hours a day/7 days a week/365 days a year. (0112-21-2 [Morris, Kelsi])

Comment: As the Commission continues these public hearings, I would just like to reiterate that nuclear energy has shown the utmost commitment to safely and securely storing spent fuel. (0112-21-5 [Morris, Kelsi])

Comment: I do not have to be a nuclear engineer to know that dry cask is safer than an overcrowded spent fuel pool on the banks of my beautiful Connecticut River or on the banks of Massachusetts Bay. I will repeat what was said before, shame on you for ever saying otherwise. I'm going to sound like a mother again, shame on you. (0112-24-4 [Darling, Ann])

Comment: You know, I'm heartened. During the 15 years I've been doing this as the work has shifted from disposing of it in the near term to storing it in dry cask and pools, which we do both

of those things safely, I've had a chance to work with some of the brightest professionals I could have ever imagined meeting. The engineers, the scientists who formed the technical foundation which keep the risks in the casks and the risks in the pool so low. I'm so heartened today to see all these young people who are devoting their careers to the same cause. It is indeed noble work and it is work that has been well done. (0112-25-2 [McCullum, Rod])

Comment: And I think the most powerful testimony of the safety of both pools and casks is Fukushima because those casks were over washed by the tsunami, they were shaken by the earthquake. The pools were not only over washed by the tsunami and shaken by the earthquake, three of them were in buildings that were completely decimated by hydrogen explosions. There's been a lot of rumors spread about what happened in those pools. But if you go on YouTube and look at the video, that fuel is in pretty much the same condition it was before the accident. And it will be there as we safely move it out of the pools as we've done in so many pools before. (0112-25-7 [McCullum, Rod])

Comment: I'd point you to the American Physical Society, the nuclear energy study group had a paper in 2007 that determined independently, unequivocally that with an appropriate schedule of monitoring and inspection, dry storage can be provided for as long as it's needed. (0112-27-2 [Curtis, Daniel])

Comment: I'm also for the dry casks, let me make that very clear. (0112-30-2 [Parks, Sheila])

Comment: So I want to start because there's this assumption out there and it's stated repeatedly that the spent fuel is safe, that it's managed safely, that it's current condition is safe, that the fuel pools are safe, that the reactors are safe. And I would really like the NRC to acknowledge that the current storage of spent fuel pools is not safe. There isn't anything about it that's safe. They're over stacked, they're beyond the design life, beyond the intentions. It can be made safer. I can agree with that. But the assertion that doing nothing but maintaining the status quo is safe is completely untrue and needs to change. So step one is to acknowledge that the spent fuel in the fuel pools is not safe. (0112-31-2 [Johanson, Birgit])

Comment: We should be designing for the worst possible scenarios, not deliberately minimizing the risks. (0112-31-9 [Johanson, Birgit])

Comment: I'm here to express my support and confidence in the storage of spent fuel on-site at nuclear facilities. The industry has shown that over the course of decades it is committed to responsible, safe, and secure storage techniques on-site. Now, we all know that on-site storage was never intended as a permanent solution. And we also know that industry's gone to great lengths to make on-site storage as safe and secure as possible. These facilities meet the standards and rigorous requirements that are set by the NRC. And the industry's invested billions of dollars and hundreds of thousands of man-hours, post 9/11 alone, in securing and reinforcing these facilities. (0112-4-1 [Kirton, Stratton])

Comment: In the phase-out period the radiated nuclear fuel should be stored in concrete and steel dry casks which do not require electricity. Because, according to the Union of Concerned Scientists, they are passively cooled by natural air flow. (0112-6-3 [Wrenn, Nancy])

Comment: Scientists now claim that the irradiated nuclear fuel will degrade with age. This means that when and if a better storage option is possible, transfer of this more radioactive and thermally hot fuel from the casks will be extremely risky. (0112-6-5 [Wrenn, Nancy])

Comment: The fuel pools [at Vermont Yankee Nuclear Power Station] are not protected by any redundant emergency systems or cooling systems nor are they housed in any robust structures. (0112-7-3 [Sachs, Leslie Sullivan])

Comment: In the phase-out period irradiated nuclear fuel should be stored in concrete and steel dry casks, which do not require electricity because, according to the Union of Concerned Scientists, they are passively cooled by natural air flow. (0116-3 [Wrenn, Nancy])

Comment: Scientists now claim that the irradiated nuclear fuel will degrade with age. This means that when and if a better storage option is possible, transfer of this more radioactive and thermally hot fuel from the casks will be extremely risky. (0116-5 [Wrenn, Nancy])

Comment: [F]or the millions of younger people in the area affected by this ticking time bomb, we owe it to THEM to have the chance to live out their lives by using common sense and exercising responsible behavior BEFORE it is too late. We are told that we shouldn't worry because it is less expensive to continue to store the waste as we have been doing, and more business-like than finding a safer way to store the deadly poisons of nuclear waste. And that there is really no danger. The last time I checked the Sunday New York Times Real Estate Section, Three Mile Island, Chernobyl and Fukushima were not places with many listings nor were there any articles indicating that there were customers looking to move to either of these three places. (0117-1 [Amram, David])

Comment: There are those here today who would like to construe the true purpose of this meeting in order to push their own agendas. The fact is that the waste confidence rule has nothing to do with Indian Point. Federal regulators and scientific experts say that it is safe to store spent fuel in pools onsite at Indian point and New York's five other nuclear power plants (0119-1 [Mooney, William])

Comment: I have no confidence under any rules that waste stored at Indian Point will be handled appropriately. (0120-1 [Seeman, Laurie])

Comment: In 2005, NRC and Entergy reported that radioactive water was leaking from IP2's spent fuel pool. Although discovered 20 days earlier, Entergy did not believe a tritium leak posed a serious enough threat to warrant public notification. 2007 a new tritium leak was found - leaks into the ground water and Hudson River. The now over 2,700 tons of high level radioactive waste that contains plutonium will remain deadly for 240,000 years - and it is being stored in ordinary buildings, not dry cask storage. And what about the amount of high burn-up fuel that presents an even far greater threat? How much is being produced? The radioactive material being stored at Indian Point is the equivalent of over 1000 Hiroshima bombs. The spent fuel pools are over-crowded, making an accident far more likely. There is no room for more spent fuel rods - stop producing them! (0121-2 [Skopic, Catherine])

Comment: First, please let me express my support and confidence in the storage of spent nuclear fuel on-site at nuclear facilities. Throughout its history, the nuclear energy industry has proven that it is committed to responsible, safe and secure storage on-site. Although storage of spent fuel on-site at nuclear facilities was not intended as a permanent solution, the industry has committed to making on-site storage a very safe and secure process. All containment structures are required to meet the rigorous requirements set by the Commission and billions of dollars and thousands of labor hours have been invested by the nuclear energy industry. (0122-2 [Bailey, Savannah])

Comment: Dry cask storage is a method of storing high-level radioactive waste, such as spent nuclear fuel that has already been cooled in the spent fuel pool for at least one year. Casks are typically steel cylinders that are either welded or bolted closed. The fuel rods inside are surrounded by inert gas. Ideally, the steel cylinder provides leak-tight containment of the spent fuel. Each cylinder is surrounded by additional steel, concrete, or other material to provide radiation shielding to workers and members of the public. There are various dry storage cask system designs. At Indian Point, the steel cylinders containing the fuel are placed vertically in a concrete vault. The concrete vaults provide the radiation shielding. The steel cylinders are vertically placed on a concrete pad at the dry cask storage site and use both metal and concrete outer cylinders for radiation shielding. Currently there is no long term permanent storage facility, dry cask storage is designed as an interim safer solution than spent pool storage. Indian Point began "dry casking" spent fuel rods in 2008, a "safer alternative", according to the Nuclear Regulatory Commission. Some rods have already been moved to casks from the spent fuel pools, which will be kept "nearly full of spent fuel, leaving enough space to allow emptying the reactor completely should that become necessary." Dry cask storage systems are designed to resist floods, tornadoes, projectiles, temperature extremes, and other unusual scenarios. NRC requires the spent fuel to be cooled and stored in the spent fuel pool for at least five years before being transferred to dry casks. Indian Point stores used fuel rods in two spent fuel pools at the facility. According to the New York State Department of Environmental Conservation, the Indian Point spent fuel pools, which contain more nuclear material than the reactors, "have no containment structure". While the spent fuel pools at Indian Point are not stored under a containment dome like the reactor, they are contained within a 40-foot-deep pool and submerged under 27 feet of water. The spent fuel pools at Indian Point are made of concrete walls that are four to six feet wide with a half-inch thick stainless steel inner liner. According to Jonathan Alter, the pools are located in bedrock, not above-ground as at many other plants including the Japanese ones. (0123-1 [Marzullo, Dominic])

Comment: Secondly, there is no safe place to store spent and radioactive fuel rods. We should not be generating more of them. Storage and liability needs to be the permanent responsibility of the nuclear energy companies. Storage of present fuel rods should, for safety's sake, be in dry casks rather than in pools. (0125-3 [Kidney, Barbara A.])

Comment: Is it possible that the NRC could finally insist that the potential for the very same catastrophe be removed from the United States by requiring dry cask storage, at the very least? (0126-5 [Houston, Ann E.])

Comment: I would remind the Region 1 NRC that the current NRC Chairman was part of a waste storage study in 2003 at MIT that concluded that dry cask storage is less dangerous than wet pool storage. (0136-5 [Shaw, Gary])

Comment: We can be confident that - Commercial Nuclear Fuel in the United States - is safely stored, can be safely stored and will be safely stored. (0138-1 [Cook, Dr. Andrew G.])

Comment: As a physicist and engineer I can say with confidence that used nuclear fuel is, can be and will be safely stored. I know it is safely stored because I have seen the used fuel at our US nuclear energy facilities. Used nuclear fuel is a solid, rock like ceramic, encased in strong metal tubes that are sealed. It is a solid, a rock, that is protected from the environment. It is temporarily stored and cooled in NRC licensed fuel storage pools. I know this fuel is safely stored. I have seen: --the attention to detail and safety exhibited in the design of those storage sites, --the care the operating staffs take with fuel and --the rigorous, independent assurance the on Site Nuclear Regulatory Commission inspectors provide. (0138-2 [Cook, Dr. Andrew G.])

Comment: I also know the fuel is safely stored because it is being safely stored and even recycled by my company at our La Hague France nuclear fuel recycling center. There, using US created technology, we are routinely, today, safely storing nuclear fuel, and safely recycling nuclear fuel. Further, we, today are melting the extremely small amount of left over material into glass. These glass cylinders, about 2 feet by 4 inches in diameter form a solid, water impervious engineered and licensed, environmentally friendly approach for long term underground storage. (0138-4 [Cook, Dr. Andrew G.]

Comment: The EIS must compare methods for storing the more that 70,000 tons of spent fuel that will be created and housed at nuclear plants by 2050, Hardened On-Site Storage (HOSS) of high-level nuclear waste to reduce risk of leakage or terrorist attack. The NRC should take immediate action to reduce the fuel assemblies in spent fuel pools, as well as analyzing the deficiencies of current dry cask storage. (0143-5 [Arauz, Jorge])

Comment: In order to justify its Waste Confidence policy, NRC is relying on the federal government's Plan B: to hide the waste problem by transporting spent fuel away from nuclear reactors to "temporary" storage sites around the country. This means more communities would be at risk from radioactive waste, more nuclear sites would have to be safeguarded, and reactor owners could continue making waste without responsibility for managing it. Temporary storage sites easily could become de facto permanent dumps if it is not politically feasible to site enough repositories to handle the waste. (0147-4 [Fallon, Gloria])

Comment: Spent fuel storage should be maintained locally until a consolidated Federal Depository is established at Yucca Mountain or another Federal depository site. (0148-2 [Ryan, Paul])

Comment: Radioactive waste from nuclear power plants should be stored on-site. This places the risks and costs of storage in the communities that benefit from nuclear power plants. Shipping nuclear waste to other storage sites is an externalization of costs, both economic and risk. (0149-1 [Powell, Michael])

Comment: Spent fuel is currently stored safely at nuclear power plants in either spent fuel pools or dry cask. In 1990 the commission made the generic determination that spent fuel generated in a reactor could be safely stored on site for at least 30 years after licensed life for operation. It was assumed that at the end of the 30 year period a deep repository would be available for long term storage. We now know that may not be the case. It is assumed that at the end of the 60 year period the United States will have a sufficient deep repository for long term storage. As a result of monitoring current storage methods and data collected since the 1990 decision it is evident that safe fuel storage can continue as a regulated activity for 60 years after the end of licensed operation. (0152-2 [Pelletier, David A.]

Comment: The strict guidelines regulating the onsite storage of the spent fuel, whether it be in storage pool or dry cask containers insure the safety of the public and should put any environmental concerns to rest. (0153-2 [Capurso, Thomas])

Comment: There is no truly safe way to store nuclear waste for thousands of years. (0155-1 [Preschle, Gus])

Comment: Think about all the nuclear waste leaking out of Japan into the Pacific Ocean. Now think about the safety of our reactors here and about how we store our most hazardous waste, the radioactive fuel rods from nuclear reactors. Are our communities at risk because of how we

store these radioactive fuel rods? It is also known that many of our nuclear reactors have overcrowded fuel pools on site. (0159-1 [Evjion, Virginia])

Comment: I know how both wet storage pools and dry casks are designed and operated. I know the redundancies in margins of safety in the designs of both types of storage technologies. Beginning in the 1980s the nuclear power plants began moving spent fuel from wet storage to dry storage and have continued to do so safely for nearly 30 years. There is no reason to believe they cannot continue to do so into the future and as long as necessary until the Federal Government starts picking up the fuel. The vast majority of today's dry spent fuel systems, including those at Indian Point are made of fully welded stainless steel canisters stored inside thick concrete casks or modules about two feet around the outside of those. They don't leak. They don't release any reactor material. They're designed to be dropped, tipped over, withstand floods, earthquakes, tornadoes and missiles without leaking an ounce of radioactivity. (0163-11-3 [Gutherman, Brian])

Comment: The technology doesn't exist. The casks that that other person was talking about with all the thickness and everything and the cement, they don't last more than I think 300 years is the max. That's it. It's uncontainable. (0163-14-3 [Schepart, Margot])

Comment: We're here to discuss spent nuclear fuel. Spent nuclear fuel is being stored onsite in well-designed, well-protected facilities in storage casks -- and quite safely at that. These facilities and storage casks are robust structures made of steel linings and reinforced concrete walls that are several feet thick. Spent fuel pools are often 40-feet deep, steel-lined with reinforced concrete walls and the structures are built to seismic standards to protect the pools. The dry storage casks where the fuel is moved are no different. For every ten tons of used fuel, facilities form a robust structure made of 100 tons of concrete and steel to protect the fuel. The industry has been doing this for more than 30 years safely and securely and to ensure safety there is regulation. American nuclear energy is also the high -- is also a highly regulated industry with operating facilities subject to onsite inspections by NRC staff 24 hours a day, seven days a week, 365 days a year. (0163-18-3 [Lapiska, Evan])

Comment: In addition, new technologies create new risks. For the past 16 years the NRC has allowed high burn-up fuel which burns longer and hotter in the reactor. When removed, this fuel needs up to twice as long in cooling pools, as well as more space between fuel rods in an already crowded pool. (0163-20-5 [Gellert, Sally Jane])

Comment: Those high-level radioactive rods and fuel assemblies need to be moved to dry cask storage. They need to be monitored and they need to stay onsite for as long as they are radioactive -- 240,000 years. We used the electricity. It was a fleeting good so-called and now we're stuck with it. And what's the answer? To stop making more. (0163-21-5 [Elie, Marilyn])

Comment: It's my understanding that only about 15 percent of the spent fuel assemblies that have been accumulating at Indian Point for the last 40-plus years have been moved to on site dry cast storage. This directly contradicts what the -- what the report out MIT that included a co-author, who is now the current chairman of the NRC, who said that -- who said that dry casks are much more safe than wet storage. I guess they don't want -- you know, it's just mind-boggling. (0163-22-3 [Shaw, Gary])

Comment: But for millions of younger people in the area affected by this ticking time bomb, we owe it to them to have the chance to live out their lives by using common sense and exercising responsible behavior before it is too late. We're told that we shouldn't worry because it's less

expensive to continue to store the waste as we've been doing, and more business-like than finding a safer way to store the deadly poisons of nuclear waste and that there's really no danger. (0163-26-1 [Amram, David])

Comment: First, please let me express my support and confidence in the storage of spent nuclear fuel on site at facilities. Throughout its history the nuclear energy industry has proven that it is committed to responsible safe and secure storage onsite. (0163-29-4 [Bailey, Savannah])

Comment: Although storage of spent fuel onsite was not intended as a permanent solution, the industry has committed to making it a very safe and secure process. All containment structures are required to meet the rigorous requirement set by the Commission, and billions of dollars and thousands of labor hours have been invested by the nuclear energy industry in recent years to upgrade physical structures and ensure security at nuclear facilities across the country. (0163-29-5 [Bailey, Savannah])

Comment: Throughout the industry's history it has shown that spent fuel can be stored on site safely, securely and cleanly. In the Commission's consideration of both this and future issues I urge them to take into account the incredible clean-air power of nuclear energy and consider ways to strengthen its commitment to clean-air - clean-energy technologies across the U.S. (0163-29-9 [Bailey, Savannah])

Comment: The now over 2,700 tons of high-level radioactive waste that contain plutonium will remain deadly as we've heard over and over again this evening for 240,000 years and is being stored in ordinary buildings, not dry cask storage. (0163-32-2 [Skopic, Catherine])

Comment: And what about the amount of high burn-up fuel that presents an even far greater threat. How much is being produced? I would really like to know. We all would like to know. The radioactive material being stored at Indian Point is the equivalent of over 1,000 Hiroshima bombs. The spent fuel pools are overcrowded, as we've also heard, making an incident far more likely. There is no room for more spent fuel. Stop producing them. (0163-32-3 [Skopic, Catherine])

Comment: We in Oyster Creek also have the problem of the unknown unknowns as was alluded to a couple of times earlier, namely of the high burn-up fuel issue. Just as recently as Monday we've asked the NRC "Do we have high burn-up fuel at Oyster Creek?" And we're assured, no, no. But the document from the U.S. Department of Energy Inventory and Description of Commercial Reactive Fuels in the United States published in March 31, 2011, clearly states we do. And many other reactors do. (0163-36-3 [Brown, Jeffrey])

Comment: Now, the problem with high burn-up fuel for this waste confidence issue in part is that it makes the fuel rods embrittled, much worse than they would be otherwise. Therefore, even handling them becomes more difficult. There's more likelihood of damage. It makes it more difficult to transport, so that the problem is multiplied. And so how can we have confidence that whatever the unknown unknowns that are going to be discovered going forth will be handled. I say we do not. (0163-36-4 [Brown, Jeffrey])

Comment: "The public has been asked to come here today to comment on the U.S. Nuclear Regulatory Commission's Proposed Waste Confidence Rule related to the appropriate and safe storage of used fuel from nuclear power reactors. There are those here today, one of which who you have already heard from, who would like to construe the true purpose of this meeting in order to push their own agendas. The fact is -- the fact is that the Waste Confidence Rule has

nothing to do with Indian Point. Federal regulators and scientific experts say that it is safe to store spent fuel in pools onsite at Indian Point and New York's five other nuclear power plants. (0163-4-1 [Thomas, Richard])

Comment: I'm here to talk about the dry cask storage. It's a method of storing high-level radioactive waste, such as spent nuclear fuel, that has already been cooled in a spent fuel pool for at least one year. Casks are typically steel cylinders that are either welded or bolted closed. The fuel rods inside surrounded by inert gas. Ideally, the steel cylinders -- steel cylinders provide leak-tight containment of the spent fuel. Each cylinder is surrounded by additional steel, concrete, and other material to provide radiation shielding to workers and members of the public. There are various dry storage systems. At Indian Point the steel cylinders contain fuel that are placed vertically in a concrete vault. The concrete vaults provide the radiation shielding. The steel cylinders are vertically placed on the concrete pad and the dry cask storage sites use both metal and concrete outer cylinders for radiation shielding. Currently there is no long-term permanent storage facility. Dry cask design is an interim safer solution than spent fuel pool. (0163-6-1 [Marzullo, Dominic])

Comment: Indian Point began dry casking spent fuel rods in 2008, a safer alternative. According to the Nuclear Regulatory Commission, some rods have already been moved to casks and the spent -- from the spent fuel pools, which they were kept, nearly full of spent fuel leaving enough space to allow emptying the reactor completely should it become necessary. Dry cask storage systems are designed to resist floods, tornadoes, projectiles, temperature extremes, and other unusual scenarios. The NRC requires all spent fuel to be cooled and stored in spent fuel pool for at least five years before being transferred to dry cask. If this was not a safe process, we would not have our employees work and they also live very close to the plant. (0163-6-2 [Marzullo, Dominic])

Comment: One thing that has not been discussed and is not discussed in the GEIS is how much high burn-up waste there is. And high burn-up waste is a really serious question and the NRC will not answer how much there is because that waste takes longer to cool and has to be handled differently, but the NRC will not reveal to anyone how much there is at the plant. (0163-7-1 [Shapiro, Susan])

Comment: Let me just answer your two questions. No. The answer is "No." There is no feasible safe storage following the operation of the reactor. We've seen that with the safe storage at Indian Point 1. (0163-7-10 [Shapiro, Susan])

Comment: I support the NRC 's conclusion that used fuel can be stored safely and without significant environmental effects. This conclusion is very well supported by years of safe storage in the U.S. and elsewhere. (0178-1 [Daniels, John])

Comment: As a former Non-Licensed Operator at Duke Energy's McGuire Nuclear Station, I am comfortable with and familiar with the safe handling and storage of spent fuel. As an employee of AREVA, I am familiar with the safe transportation of nuclear material, which has occurred accident free for decades in this country. I have every confidence that solutions will be available, when needed, for dealing with spent fuel and high-level radioactive waste. (0179-2 [Graham, Susan])

Comment: As an NRC Commissioner, I clearly saw that U.S. nuclear power plant operators take used fuel storage very seriously. Whether stored in a pool, or in a dry canister, that fuel receives the highest level of attention to ensure its long term safety and security. As a result of 9-11 and Fukushima, the nuclear industry has taken a series of measures to enhance the safety

of these facilities. In my view, these efforts have enhanced the high level of assurance that this fuel can be safely managed-on site or off-site after the lifetime of the nuclear plant. (0180-1 [Merrifield, Jeffrey])

Comment: I also believe that temporary-away from reactor storage can be successfully utilized as an interim solution for used fuel. In February of 2006, the NRC issued a license to build the Private Fuel Storage Facility in Utah which was an interim dry storage site for 44,000 metric tons of used fuel 50 miles outside of Salt Lake City. As part of the permitting process, Holtec, the cask manufacturer, conducted testing to successfully demonstrate that these canisters can withstand the direct impact of an F-16 fighter jet. While PFS did not move forward, this licensing process clearly showed the ability of the NRC to review and approve such a site and has prompted a number of communities to consider volunteering to host a similar facility in the future. (0180-3 [Merrifield, Jeffrey])

Comment: Combined with the high quality design and manufacturing that I saw visiting facilities that were fabricating dry storage canisters, I became convinced that dry storage and transportation containers are a safe, demonstrated, and reliable used fuel storage technology. (0180-5 [Merrifield, Jeffrey])

Comment: I have learned through my short career in this business that nuclear power plant owners have safely managed spent nuclear fuel for decades and continue to do so today. There is no reason to believe they cannot continue to do so well into the future, and as long as is necessary for the federal government to begin removing fuel from these sites. The fact that the government has not lived up to its promise to remove fuel from the reactor sites is disturbing, but considering that the current scenario is likely to remain the status quo for decades, I feel confident that nuclear power can safely continue to play a role in U.S. electricity generation, and the necessary storage of spent fuel at the reactor sites gives me no cause for concern. My understanding is that the nuclear industry is the most highly regulated industry, and the NRC has proven that it protects the health and safety of the public. With the excellent safety record the industry has established over the last several decades, I see no reason to believe this will change. The vast majority of today's dry spent fuel storage systems are made of fully welded stainless steel canisters stored inside thick concrete casks or modules. The canisters do not leak and therefore do not release any radioactive material. The concrete casks and the canisters inside are designed to withstand drops and tip-overs, as well as severe environmental conditions, including earthquakes, tornadoes, fires, floods, and wind-borne missiles all without releasing any radioactivity whatsoever. Zero. These storage systems are passive. That is, they require no electric or other source of power and will last a long, long time with minimal maintenance. (0181-2 [Waters, Christine])

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Comment: As long as nuclear reactors generate this waste, would not "interim" waste sites simply create more contaminated sites, while at the same time allow for the production of ever increasing amounts of these dangerous materials for which future generations would have to contend? (0189-2 [Patrie, MD, MPH, Lewis E.]

Comment: Before transferring the fuel rods to cask storage, the cask storage needs to be examined and reinforced to be able to safely store the fuel rods particularly those that qualify as high burn up fuel. (0198-3 [Cerrito, Robert])

Comment: Throughout my career, the Nuclear Professionals I have worked with have displayed one core value that has never changed - which is a focus on safety. Our industry has a demonstrated track record of operating safely. In particular, I note the transportation and storage of spent nuclear fuel where we have decades of experience operating safely, both in the US, and around the world. Safety has been, and is, our highest priority. (0201-3 [Fregonese, Vic])

Comment: Safer on site measures must be taken regarding temporary storage to avoid any and all environmental and human impact. (0202-4 [Hill, Jack])

Comment: Although on-site storage is not appropriate for long-term storage and a national repository does not appear to be available in the present, there are other options. A recent Senate bill discussed the option to have interim repositories which would act as locations where several reactors could consolidate their waste. These would not take the place of a national repository but would act as "buffer locations" until the national repository is accessible (Dolley, 2013). Interim locations are a way of alleviating the problem but are not a permanent solution. (0205-13 [Lyons, Laura])

Comment: On-site storage is not appropriate for long-term, as it can present disastrous effects[.] (0205-16 [Lyons, Laura])

Comment: The first issue is that on-site storage is not necessarily appropriate for long-term nuclear waste storage, as it can present hazardous conditions. (0205-3 [Lyons, Laura])

Comment: The proposed rule states that the Nuclear Regulatory Commission: "has concluded that the analysis in NUREG-2157, "Waste Confidence Generic Environmental Impact Statement" (DGEIS) generically supports the environmental impacts of continued storage of spent nuclear fuel beyond the licensed life for operation of a reactor and supports the Commission's determinations that it is feasible to safely store spent nuclear fuel beyond the licensed life for operation of a reactor and to have a mined geologic repository within 60 years following the licensed life for operation of a reactor." However, the most common methods of on-site storage currently in use are concrete-lined pools or large concrete and steel casks which are not meant for long-term storage (Harnett, 2013). The lifetime of a cask is decades, yet nuclear waste remains dangerous for thousands of years ("Nuclear waste can't," 2013). Moreover, these casks are not in a form that can be stored at a repository -- even if one is found

in the next sixty years (Wald, 2013). Every year reactors in the United States generate about 2000 metric tons of radioactive waste (Kintisch, 2011). As they continue to generate nuclear waste and store it in these casks, they are losing precious storage space every day. (0205-6 [Lyons, Laura])

Comment: Please forward this info to the Waste Confidence people: Article from Power Engineering: Briefer on the DOE's High Burn-Up Used Fuel Demonstration Project; <http://www.power-eng.com/articles/npi/print/volume-6/issue-5/departments/nuclear-world/briefer-on-the-doe-s-high-burn-up-used-fuel-demonstration-project.html>; The NRC should not be allowing the industry to use (and make more of) this type of high burn-up fuel when they do not have either the safe long term storage or the safe transportation of it figured out yet! "Since the 1990s, almost all used fuel being removed from the reactors have burn-ups in excess of 45 to 50 GWd/MTU. This is considerably higher than the burn-up of the PWR assemblies in the initial demos at INL. The higher burn-ups have generated regulatory interest regarding the ability of used fuel that has undergone prolonged storage to remain intact during transportation; there are some concerns that high burn-up fuel could become critical after a transportation accident." In truth, the NRC Waste Confidence environmental impact statement cannot hope to comment on these issue since the potential answers are not even known. (0211-1 [Leichtling, Don])

Comment: The NRC has placed its own safety employees in a catch-22 situation because they allowed the nuclear industry to promote the use of high burn-up fuel before the safe transportation and long term storage were ever considered, in fact until recently the public did not even know that high burn-up fuel was even in use since the 1990's, much less that it required much longer cool down periods after being in use which will surely increase the nuclear "footprint" of nuclear waste located at all NPP using high burn-up fuel! (0211-2 [Leichtling, Don])

Comment: We're here to discuss spent nuclear fuel-not something that is new, and not because of an issue, but because of the way the system works, providing due process to address questions and concerns and ensure the safe operation of nuclear facilities, and the safe storage of fuel after it has been used. Spent fuel is currently being stored safely on-site in storage casks as well as fuel pools. Most importantly, it is being stored safely and securely, as it has been for many years and can be for many more[.] On top of the physical safety measures that are the design of the storage options, the regulation the industry operates under is second to none. American nuclear energy operating facilities are subject to on-site inspections by NRC staff 24 hours a day, seven days a week; 365 days a year. (0212-3 [Lapiska, Evan])

Comment: Spent nuclear fuel is currently being stored on-site at facilities in storage casks that are steel-lined with reinforced concrete walls. These are robust structures--for every 10 tons of used fuel, facilities use 100 tons of concrete and steel to form a structure designed to protect the fuel. Over the last 30 years, nuclear energy facilities have safely and securely stored used fuel in these structures. American nuclear energy is also a highly regulated industry, with operating facilities subject to on-site inspections by NRC staff 24 hours a day, every day of the year. (0213-3 [Coalition, Clean and Safe Energy])

Comment: Leaving spent fuel in fuel pools indefinitely is not acceptable. (0215-2 [Matsuda, Thomas])

Comment: NRC is currently evaluating Edison's requested use of a new dry cask system that crowds 32 fuel assemblies into the same space that currently holds 24 at San Onofre. This new system will increase risk of dangerous radiation releases into the environment. (0218-7 [Borchmann, Patricia])

Comment: Use of High burn-up fuel at San Onofre requires more storage space between fuel assemblies due to higher heat, higher radioactivity, and instability. (RWMA Marvin Resnikoff, PhD.) No transportation casks for high burn-up fuel are approved by NRC, so waste cannot be relocated. Insufficient data exists to approve dry casks for over 20 years. (per NRC Robert E. Einziger, PhD, <http://1.usa.gov/15E8qX5>. High burn-up fuel has unresolved serious waste storage issues. A June 2013 Department of Energy Report states: ".cladding performance issues need to be addressed before this fuel can be loaded into dry casks and transportation systems", and "burnup rates as low as 30 GWd/dMTU can present performance issues including cladding embrittlement under accident conditions as well as normal operations. San Onofre now has 1,123 high burn-up fuel assemblies (which require a longer minimum of 15 years of cooling in spent fuel ponds). (DOE FCRD=NFST-2013-000132, Rev.I; /Fuel Cycle Research & Development-Nuclear Fuel Storage and Transportation 2013,-000132, Rv.1, 6/15/13 <http://222.hsdn.org/abstract&id=739345/>) (0218-8 [Borchmann, Patricia])

Comment: Long-term storage of radioactive waste at nuclear power plant sites should be done in dry, secure canisters. The industry which made the waste and profited from it should manage it. And storage on-site at nuclear power stations represents the least hazard to public health in the areas both near the reactors and along transport routes. (0222-3 [Zeller, Lou])

Comment: The EIS must consider the risks of current dry cask storage. Lack of quality assurance for design and fabrication of dry casks casts doubt on the structural reliability of current casks, most of which are stored outdoors in plain sight, and are not designed to withstand terrorism or severe earthquakes. Accidents with dry casks have occurred. The EIS must consider seismic risks to dry cask storage. (0230-12 [Garb, James])

Comment: Moreover more and more of today's fuel is the radioactively hotter high burn-up fuel. (0233-2 [Dubois, Gwen L])

Comment: The University of Florida is part of a six university consortia which is researching the performance of nuclear fuel which may be stored in airtight dry steel or concrete and steel containers for long periods of time exceeding hundreds of years. This university research consortia is funded by the Department of Energy and is headed by Texas A&M University and includes universities of Florida, Boise State, Illinois, Wisconsin, and North Carolina State. I am the task leader for the thermo creep of nuclear fuel in long-term storage. Our initial studies indicate the satisfactory performance of nuclear fuel in this long-term storage. (0244-1-1 [Tulenko, James])

Comment: I would also like to indicate the research teams from the Electric Power Research Institute and our national nuclear laboratories are also forming consortias which are ensuring the safety of the long-term dry storage of nuclear fuel. (0244-1-6 [Tulenko, James])

Comment: There were seven used fuel pools and nine dry casks on the Fukushima site. They all survived the accident very well. Some of us who were familiar with the details of those pools were talking before the meeting. The pool -- there was concern that we didn't know what was going on in the pools, but when the pools were investigated that fuel was still in good shape, that fuel will be very thoroughly and methodically removed from those pools. And the casks

were over washed by the tsunami and shaken by the earthquake; three of those pools, and they're fine. Three of those pools were in the buildings that suffer the hydrogen explosion. It is perhaps the most dramatic example of how robust its used fuel storage is, what happened at Fukushima. If you look at the videos on YouTube, the data that exists now that we've seen those pools, it is indeed a dramatic counterexample as to why they're not safe but why they are safe. (0244-11-11 [McCullum, Rod])

Comment: Because what we know, based on our experience, that we can safely store used nuclear fuel in both pools and casks, we know we also have to demonstrate that to the public. So it's important for me and for our industry to hear what others are saying. (0244-11-4 [McCullum, Rod])

Comment: Well, if you look at the experience we've had in loading 1,700 casks, in managing 104 spent fuel pools for 40 years, or longer in some cases, and you look at all of the events, these things are all in great detail discussed in the EIS. We don't stop there. Well, we don't say, oh, "Well, past predicts the future," because you never know what can happen. There is a lot of very forward-looking science and it was good to hear a representative of that scientific community speak earlier about how we're always looking, doing research to look further into the future, to keep our headlights safe on the road ahead of us. (0244-11-7 [McCullum, Rod])

Comment: In Waste Confidence the NRC proposes reasonable assurance that the disposal of spent fuel will not pose an undue risk to public health and safety. It does so via the NRC finding and assumption that disposal is technically feasible and can be achieved with no significant environmental impact. The Waste Confidence decision makes a key assumption that spent fuel in the future, when necessary, can be isolated in a repository and no radioactive releases will go to the biosphere. (0244-14-2 [Prescott, Lisa Marie])

Comment: The American Association of Blacks in Energy supports Federal action to develop consolidated facilities for interim storage of high-level radioactive waste until a permanent repository is sited. We urge the NRC to continue its strong, independent oversight of commercial nuclear energy facilities; the operation of existing plants; the licensing of new reactors; the renewing of operating licenses of existing reactors; and the management, transportation, and disposal of spent nuclear fuel. (0244-2-3 [Knowles, Berdell])

Comment: For the many decades which nuclear energy has been use, spent nuclear fuel has been stored safely and securely onsite at Florida's nuclear power plants. With their environmental assessments, the Nuclear Regulatory Commission has shown that the environmental impact of the storage of spent nuclear fuel is small. In addition, research by major universities around the nation have shown the safety of the storage of spent nuclear fuel. (0244-7-3 [Kuntawala, Jitesh])

Comment: Which, quite frankly, is a fairly narrow question, and that is do -- is there confidence that we can safely, and for an extended period of time, store spent nuclear fuel onsite beyond the reactor life. And the simple truth is, is that those who suggest that you can't have suggested that 50 years ago, 40 years ago, 30 years ago, 20 years ago, 10 years ago, and they have always been wrong. They were wrong then and they're wrong now. For five decades in the state of Florida we have operated successfully five reactors, which, quite frankly, have provided -- as I think another engineer pointed out, Mr. Bernard Knowles from American Association of Blacks in Energy -- have provided 98 percent of the emission-free energy in the state of Florida. Those plants have done that by storing their spent nuclear fuel onsite in spent fuel pools and now in dry cask storage. If what the opponents have suggested were true, 50 years ago, 40 years ago,

30 -- 10, 30, 20, 10, and tonight, I wouldn't have been able to say that. I believe we do have confidence in our ability to store fuel onsite for an extended period of time; short term, intermediate term, and indefinitely. (0244-9-3 [Paul, Jerry])

Comment: So, the fundamental question of today's meeting is do we have reasonable assurance that it's safe to store spent fuel beyond the license life of nuclear power plants. And to answer this question, the NRC put out the generic environmental statement which concludes that it is safe to store. And upon reviewing it and using my engineering background and knowledge from the industry, I agree with their conclusions. The fact of the matter is, even if we never get a repository, spent fuel pools and dry casks are both safe options based on their continued performance. In fact, Illinois has the largest inventory of used spent nuclear fuel and has not had a spent nuclear fuel accident. And that's not shortsightedness, that's proven engineering. This is because both technologies are designed to be robust. Everyday we think about what's the worst case scenario. That's what I'm trained to do and we design to protect the health and safety of the public. (0245-12-1 [de Graaf, Brandon])

Comment: So, for example, spent fuel pools are designed with reinforced concrete walls, stainless steel liners, leak-detection systems, redundant monitoring and cooling, and makeup water systems. Dry casks, they are designed with the tight steel cylinders, they're actually welded shut, and they have concrete liners which protect and shield the environment from the radiation. I walk by these things everyday. I've worked in the spent fuel pool buildings. And I still get more radiation from flying on an airplane to visit my sister in the south. The casks are also air-cooled and, have no moving parts, and are not dependent on any operator or system actuation to be safe. (0245-12-2 [de Graaf, Brandon])

Comment: So, on top of all that, the fuel itself is robust. I mean we take materials so that they can handle the harsh environment of the reactor, so it has to be degradation-resistant. So, once it becomes spent nuclear fuel, that's a property that won't actually disappear, it's still degradation-resistant. (0245-12-4 [de Graaf, Brandon])

Comment: But until then, there is reasonable assurance that it is safely stored spent fuel in dry casks and pools. (0245-12-7 [de Graaf, Brandon])

Comment: My final point has to do with a whistleblower right here in the Chicago area, Oscar Shirani, who passed away a number of years ago, who called attention to the shortcuts on safety going on with the Holtec cask design. In a short three-day inspection, he and a team of experts from across the country identified nine categories of quality assurance violation with the Holtecs. These are deployed at Dresden and he questioned the structural integrity of these dry casks sitting still. So, for over a decade now, hundreds of environmental groups have called for the pools to be emptied into hardened onsite storage, a major safety upgrade on the status quo of dry cask storage, fortifications against terrorist attacks, safeguards against accidents. That's what needs to happen. (0245-13-6 [Kamps, Kevin])

Comment: There is talk about Illinois becoming a centralized interim storage site although interim seems to be taking on a new meaning of possibly forever. Maps from Oak Ridge National Laboratory put Illinois number one and all but a few, because of our centralized location. We also have the most reactors and the largest amount of waste. We don't want interim storage here. Fuel should be moved only once on the way to the repository. Interim storage wastes time and money and we'd be a prime destination for terrorists. (0245-14-6 [Kurz, Carol])

Comment: NRC also has not adequately studied the environmental impact of fuel degradation and cask deterioration over time. Finally, since the NRC is doing, engineering, an environmental impact study, the site-specific issues, of which there are several major issues, aren't being addressed. It sounds to me like we're inviting a catastrophe. Is this what we want? (0245-15-3 [McComb, Sandy])

Comment: The storage of spent nuclear fuel has been taking place in Illinois for decades, in fact for half a century since the first commercial reactor went online in Illinois. In that time, there has not been a single breach at a spent fuel storage facility. There has not been a single case of public injury or contamination as a result of spent fuel storage facility failing. There has not been a single incidence where any person or group has been able to obtain spent fuel for nefarious purposes. (0245-16-2 [O'Brien, Doug])

Comment: We can't find the proper solution to deal with this so-called low-level ionizing radiation in the landfill, what the heck are we going to do with the stuff that's sitting in the spent fuel pools, like the 2,363 fuel pools at the Callaway I nuclear reactor that my organization is legally challenging the license extension of. (0245-19-3 [Smith, Ed])

Comment: But we've done pretty well with these and I want to thank the NRC, IEMA, and all those for working with the owners of our nuclear facilities to keep the onsite storage of spent nuclear fuel safe. And it is safe. Unlikely scenarios that are designed to scare people are not productive to the discussion nor to our energy debate in general. Opponents of nuclear energy paint a picture of piles of growing glowing waste sitting out in open air or implying that they're easy targets. All this hyperbole and hot air just obscures the fact that there has never been a single incident where spent nuclear fuel storage has been compromised by any outside individual or group. It's been safely stored for decades and I believe the NRC and IEMA and the owners of nuclear plants can keep it that way for decades to come. Of all the reasons people give for wanting to move away from Illinois, I can say that no one has ever talked to the Chamber about the stored nuclear waste as the reason that they moved out of the state. The tax structure, the pension problem, the high workers comp rates, restructured attitudes in Springfield, those are the major active issues that keep businesses from coming to or growing in our state. (0245-2-2 [Wolf, Tom])

Comment: I'm a manager in the area of spent fuel at Exelon. And I appreciate the opportunity to provide these comments on behalf of Exelon. What we have shown and continue to show as an industry is that we safely store fuel at our sites, both dry and wet storage. (0245-20-1 [Dunlap, Jeff])

Comment: In the interim, for storage at the reactor, as I have said, we continue to safely store fuel in both wet and dry storage. And just to add a little perspective, the amount of storage required is very small. If you stacked all the stored fuel in Illinois up to the height of the average person, it would only fill up half of one football field. The NRC environmental assessment of nuclear fuel storage accurately reflects the environmental impacts, which is small for the continued storage at plant sites and away-from-reactor storage, even with many bounding assumptions that may overstate the impact. This conclusion is based on storage systems for nuclear fuel that are proven technology with robust design and safety features that prevent environmental impacts. The analysis contained in the Draft Waste Confidence Generic Environmental Impact Statement supports what the industry has long known. If necessary, used fuel can be stored in a safe, environmentally sound manner for a long period while we wait for the political process to reach agreement on a disposal solution. (0245-20-6 [Dunlap, Jeff])

Comment: We take our jobs seriously, and its essential to the design, building, maintenance, and security of our spent fuel storage system. Our dry cask storage containers, they're lined, they're steel lined with thick concrete post structures. They are designed to improve and to protect the fuel under the most extreme weather conditions or other destructive forces. I personally have no doubt that this passive technology offers a long-term solution that will protect my colleagues, my family, and my neighbors. (0245-23-2 [Korn, Susan])

Comment: And we know a lot of defective casks arrived from Holtec at Dresden and were loaded after some welding was done without -- in violation of 10 CFR 50 Appendix B, a lot of those casks that lead to the reasonable expectation that they do not have the strength that the original designs have. I'm sure you've heard of -- dirty operation. (0245-24-1 [Conn, Corey])

Comment: An available repository is actually of little value if the thousands of tons of freshly radiated fuel remains precariously perched in elevated pools. It matters not that the waste may also be stored in dry casks as every operating reactor must also have its pool. (0245-24-4 [Conn, Corey])

Comment: I have spent some time in my career working at the nuclear station and I have first-hand experience with spent fuel storage. I personally walk down the dry cask storage area and work next to a loaded dry cask, and I have spent considerable time working near spent fuel pools. Storing fuel in the spent fuel pool or in dry cask storage is very safe. First, I'd like to discuss the spent fuel pool and spent fuel storage, the dry cask storage. I have spent many hours working near spent fuel pools, observing the fuel and the actions of moving the fuel. This is a safe location designed to withstand severe natural accidents including floods, tornadoes, and earthquakes. The safety of the spent fuel pool is ensured by maintaining sufficient water level above the fuel, even during -- This pool is designed to be about 40 feet deep, and to maintain about 20 feet of water above the fuel in an accident condition. Everyone involved with the spent fuel pool recognizes the importance of spent fuel pool. And as an employee, I can tell you we consider safety in every decision that we make. Next, I would like to discuss dry cask storage. Dry cask storage is proven safe technology that is designed for long-term isolation of spent nuclear fuel. The casks themselves are robust concrete in steel structures with no moving parts. These casks are engineered to monitor and protect 10 tons of spent fuel per cask. Over the last 30 years, the nuclear industry has over 1,700 dry cask storage systems. All these systems are still in service and have had zero release of their radioactive contents. I personally have worked near dry casks and I feel confident in their design and safety. Throughout my career, I have learned that Exelon Nuclear values the health and safety of the public above all else. Safety is infused in everything that we do. (0245-26-1 [Kovacs, Ashley])

Comment: So, one thing I did want to respond to that I saw and I heard mentioned a couple of times was in response to criticisms of casks falling through to the bottom of the spent fuel pool. That's a great challenge. So, the question is why the heck would we lift these heavy structures over a spent fuel pool, and the answer is we don't. They're designed so that we don't lift heavy structures near these safety critical systems. And I've actually went over that several times when development plans because we have to keep these, anything over 2,000 pounds, you know, a set distance away from safety critical things such as spent fuel pools. (0245-28-2 [Rosso, Chris])

Comment: The third thing is reduce Illinois' chances of becoming the nation's dump. Illinois already is home to over 9,000 metric tons of used nuclear fuel, more than in any other state. The previous two alternatives would work to minimize Illinois' chances of receiving an even greater proportion of the nation's spent fuel. According to an Oak Ridge National Laboratory

report, as a totally separate analysis, a consolidated independent storage site in Illinois is the single optimized site for an independent spent fuel installation and only SNF reactors is considered relative to siting itself. In other words, it's a lot of tech speak in that particular paragraph but what it's saying is that Illinois is in a position to become the site of one of these independent spent fuel storage facilities. And, of course, we have a nuclear plant already, a nuclear spent fuel facility at Morris, Illinois. (0245-29-4 [Shineflug, Marilyn])

Comment: How can long-term, let alone indefinite, waste storage even be considered credible? How disintegrated will spent fuel rods be, particularly those with high-product fuel when the need for transfer to new casks arises every many years or so? (0245-29-9 [Shineflug, Marilyn])

Comment: And to me, in order to have any kind of waste confidence, confidence in any kind of exclusion, you have to have an underlying risk-management system that makes sense. This doesn't seem to have a system at all. Instead, I think they want to conflate waste confidence with, as my husband terms it, waste arrogance, and that's really all this is, the belief that we can just say, whoosh, we've got a solution, we will continue doing as we are and it will work great and everyone will be happy. Instead, I think about the very real engineering nitpicky details, things like fatigues, stresses on metals that begin to fail, the impacts of corrosion. When things are designed for a 30-year-life or even a 60-year-life, they do not last for 100 years. Otherwise, then they are over-designed and that doesn't serve shareholders so it never, ever happens. (0245-31-6 [Fox, Tracy])

Comment: I'm here speaking on behalf of my nieces and nephews and for future generation in all walks of life. As I was thinking about what I wanted to say here in response to this hearing tonight, I was reminded of a story of a young person with clothes. It's a story of a vain emperor who cares about nothing except wearing and displaying clothes. He hires two swindlers who promised some of the finest best clothes with a fabric invisible to anyone who is unfit for his position or hopelessly stupid. The emperor's ministers could not see the clothing themselves but they pretend that they can for fear of appearing unfit for their positions, and the emperor does the same. Finally, the swindlers report that the suit is finished and they mime dressing the emperor and he marches in procession before his subjects. And the townsfolk played along with the pretense not wanting to appear unfit for their positions or stupid. But then there's a child in the crowd and he's too young to understand the desirability of keeping up this pretense and he blurts out that the emperor is wearing nothing at all. And he frees everyone else in the crowd who start realizing that the emperor is naked. This is a fable that is an apt description of the nuclear industry and the issue before us tonight. It's the feasibility of safely storing nuclear waste. The nuclear industry has dressed this operation in a sham of safety, claiming that nuclear power is safe, and spent fuel rods can be contained, and so posing no threat to life on the planet. But that simply isn't true. The emperor has no clothes. Nuclear power plants produce the most deadly waste imaginable. We have already created enough radioactive waste to destroy life on Earth. And the hard truth is we don't know what to do about it. Fukushima is not hypothetical. It is not theoretical. It is not science fiction or a made-up story. It's real. And it is proof of the fallibility of nuclear power and protection of spent fuel rods. The experts don't know how to keep us safe from it. And yet the NRC and the nuclear industry is acting as if we do. We're looking at the naked emperor and praising his imaginary outfit. (0245-32-1 [Rude, Kathleen])

Comment: This safety one hundred percent translates to our nuclear waste program. I personally work with the dry cask storage campaign at LaSalle and I can testify that those casks are far more robust than you can imagine. Over a hundred tons of steel and concrete form a precisely engineered structure to protect the fuel that we place inside. And I have walked past

those loaded casks many times, and I assure you that I get way more radiation from the sun that's shining down on me than from those casks. They've been proven to survive severe hurricanes and earthquakes, aircraft crashes. They have flown planes into those concrete cask storage and the plane was disintegrated with the cask remaining intact. And we've also tested missiles 30 times more powerful than a typical antitank weapon. And all this has been done to keep the casks intact. (0245-33-2 [Schussele, Samantha])

Comment: Illinois has 50 years of experience managing spent nuclear fuel and has done so safely. And I believe that's only going to get better. Illinois has loaded 120 casks, safely stored in pools for 50 years including the only independent spent fuel storage installation - that is the Morris facility - which was recently relicensed, a very tough, highly specific process like all NRC process just to use an example. (0245-34-1 [McCullum, Rod])

Comment: I want to talk about two things specifically that's been mentioned a lot, the safety culture and climate change. I see these things becoming intertwined. Safety culture is not about rhetoric. It's not about anecdotes. It's not about speculation. It's about facts. It's about analysis. It's about questioning the facts and doing more analysis. This is what nuclear engineers do. This is why the young people who got up here are so confident. This is why we have achieved the safety record we have. (0245-34-3 [McCullum, Rod])

Comment: Nationwide, there is well over 80,000 tons of spent nuclear fuel, with plutonium that will remain toxic for 240,000 years. Other elements in the radiated fuel will be dangerously radioactive for even longer. No storage facility has been designed that can contain radioactive waste for such periods since spent nuclear fuel contains large quantities of fissile fuel or -- material that can be used to make nuclear weapons. So, they also must be safeguarded to prevent theft. (0245-37-3 [Bilenko, Stephanie])

Comment: Proponents of nuclear power treat the radioactive waste as a minor matter. It is not. A nuclear fusion reactor produces waste so lethal that it has to be isolated from the rest of existence for a quarter of a million years. In theory, containing high-level waste is possible. In practice, Murphy's Law is the safer god. In the real world, it is certain that sooner or later things go wrong. By accident or passiveness of nature, that waste is going to leak into the biosphere. And once that happens, anyone and anything that comes into contact with even a few milligrams of it will suffer a miserable death. The more nuclear power we generate now, the more of this ghastly 'gift' will be stockpiling for the people of the far future. A basic concept of morality is that each of us ought to leave the world a better place for those who come after us. If we know better, we ought to do that. One of the essential boundaries of appropriate tech is the boundary between the kinds of matter you can change with tools you have on hand and the kinds you can't. And if you can't change it into something safe, it's a bad idea to produce it in the first place. (0245-37-4 [Bilenko, Stephanie])

Comment: Now, the young lady who came up from Exelon, all the people from Exelon, thank you. You're very nice. I like you. I'm sorry you work for Exelon and I'm glad your organization and company provides you with experiences that you feel make things safe. Exelon gets cited many times for doing wrong things. So, don't forget that. But they have never put you in a situation with a tornado or a typhoon or an earthquake. How about that for pools of radioactive waste? You've never experienced that. So, you really can't stand up and say confidently they have done everything and I do feel safe. (0245-38-2 [Good, Joyce])

Comment: Those of us who live and work in that area, especially someone who is looking to attract new business in the area would not be satisfied with the substantial economic impact that

we gain at the expense of our safety. The Center for Economic Development is also a member of the Braidwood Citizens Advisory Panel and have been fortunate to closely follow the way Braidwood operates. Its culture of safety and security is second to none, and its transition to dry cask storage of spent fuel is a good example. Exelon took the initiative to invest in dry cask storage that provides an added level of safety and security, and we applaud them for taking that step. We also encourage the NRC to continue to work with industry to promote innovations that will improve or enhance operational safety and ultimately lead to the creation of spent fuel repository for the storage of this material. The Will County CED is confident with the safety and security of the storage facilities at Braidwood and we look forward to the continued positive impacts of the station in our community for many years to come. (0245-4-2 [Fleming, Scott])

Comment: I do have confidence in the NRC's rulemaking and policies and procedures. I reside at, well, with this crowd, I don't think I'm going to tell you where I reside it. But, as the crow flies, I live eight miles downwind of Dresden Nuclear Power Plant. And there are nuclear spent fuel storage casks there that have been there for years. And my -- isn't wired shut and I haven't lost any teeth either. I feel safe that the fuel is stored safely and not a threat to my safety or my family's. And I live downwind of the casks. And I represent one of the neighbors and we know the casks. I have witnessed the fuel being put into the casks. I have witnessed the welding of the casks. And I have witnessed the inner cask being put in the outer cask, and I have witnessed the two feet of concrete, the new product concrete poured around the inner casks and the outer lid welded on. I have all the confidence that the NRC's design and engineering will keep the fuel safely stored with all the criteria and the most stringent standards. Each inch is reviewed. The casks are made of neutron material. I have confidence in the NRC's expertise in continuing to develop policies and procedures to protect us as they have done in the past. And I'm not moving. And I challenge the previous speaker who contested the safety of the casks and the building of the casks in the parking lot after this meeting. (0245-40-1 [Schwartz, Robert])

Comment: And nuclear waste continues building up, so nuclear spent fuel is now stored in dry casks at nuclear plants while they work on the problem. It is as simple as this. Everything leaks eventually. Everything leaks. And nuclear matter, when it leaks, contaminates that which contains it and everything far, far beyond. Leakage cannot be controlled or contained. (0245-42-2 [Rorem, Bridget])

Comment: [W]e also recognize the need to address the transportation, storage, and disposal of used nuclear fuel. The issue of developing a solution to the safe and secure storage of high-level radioactive waste and used nuclear fuel is of great importance. NCLS supports Federal action to develop consolidated interim storage facilities to temporarily house high-level radioactive waste inventories until a permanent repository is operational. (0246-1-2 [Husch, Ben])

Comment: We urge the Nuclear Regulatory Commission to continue providing strong, independent oversight of all commercial nuclear plant operations, including plant licensing for new reactors and license extensions for operating reactors and in used fuel and radioactive waste management, transportation, and disposal. (0246-1-3 [Husch, Ben])

Comment: As the Federal government continues to default on its legally mandated responsibility to handle spent nuclear fuel, utilities and the nation's rate payers have been left to foot the bill. The work-around has been dry cask storage, nearly 2,000 of which have been installed in the U.S. with zero release of radiation. This historical track record lent strong support to the rigorous technical evaluations that the Agency has compiled as part of its rulemaking. (0246-10-3 [Bennett, Nathan])

Comment: All of that notwithstanding, the Agency has ample reason to have confidence and remain confident in the fact that a safe disposal option will become available and that continued storage can be accomplished in a safe and environmentally sound manner in the meantime. (0246-14-2 [Ginsberg, Ellen])

Comment: There is no proof that spent fuel stored in dry steel containers inserted into these concrete casks can be safely removed or transported in the future and there is no place for it to go. How can the NRC assure that the containers will be replaced after their 50-year lifetime or before that if they fail? (0246-17-4 [Dugdale, Jane])

Comment: In spite of the risks it poses, cask storage onsite is the least-bad long-term solution to waste containment. (0246-17-6 [Dugdale, Jane])

Comment: The current system of storage has been approved and continues to be studied to find ways to make things more secure and safe. (0246-18-4 [Karbowsky, Brad])

Comment: Dry cask storage systems, they are robust, no moving parts, passively cooled, a hundred tons of concrete and steel and other materials to protect every 10 tons of fuel. Pools are equally robust with 20 feet of water above the fuel, several feet of concrete structures. And of course, the casks are most relevant to the discussion here because over these incredibly long time frames, the fuel will move to the casks, it is decades or less that we tend to do that. Now, I have talked about at some of the other meetings I have had the pleasure to attend and learn from, the robustness of the casks, I have talked about my confidence in the people who manage the casks. It is one of the things that I think is underappreciated in the EIS is the human element and the very dedicated people that do this. (0246-19-2 [McCullum, Rod])

Comment: But what I want to talk today is a little bit more about the robustness of the process. A couple of things have been mentioned. One is high burn-up fuel. That is mentioned in the EIS as an example of how the process works. And I was going to cite a letter that I left back there. But industry has documented its position and in our comments, we will send a letter which we wrote to NRC within the last year that cites 15 different scientific studies, which document the technical basis for the safe and long-term storage of high burn-up fuel. The high burn-up demo project was mentioned previously. That project is intended to confirm, further confirm the findings of those studies. And the results of that project, whatever it be, good, bad, or indifferent, will go into aging management plans. Every 40 years these casks have to be relicensed. The NRC has done a very bounding analysis here, talked about repackaging every 100 years, dry transfer facilities everywhere. We don't think that will happen. But the regulatory process will be what decides what does happen. So, we do have a very robust technical basis for storing high burn-up fuel for addressing other technical concerns. It is very forward looking. (0246-19-3 [McCullum, Rod])

Comment: One of the things about this EIS is it is a snapshot in time. It looks at the world based on what we know today. If you look at the opportunities for learning that go beyond what we hear in these meetings and go through the aging management plans and the scientific investigations, industry has multiple programs in place to look at all the long-term aging characteristics of not just the fuel but the casks. Just like we are looking at high burn-up fuel, we are looking at various cask degradation mechanisms. Everything with dry storage happens slowly. So whatever we find, we will have time to address it. We will take what we learn and we will move on. (0246-19-4 [McCullum, Rod])

Comment: I believe as strongly as anybody we need a permanent disposal solution and I am committed to continuing to work towards that. But until we have that, I know our processes will work. They will continue to learn. And throughout my career in this area, the more we learn about this, the more we know, the safer it looks. (0246-19-5 [McCullum, Rod])

Comment: There is not adequate understanding of the high burn-up fuel that has now, we are hearing, half of the inventory this high burn-up fuel, fuel with more radioactivity has to be cooled longer in the pools. It is not an integral part of the analysis that we have done, even though it is an integral part that we'll continue to generate, so the high burn-up fuel is not adequately addressed in the Environmental Impact Statement. (0246-2-5 [D'Arrigo, Diane])

Comment: Spent fuel is currently being stored safely onsite in storage casks, as well as fuel pools. Most importantly, it is being stored safely and securely, as it has been for many years and can be for many more. On top of the physical safety measures that are design of the storage options, the regulation the industry operates under is second to none. American nuclear energy operating facilities are subject to onsite inspections by NRC staff 24 hours a day, 7 days a week, and 365 days a year. (0246-20-3 [Lapiska, Evan])

Comment: [We don't] need interim storage solutions for nuclear waste. What we need are permanent storage solutions because right now at the beginning of the nuclear waste problem, the fuel is thousands of times more dangerous. (0246-29-10 [Hoffman, Ace])

Comment: And there is no feasible safe storage. And I am talking about something that is going to survive today's environment. There is not a policy decision either that is scientific fact because ionization destroys any containment. The containment, as we have just heard from the last speaker [Mark Leyse], are degrading. (0246-29-2 [Hoffman, Ace])

Comment: Honestly, I think that the whole process is pathetic because the state-of-the-art of high burn-up fuel knowledge is practically zero. Despite the claims that we have been hearing to the contrary, every zirconium fitting is different and maybe one has been tested. And nothing has been tested for very long. The testing just simply hasn't been done. We are talking about engineers who cannot, in 65 years, they haven't been able to solve the transit problems that occurred in Fukushima. And now, two years later, we are still nowhere near a good solution to that. There are gingerly trying to move the fuel. (0246-29-8 [Hoffman, Ace])

Comment: I would like to address the high burn-up fuel, which the NRC is allowing to be used nationwide and they don't even have a safe way to store it. It is a classic case of putting the cart before the horse. And if they are going to do any kind of environmental impact statement, that should have all been done before they approved the use of this high burn-up fuel, period. I mean the NRC needs to step up and take a good look at what they are approving and to make sure they can safely secure what they are allowing utilities to create more of. And right now, there is no safe way to store that. In fact, I am reading off a thing from Power Engineering. They posted, on the internet, a briefer under Department of Energy's high burn-up used fuel demonstration project, which is a \$16 million five-year award to a team led by some different companies, the objective of which is to observe and confirm the long-term characteristics and behavior of high burn-up fuel under real conditions and a full-scale dry storage system. (0246-5-1 [Leichtling, Don])

Comment: So, the NRC needs to immediately address what is happening with high burn-up fuel, how it can be transported safely, how it can be stored, and not let more of it get created until they have this thing worked out, waiting for another 10, 15, 40, 100 years is not a good

answer when they are trying to come up with an Environmental Impact Statement that describes what they are going to do in the future. (0246-5-3 [Leichtling, Don])

Comment: The nuclear energy industry has built a comprehensive system, using state-of-the-art technology to safely and securely contain the spent fuel it creates that keeps both the public and the environment safe. Spent nuclear fuel is currently being stored onsite of facilities in storage casks that are steel-lined with reinforced concrete walls. These are robust structures. For every 10 tons of used fuel, facilities use 100 tons of concrete and steel to form a structure designed to protect the fuel. Over the last 30 years, nuclear energy facilities have safely and securely stored used fuel in these structures. American nuclear energy is also a highly regulated industry with operating facilities subject to onsite inspections by NRC staff 24 hours a day, every day of the year. (0246-8-1 [Vince, Jenny])

Comment: In spite of the risks it poses, cask storage on site is the least bad long term solution to waste containment, because removing and transporting the containers is much too dangerous. (0249-10 [Dugdale, Jane])

Comment: First, regarding Limerick's use of "high-burn" nuclear fuel, evidence suggests its use is far more dangerous than fuel previously used at Limerick. Higher radioactive gas releases; increased corrosion, thinning, and brittleness of fuel cladding; increased radioactivity and decay heat from spent fuels; and increased damage to the fuel rods in the reactor vessels -- all these can result, leading to radiation leaks in the spent fuel pools and casks.; o The public has a right to full and accurate disclosure of the long-term consequences of using "high-burn" nuclear fuel.; o Requests by ACE for this information have gone unanswered. Specifically, ACE wants to know if the NRC has verifiable answers to the following questions: When did Limerick start using this fuel? When was Limerick's license amended to start using this fuel? Does the NRC plan to continue allowing Limerick to use it, despite the increased risks to our region? (0249-5 [Dugdale, Jane])

Comment: There is no proof that spent fuel stored in dry steel containers inserted into these concrete casks can be safely removed or transported in the future. There is no place for it to go. (0249-8 [Dugdale, Jane])

Comment: o Steel Containers for spent fuel at Limerick are only expected to last 50 years. How can the NRC assure that the containers will be replaced after that, or before that, if they fail? (0249-9 [Dugdale, Jane])

Comment: [L]ong-term storage of radioactive waste at nuclear power plant sites should be done in dry, secure canisters. The industry which made the waste and profited from it should manage it, and storage onsite at nuclear power plants represents the least hazard to public health in the area, both near the reactors and along transport routes. (0250-1-3 [Zeller, Lou])

Comment: I believe that the U.S. nuclear facilities will continue to safely handle and store used nuclear fuel for the time frames discussed in the draft Environmental Impact Statement. (0250-10-2 [Tampas, Courtney])

Comment: Yes, it's hard for me to get to the meetings, but I'm on a mission. I want you to know that North Carolina citizens do not want Shearon Harris to continue to store dangerous irradiated nuclear fuel in the overcrowded and unprotected cooling pools. How did North Carolina come to provide a home for the four largest overcrowded cooling pools in the country? Why didn't we get to say something about this before it happened? Most people don't even

know the danger of these pools. But you do, don't you? It's your responsibility to protect the public health by transferring this nuclear waste to dry cast storage. You must make it a national security top priority. (0250-11-2 [Kerr, Julius])

Comment: I appreciate the opportunity to provide input to the important topic of used fuel management. We currently safely store our used fuel assemblies in our used fuel storage pool. We have taken steps to assure the long-term safety of used fuel stored in our pool. In 2003, we replaced all of the storage racks with an improved neutron absorber. We also have an ongoing surveillance program, to monitor the long-term performance of this material during the wet storage of our used fuel. Summer Unit 1 is currently making the transition to dry fuel storage. By being one of several nuclear plants that have yet to implement dry fuel storage, we have been able to take advantage of the successful operating experience of other plants with many years of dry storage experience. We have also been able to take advantage of technical advances in the design and processing of fuel storage systems, and will implement a state-of-the-art dry storage system. Our current plan is to load our first dry storage systems in 2015. (0250-13-1 [Herwig, Bill])

Comment: I firmly believe that we will continue to safely handle and store used fuel in the wet and dry configurations, in the three time frames mentioned in the draft EIS. (0250-13-2 [Herwig, Bill])

Comment: There are no technical barriers to the safe, secure, long-term storage of spent nuclear fuel. (0250-15-6 [Rodack, Tom])

Comment: Right now, however, we are considering whether or not we feel confident that nuclear waste can be handled at our reactor sites. The answer is yes. It has been done for decades, and we have the technical expertise to handle our used nuclear fuel. (0250-18-4 [Lang, Amanda])

Comment: One project recently analyzed used fuel canisters and their storage systems. The casks were much larger than I expected seeing them first hand, on the order of 100 tons, reinforced concrete and steel. These clearly provide the shielding needed to protect the public, as well as providing protection of the used nuclear fuel from hazards posed by not only Mother Nature, but terrorists. In addition, seeing the studies attempted to breach the cask with everything from rocket sleds to military ordinance, my appreciation of the engineering has only increased. My other project focused on fuel storage and repackaging, both short- and long-term in closed casks in storage facilities. We have the technology available to move, store, dispose, recycle used nuclear fuel. The dry transfer systems operated in France and around the world are quite impressive. Overall, our generation is frustrated by lack of political will to move forward with the technically sound commonsense options for nuclear energy production and used fuel management. We want those who are experts to be making rational, not emotional decisions for our future. (0250-19-2 [Howell, Adam])

Comment: The Savannah River Site Citizens Advisory voted no to interim storage at SRS. The SRS Citizens Advisory Board reflected the overwhelming concern that once waste was allowed to be stored at SRS, that perhaps SRS would be considered a permanent depository. This decision shocked me. I've never heard this coming from that area, coming from an area where folks depend on SRS, depend on the nuclear industry for their jobs. This spoke volumes, reflecting the public's concern over nuclear waste piling up onsite and its lack of permanent storage. Basically, I have not experienced such an overwhelming concern about the lack of a

permanent disposal of radioactive waste ever, compared to the many years that I've been going to these meetings from South Carolina rate payers. (0250-20-3 [Cooper, Elaine])

Comment: I loaded fuel in my first dry fuel storage canister in 1996. I'm involved with virtually every aspect of dry cask storage process at reactor sites to date, from performing nearly every physical task associated with the placement and sealing of used fuel canisters, to performing engineering and licensing technical evaluations that document the impact of implementation of dry cask storage systems at numerous reactor sites around the country. I am intimately familiar with the majority of all dry cask storage systems licensed for use in the United States by the Nuclear Regulatory Commission. As you well know, dry cask storage containers have been deployed successfully across these United States since 1986 at both active and decommissioned reactor sites. These containers have been qualified by analytical methods, and proven by rigorous testing to be able to successfully withstand any accident scenario, whether it be natural or a manmade event. (0250-25-2 [Wellwood, Jay])

Comment: The analysis contained in the Waste Confidence draft Generic Environmental Impact Statement support what the Commission and those of us in the industry have long known; if necessary, used fuel can continue to be stored in a safe, environmentally sound manner for a very long period of time while we wait for the political process to reach consensus on a final disposal solution. For nearly 56 years now, American homes, businesses, and government operations have benefitted from electricity generated using nuclear technology safely. In closing, it is my professional opinion that there are simply no indication that even a minimal decrease in safety margin or a challenge to the environment will be experienced by the continued practice of storage of used fuel in dry fuel storage canisters at or away from reactor sites for 60, 160, or even indefinitely. (0250-25-5 [Wellwood, Jay])

Comment: [T]onight I want to expand upon the robustness of dry used fuel systems, which is more than just a bit understated and, in fact, under-documented in the GEIS both for severe accidents and for potential acts of sabotage and terrorism. I will use some selected information presented to the Blue Ribbon Commission in 2010 and 2011. Dry used fuel systems are among the safest of all industrial technologies as presented and discussed by the National Academy of Sciences in two publications. Extensive safety analyses and testing have been performed to conclude that used fuel systems in a license configuration will not release radioactive material under any credible accident conditions. Conservative materials for used package containment boundaries result in about two orders of magnitude more energy absorption capability before failure than is permitted for credit by our current design standards, and that is one reason why the largest conditional consequence doses reported in the GEIS and, in fact, in the NUREG-1864 reference document are incorrect. They greatly overstate what the actual results would be. (0250-27-2 [Pennington, Charlie])

Comment: We face those same threats here where dozens of reactors in the United States or overly loaded fuel ponds are sitting three stories tall. And since they are outside of the containment could contaminate entire states. (0250-28-2 [Embrey, Monica])

Comment: I'm sure the authorities in Japan also considered the potential negative impacts of storing nuclear waste in the pools onsite to be small just as this EIS does, but accidents happen. Because of Fukushima we know the negative effects of storing spent fuel in pools onsite. (0250-29-4 [Rivard, Betsey])

Comment: In my role as chief nuclear officer, I'm accountable for oversight of our current nuclear operations, as well as supporting oversight of our new nuclear construction activities.

South Carolina Electric and Gas owns and operates the V.C. Summer Unit 1 Nuclear Station in Jenkinsville, South Carolina, which is located approximately 30 miles north of Columbia, the state's capitol. This plant has operated safely for 30 years, providing emission-free electric power to customers in our service territory. Since bringing V.C. Summer Unit 1 online in 1984, we have demonstrated the ability to store used fuel safely in our wet fuel storage pool located onsite. We have extremely competent, well-qualified individuals that provide oversight of fuel-related activities, and we have not had any events that have challenged the safety of the public or our employees. We are currently building an integrated spent fuel storage installation that will in the future allow fuel to be transported from our wet spent fuel storage location to a dry storage location when wet storage capacity is exhausted. We have benchmarked extensively with other utilities in the U.S. to ensure we benefit from the knowledge gained by organizations that have implemented dry spent fuel storage successfully for many, many years. The demonstration of safe nuclear plant operation and spent fuel management at V.C. Summer has been a part of the foundation for the strong public support we have received over the years. I'm especially proud of the fact that a recent survey commissioned by the Nuclear Energy Institute, and conducted by Viscon (ph) Research Incorporated, show that 90 percent of our neighbors that live within the ten-mile radius of the plant had favorable impressions of the plant and how it is operated. Our ability to ensure and demonstrate excellence in plant operation was one of the primary drivers in our decision to build two new Westinghouse AP-1000s adjacent to our existing Unit 1 plant. These reactors, V.C. Summer Units 2 and 3, received a combined operating and construction license from the NRC in March of 2012. We expect to bring Unit 2 online in late 2017 or first quarter 2018, and we are well on our way to achieving that goal. Construction activities for V.C. Summer Units 2 and 3 have gone very well, with a number of significant milestones achieved to date. Recently, we completed the foundation preps and required rebar installations for both units, and completed an installation of the first nuclear concrete for both units, having finished the concrete pour for Unit 3 just this morning. (0250-3-2 [Archie, Jeff])

Comment: As long as nuclear reactors generate this waste would not interim waste sites simply create more contaminated sites, while at the same time allow for the production of ever increasing amounts of these dangerous materials for which future generations would have to contend? (0250-30-2 [Patrie, Lewis E.])

Comment: Used nuclear fuel is equally safe in pools or in dry storage located at nuclear energy facilities, and we use both at Vogtle. The NRC has reiterated the safety and security of used nuclear fuel management and post-Fukushima. Used nuclear fuel is well protected from potential natural events and terrorist attacks by a combination of sturdy design and construction, multiple safety systems, ongoing surveillance and inspection, and state-of-the-art security measures. Used fuel pools are large robust structures with reinforced concrete walls several feet thick and steel liners. Water offers superb shielding for radiation, and every fuel pool offers 25 to 30 feet of water for shielding and fuel cooling. The volume of water in the pools is so large that any evaporative process associated with a loss of cooling system would provide ample time for operators to establish backup water supply. All used fuel pools are designed to seismic standards consistent with other important safety-related structures on plant sites. Augmenting already redundant safety systems to insure cooling of fuel assemblies in pools, the industry has added backup cooling water spray systems and placed potable water supply equipment at locations near the pools so they can be available quickly in the event of an emergency. As part of their post-Fukushima safety enhancements, our facilities are also adding instrumentation with improved capabilities to monitor levels in used fuel pools in the face of extreme events, such as Fukushima. Dry storage containers are robust concrete and steel structures with no moving parts. Multiple barriers provide the defense-in-depth protection. More than 100 tons of concrete

and steel forms a precisely engineered structure to protect every 10 tons of used fuel. Over the past 30 years, the nuclear industry has safely loaded more than 1,700 dry storage systems. All these systems are in service today, and there has been zero release of their radioactive contents. To gain license renewal, facilities must put in place stringent Aging Management programs to insure the containers are adequately maintained and inspected. Vogtle has done that and will continue to do so each and every our license is up for renewal. (0250-32-3 [Wesley, Ashleigh])

Comment: I am confident, and you can be confident that nuclear fuel is, can be, and will be safely stored. It is safely stored because the used fuel that is stored at the sites was designed by many of my friends, some of who are here today, using the stringent standards required by the Nuclear Regulatory Commission. (0250-35-1 [Cook, Andrew])

Comment: I have also been to those sites and seen how the operators of those plants have so carefully managed that fuel and continue to prudently manage it, and I have observed the Nuclear Regulatory onsite inspectors who rigorously require that the operators maintain adherence to the Nuclear Regulatory requirements. (0250-35-2 [Cook, Andrew])

Comment: But those of you who do this work, those of you who I have seen safely manage the pools over a 50-year period, safely load over 1,700 dry casks, developed technological innovations in both the pools and the casks to assure safety, you are my inspiration. (0250-36-1 [McCullum, Rod])

Comment: Concerning the Waste Confidence Rule, these dedicated professionals have done analysis to show the storage of the spent fuel and dry storage is safe. Storage either onsite at power plants or offsite is also feasible, and 25 to 35 years is a reasonable estimate for the time period, while a longer term solution is implemented. In addition, spent fuel has been stored safely for decades. The technology is proven, and mature, and well understood, more well understood than the iPods that we're all using tonight to take pictures. (0250-37-2 [Barilla, Frank])

Comment: As an NRC Commissioner, I clearly saw that U.S. nuclear power plant operators took used fuel very seriously. Whether it's stored in a pool or in a dry canister, that fuel receives the highest level of attention to ensure its long-term safety and security. As a result of 9/11 and Fukushima, the nuclear industry has taken a series of measures to enhance the safety of these facilities. In my view, these efforts have reinforced the high level of assurance that this fuel can be safely managed, onsite or off, well after the lifetime of a nuclear plant. (0250-4-1 [Merrifield, Jeffrey])

Comment: I also believe that temporary, away-from-reactor storage can be successfully utilized as an interim solution for used fuel. In February of 2006, the NRC issued a license to build a private fuel storage facility in Utah, which was the interim dry storage site for 44,000 metric tons of used fuel, 50 miles outside of Salt Lake City. While PFS did not move forward, this licensing process clearly showed the ability of the NRC to review and approve such a site, and has prompted a number of communities in our country to consider volunteering to host a similar facility in the future. (0250-4-3 [Merrifield, Jeffrey])

Comment: Misleading and biased information is being given to the public here. The NRC and the industry is ignoring real world multiple risk factors. We all know that waste cannot be contained for as long as it poses a hazard. We see that nuclear plants are becoming permanent waste dumps. This increases the need for a safer storage plan. Irradiated fuel pools are dramatically overcrowded and not protected. (0250-40-1 [Kerr, Beverly])

Comment: At least minimize the risk of storage of irradiated fuel by placing it below ground and get it out of cooling pools like those at Shearon Harris near Raleigh. Shearon Harris' four cooling pools are the largest in the United States, and represent one of the greatest risks at nuclear plants because they are so overcrowded with so much highly irradiated material. (0250-40-2 [Kerr, Beverly])

Comment: Keep nuclear waste onsite where it is created. As soon as it leaves the nuclear plant property, then whose responsibility is it? Is that why the industry wants to move irradiated nuclear waste around and cloud the issue of who pays the bill when an accident occurs? I agree with the Blue Ridge Environmental Defense League who says, "If you make it and profit by it, then you keep it. If you can't maintain it, then stop making it." (0250-40-7 [Kerr, Beverly])

Comment: For those 40 years, we have safely stored spent fuel onsite. (0250-41-2 [Abendano, Juan])

Comment: So I will talk about consolidating the waste around the country at temporary sites with a plan to move to a permanent storage facility. As of 2010, nuclear power plants have already generated 70,000 tons of spent fuel. The industry is moving towards new fuel types, such as MOX and high-burnup fuels, which are more radioactive, dangerous, thermally hot, and difficult to store and transport. Again I will say we have no way to deal with high-level nuclear waste. To say a consolidated storage area is the answer just creates more problems. (0250-49-3 [Gantt, Carol])

Comment: While tragic and avoidable, the event at Fukushima Daiichi examined objectively and dispassionately further demonstrates the robustness and relative passivity of spent fuel storage. The fuel stored in dry cask systems was unaffected while the fuel in the spent fuel pools, even the unit 4 pool of greatest concern, emerged from the event without contributing to offsite releases whatsoever. (0250-56-2 [Murphy, William])

Comment: My biggest concern early on in my career was not about how the power was generated or how safely it was generated but, rather, what happens to the waste. That's the hardest thing for people to understand. As I have learned and observed, used nuclear fuel has been stored safely in used fuel pools and dry storage systems worldwide for many, many years. I visited nuclear power plants, and I have seen the rigor with which it is stored and secured. I have worn a dosimeter near a fuel exchange pool and watched closely as the minimal reading stayed stable. There was no creep up, down, or otherwise. It stayed fully stable. (0250-57-3 [Jones, Lauren])

Comment: In the United States, used nuclear fuel has been safely and securely stored on plant sites for some time. And I support the NRC's evaluations in this regard. Contrary to what some may believe, fuel storage casks are much more than 55-gallon steel drums. They are excruciatingly engineered pieces of equipment weighing 100 tons and designed to shield the population from radiation and the fuel from any number of natural and manmade threats, including floods, earthquakes, and ordnance. (0250-58-4 [Cagnetta, Matt])

Comment: The nuclear industry in general and Duke Energy in particular have extensive operational experience that supports this conclusion. The history of used fuel storage goes back to the beginning of the nuclear enterprise in the 1940's, and there has never been an instance in which a member of the public was harmed by used fuel storage. Duke Energy began its nuclear power plant operations more than 40 years ago. Since that time, we've safely stored used fuel in spent fuel pools, as well as in dry storage facilities. In addition, we safely transported

thousands of fuel assemblies between reactor sites. At no time have these activities resulted in harm to the public or significant adverse environmental impacts. The NRC performed a thorough and extensive evaluation of projected future impacts from used fuel storage, and found them to be small. We agree with the NRC's conclusion. (0250-6-3 [Nesbit, Steve])

Comment: Both methods of storage, wet and dry, have been proven to be safe through analyses, as well as decades of operating experience. (0250-6-5 [Nesbit, Steve])

Comment: So what worries me probably most of all is our current focus on storage in pools, which are at risk from really a lot of -- you know, we've heard terrorist. We have heard natural disasters. (0250-69-4 [Rundle, Steve])

Comment: Storage and transportation can be done safely because they have been done safely for decades. (0250-70-3 [James, Andrew])

Comment: The development of consolidated facilities for interim storage of spent fuel must be pursued until a permanent repository is ready. Over 100 commercial spent fuel pools are or have been in service in the U.S. Most of these pools have safely contained spent fuel for 30 years or longer. This is the equivalent of 3,000 years of operating experience with no significant environmental impact - a record that is very hard to compete with. (0253-5 [Avilla, Karen])

Comment: We need a thorough review of the following: long term storage for spent nuclear fuel, spent fuel fires, and spent fuel pool leakage. The crisis in Japan has shown us that dry casks are less vulnerable than pools. The dry casks at Fukushima survived, whereas, the pools are collapsing. (0257-1 [Abbott, Dana])

Comment: We have a nuclear waste problem from 60 years of power generation. The indefinite storage of nuclear waste at the reactors that generated it is NOT an acceptable storage option. No interim storage policy should be put in place until a geologic waste repository is operational. The alternative allows for the possibility of indefinite storage at generating plants, which is unacceptable to the public. (0259-1 [Katz, Shari])

Comment: Climate change is brining unexpected and unimaginable events that were not part of the resiliency planning for reactor site selection and design. 60 year "short term" storage is not short term, and 100 years long term storage are NOT acceptable storage periods. We should be able to come to a resolution before at least 20 years to get this material into the ground. In the interim, waste should stay where it was generated and not get shipped around to interim storage type locations. Fuel should be moved from cooling pools to concrete storage casks when it has appropriately cooled, as this is a safer storage means. (0259-2 [Katz, Shari])

Comment: We understand that the purpose of a NEPA analysis is to draw conclusions regarding environmental impacts, and that other analyses support safety assessments, however, the safety of spent fuel storage is a concern of the public. Notwithstanding the NRC's request for comments only on the conclusions in the GEIS, the GNAC also notes that used fuel has been stored safely for decades. Storage system designs and operations have become more robust over time; the GNAC expects that spent fuel storage will continue to evolve in the future as it has in the past, enhancing an already safe system. At the same time, the GNAC encourages the NRC to evaluate and validate the sufficiency of the design life of individual used fuel storage systems and facilities in a comprehensive, programmatic manner. (0262-2 [Patterson, Karen])

Comment: There are 94 identified knowledge unknowns or "gaps" in Spent Nuclear Fuel storage and transportation. There are no solutions presented, in addition to incomplete research, for the NRC to validate the Generic EIS conclusion. It seems logical to basically complete NRC and DOE extended storage and transportation research prior to an NRC final EIS report. (0267-2 [Rodarte, Ron])

Comment: The NRC states in Division of Spent Fuel Storage and Transportation Interim Staff Guidance-24, Revision 0, "The Use of a Demonstration Program as Confirmation of Integrity for Continued Storage of High Burnup Fuel Beyond 20 Years" that the NRC has insufficient data to support dry cask licensing for more than an additional 20 years for high burnup SNF. How can the NRC GEIS have confidence in extended storage of high burnup (>45 GWd/MTU) spent nuclear fuel SNF? (0267-3 [Rodarte, Ron])

Comment: How can the NRC GEIS have confidence in extended storage of SNF when their own Interim Staff Guidance 11, Rev 3, "Cladding Considerations for the Transportation and Storage of Spent Fuel" excludes approval of transportation casks for high burnup SNF except on a case by case basis? (0267-4 [Rodarte, Ron])

Comment: The NRC GEIS ignores information about how the level of burnup negatively impacts extended storage in both dry casks and spent fuel pools. "...An additional issue involves advancing corrosion and hydriding of zirconium alloy cladding subject to extended burnup. Diminished low temperature ductility imposes the need for additional care in spent fuel handling operations to avoid any mechanical impact that may cause cladding fracture." This information, a cautionary note from the 1998 IAEA report is excluded in the NRC GEIS. All of the GEIS inspections and characterizations were performed on low-burnup fuel after only 15 or less years of dry storage. No information was offered on inspections conducted on high-burnup fuels to confirm the predictions made about the brittleness or cladding fracturing in highburnup dry storage and long term storage of high-burnup SNF spent nuclear fuel. (0267-5 [Rodarte, Ron])

Comment: I want to thank the NRC for working with the owners of our nation's nuclear facilities to keep the on-site storage of spent nuclear fuel safe. And it is safe. Unlikely scenarios that are designed to scare people or grab headlines are not productive to this discussion nor to our energy debate in general. (0275-2 [Wolf, Tom])

Comment: There's talk of Illinois becoming a centralized interim waste storage site although interim seems to be taking on a new meaning of possibly forever. Maps from Oak Ridge National Laboratory put Illinois #1 on all but a few maps because of our centralized location. We also have the most reactors, and the largest amount of waste. We don't want interim storage here. Fuel should be moved only once--on the way to the repository. Interim storage wastes time and money, and we'd be a prime destination for terrorists. (0276-7 [Kurz, Carol])

Comment: While reviewing the documents for comment, the term "adequate" repeatedly appears regarding the steps currently used to store toxic nuclear waste. Whenever I hear the term used by NRC staff to describe any of the nuclear plants across the country, but in particular Entergy's Palisades Nuclear Plant, I cringe. I am not sure how the use of this term is supposed to be reassuring to the public since it means "good enough." The connotation connected with "good enough" is mediocre. So, I ask you , how safe would you feel with an "adequate" pilot on a turbulent transcontinental flight? Or, how quickly would you employ an "adequate" heart surgeon if you required surgery? Yet, you throw the word "adequate" around to the public like that is supposed to reassure us about the safety of these aging, decrepit

nuclear power plants in this country and what you propose as the generic treatment of high-level radioactive waste storage for a number of years far into the future. (0277-2 [Pierman, Bette])

Comment: But those of us who live and work in the area, and especially someone who is looking to attract new businesses to the area, would not be satisfied with that substantial economic impact if it came at the expense of our safety. The CED is also a member of the Braidwood Citizens Advisory Panel and have been fortunate to closely follow the way Braidwood operates. Its culture of safety and security is second to none. And its transition to dry cask storage of spent fuel is a good example. Exelon took the initiative to invest in dry cask storage that provides an added level of safety and security and we applaud them for taking that step. We also encourage the NRC to continue to work with industry to promote innovations that will further enhance operational safety, and, ultimately, lead to the creation of a spent fuel repository for the storage of this material. The Will County CED is confident in the safety and security of the storage facilities at Braidwood and we look forward to the continued positive impacts of the Braidwood station in our community for many years to come. (0278-2 [Fleming, Scott])

Comment: When decommissioning a plant, get the spent fuel relocated into secure dry storage systems as soon as the fuel is cool enough to do so. Stop allowing the utilities to utilize dry cask systems that are not capable of protecting their contained fuel from an impact from a large aircraft. The Draft GEIS talks about storing fuel in casks for up to several hundred years. The casks need to be able to endure whatever mechanical impacts we can foresee in our current society before we pass the site on to the next seven generations. (0279-2 [Morgal, Richard])

Comment: What exactly are the current safety standards for the spent fuel cooling pools at SONGS? What exactly are the current safety standards for the 42 dry storage casks? What back up is required today to protect the spent fuel pools from an electrical shut down of more than four hours? How many hours without cooling are the spent fuel pools safe? How far away are the back -up generators? Are they sufficient to keep all cooling pools safe for the three days of 90 mile an hour winds that our Santa Ana winds which hit Southern California each year might continue, keeping air support from the cooling pools if firestorm over ran the facility where the spent fuel pools are kept? What safety precautions exist for that circumstance? What is the safety formula for protecting the spent fuel from all disaster possibilities? Firestorm, earthquake, tsunami or terrorists? Such as the reactor domes were "adequate" against a 7.0 earthquake, and five terrorists on the ground. (0280-3 [Magda, Marni])

Comment: We were led to believe that nuclear spent fuel must wait five to seven years to be put in dry storage. No new fuel has been generated at SONGS for two years, so conceivably in five years all spent fuel at Songs could be in dry storage. Why have only 42 dry storage casks been created in the 30 years the spent fuel has been accumulating at SONGS? Since the shutdown, the public has learned that 16 years ago a dangerous high burn fuel began to be used at SONGS. Who approved of that change? This kind of fuel is considered by the rest of the world too dangerous to use. What environmental impact did this higher burn fuel have on the ocean? What temperatures changed or volume of ocean water used and dispersed? Who approved of this change of fuel at SONGS? What studies were demanded? Have we stored any of this more deadly spent fuel in dry storage at SONGS in the last 16 years? How? In what kind of storage? Where? Have we moved any of this more deadly high burn spent fuel from the SONGS spent fuel cooling pools? How? Where? How much of the spent fuel in cooling pools at SONGS is not high burn fuel? Is it stored in separate cooling pools from the high burn more dangerous fuel? Since this fuel is older than 16 years, could it all be in dry storage? Is all of it in dry storage? (0280-4 [Magda, Marni])

Comment: How long must the high burn fuel at SONGS remain in cooling pools before it can be stored in dry storage? How long will those dry storage casks last? How long must we wait to put the high burn fuel in final geologic disposal transportable casks? How soon could it be moved to MRS monitored, retrievable storage and how do we begin to get a California solution for MRS of high burn fuel? We need it YESTERDAY. It can't wait, 2 years, let alone 20 to 60. SONGS can't keep the spent fuel where it is because of earthquake or tsunami possibilities that could create a Fukushima meltdown here any day. How can spent fuel in cooling pools be moved from Songs to a geological location that would be safe to store the fuel in new cooling pools that are away from earthquake faults, the ocean, and 8.4 million people? This must be done!!!! Has MOX been moved from SONGS that wasn't in dry storage casks? How? When? Where? (0280-5 [Magda, Marni])

Comment: We need final geologic disposal casks that are transportable. Is that the NRC recommendation? We can't leave our grandchildren with the Chernobyl type mess of no money and containment needing to be redone every thirty or so years. (0280-7 [Magda, Marni])

Comment: The planning for long-term storage is wholly inadequate given the half-life of some of the material. (0282-3 [Haber, Jim])

Comment: On October 19, the Sierra Club joined the Coalition to Decommission San Onofre in sponsoring a Community Symposium on that topic [High Burn Fuel]. Three nationally regarded experts addressed the challenges and concerns. The expert panel presentations at the Symposium include references to several "high burn" concerns: there appears to be no record of NRC prior approval for use of high burn at San Onofre; workers at the plant were and are unaware high burn was being used; the energy density of the specific form of fuel being used exceeded NRC standards even for high burn; and finally, there is no currently certified or approved technology for storage of high burn on site or its transport to remote sites. (0283-1 [Pascall, Glenn] [Watland, George])

Comment: Dr. Marvin Resnikoff, Senior Associate at Radioactive Waste Management Associates, told the Symposium that at San Onofre spent fuel will need 15 to 20 years to cool in pools before it can be put in dry casks. Edison has said spent fuel will be removed from the pool by 2034. After that, Resnikoff said, "San Onofre will consist entirely of fuel casks or silos in a Stonehenge configuration. What remains? A fuel mausoleum and the conversion of a valuable site into a wasteland." An urgent issue is the use of high burn fuel, brought to the fore by the diligent research of San Clemente activist Donna Gilmore. This fuel permits longer continuous operation before refueling but is twice as radioactive and twice as hot after use. "We should be very concerned about the challenge of storing high burn fuel," Resnikoff said. "There is a long cool-down period for fuel used at 67 megawatt-days per metric ton. How did San Onofre get permission to operate at this level? The question has not been analyzed and San Onofre has put little or no high burn fuel in storage. Indeed, no form of storage has yet been approved for fuel this hot." Resnikoff concluded with a charge to Symposium attendees: "The NRC doesn't have all the answers. Sometimes citizens have to force the issue by getting involved in the proceedings of regulatory agencies. Educate yourselves on the minutiae of safety. Continue to question authority. Work to empower independent voices that have demonstrable expertise. Challenge the NRC and Edison to be sure they are employing the best possible technology in every regard." (0283-5 [Pascall, Glenn] [Watland, George])

Comment: Use of High burn-up fuel at San Onofre requires more storage space between fuel assemblies due to higher heat, higher radioactivity, and instability. (RWMA Marvin Resnikoff, PhD.) No transportation casks for high burn-up fuel are approved by NRC, so waste cannot be

relocated. Insufficient data exists to approve dry casks for over 20 years . (per NRC Robert E. Einziger, PhD, <http://1.usa.gov/15E8gX5>. High burn-up fuel has unresolved serious waste storage issues. A June 2013 Department of Energy Report states: "...cladding performance issues need to be addressed before this fuel can be loaded into dry casks and transportation systems", and "burnup rates as low as 30 GWd/dMTU can present performance issues including cladding embrittlement under accident conditions as well as normal operations. San Onofre now has 1,123 high burn-up fuel assemblies (which require a longer minimum of 15 years of cooling in spent fuel ponds). (DOE FCRD=NFST-2013-000132, Rev.I; /Fuel Cycle Research & Development-Nuclear Fuel Storage and Transportation 2013,-000132, Rv.1, 6/15/13 <http://222.hsdll.org/abstract&did=739345>) (0284-10 [Borchmann, Patricia])

Comment: NRC is currently evaluating Edison's requested use of a new dry cask system that crowds 32 fuel assemblies into the same space that currently holds 24 at San Onofre. This new system will increase risk of dangerous radiation releases into the environment. (0284-9 [Borchmann, Patricia])

Comment: The US government's long delayed commitment to take possession and manage the spent fuel rods now becomes the focus. Recently, the National Conference of State Legislatures said that it supports federal action to develop consolidated facilities for interim storage of high-level radioactive waste until a permanent repository is ready. This is an extension of the current onsite storage facilities which places fuel bundles into casks after about seven years of storage in the spent fuel pools. The casks are stored on the plant sites awaiting transfer to federal facilities. SCE's plan for 20 years is compatible with this time frame. (0286-2 [Hannaman, Bill])

Comment: Nuclear waste can never be stored in a completely safe manner. There is no viable method available for long-term storage. (0288-3 [Wickham, Wendelyn])

Comment: I am here this evening to support the reasoning of many in this county who have great concern over the huge and growing amount of nuclear waste accumulating at Diablo Canyon plant. The high-level waste in the cooling pools is of critical importance. (0290-1 [Brown, Marty])

Comment: There are approximately 70,000 metric tons of commercial spent fuel across our country -78 % of it in pools. These pools have the largest concentration of radioactivity on the planet. The cooling pools literally sit on earthquake faults here, are unprotected from air strikes and are overcrowded even now having 4-5 times the amount of fuel rods than they were designed for. You must demand that PG&E transfer the fuel rods from the cooling pools to dry cask storage starting immediately. (0290-3 [Brown, Marty])

Comment: No one knows how long the dry casts will remain safe. NRC is experimenting with my families health and property value Only 1/3 of the spent fuel is in dry casts - why hasn't PG&G(sic) taken a more aggressive stance to protect the community[.] (0291-2 [Mauter, Nancy])

Comment: I am dismayed that the NRC is allowing PG&E to make more nuclur (sic) waste without PG&E safely storing all the waste in dry casts. The only people who spoke in favor of PG&E nuclear power industry was the employees who benefit financially from the plant. (0291-4 [Mauter, Nancy])

Comment: We are in an impossible situation. When the Spent Fuel Pools were first licensed there were fewer assemblies placed in open racks where water could circulate freely to help cool down the very hot and very radioactive spent fuel rods. Circulating water is the best way to absorb the heat and also to shield against radiation. (0293-1 [Lewis, Sherry])

Comment: But early on, a more highly enriched uranium fuel, we now call high burn-up fuel, was developed. Unfortunately, the waste created from high burn-up fuel is even hotter and also more radioactive than before. (0293-2 [Lewis, Sherry])

Comment: There is currently no safe way to store nuclear waste. There has been a lot of thought and money diverted to this problem for many years, and there is no real answer. Very possibly, we are at a cul-de-sac with this technology. It may be an unsolvable problem. (0297-1 [Fishman, Zelma])

Comment: The Commission simply, so far, has allowed generators to compress the spent fuel rods in the “temporary” on-site cooling pools to such extent that many of these now hold several times more than they were designed to hold. Despite this dangerous overcrowding, the Proposed Rule states, quite cavalierly quite a few times, that the Commission “continues to support the...storage of spent nuclear fuel in spent fuel pools” until a repository becomes available. Though it mentions dry casks, it fails to acknowledge that by far the most of it – some 75 percent – is being kept in the overcrowded pools, very little in the much safer and more stable dry canisters. (0303-3 [Lamberts, Frances])

Comment: However, the FSHCC understands that it is critical that the transportation, storage and disposal of used nuclear fuel are properly and adequately addressed. There are many misconceptions about nuclear energy and we are pleased to see that the NRC is working to educate the public on the important measures that are being taken to ensure that used nuclear fuel is well protected from potential natural events and terrorist attacks, including a combination of strategic design and construction, multiple safety systems, ongoing surveillance and inspection, and state-of-the-art security measures. We also appreciate the NRC's transparency in informing the public around the safety and security of used nuclear fuel management in post-Fukushima. (0307-2 [Fuentes, Julio])

Comment: Although we continue to wait on the political process regarding reaching an agreement on a disposal solution, it is a well-known fact that nuclear fuel can be safely stored in an environmentally sound manner for very long periods of time in the interim. (0307-4 [Fuentes, Julio])

Comment: While nuclear energy is a vital part of our state's electricity portfolio and economy, I recognize the need to address the transportation, storage and disposal of used nuclear fuel. As the political process and debate continues regarding reaching an agreement on a disposal solution, the development of consolidated facilities for interim storage of spent fuel must be pursued until a permanent repository is ready. Over 100 commercial spent fuel pools are, or have been, in service in the U.S. and most of these pools have safely contained spent fuel for 30 years or longer. The safety and security measures taken to maintain these spent fuel pools are unprecedented measures that include a combination of strategic design and construction, utilization of multiple safety systems, ongoing surveillance and inspection, and state-of-the-art security measures. (0308-2 [Weinberg, Luz])

Comment: As many nuclear plants in the U.S. have spent fuel pools containing double the amount of spent fuel rods as originally planned, we are in a dangerous situation. Looking at

what happened and is still happening at Fukushima Daiichi, the contention that these over-packed pools sitting above reactors are a minimal danger is false. Simple loss of coolant due to even temporary energy loss or leaks is a probability that can no longer be easily dismissed as improbable. (0309-1 [Green, Jeanne])

Comment: I am familiar with the issues concerning dry cask storage of spent fuel at nuclear power plants and I believe it is a safe method of long term storage. (0313-1 [Waage, Edward])

Comment: The so-called 'temporary' storage sites could become de facto permanent dumps if it is not politically feasible to site enough repositories to handle the waste. (0319-7 [Nichols, John])

Comment: NRC's Waste Confidence policy assumes that all nuclear waste is the same. This is far from the truth. The industry is moving toward new fuel types, such as MOX and high burnup fuels, which are more radioactive, dangerous, thermally hot and difficult to store and transport safely. (0319-8 [Nichols, John])

Comment: I am opposed to storing used radioactive fuel rods in a pool of water 100 feet above ground level. The imagination runs wild when considering all the bad things that could happen to such a massive object that high up on a manmade structure. (0321-1 [Bagwell, Charles])

Comment: Even without catastrophic accidents like at Chernobyl, our current way of holding spent nuclear fuel at reactor sites, in greatly overcrowded cooling pools, adds a large amount of risk to nuclear power production. (0322-4 [Baker, Hannelore])

Comment: They have to be able to take whatever is this high-burnup fuel, whatever is the real truth about that here, we have to have all these great minds together now creating a solution to get the casks that we need right now today to begin putting that storage in casks that can be moved as soon as we have a place for it. We need Camp Pendleton involved. (0325-12-5 [Magda, Marni])

Comment: Under the nuclear fuel, it's safe in the pool over there. Dry storage works in this country. It's worked for years. Over the past 30 years, the nuclear industry has safely loaded more than 1,700 dry storage caskets. There's been no problems with any of them, no disaster of any kind, any kind has ever bothered any of these caskets. There's no reason not to continue to go on and use this way. These pools are safe. This pool over here across the street has got backup system after backup system. That plant has so many backup systems in it you can't believe it. (0325-14-1 [Sallis, Gary])

Comment: There's so many already redundant systems to ensure cooling and fuel assemblies in the pools, and the industries have backed it up with more. The NRC made more rules after the thing that happened in Japan. They made more rules to make it even better and better. They do this all the time. Don't condemn them. Continue to let them work, and work with them. (0325-14-4 [Sallis, Gary])

Comment: [S]pent nuclear fuel is currently stored onsite at facilities across the country in well designed, well protected facilities and storage casks. Both facilities and storage casks are robust structures made out of steel linings and reinforced concrete walls that are several feet thick. Spent fuel pools are often 40-feet deep and seal lined with reinforced concrete walls. Further, the structures protecting these pools are built to seismic standards. The dry storage casks where the fuel is moved are also strong structures made of concrete and steel. For every 10 tons of spent fuel, facilities use 100 tons of concrete and steel to form a structure designed

for the highest level of protection. Over the last 30 years, nuclear energy facilities have proven that they can safely and securely store spent fuel onsite at facilities in these structures. (0325-16-2 [Bailey, Savannah])

Comment: [I would like to] reiterate that nuclear energy facilities across the country have continued to show the utmost commitment to safely and securely storing spent nuclear fuel. (0325-16-6 [Bailey, Savannah])

Comment: First, dry storage, dry cask storage. Dry cask storage systems have withstood severe earthquakes, hurricanes, and other natural disasters. Nine of these systems were in place in Fukushima, were shaken by the earthquake and over-washed by the tsunami and suffered no damage. Another fun-filled fact about spent fuel pool safety. In the 2011 Fukushima event in Japan, there were seven spent fuel pools. All endured the earthquake and tsunami, three of the pools were in the reactor building also suffered catastrophic hydrogen explosions. Active cooling capacity was lost for several days, yet all the fuel was safely protected. (0325-18-1 [Lemmon, Tom])

Comment: I've collected information about nuclear waste. And what I've learned is a scandal. The nuclear -- the NRC has allowed the nuclear plants to run much more dangerous fuel without having a solution for storing it, even short term. They call it high-burnup fuel and Dr. Einzinger in March said they're not going to license this fuel for more than 20 years because they don't have the data to show its safe in dry cask for over 20 years. And then I find out that there's no transportation approved for this fuel, and we have tons of it at San Onofre. Apparently, the protective cladding becomes brittle and it's subject to shattering and could eventually lead to radiation release. You know, we're talking short-term problems. How can -- if the NRC doesn't have confidence short-term in this fuel, how can this plan possibly say it has confidence for hundreds of years? I mean, this is outlandish. And to call it a generic plan. Sitting by the ocean, we've got metal corrosion going on here with the facility. We're in the ring of fire just like Fukushima, and if we have problems here we're talking national security, we're talking national, international economy, we're talking the food supply for the nation. This is totally unacceptable. The NRC needs to complete their research on extended storage before it completes the EIS, because the research that they've already done shows there's no confidence. And there's -- and the high-burnup issue that I'm talking about, it's not covered -- the research that went into this information is not covered in this document. All the research the NRC has should be evaluated and included in there, and what the DOE has should be part of that. So, there's no confidence here. This is just a bunch of BS, as far as I'm concerned. (0325-2-1 [Gilmore, Donna])

Comment: The U.S. Government, not the NRC, but the U.S. Government's long delayed commitment to take possession and manage the spent fuel rods now becomes the focus. Recently, the National Conference of State Legislators said that it supports Federal action to develop consolidated facilities for interim storage of high-level waste until a permanent repository is ready. I think that satisfies the idea of moving the fuel away from San Onofre to an interim place, but it's really just an extension of the onsite storage facilities, which already takes the fuel bundles in the casks. And there is an issue here of timing. (0325-26-3 [Hannaman, Bill])

Comment: I am very troubled by the use of this high-burnup fuel at San Onofre. It puts my children at a much higher risk, and it puts them at a higher risk for a longer time. Wasn't nuclear waste bad enough to begin with? Did they have to go and find a way to make it worse? And what about the roof that is on that spent fuel pool? Certainly, yes, you have hardened sides and a concrete bottom, and that sounds very good, but the roof? Not much help there. (0325-27-1 [Davis, Patti])

Comment: [H]igh-burnup fuel has changed everything, and has made a terrible challenge a horrendous one. Everything in this process about Waste Confidence needs to stop until there is enough data to reliably manage and monitor the high-burnup fuel. According to NRC's own documents, their assumptions about how high-burnup fuel would react and perform have not proven correct. How can we honestly talk about any plans for storing and managing this waste when the high-burnup fuel problem is not even fully acknowledged and addressed? (0325-28-5 [Branigan, Mary Beth])

Comment: Intense radiation, as you know, breaks down concrete, salt water breaks down metal, no containment will even reliably last for 50 years, much less the hundreds and thousands of years needed to isolate this deadly waste from the environment. And it's everywhere, it's everywhere in our country. (0325-28-6 [Branigan, Mary Beth])

Comment: Spent fuel pools at nuclear power plants are intended to house nuclear waste only until it's cool enough to be transferred to permanent storage. In the U.S., overcrowded cooling pools can contain up to 40 times more nuclear material than the reactor cores. Furthermore, they lack equivalent containment buildings and safety systems for protection. These pools have now become nuclear waste storage sites. (0325-29-2 [Feathers, Jösan])

Comment: Unlike some of the other nuclear power plants to be covered by this Generic EIS, there are known offshore earthquake faults capable of up to an 8.0 magnitude earthquake here. In the event of an earthquake of this size and potential tsunamis, failure similar to Fukushima, Japan are possible. In contrast to spent fuel pools, concrete and steel dry casks are not vulnerable to the loss of the coolant if electricity is disrupted by an earthquake or other natural disaster because they are passively cooled by natural air flow. (0325-29-3 [Feathers, Jösan])

Comment: Rather than invest in dry casks, plant owners continue to fill cooling pools well beyond what they were designed for. Today around 80 percent of U.S. nuclear waste currently is stored in pools. Let me say that again. Today around 80 percent of U.S. nuclear waste currently in pools could be moved to onsite dry casks until permanent storage is available. (0325-29-4 [Feathers, Jösan])

Comment: However, in the case of high-burnup fuel like we have here at San Onofre unbeknownst to us, it's back to the drawing board. At a minimum, the NRC should not approve higher density of fuel assemblies in dry cask systems, and they should stop approving the use of high-burnup fuel in existing plants. (0325-29-5 [Feathers, Jösan])

Comment: Independent experts of the Union of Concerned Scientists and elsewhere agree that the dangerous radioactive waste from spent fuel pools that has cooled sufficiently should be required to be transferred to safer onsite dry cask storage. Dry casks are economically viable and provide a storage alternative for 20 years for high-burnup fuel until an offsite storage facility becomes available. (0325-29-6 [Feathers, Jösan])

Comment: Now we're stuck with a whole lot of nuclear power plants with a whole lot of waste stuff that we don't know what to do with it. There's no answer to safe storage, and the safe transport of this material. It's right here in our backyard. It's threatening us at all times. We don't have a way to deal with it. (0325-33-2 [Zigler, Randy])

Comment: The industry has shown over decades that it has the ability and the technology to safely store spent fuel onsite. Now, we all know that permanent onsite storage is not what was ever intended, and it's not a long-term solution, but we should not punish the nation's largest

source of clean air electricity because of that. These structures have met rigorous standards that have been set out by the NRC and the industry has invested billions of dollars and thousands of man hours in improving these facilities and structures. (0325-5-3 [Kirtan, Stratton])

Comment: The nuclear industry switched to high-burnup fuel because it burns longer in the reactor and increases industry profits. This has further reduced our safety here and across the nation. It turns out that the NRC and the nuclear industry have no safe storage solution for high-burnup fuel, used fuel, even short term, and there's no solution for transporting this waste offsite. So, we're asking the NRC to include in your Generic Environmental Statement and in your document to solve these unsolved problems. (0325-8-2 [Von Thillo, Grace])

Comment: If the NRC won't even approve short-term storage or transport of high-burnup used fuel because you don't have the confidence, then you must stop wasting and making this waste. Your demonstration project with the DOE is still experimenting on the technology and the materials. We want this extremely vulnerable fuel moved away from San Onofre as soon as it is reasonably safe to do so, and storing it longer in this sensitive area where you've heard again we are prone to tsunami, earthquake, our coastal and marine environments, next to California's critical transportation, economic, and military arteries and surrounded by 8.5 million people, increase our concerns and lessen our confidence daily. (0325-8-4 [Von Thillo, Grace])

Comment: I have absolutely no confidence in a regulatory agency that even allows the nuclear industry to continually increase the level of burnup for its fuel. But, essentially, the nuclear power industry wanted to increase profits and be allowed to keep the fuel in the reactors longer, and the NRC gave them the go ahead. And they have been creating an inventory of high-burnup fuel and creating an intractable problem, and that has to end because it amounts to nothing less than the reckless endangerment of the American people. (0325-9-1 [Reson, Myla])

Comment: Some of the areas that we heard from the public that we would like the NRC to better address has to do with the storage and transfer of spent fuel. Concerns are chiefly over the density and configuration of assembly storage and spent fuel pools before they're transferred to dry cask storage. The concern about this practice is that the current allowable density and configuration of highly radioactive material is far more vulnerable to a variety of accidents or even natural disasters, and thus, more threatening to our populations. Thus, my colleagues and I have been asked to urge the Nuclear Regulatory Commission to better address this potential danger to our citizens by creating, adopting, and implementing regulations to further reduce the likelihood and/or better mitigate the potential for any kind of spent fuel disaster. (0326-1-2 [Hill, Adam])

Comment: PG&E has a detailed and regulated spent fuel management program in place. The wet storage fuel pools, where the solid spent fuel is housed, are robust concrete and steel structures designed to withstand extreme events such as earthquakes, floods, hurricanes, and tornados. The most likely of these scenarios for here on the Central Coast is earthquakes, but the NRC's analysis shows that even a powerful earthquake is unlikely to damage a used fuel storage pool to the extent that it would lose water. Even in the case of Fukushima, where there was a loss of all offsite electrical power for weeks, and explosions resulting from hydrogen buildup in containment structures, all seven fuel pools at the Fukushima Power Plant in Japan remained intact and the used fuels in the pools remained safely covered with cooling water. PG&E has been and continues to be a good neighbor in our community. They have layer upon layer of safeguards in place to manage and monitor spent fuel. Like I said earlier, we're none too keen on storing spent fuel at Diablo Canyon, but unless the Federal government follows

through on their responsibility, it's my opinion that PG&E has done everything possible to deal with the situation. (0326-11-3 [Bean, Judith])

Comment: "There are approximately 70,000 metric tons of commercial spent fuel across our country; 78 percent of it in pools. These pools have the largest concentration of radioactivity on the planet. The cooling pools literally sit on earthquake faults here, are unprotected from air strikes, and are overcrowded, even now, having four to five times the amount of fuel rods than they were designed for. You must demand that PG&E transfer the fuel rods from the cooling pools to dry cask storage starting immediately." (0326-14-3 [Brown, Marti])

Comment: It was badly needed here for the county, but something else that's also very badly needed, and that's safer storage of nuclear waste here at the Coast. The proposed -- well, I should say, I was actually a member of the Nuclear Waste Management Committee of San Luis Obispo County from 1996 to 2002, and already, some 12 years ago, we came to the conclusion that the dry cask storage would be a lot safer way to go. (0326-15-1 [Schumann, Klaus])

Comment: For the already existing spent fuel, dry casks are far safer than crowded pools[.] (0326-15-6 [Schumann, Klaus])

Comment: [F]or the already produced spent fuel, certified dry casks for high-burnup fuel is ASAP ; return storage fuels to low density ASAP[.] (0326-15-9 [Schumann, Klaus])

Comment: I'm here to express my support and my confidence in the storage of spent nuclear fuel onsite. The industry has shown, over the course of decades, that it can store spent fuel onsite safely. Now, I think many of us are in agreement that onsite storage was never meant to be a permanent solution and we want a permanent solution, but we shouldn't punish our nation's number one source of greenhouse-gas-free electricity because of a political problem in Washington. Now, these structures meet rigorous requirements that have been set by the NRC, and the industry has invested, literally billions and thousands of man hours over the last few decades, upgrading both the physical structure and the security of these facilities. (0326-16-2 [Kirtan, Stratton])

Comment: For approximately the past two-and-a-half years, I have helped maintain Diablo Canyon as one of the safest plants in the industry. In all the work that I do, safety is at the forefront of my mind, for myself, my co-workers, our friends and families, and the entire community; all of you here. I grew up as the son of a PG&E employee, my mother worked as a meter technician in Stockton for PG&E for 37 years. I've witnessed the company's focus on safety my entire life, throughout the countless training sessions and meetings my mother had to attend, often out of town. I continue to see that same focus at a companywide level and as demonstrated in my interactions with personnel at the plant. The safety of long-term onsite storage is a political issue, not a technical one. (0326-17-2 [See, Daniel])

Comment: Used fuel has been stored safely at nuclear plants for many years and with the engineering technologies we have nowadays, we can continue that for many years in the future. (0326-18-3 [Schrader, Ken])

Comment: I'd also like to thank Representative Diane Feinstein, who I'm relieved to know that she's here. In 2011, after touring the power plants at Diablo and San Onofre, Senator Feinstein commented that what jumps out at you is that some spent nuclear fuel rods are stored in pools, similar to the ones leaking radiation at a crippled Japanese reactor. (0326-19-2 [Carrigan, Milton])

Comment: The NRC is exposing us all to the possibility of a horrendous nuclear accident. The Union of Concerned Scientists state, and I quote, "Tens of thousands of tons of radioactive waste is being stored in unsafe, insecure, overcrowded spent fuel pools, which puts the American people at risk." They call for the accelerated transfer of spent fuel into safer dry casks. There is no scientifically proven solution for safely disposing of nuclear waste. (0326-20-2 [Caulfield, Lee])

Comment: Now, moving to the topic of tonight's discussion, spent nuclear fuel is currently stored onsite at facilities across the country in well-designed, well-protected facilities and storage casks. Both facilities and storage casks are robust structures made out of steel linings and reinforced concrete walls that are several feet thick. Spent fuel pools are often 40-feet deep and steel-lined with reinforced concrete walls. Further, the structures protecting these pools are built to seismic standards. The dry storage casks, where fuel is moved, are also strong structures made of concrete and steel. For every 10 tons of spent fuel, facilities use 100 tons of concrete and steel to form a structure designed to the highest level of protection. While our coalition continues to support a Federal long-term storage solution, over the past 30 years, nuclear energy facilities have proven that they can safely and securely store spent fuel onsite at facilities. Beyond that, the NRC is committed to ensuring American nuclear facilities adhere to the strictest regulations and operate in the best interests of the public. As such, operating facilities are subject to onsite inspections by NRC staff 24 hours a day, 7 days a week, and 365 days a year. (0326-25-2 [Bailey, Savannah])

Comment: PG&E has had a comprehensive fuel management program in place to safely store used nuclear fuel until the time that the Federal government can assume their responsibilities. As a utility, we have long advocated that the Department of Energy act on its commitment to collect used fuel. We support the establishment of the President's Blue Ribbon Commission and its recommendations to advance a workable storage solution that includes, also, the establishment of the interim consolidate storage facilities. In the absence of an existing Federal repository, PG&E will continue to store used fuel assemblies onsite at Diablo Canyon in safe, secure, and Federally monitored storage facilities. With the continued delays in collection of the used nuclear fuel, most nuclear facilities, including Diablo Canyon, have had to develop dry storage facilities, and the need to develop these dry storage facilities is to augment the existing wet storage facilities. (0326-3-1 [Strickland, Gerald])

Comment: Tonight, there will be a number of questions and comments tendered to the NRC associated with high-burnup fuel. PG&E has used fuel that is greater than what's termed 45 gigawatt-days per metric ton of uranium, and that meets the definition of high-burnup fuel. This fuel is safely stored in both our wet and dry storage systems in accordance with the licensed requirement set forth by the Nuclear Regulatory Commission. (0326-3-3 [Strickland, Gerald])

Comment: [B]ut along the way an issue came up, and of course, if you're not going to reprocess the fuel, what are you going to do with it? And of course, re-racking came in and I was in the State Department, so I didn't do any calculations, but of course, the government did calculations about re-racking, but the one thing they didn't know is-- it was 35 years since then, since this took place-- and of course, you exceed what they could have from a safety point of view. Now, these things can be calculated in terms of if you have too many watts per square meter, and how much air circulation you lose if you have too much racking, but it's clear there are, in some cases, you can have uranium fires, so I support moving them out, but I wouldn't say exactly at what point you make that decision, because I don't know; because I have studied it. It's been a long time. But clearly, you should move them into dry cask storage, which is pretty safe. (0326-30-2 [Hafemeister, David])

Comment: To start, I'd like to thank the Nuclear Regulatory Commission for the opportunity for myself, and so many others, to say a few words here tonight. I started working at Diablo Canyon in February of 2009. My first impression of the facility was that it was very safe and open. Everyone watching out for one another. The culture of Diablo Canyon is one that is centered on safety and doing the right thing. I've held various positions at Diablo Canyon in design engineering, mechanical system engineering, and regulatory services, exposing me to a variety of technical and regulatory issues. Throughout them, I've witnessed and participated in some tough decisions. These tough decisions were made to take the high road, the conservative road, the safe road. Rather than letting cost make the call, or schedule pressure make the call, safety always makes the call. With regard to spent nuclear fuel, the NRC has been thorough in their evaluation and then providing a comprehensive and reliable Generic Environmental Impact Statement. This Impact Statement concludes that it is feasible to safely store spent fuel following the licensed operating life of a nuclear facility without significant environmental impact. Having seen the dry cask storage at Diablo Canyon, I believe that it is a safe and secure way to store our spent fuel until a long-awaited permanent repository is available. Having seen the spent fuel pool and worked with reactor engineering during fuel inspections, I believe that the pool is safe and well-designed. I know and worked very closely with the engineers, the operators, security, and training personnel of Diablo Canyon. We work very, very hard in everything we do to ensure the health and safety of the public; of ourselves too. I'm confident that the future of Diablo Canyon is in good and skilled hands. (0326-32-1 [Landreth, Will])

Comment: And then, you need to put that waste into dry cask storage. Give us some confidence. (0326-35-5 [Owen, Linde])

Comment: The only components of the four damaged reactors that survived the earthquake tsunami, loss of coolant, and reactor explosions relatively intact were that portion of the 11,000 fuel rods that were in dry cask storage. According to PG&E's statement that you just heard, only 1/3 of the spent fuel assemblies are now in dry cask storage. (0326-4-4 [Brown, Jerry])

Comment: We are in an impossible situation. When the spent fuel pools were first licensed, there were fewer assemblies placed in open racks where water could circulate freely to help cool down the very hot and very radioactive spent fuel rods. Circulating water is the best way to absorb the heat and also to shield against radiation. But early on, a more highly-enriched uranium fuel, we now call high-burnup fuel, was developed. Unfortunately, the waste created from high-burnup fuel is even hotter and also more radioactive than before. At the same time, the capacity for storing all this waste was becoming a problem. (0326-44-1 [Lewis, Sherry])

Comment: The idea that storing nuclear waste at Yucca Mountain, or Diablo Canyon, or anywhere, is not a resolution. We suggest PG&E and the Federal government go back to the drawing board. These ideas are unacceptable. There is no safe storage for toxic waste. And in the words of the Russian Prime Minister, after the asteroid landed five miles away from a nuclear power plant, he had stated, "Nothing nuclear is safe for the human race." (0326-45-4 [Baker, Crystal])

Comment: I think that this evening we've had a great deal of good articulation about some of the risks of nuclear energy in Diablo Canyon. I guess I'm in the minority though tonight in believing a little bit in the ability of the human spirit and human ingenuity to perhaps find some solutions in the next 250,000 years for some of the problems we've been discussing. Meantime, I think that there is some, at least in my view, a reason for some level of confidence in PG&E's ability to do the right thing or to safely manage the problem in the short term. (0326-49-1 [Connor, Vicki])

Comment: And, for the record, I just want to say I have no confidence in safe storage of nuclear waste. (0326-54-3 [Crimmel, Steve])

Comment: So also I've heard, though I'm for fairly rapid transfer when safe, to dry casks from cooling ponds; however, I also-- I saw-- got an email that said 26 technical data gaps for dry cask storage. And a DOE website stated there are 94 technical data gaps in dry cask storage. Anyway, try to make dry cask storage safer[.] (0326-63-6 [Campbell, Bruce])

Comment: There have been absolutely no studies on the extended storage of nuclear waste, either in spent fuel pools or in dry casks. You need to have those data before you can write a Final EIS, but the research hasn't been done. The dry casks are guaranteed for 20 years. You assume they will last longer, but you don't know because they haven't been tested, and you don't know how high-burnup fuel acts in dry casks. (0326-9-5 [Seeley, Linda])

Comment: Does it embrittle the casing? I understand that you've just started a study on the characteristics of high-burnup fuel in casks, but it won't be finished until 2016. How can you issue a Final EIS before you know the results of that investigation? It's like writing a cookbook before you've even prepared any of the food before you publish the book, except you're dealing with the most lethal substance on Earth, not bread dough. (0326-9-6 [Seeley, Linda])

Comment: Onsite storage facilities for spent nuclear fuel have been designed to withstand potential natural disaster events or terrorist attacks by durable design and construction, ongoing surveillance, inspection, and state-of-the-art security measures. The two methods for storage of spent nuclear fuel have proven to be extremely safe. Dry storage systems used to store spent nuclear fuel have more than 100 tons of concrete and steel forms, precisely engineered, to protect every 10 tons of fuel. And in the past 30 years, over 1,700 dry storage systems have been used by the industry, and there's never been a release of any potential radioactive material. Fuel pools used to store spent nuclear fuel are large structures with reinforced concrete walls and steel liners. At Japan's Fukushima Daiichi site, used fuel was stored in seven fuel pools, and after the severe earthquake, tsunami, and subsequent explosions which occurred none of the spent fuel was compromised. (0327-12-2 [Knisley, Mike])

Comment: In 1994, a couple of good friends of mine, Bill and Alice Hurt, long-time anti-nuclear activists were plaintiffs in a law suit that I filed in the District of Columbia challenging the permission, the rulemaking, that the NRC implemented to allow an exception for the use of the three defective casks that Kevin Kamps mentioned a little while ago. There were three dry casks up for use as storage modules that were defectively ground. They were too thin, they weren't up to spec, and in classic traditional response, the NRC simply made the exception into the rule. We challenged the rulemaking and ran into a brick wall, figuratively, at least. But therein lies the message. Here we are about a generation later and these three casks are sitting there, and the NRC now expects them to last forever. (0327-13-2 [Lodge, Terry])

Comment: I'm here today to voice my opinion on a new concept called "consent-based siting approaches" that you're moving towards for nuclear waste-management facilities, for interim storage and for geological repository. The idea of local communities forming partnerships with the implementers under the auspices of a national government appears to be gaining a lot of traction in countries that are opting for voluntary siting. Some version of this idea has been found in Sweden, the UK, and Canada. The only catch here is that there must be a community that has infrastructure, that has real estate, that has a knowledgeable workforce, that has educated citizens that understand both science and risk. I'm not sure that that community exists at all. (0327-20-1 [Clemons, Victoria])

Comment: We need to contain it onsite, but not at Perry on top of a nuclear fault line, for God's sake. (0327-23-4 [Tolls, Leatrice])

Comment: Maybe we all remember Fukushima, Three Mile Island, and Chernobyl. According to the Union of Concerned Scientists, there are continuing safety concerns, including where to store nuclear waste. In the absence of an interim or permanent repository for spent nuclear fuel, which remains dangerously radioactive for hundreds of thousands of years, plant owners keep it onsite, mostly in overcrowded, relatively unprotected cooling pools. Nearly 75 percent of all spent nuclear fuel sits in these pools. About 120 million United States citizens live within 50 miles of a nuclear plant and continue to be at risk, and we are among them here. (0327-26-1 [Myers, Dan])

Comment: Nuclear facilities have already been required during license renewals to have stringent storage standards and management programs in place to ensure adequate inspection and maintenance of these systems. These requirements ensure that any issue which could have safety ramifications are detected and helps keep our communities safe. (0327-31-5 [Dorans, Rob])

Comment: A decision to do nothing now is not a solution, so I'll say that again. A decision to do nothing now is not a solution. What we actually have is the capability of doing now is the best technology we have to put sufficiently cooled fuel rods into state-of-the-art hardened canisters. How can moving this most deadly of all materials around the country with no solution be a solution? Canisters must be stored as close as safely possible to the sites of generation. Moving it for no purpose is not a solution. (0327-4-5 [Marida, Patricia])

Comment: Do I have confidence? No, I have no confidence because the nuclear waste we have right now is not being handled properly. At Palisades there's a cask that's got a bad weld. I've been at meetings in the past like many others, and I say well, why don't you take the nuclear waste out of this cask with the bad weld which could deteriorate and break, and leak, and contaminate the lake? Why don't you take the fuel rods out of it and put it in a good cask, you know, and monitor it? Well, instead, they've kind of like put casks up around it to kind of buffer it. And they say it's too dangerous, we can't take those rods out. Well, come to find out it's never been done. Those casks were not licensed when they were loaded. And the company got away with that. I mean, do you put a car on the road that might be dangerous - thanks for the one minute - and just run it down and see if it blows up, or if your engine blows 300 feet out ahead, or whatever. No, you don't do that. They don't let anybody do that, but the NRC has let the nuclear industry get away with a lot, and part of it is in the storage of nuclear waste. It's just not safe right now. And I can't see it being safe in the future. (0327-8-2 [Barnes, Kathryn])

Comment: The proposed interim storage sites until a final solution is found makes no sense either. It would just double the shipments and exposures to accidents. And this temporary solution would also take decades to implement. Keeping waste onsite in dry casks also is not a good solution, but seems the best alternative for now to moving the waste multiple times. (0327-9-2 [McArdle, Ed])

Comment: My worst fear, and the worst fear of our people is that we will be forced to abandon our homeland because of an incident at the plant. And to be honest with you, my biggest concern isn't with the plant operations, it's with the nuclear waste packed into the spent fuel pools and the stored aboveground dry casks less than a half mile from our lower Island residential area. (0328-1-4 [Johnson, Ron])

Comment: Allowing for the continued storage of spent nuclear fuel onsite will allow the industry the flexibility to maintain our current supply of spent nuclear fuel in a safe and effective manner until a final repository or alternative solution can be agreed upon without the added pressure on license renewal. It will also lift a burden not only on the industry, but the country as a whole by allowing sites with proven track records to maintain their fuel on site. The industry has shown that it is fully capable of maintaining spent fuel safely and effectively for over 50 years. It can and will continue to do so. (0328-10-3 [Biersdorf, John])

Comment: First, there were some comments earlier, I believe it was Mr. Mahowald talking about degradation. So, I've got this cute little report that I found called, "Premature Degradation of Spent Fuel Storage Cask Structures and Components from Environmental Moisture." And this is specifically dealing with TN casks, which is what we have at Prairie Island, so I want to put that in. And then another one, and I will have more detailed comments. I haven't had any time to really look at this, so I'll have written comments by the 20th. Another one, "Spent Fuel Integrity During Dry Storage," and it talks about things like leaks. And this is about krypton levels, so that can tell if the casks are leaking or not. And they're talking about the work that they've done to determine whether or not casks are leaking. And it says, "Before this test," this is like this one test, "four cask performance tests of similar duration and scope had been performed. Only two indications of release were observed," two out of four. Well, don't we have a problem there? I want to introduce that. And that's a study by M.A. McKinnon. McKinnon has done a lot of these studies. (0328-14-3 [Overland, Carol])

Comment: And then I also want to introduce this -- it's hilarious. It's the Keystone Cops, and I'm sure some of you are familiar with this. I got this in a brown envelope when I was representing Florence Township. INEL did a study where they tried -- well, not a study, an attempt to unload a cask, and it's Keystone Cops. It's -- they tried to pull -- it had been in storage for not that long. They tried to pull it out, and it got stuck. They tried to pull it in, they couldn't get the thing back in. And they tried to pull -- and it sat there for a while until they finally figured out what to do, and they rammed it back in and shut it up, and put it away. As far as I know, no casks have actually been unloaded. Is that -- like have any of the TN-40s on Prairie Island been unloaded since '95? I don't think so. Have any TN-40s anywhere been unloaded or 29s? It's a problem. So, I want to introduce this. (0328-14-4 [Overland, Carol])

Comment: Another problem, do you all remember the exploding cask at Point Beach? This is where they took the cask, filled it up, picked it up, let it sit there. Well, the cask had a zinc basket in it, and it had boric acid sitting in it, and the shift went home. And like 8 hours, 12 hours later the shift -- another shift comes in and they go to load it up, and so you've got fire and zinc and boron which is -- you end up with hydrogen, kaboom. And a big old what, I don't know how many tons it was, 9-inch-thick cover bent up, the shims that were in holding the basket in flew up, landed on the floor. I'm sorry, I don't have confidence in nuclear waste storage if this is the kind of thing that happens. How many of you remember all the failed welds that have been addressed over the years? So, we should have confidence because someone takes an x-ray of it? No, the welds fail, it happens. So, I have no confidence. (0328-14-5 [Overland, Carol])

Comment: My involvement with nuclear, other than playing with the Geiger counter, started in 1994, in December, so we're looking at now almost 19 years. And that was just kind of scary concept for me. And before that, actually at that very time I was still being a truck driver trying to raise money to open up my office, and so this is December '94, and we're having this little meeting sponsored by Northern States Power, and we're trying to figure out where to put the nuclear waste. And, Kristen, remember this? And so we're sitting there trying to figure out, this is an NSP-sponsored committee, and they were describing the casks. And, you know, I'm a truck

driver, and they were talking about the seals on the casks. Well, so I was like excuse me, don't you have to change the seals? Like eh, didn't know what to say. It's like yes, those seals have to be changed. They have to be changed every 20 years. Okay. First cask was loaded 1995, and now here we are, we're coming up on 10 years, 20 years isn't that far away, no cask has been unloaded. How many seals have been changed? What's the process for doing that? Does anybody know? So, you think it can be safely stored there for 100 years? Right. (0328-14-7 [Overland, Carol])

Comment: The uncertainties associated with the long-term storage high-burnup fuel are simply wished away. There are known documented problems associated with high-burnup fuel. The NRC has yet to determine precisely how to monitor those effects during the extended storage periods contemplated in the Draft Generic Environmental Impact Statement. But, yet, we're told that there's no need to worry about cask and cladding degradation or the embrittlement of fuel assemblies and internal cask components because the casks will simply be reloaded every 100 years. (0328-3-2 [Mahowald, Philip])

Comment: What are the effects of high-burnup fuel on fuel rod cladding and fuel assemblies over 100 years, over 200 years, over 300 years? What are the effects of high-burnup fuel on the internal dry cask components themselves, the baskets and the separators, again, over 100 years, over 200 years, over 300 years? (0328-3-4 [Mahowald, Philip])

Comment: Well, maybe we've figured out how to mass produce those gadgets and maybe they won't cost so much, but we've also done a really remarkable job of diversifying the fuel that these reactors are burning. And when you have the higher burnup rates and the mixed oxides in the reactor fuel, and all the other stresses that happen uniquely cask by cask to say nothing about site by site, and then you assume that you're going to be actually able to transfer this waste. What happens if it disintegrates? What happens if one-half of 1 percent of the fuel assemblies at the end of 100 years, or at the end of 150 years, or 200 years, or 20 years, whenever we get to the repository, if we ever get there, what happens if one-half of 1 percent of those fuel assemblies disintegrates? What happens to your assumption then? How do you manage that? (0328-7-5 [Crocker, George])

Comment: The design of fuel assemblies and storage casks have undergone significant developments over the 15 years of my career with a primary goal to improve the safety and security of managing used nuclear fuel. First has been a transition from bolted cask designs to welded canister-based systems. These welded canisters are tested with liquid penetrant exams, radiography, and ultrasonic hydrostatic and helium leakage tests. These designs are now implemented in over 1,600 of the approximately 1,900 loaded storage systems. (0328-8-2 [Cummings, Kristopher])

Comment: Second, there's been an evolution to larger canister-based systems, larger capacities. Canisters that were originally designed to contain 24 PWR assemblies can now hold 37. There's also 40 at the Prairie Island that they can hold. Those that were designed contain 44 BWR assemblies can now hold 89. Higher capacity casks result in a reduced number of handling operations, reduced dose during loading, and eventually a smaller number of shipments (0328-8-3 [Cummings, Kristopher])

Comment: Third, the fuel assembly burnup has steadily increased. Higher burnups allows more energy to be extracted from a fuel assembly for the same amount of volume. This leads to a smaller amount of used fuel that needs to be managed. (0328-8-4 [Cummings, Kristopher])

Comment: Fourth has been the development of more sophisticated cladding materials that can perform under longer exposure times with less susceptibility to cladding breaches. Over the past 20 years, the number of fuel assemblies with leaking rods has been reduced dramatically. The industry now maintains a small fraction of a percent of fuel rods that developed leaks in the reactor. (0328-8-5 [Cummings, Kristopher])

Comment: There's been much discussion of the challenges associated with high-burnup fuel during this comment period. NEI has previously provided information on this issue to the NRC which can be found in ADAMS under the accession number ML13084A045. This letter identifies areas where the industry and NRC are addressing are addressing this challenge to assure the long-term safety of managing high-burnup fuel. (0328-8-6 [Cummings, Kristopher])

Comment: Recent experiments have questioned whether the drying process during storage may cause cladding to become more brittle. However, these experiments have been performed at conditions that are not representative of the majority of used fuel assemblies. First, the hydrogen content in the cladding used in these experiments is at or exceeds the NRC established limit. Second, the simulated drying conditions in these experiments are performed at or above the cladding temperature limit of 400 degrees Celsius. Finally, all of these experiments have been conducted by pinching the fuel rod. In reality, the loading during transportation would be axial compression or bending of the fuel rod which is less severe. In conclusion, the recent experiments are not -- are highly conservative with respect to the fuel condition and structural loads expected during used fuel management, and are not representative of the majority of the fuel in storage or in the spent fuel pools. (0328-8-7 [Cummings, Kristopher])

Comment: Moreover, there are some simple solutions that can be implemented to safely accommodate high-burnup fuel. High-burnup fuel can be placed in individual cans inside the canister. Alternatively, the allowable cladding temperature during drying can be reduced to prevent embrittlement and hydrate reorientation. Additionally, there needs to be a recognition by the NRC that a cask is never loaded with a heat load more than about 90 percent of the licensed limit, thereby reducing the cladding temperature during drying. All of these conclusions are further justification why storage and transportation of used nuclear fuel continues to be conducted in a safe and reliable manner. (0328-8-8 [Cummings, Kristopher])

Comment: The NRC is surely the only regulatory body in the world that would argue that indefinite and essentially permanent storage of highly radioactive waste in cooling pools and dry casks creates confidence that this waste will never threaten the public and the environment with radiological disasters. Neither dry casks, nor cooling pools are designed for permanent high-level radioactive waste storage. Rather than insist on a robust waste management system designed to handle conceivable accidents, whether through equipment failure, natural disasters, operator error, or other causes that could release radioactive materials to the environment, the NRC's draft document ultimately relies on the low probability of an accident to justify its position that reactor licensing and relicensing should resume. (0328-9-4 [LaForge, John])

Comment: What I want to do today is specifically address one thing that was said in the November 19th meeting in Rockville. In that meeting, I was quoted by a Mr. Mark Leyse, and I wanted to address the issue he raised. First of all, I want to thank him for being factual and accurate to a point. He accurately quoted me, and he did cite two documents, and those documents were ML021230367 and ML132568086. What he quoted me saying, which is true, is that I or, in my case, when I was saying this in a previous public meeting that preceded the waste confidence meeting in September, we understand in the industry that we can no longer rely on boraflex. This is absolutely a true statement. I said that in the context of explaining what

industry was doing to replace boraflex, which is a neutron absorber, with more reliable neutron absorbers that will have more longer-term utility. Mr. Leyse then went on to say that there was a documented history of degradation of boraflex at the Indian Point reactor. That's where he cited the two documents. And he then raised that documented history of boraflex degradation as a concern for the safety of that pool. And that's where I do disagree with Mr. Leyse. The two documents he cited are, to me, in fact, evidence of quite the contrary point. If there was not a documented history of boraflex degradation in that pool, then the situation would be that boraflex was degrading and we were either not doing anything about it or not aware of it. The two documents he cites, one a 2001 or 2002 license application, license amendment application which basically removes a lot of credit for the boraflex and puts in place some compensatory measures, and then a 2013 meeting submittal where Indian Point proactively came to NRC and said, okay, here's what we're doing, we're further tracking the boraflex degradation, and here's our plan to replace it with new neutron absorbers. In all cases, the licensee, Indian Point, was within the parameters of their safety analysis. The plant is safe, and a criticality has been and will be prevented. (0329-10-2 [McCullum, Rod])

Comment: The NRC, a couple of times in the Draft Environmental Impact Statement or Generic Environmental Impact Statement has cited examples of how issues are dealt with as being reasons we can have confidence in the regulatory process working, being high burn-up fuel and chloride-induced stress corrosion cracking. Since Mr. Leyse raised it, I'd want to suggest this should be another example. Indeed, we did discover over our experience with boraflex that it degrades, and that has driven the market to develop better neutron absorbers. Those are being deployed throughout industry. And the documented history that Mr. Leyse cites at Indian Point is but one example of how we're doing that and how we're assuring safety while we're doing that. In other words, it is another example of how the regulatory process assures safety as we go forward into longer periods of time. And I believe it should be cited as such. (0329-10-3 [McCullum, Rod])

Comment: But whatever we do, whether it's repackaging or repairing or replacing materials, as long as these things are under NRC license, as long as these things are managed by responsible companies that are held accountable to their shareholders and the citizens around them, as well as the regulators, examples of how we will take the steps to do the things we need to do to manage the inevitable time-dependent degradation mechanisms, and boraflex is probably one of the most extreme examples, those things will continue. So I guess what I've learned from having listened to Mr. Leyse's comment, and I thank him for taking the trouble to listen to what I said earlier, is that, indeed, this is something that should be more strongly emphasized in the Generic Environmental Impact Statement, the extent to which the processes that we have in place can address the effects of time. (0329-10-5 [McCullum, Rod])

Comment: I want to reiterate some things about this high burn-up fuel problem. It's come to my attention lately that an analysis of the high burn-up fuel and its impacts were not a part of the EIS. And I want to ask were they, and I want to request, if they weren't, that there be an analysis based on that. And what I've learned is that they must stay in the pools much longer, up to five years. I've also learned that they put in cask storage. They have to come out, and I've seen estimates as quickly as 20 years. And I've also learned that there was a ruling that they are not transportable. In other words, waste from high burn-up fuel is currently disallowed in terms of transport. And so this, in my mind, shakes up the entire EIS if it did not take those factors into account, and so I ask that be taken into account. (0329-14-1 [Sondheim, Steven])

Comment: I just also think that we should not be making any more spent fuel until we find out what we should do with the existing. All the pools are completely full. They are rack systems of

maybe four times as much fuel, sometimes more than that, than they were designed for. We need to get everybody out of the pool, as the lifeguard says. There's danger. There's danger. (0329-18-4 [Carberry, Mike])

Comment: He [Oscar Shirani] was a lead quality assurance inspector for Commonwealth Edison. And he led a nationwide quality assurance inspection on the Holtec casks. I recently learned at the U.S. Nuclear Waste Technical Review Board meeting a few weeks ago in Washington, D.C. that Holtec has 46 percent of the dry cask storage market in this country, which I hadn't known before that it was such a high percentage, which is truly frightening because in the year 2000, Oscar and a dozen other quality assurance inspectors from a dozen different nuclear industry utility companies that use Holtec casks identified 9 major categories of quality assurance violations having to do with these containers. So Oscar Shirani questioned the structural integrity of the Holtecs sitting still in onsite storage, let alone, as has been mentioned by several commenters today, traveling at 60 miles per hour or greater speeds on the rails in this country as the Holtecs are a rail-sized container. So that's a real problem. And, unfortunately, the Nuclear Regulatory Commission was not there for Oscar as a nuclear industry whistleblower. He did get a few days at the Office of Inspector General to tell his story. The Office of Inspector General at NRC said they did not dispute his insights or observations, but they did not see that NRC had done anything wrong. So this nuclear industry whistleblower was left out to dry, a personal tragedy of great proportions for him, blacklisted from the U.S. nuclear industry for the rest of his life, but perhaps even greater societally is the fact that we have hundreds and at some point thousands of Holtec containers deployed across this country loaded with high-level radioactive waste in all kinds of barrable situations in the onsite storage, let alone discussing the transportation risks that would be involved. (0329-20-3 [Kamps, Kevin])

Comment: I was asking about high-burnup fuel. And I want to ask you if you can answer me or if there's a way we can get an answer, if you can answer me now or if there's a way. All the possible risks of the high-burnup fuel, which has different, different criteria, were those taken into account in the EIS? Do you know? But I would like to be able to get an answer quicker than when the final decision comes out. (0329-22-1 [Sondheim, Steven])

Comment: I want to reiterate that it's looking to us like the plans for both onsite cask storage and transportation do not cover the intensity of the heat and the problems that may come from the high-burnup waste. So we've got a situation that needs attention. (0329-22-2 [Sondheim, Steven])

Comment: And when you're talking about materials that remain deadly dangerous for tens of thousands of years, longer than all of human history, anything less than 100 percent safety is not safe. And we are not infallible. Humans cannot produce something that is infallible. That means that nuclear plants cannot, cannot, cannot be guaranteed to be safe. And anything less than 100 percent safety in taking care of nuclear materials is not good enough. (0329-28-2 [Wilansky, Laura])

Comment: We're suggesting also that the NRC should require nuclear waste to be stored safer on sites where they are produced and to stop the plan for dangerous nuclear waste transport and interim storage when they reach their final conclusions. We've identified a number of transport and interim storage plan problems. Risks are not eliminated from current sites where waste would still be stored, and risks are, in fact, increased with waste spread to more locations throughout the nation, resulting in more targets for potential problems from either natural disasters or terrorist activities. (0329-3-3 [Cuthbert, Lewis])

Comment: Interim storage is a dangerous proposition. It's not good for Nevada. It's not good for any of the interim storage sites. And it's going to put people and the environment at risk. (0329-33-2 [Feldman, Jane])

Comment: Nobody wants it [nuclear waste]. It's dangerous. There is no safe method to contain the waste, and we have created a monster for ourselves. (0329-4-3 [Messer, Diane])

Comment: I have little to no confidence in the NRC in long-term storage. It's not really been looked into good. (0329-9-2 [Martin, David])

Comment: Indefinite storage of high-level radioactive waste in fuel pools and dry casks threatens public health and safety. Casks and fuel pools are not designed for permanent storage. We need a waste management system that is designed to handle myriad possible accidents -- operator error, equipment failure, natural disasters, terrorist attacks, etc. -- as shown at Fukushima, Chernobyl, and Three Mile Island. (0331-1 [Miller, Kirk])

Comment: I see no reason to believe that there is no significant risk to lives and property from the currently-contemplated means of storing radioactive waste. (0333-1 [Balke, Karl])

Comment: To this day, there is no clear evidence that there is any way to safely store nuclear waste indefinitely. Obviously, given the nature of these waste products, storing them for an indefinite period of time is the only real solution. (0334-3 [Nuccio, Theresa])

Comment: I am very concerned about how we store our most hazardous waste-the radioactive fuel rods from nuclear reactors. (0336-1 [Lish, Christopher])

Comment: Over 67,500 metric tons of high-level nuclear waste (or MTU) are being stored at commercial nuclear power plants and that amount is expected to increase at a rate of approximately 2,000 a year or 20,000 MTU each decade. The typical spent fuel pool at a light water reactor now holds the equivalent of about 6 reactor core loads of spent fuel, about 700 MTU. Low-burnup fuel can be transferred from cooling pools into dry casks after 5 years, but high-burnup fuel may need to remain within pool cooling for over 20 years, and the use of high-burnup fuel has been increasing. Transfer of fuel from pool to pad or from wet to dry storage (and back and forth) is an abrupt change of environment for used spent fuel assemblies. Transfer of fuel also involves varying degrees of mechanical stress and dropping risk. Aging effects/mechanisms include: degradation of toughness and strength of materials due to irradiation, including degradation of neutron absorber materials; changes in a mechanical property of materials, including change in dimensions or reconfiguration due to creep and effects of freeze-thaw; loss of preload due to stress relaxation; crack initiation and growth; loss or weakening of material due to corrosion; loss of strength and modulus due to elevated temperature. (0341-1-12 [Mermelstein, Richard])

Comment: Aging effects/mechanisms applicable to high-burnup fuel remain to be determined, but the current engineering consensus is that high-burnup fuel is more subject to cladding radial hydride formation and embrittlement 20-25 years after the high-burnup fuel assemblies are placed in dry storage. And casks for high-burnup fuel are still under development. (0341-1-13 [Mermelstein, Richard])

Comment: America's existing nuclear fleet and the on-site spent fuel pools where most of the high-level spent fuel waste remains stored are aging. It is a fundamental of engineering that as machines and structures age they become subject to age-related deterioration. Aging

effects/mechanisms apply to spent fuel pools and their associated structures. (0341-1-14 [Mermelstein, Richard])

Comment: When the spent fuel pools were originally constructed they were planned to hold spent fuel for a very short term - less than a year. Unlike the reactors, the spent fuel containments are not hardened. The roofs are similar to the roofs commonly built at box top stores. The spent fuel pool structures at nuclear plant sites were never designed, nor built, with the intention of holding large quantities of nuclear material for a decade, much less a century. Data on dry cask performance has been collected for a matter of decades. (0341-1-15 [Mermelstein, Richard])

Comment: I firmly believe that the best solution that can be agreed upon by most parties and implemented in a reasonable time, and that provides the best level of security and protection is a dedicated above ground long-term retrievable storage at a central facility. Idaho National Laboratory meets the general requirements for such a facility. (0343-1 [Blacker, Paul])

Comment: Current on-site interim storage is a terrorist dream waiting to be exploited. Multiple sites, many located near population centers, cannot provide the confidence required for these spent fuel items. (0343-2 [Blacker, Paul])

Comment: I am writing to support the NRC's Spent Fuel Storage Rule, and wish to say that with NRC oversight PG&E has a very detailed and successful spent fuel management program and continues to safely store fuel via both its wet and dry cask storage systems. I am confident that layer upon layer of safeguards are in place to effectively manage and monitor the stored spent fuel. (0350-1 [Martz, Robert])

Comment: Nuclear waste should not be transported and stockpiled in "interim" sites around the country, as the cost to taxpayers and risk to communities of moving this deadly cargo are too great. (0357-5 [Daily, G. Allen])

Comment: For the already produced "spent fuel": a. Certify dry casks for high burn-up fuel a.s.a.p.; b. Return the storage pools to low density a.s.a.p. (0358-13 [Schumann, Klaus])

Comment: Furthermore, the US Dept. of Energy and the NRC's records on spent fuel wastes at the Diablo Canyon Nuclear Power Plant (DCNPP) are dismal and do not inspire any "confidence" in their ability to safely regulate the Nation's nuclear waste. (0358-2 [Schumann, Klaus])

Comment: 4. The decision to allow the use of high burn-up fuel has compounded the problems with storing and transporting spent fuel due to increased radioactivity and embrittlement of the fuel cladding. All these decisions were made for the sake of keeping the industry afloat while ignoring public safety concerns explicitly stated by scientists and concerned citizens alike! (0358-6 [Schumann, Klaus])

Comment: There is not now and never has been safe storage for radioactive waste. (0359-1 [Kushigian, Elizabeth])

Comment: In all these decades, it has become more clear each day that there IS NO SAFE solution to the problem of 'STORING' nuclear waste! (0361-2 [Greenfield, Jan])

Comment: The NRC's Draft NUREG-2157 makes laughable claims about the safety of storing high-level radioactive waste in fuel pools and dry casks: by their very nature, neither casks nor fuel pools are designed for permanent storage. (0362-2 [Schietinger, Helen])

Comment: Temporary storage sites put more communities at risk and create security issues. (0368-3 [Mattox, Judy])

Comment: I support the NRC's Spent Fuel Storage Rule. The NRC oversight of PG&E has a very detailed and successful spent fuel management program and continues to safely store fuel via both its wet and dry cask storage systems. With all the safeguards in place to effectively manage and monitor the stored spent fuel I am confident they will continue to do so. (0372-1 [Salas, Peggy])

Comment: Locally stored spent fuel could be safely removed to a single or regional locations controlled by and protected by our national government. (0372-3 [Salas, Peggy])

Comment: 2. Require nuclear wastes to be stored safer on sites where they were produced (0377-1-12 [Cuthbert, Lewis])

Comment: 5. Would result in additional locations that store these high-level radioactive wastes which are some of the most deadly materials on earth. Nuclear plants would still have this waste on site. (0377-1-14 [Cuthbert, Lewis])

Comment: ACE Strenuously Objects To Nuclear Waste Transport and Interim Storage: -It transfers ownership and costs to the public for transport, plus endless storage and security -It absolves reactor owners of responsibility and liability -It makes room for more lethal wastes for which there is no safe solution. There is no benefit to the public, only unjust increased costs and risks. -The minute deadly radioactive wastes are transported off-site from nuclear plants, the public is forced to bear the astronomical financial burden for nuclear waste transport, storage, and liability forever. (0377-1-15 [Cuthbert, Lewis])

Comment: NRC's Interim Storage scheme creates a misleading illusion of a solution. - This is NOT a solution. In fact, it drastically increases risk of a nuclear waste disaster. -We would end up with more deadly radioactive wastes at more locations throughout our nation, facing devastating consequences from radioactive contamination due to a natural disaster or terrorist attack. - The public would be forced to forever pay for security at all these new locations, to guard this lethal waste from a terrorist attack. -New locations would now also face radioactive contamination from a natural disaster. -Risks are not eliminated from current sites, where wastes would still be stored. (0377-1-17 [Cuthbert, Lewis])

Comment: 3. Stop Limerick's use of high-burn fuel based on unacceptable increased risks from its long term storage. (0377-1-8 [Cuthbert, Lewis])

Comment: Safety Is A Dangerous Illusion - To Claim Otherwise Is Intentional Deceit: NRC cannot guarantee safe transport or storage of high-level radioactive wastes; NRC cannot guarantee transported storage containers will remain safe for 50 years, the time they are expected to last. There is no proof.; NRC cannot guarantee storage containers will be replaced in time to protect public health and safety. There may be no federal funds to do that or a future Congress may refuse to provide funding.; NRC cannot guarantee that increasingly dangerous weather events will not cause a catastrophe in transport or in interim off-site storage; NRC cannot guarantee there will not be a terrorist attack. Moving Nuclear Wastes Won't Solve

Nuclear Waste Problems At Nuclear Plants: It is an outright lie for the nuclear industry and their supporters to claim transport to another location will remove nuclear waste storage threats at nuclear plants -As long as nuclear plants operate, deadly radioactive wastes will pile up on site - Transport won't reduce the number of radioactive waste sites, it just adds enormous risk at more locations, to the already unprecedented threats from high-level radioactive wastes; The evidence shows why it is both indefensible and unreasonable for NRC to suggest that transport and interim storage is a solution; Transport and interim storage is an irrational pea and shell game that ignores the additional unnecessary health and financial risks it presents to the public; Moving wastes only benefits nuclear plant owners, allowing them to avoid accountability for their deadly wastes. (0377-2-17 [Cuthbert, Lewis])

Comment: "High-Burn Nuclear Fuel" Is Not Transportable. Limerick and Other Nuclear Plants Using High-Burn Fuel Must Be Required To Stop: Due to increased radioactivity and decay heat in spent fuel; Due to increased corrosion, thinning, and brittleness of fuel cladding; Due to increased damage and rupture of fuel rods in the reactor vessels, leading to damage in the form of pinhole leaks and small cracks that can lead to breaching of fuel cladding. NRC has known about the potential for damage from this fuel for several years. NRC has NO PROOF use of High-Burn fuel is safe, yet negligently allows its use to continue. NRC's decision to allow this to continue abandons public interests while it further jeopardizes safe storage and transport. It is clearly motivated by economic benefit to the nuclear industry. "Spent fuel that may have degraded after extended storage may present new obstacles to safe transport". According to the National Academy of Engineering of the National Academy of Sciences, The technical basis for the spent fuel currently being discharged (high utilization, burn-up fuels) is not well established". "NRC has not yet granted a license for the transport of the higher burnup fuels discharged from reactors." -This even more dangerous waste could be transported whether or not NRC grants a license for that. Evidence shows why with higher burn-up, nuclear fuel rods undergo several very risky changes that include: Increasing oxidation, corrosion and hydriding of the fuel cladding. Oxidation reduces cladding thickness, while hydrogen (H3) absorption of the cladding to form a hydrogen-based rust of the zirconium metal from the gas pressure inside the rod can cause the cladding to become brittle and fail. Higher internal rod gas pressure between the pellets and the inner wall of the cladding leading to higher fission gas release. Pressure increases are typically two to three times greater. Elongation or thinning of the cladding from increased internal fission gas pressure. Structural damage and failure of the cladding caused by hoop (circumferential) stress. Increased debris in the reactor vessel, damaging and rupturing fuel rods. Cladding wear and failure from prolonged rubbing of fuel rods against grids that hold them in the assembly as the reactor operates (grid to rod fretting). A significant increase in radioactivity and decay heat in the spent fuel. A potentially larger number of damaged spent fuel assemblies stored in pools. Upgraded pool storage with respect to heat removal and pool cleaning. Requiring as much as 150 years of surface storage before final disposal. (0377-2-9 [Cuthbert, Lewis])

Comment: WE URGE NRC TO CHOOSE THE LEAST BAD SOLUTION: STORE IT ON- SITE "SAFER." REQUIRE NUCLEAR PLANT OWNERS TO DRY-STORE HIGH-LEVEL RADIOACTIVE WASTE WHERE IT IS, IN THE SAFEST POSSIBLE WAY (0377-3-4 [Cuthbert, Lewis])

Comment: NRC's Regulatory Oversight Of Fuel Pools Is Failing To Reduce Risks At Limerick and Elsewhere (0377-4-10 [Cuthbert, Lewis])

Comment: WHY THE SAFEST DRY-CASK STORAGE AND MOST STRINGENT REGULATORY OVERSIGHT ARE REQUIRED FOR ON-SITE DRY STORAGE; EVIDENCE

BELOW SHOWS WHY ON-SITE CASK STORAGE AT LIMERICK NUCLEAR PLANT PRESENTS LONG-TERM ENVIRONMENTAL RISKS AND PROVIDES COMPELLING EVIDENCE THAT MUST NOT BE IGNORED BY NRC. CASK ISSUES THAT NEED TO BE CONSIDERED BY NRC: Casks Are Threatened by Natural Disasters like Earthquakes, Tornadoes, and Floods; If air flow vents get clogged from severe weather events and remain clogged for an extended period, rods can overheat and combust; Extremely heavy casks were shifted on their base during the North Anna earthquake; Corrosion of steel holding Limerick's high-level radioactive waste rods is a huge concern. NRC is well aware of Limerick's highly corrosive air as a result of chlorine and other corrosives massively released into the air from Limerick cooling towers with 44 million gallons of steam every day; Corrosion over time may make it impossible to remove rods in the event of a problem with leaking, for transport, or in the event of combustion; Containers are expected to last 50 years - wastes stay dangerous over a million years. What will happen if corrosion makes it impossible to remove the wastes into new containers every 50 years? (0377-4-12 [Cuthbert, Lewis])

Comment: CASK DESIGN FLAWS A SERIOUS CONCERN OVERLOOKED BY NRC: A Nuclear Engineer Warned ACE About Design Flaws In Casks For Storing Limerick's High-Level Radioactive Wastes. ACE Reported The Information To NRC. Sadly, Design Flaws Were Denied Or Ignored. THE NUCLEAR ENGINEER WHISTLE BLOWER CALLED LIMERICK CASK TECHNOLOGY "OLD AND DOWNRIGHT DANGEROUS" 1. Cask Design Flaws: Cement Blocks, Assembled Together, Are Not The Safest Housing For Enclosing Deadly Nuclear Fuel, Not Even Anchored to the Concrete Floor. Industry Workers Claim NUHOMS Concrete Enclosure Falls Apart and Container Is Breached Under a Boeing Airplane Strike. 19 Corrosion of Steel Can Eventually Cause Nuclear Wastes to Collapse On Their Own Safe Storage Depends on Airflow. Air Around Limerick Is Likely Highly Corrosive. It's Only a Matter of Time Before Invisible and Inaccessible Steel Tubes Turn to Rust. 40 Ton Radioactive Waste Containers, "Filled With The Nastiest Of Manmade Stuff", Are Placed And Rest Unfastened On A Set Of Steel Columns. 3. Wastes May Not Be Able To Be Retrieved: Rods Are Being Removed From Pools at Limerick Years Before NRC Regulations First Required. Rods Stored In Casks Too Hot Can Heat Up And Cause Fire. Containers Are Expected To Last 50 Years, While Wastes Are Deadly Hundreds Of Thousands Of Years (0377-4-15 [Cuthbert, Lewis])

Comment: This Nuclear Engineer Said Casks May Be A Sitting Duck In Case of a Crashing Aircraft: PROVEN CORROSION CONCERNS ARE A RECIPE FOR DISASTER: Research validates ACE concerns about corrosion of steel storing deadly wastes at Limerick Nuclear Plant. No one knows how long it will take for nuclear waste storage containers to break down from corrosion and eventually leak It is only a matter of time. How long will it take for steel to corrode that holds high-level radioactive wastes above ground in our back yard at Limerick Nuclear Plant? (0377-4-16 [Cuthbert, Lewis])

Comment: Summary Concerns and Questions About Spent Fuel Stored In Above Ground Casks That NRC Should Address. Clogged air flow vents from natural disasters like earthquakes, tornadoes, or floods, for an extended period, causing rods to overheat and combust. Corrosion of steel holding wastes making it impossible to remove wastes in the event of internal combustion. Containers are expected to last only 50 years - while wastes stay dangerous over a million years, leading to radioactive leaks that could cause future devastating harms. What guarantee is there that aging, corroded containers can or will be replaced? Who will pay? (0377-5-2 [Cuthbert, Lewis])

Comment: NRC SHOULD TAKE IMMEDIATE ACTION TO REDUCE RISKS BASED ON THE FOLLOWING CONCERNS: UNDETECTED CORROSION; INABILITY TO REMOVE IN CASE

OF FIRE OR NATURAL DISASTER; FAULTY CONCRETE; LAX NRC OVERSIGHT AND ENFORCEMENT EASY TERRORIST TARGET (0377-5-5 [Cuthbert, Lewis])

Comment: I also wish to add that my comments on the issue of spent fuel recriticality AKA 'K' factor are also impacted with the issue of the fragility and easy failure of the cladding and ease of fuel pellets forming geometries which support recriticality. I hope that the NRC staff will answer the questions posed by recriticality due to new geometries subsequent to cladding failure. Specifically How will issues such as fragility of cladding, relocation of fuel pellets and many experimental fuels and cladding in spent fuel pools impact chance of recriticality during storage and accidents? (0378-1 [Lewis, Marvin])

Comment: EPRI is pleased to provide the attached bibliography of EPRI publications that provide information and analysis related to NRC's Waste Confidence GEIS. EPRI requests that the relevant NRC Waste Confidence staff review the EPRI publications for potential use in preparing the final Waste Confidence GEIS. Wet and Dry Storage of Used Nuclear Fuel: *Impacts Associated with Transfer of Spent Nuclear Fuel from Spent Fuel Storage Pools to Dry Storage After Five Years of Cooling, Revision 1*. EPRI, Palo Alto, CA: 2012. 1025206. <http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001025206>. In 2010, EPRI performed a study of the accelerated transfer of spent fuel older than five years from pools to dry storage in response to the threat of terrorist activities at nuclear power plants. Following the March 2011 Great East Japan Earthquake and the subsequent accident at the Fukushima Daiichi nuclear power plant, some organizations issued a renewed call for accelerated transfer of used fuel from spent fuel pools (SFP) to dry storage. Their reasoning was that this would lessen the potential consequences from a loss-of-spent-fuel cooling accident by decreasing the heat load and source term available for release. This report revises the 2010 study to evaluate the costs and benefits of accelerating transfer of used fuel from SFPs to dry storage for two scenarios-one taking 10 years to transition the removal of all fuel cooled for at least five years, and the other taking 15 years to complete the transition. EPRI estimated the reduction of the number of assemblies, decay heat, and Cs-137 inventory in the spent fuel pool due to accelerated transfer of fuel older than five years. EPRI also estimated the increased cost and dose to workers caused by accelerated transfer. *Extended Storage Collaboration Program International Subcommittee Report*. EPRI, Palo Alto, CA: 2012. 1026481. <http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001026481>. With the prospect of spent nuclear fuel being stored at reactor sites for the foreseeable future, EPRI established the Extended Storage Collaboration Program (ESCP) in 2009 to investigate aging effects and mitigation options for the extended storage and transportation of spent nuclear fuel. ESCP's International Subcommittee developed this summary of the regulatory status, operational status, fuel inventory, and technical gaps identified for extended storage of spent fuel for each country involved. (0379-1 [Kessler, John])

Comment: Strategy for Managing the Long Term Use of BORAL® in Spent Fuel Storage Pools. EPRI, Palo Alto, CA: 2012. 1025204. <http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001025204>; BORAL® is a neutron poison material commonly used in spent fuel pool storage racks. This report examines the performance of BORAL® based on evaluation of surveillance coupons, identifies the degradation mechanisms for BORAL® in spent fuel pools, and evaluates the impacts of degradation. The report also develops a defense-in-depth strategy for managing BORAL® degradation for long-term use and suggests areas of research for further refinement of the BORAL® management strategy, including a recommended long-term corrosion test program. Summary of EPRI's Early Event Analysis of the Fukushima Dai-ichi Spent Fuel Pools Following the March 11, 2011 Earthquake and Tsunami. EPRI, Palo Alto, CA: 2012. 1025058.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001025058>;
As part of its Fukushima response, EPRI collaborated with experts from nuclear utilities, vendors, and national laboratories to evaluate the key theories and available data in support of EPRI's larger effort to provide timely information to the Tokyo Electric Power Company (TEPCO) and other member utilities on issues relevant to the safe management of spent nuclear fuel. Early products included assessments of the following: 1) re-criticality risk upon reflooding of a dry pool; 2) fuel pool evolution following loss of cooling; 3) likelihood of localized voiding within individual fuel assembly channels, leading to cladding heat-up and oxidation with release of hydrogen gas; and 4) potential significance of hydrogen from radiolysis in a boiling fuel pool. This report compiles individual analyses and assessments developed early in the Fukushima response for the purpose of documentation and for future reference and use. (0379-2 [Kessler, John])

Comment: *Extended Storage Collaboration Program (ESCP)*. EPRI, Palo Alto, CA: 2011. 1022914.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001022914>. EPRI is coordinating the Extended Storage Collaboration Program (ESCP)—a group of organizations representing the nuclear industry, federal government, national laboratories, and suppliers of used fuel dry storage systems—to investigate aging effects and mitigation options for the extended storage and transportation of used/spent nuclear fuel and high-level radioactive waste (HLW). The primary ESCP activity in 2010 through mid 2011 has been significant progress toward completion of technical "gap analyses" conducted by three organizations: U.S. Department of Energy Office of Nuclear Energy (DOE-NE) Used Fuel Disposition (UFD) Program; U.S. Nuclear Waste Technical Review Board (NWTRB); and U.S. Nuclear Regulatory Commission (NRC). *Delayed Hydride Cracking Considerations Relevant to Spent Nuclear Fuel Storage*. EPRI, Palo Alto, CA: 2011. 1022921.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001022921>. In this report, the main features of delayed hydride cracking (DHC) in zirconium alloys are reviewed. The conditions inside fuel rods during dry storage are estimated and used to evaluate whether DHC is possible during dry storage. Although some of the conditions for DHC exist—sufficient hydrogen for hydride formation, cooling from a high temperature, and at long times—crack initiation is unlikely because either the required high stresses or large sharp flaws are absent. In addition, DHC in zirconium alloys at low temperatures is reviewed. The conditions inside fuel rods during wet storage are estimated and used to evaluate whether DHC is possible during pool storage. Crack initiation, and therefore crack growth, is unlikely because the tensile stresses are too low, even if the outside surface of the cladding contains fretting damage from grids of modern design. If cracks were nucleated, they would grow sufficiently quickly that they would be apparent during pool storage. Their absence supports the conclusion that DHC is improbable. (0379-3 [Kessler, John])

Comment: *Industry Spent Fuel Storage Handbook*. EPRI, Palo Alto, CA: 2010. 1021048.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001021048>; The Industry Spent Fuel Storage Handbook "the Handbook") addresses the relevant aspects of at-reactor spent (or used) nuclear fuel (SNF) storage in the United States. With the prospect of SNF being stored at reactor sites for the foreseeable future, it is expected that all U.S. nuclear power plants will have to implement at-reactor dry storage by 2025 or shortly thereafter. The Handbook provides a broad overview of recent developments for storing SNF at U.S. reactor sites, focusing primarily on at-reactor dry storage of SNF. The Handbook provides an overview of current regulations and regulatory guidance for dry storage of SNF; descriptions of dry storage technologies available in the United States, and an overview of the process for planning and implementing an at-reactor storage facility. (0379-4 [Kessler, John])

Comment: *Used Fuel and High-Level Radioactive Waste Extended Storage Collaboration Program*. EPRI, Palo Alto, CA: 2010. 1020780.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001020780>;

The Electric Power Research Institute (EPRI) convened a workshop of over 40 representatives of the nuclear industry, federal government, national laboratories, and suppliers of used-fuel dry-storage systems to discuss the potential issues associated with extended dry storage of used fuel, that is, storage considerably beyond the term of current and recently proposed U.S. Nuclear Regulatory Commission (NRC) regulations. The workshop was held November 18-19, 2009, at EPRI's offices in Washington, DC. *Handbook of Neutron Absorber Materials for Spent Nuclear Fuel Transportation and Storage Applications*. EPRI, Palo Alto, CA: 2009. 1019110.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001019110>;

This handbook is intended to become a single source of information regarding technical characteristics of neutron absorber materials that have been used for storage and transportation of spent nuclear fuel as well as to provide a summary of users' experience. The second edition of this handbook was published in 2006. This third edition, the 2009 Edition, updates materials covered in the 2006 Edition, presents new products introduced since 2006, and reflects recent realignments of neutron absorber suppliers. *Cost Estimate for an Away-From-Reactor Generic Interim Spent Fuel Storage Facility*. EPRI, Palo Alto, CA: 2009. 1018722.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001018722>;

As nuclear power plants began to run out of storage capacity in spent nuclear fuel (SNF) storage pools, many nuclear operating companies added higher density pool storage racks to increase pool capacity. Most nuclear power plant storage pools have been re-racked one or more times. As many spent fuel storage pools were re-racked to the maximum extent possible, nuclear operating companies began to employ interim dry storage technologies to store SNF in certified casks and canister-based systems outside of the storage pool in independent spent fuel storage installations (ISFSIs). Since there will be a need for additional SNF storage capacity for several decades into the future, an alternative to storing SNF at reactor sites would be to store SNF at away-from-reactor interim SNF storage facilities, referred to herein as a "generic interim storage facility" or "GISF." This study provides an overview of the timing and projected costs associated with the design, licensing, construction, and operation of a GISF. (0379-5 [Kessler, John])

Comment: *Climatic Corrosion Considerations for Independent Spent Fuel Storage Installations in Marine Environments*. EPRI, Palo Alto, CA: 2006. 1013524.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001013524>;

It has been clearly demonstrated in laboratory and field studies plus field experience with actual and simulated components that the stress corrosion cracking (SCC) of austenitic stainless steel can occur at ambient temperatures in marine-type environments. This report evaluates the climatic differences among the various independent spent fuel storage installation (ISFSI) sites compared to the reference marine test site at Kure Beach, NC among the various reactor sites that have or plan to have spent fuel storage systems exposed to a marine environment. The typical surface temperature vs. time profiles of spent fuel canisters are also presented as is an evaluation of composition of airborne materials that could deposit on the spent fuel canisters exposed to a marine environment. *Effects of Marine Environments on Stress Corrosion Cracking of Austenitic Stainless Steels*. EPRI, Palo Alto, CA: 2005. 1011820.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001011820>;

It has been clearly demonstrated in laboratory and field studies plus field experience with actual and simulated components that the stress corrosion cracking (SCC) of austenitic stainless steel can occur at ambient temperatures in marine-type environments. There are a number of qualified techniques readily available to mitigate SCC of the proposed spent fuel storage canisters by addressing the tensile stress parameter of the SCC equation. There are also a

number of new emerging techniques for mitigating residual tensile stresses. This report presents information on both established tensile residual stress mitigation techniques and also newer techniques considered by the Yucca Mountain Project and the pressurized water reactor (PWR) industry for mitigation of SCC. *Probabilistic Risk Assessment (PRA) of Bolted Storage Casks: Updated Quantification and Analysis Report*. EPRI, Palo Alto, CA: 2004. 1009691. <http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001009691>; This report describes radiological risks and consequences to individuals from a bolted cask containing spent fuel from a pressurized water reactor while the cask is on-site. The risk to the public from the cask design is extremely low, with no calculated early fatalities and a first year risk of latent cancer fatality of $5.6E-13$ per year per cask. Subsequent year risk to the general public is even lower, attain, with no early fatalities and a cancer risk of $1.7E-13$ per cask per year. (0379-6 [Kessler, John])

Comment: *Technical Bases for Extended Dry Storage of Spent Nuclear Fuel*. EPRI, Palo Alto, CA: 2002. 1003416.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001003416>; In the United States, independent spent fuel storage installations (ISFSIs) were initially licensed for a 20 year-year period. However, delays in developing permanent spent fuel disposal capability require continued ISFSI storage beyond the 20-year term. This report provides a technical basis for demonstrating the feasibility of extended storage of low burnup spent fuel (i.e., < 45 GWD/MTU) in ISFSIs. *Dry Cask Storage Characterization Project*. EPRI, Palo Alto, CA: 2002. 1002882.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001002882>; Nuclear utilities have developed independent spent fuel storage installations (ISFSIs) as a means of expanding their spent-fuel storage capacity on an interim basis until a geologic repository is available to accept the fuel for permanent storage. This report provides a technical basis for demonstrating the feasibility of extended spent-fuel storage in ISFSIs. *Creep as the Limiting Mechanism for Spent Fuel Dry Storage*. EPRI, Palo Alto, CA: 2000. 1001207.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001001207>; Cladding creep is the dominant deformation regime for spent fuel in dry storage, and the evaluation of creep related time-dependent damage is an essential component of spent fuel storage licensing. Several potential damage mechanisms have been postulated for spent fuel in dry storage, which include accelerated (tertiary) creep leading to creep rupture, delayed hydride cracking (DHC), and stress corrosion cracking (SCC). These mechanisms are examined in detail in this report with the objective of determining their effect in potentially limiting the creep capacity of spent fuel cladding in dry storage. It is shown that the sent fuel environment lacks the conditions that are necessary for SCC and DHC mechanisms to become operative in dry storage. *The Castor-V/21 PWR Spent-Fuel Storage Cask: Testing and Analyses*. EPRI, Palo Alto, CA: 1985. NP-4887.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?AbstractId=NP-4887>; In full-scale tests, the 100-t Castor-V/21 cask proved itself both technically sound and practical for on-site storage of spent PWR fuel--a milestone in the qualification of metal casks for dry storage. Moreover, pretest predictions of the cask's thermal performance demonstrated the accuracy of the advanced HYDRA computer code, soon to be available for utility licensing analyses. (0379-7 [Kessler, John])

Comment: *Interim Storage of Greater than Class C Low Level Waste, Rev. 1*. EPRI, Palo Alto, CA: 2003. 1007862.

<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001007862>; This report serves as a guideline for the safe, interim on site storage of low level radioactive waste (LLW) that exceeds the activity limitations for near-surface disposal set forth in 10 CFR

61.55. The nuclear industry refers to this waste as "greater than Class C (GTTC) waste" as it exceeds the Class C limits in the referenced regulation. At the present time, there is no licensed disposal facility for GTCC waste in the US. This situation forces commercial nuclear reactors to store it on site until a disposal facility is constructed and licensed. *Oxidation of Spent Fuel at Between 250 and 360 C*. EPRI. Palo Alto, CA. 1986. NP-4524 (0379-8 [Kessler, John])

Comment: I see no reason to believe the NRC's reassurances because I know your overly permissive record. As for technical back-up for my failure to believe that nuclear power generation and nuclear waste storage can be safe....need I do more than cite Murphy's Law? (0380-5 [Holt, Joan])

Comment: It is your job to protect this generation and many, many to come from the hazards of the nuclear industry. Your present decisions, actions, non-actions will cause countless deaths, cancers, birth defects, life disruptions, etc. now and generations into the future. 1. Acknowledge that there is no way to safely deal with nuclear waste. (0381-5 [Fasten, Susan])

Comment: The current way to handle the spent rods works. I feel strongly that with the great minds of our young engineers, we will come up with an even better way. (0382-3 [Tognazzini, Randall])

Comment: Due to the NRC watching over PG&E, it has a very detailed and successful spent fuel management program and continues to safely store fuel via both its wet and dry cask storage systems. I am confident that layer upon layer of safeguards are in place to effectively manage and monitor the stored spent fuel. I was on a tour of the Diablo facility and was able to learn and see for myself the safety measures. One way to calm the populace down is to tour the facility. There are so many mistruths flying around. (0383-2 [Mordaunt, Brandon] [Mordaunt, Laura] [Mordaunt, Philip])

Comment: I am writing to support the NRC's Spent Fuel Storage Rule, and wish to say that with NRC oversight PG&E has a very detailed and successful spent fuel management program And continues to safely store fuel via both its wet and dry cask storage systems. I am confident that layer upon layer of safeguards are in place to effectively manage and monitor the stored spent fuel. (0384-1 [Tannler, Sandra])

Comment: I am taking the time to write to share my views and concerns about the storage of spent nuclear fuel. I appreciate the work PG&E and the NRC have done to safely store spent nuclear fuel in wet and dry cask storage systems on site at Diablo Canyon. As a local resident I have taken the time to tour the plant and see the storage systems and to talk with PG&E about the process. I am impressed with the construction methods PG&E has used and the procedures for handling the fuel that have been developed with NRC oversight. Storage of spent nuclear fuel is a very serious issue and I feel it is well worth the time and energy that has been contributed. I'm sure the attention to detail will continue in the future. (0385-1 [Buckingham, Jeffrey])

Comment: I am writing to support the NRC's Spent Fuel Storage Rule, and wish to say that with NRC oversight PG&E has a very detailed and successful spent fuel management program and continues to safely store fuel via both its wet and dry cask storage systems. I am confident that layer upon layer of safeguards are in place to effectively manage and monitor the stored spent fuel. (0386-1 [Thompson, Lydia])

Comment: I have personally toured the Diablo Canyon Nuclear Power Plant and have seen firsthand Pacific Gas & Electric Company's spent fuel storage area and have heard a detailed

description of the management program, directed by the NRC. Safeguards are multilayered, and the monitoring is comprehensive, providing me great confidence in the NRC and PG&E. (0388-2 [Cox, David])

Comment: I am writing to support the NRC's Spent Fuel Storage Rule, and wish to say that with NRC oversight PG&E has a very detailed and successful spent fuel management program and continues to safely store fuel via both its wet and dry cask storage systems. I am confident that layer upon layer of safeguards are in place to effectively manage and monitor the stored spent fuel. (0391-1 [Trahey, Linda])

Comment: I have no doubt that the Nuclear Regulatory Commission will continue its strong, independent oversight of commercial nuclear energy facilities-the operation of existing plants, licensing new reactors, renewing the operating licenses of existing reactors, and the management, transportation and disposal of used nuclear fuel. (0398-2 [Helsel, Adam])

Comment: I have no doubt that the Nuclear Regulatory Commission will continue its strong, independent oversight of commercial nuclear energy facilities-the operation of existing plants, licensing new reactors, renewing the operating licenses of existing reactors, and the management, transportation and disposal of used nuclear fuel. (0399-2 [Sylvester, Richard])

Comment: I have no doubt that the Nuclear Regulatory Commission will continue its strong, independent oversight of commercial nuclear energy facilities-the operation of existing plants, licensing new reactors, renewing the operating licenses of existing reactors, and the management, transportation and disposal of used nuclear fuel. (0400-2 [Blankenmyer, Eric])

Comment: Because there is no place to sent this radioactive waste the atomic power plants have become de facto major radioactive waste-management operations. About 13% of America's 70,000 tons of radioactive wast is being held in water pools or casks at atomic plants in Illinois. This is just crazy. According to Bloomberg News the safest way to store radioactive waste is to put it into "dry casks" (i.e., steel and concrete casts) after the waste has cooled in "cooling pools" for about 5 years. But, 71% of the nation's spent fuel now remains in the water pools which are susceptible to fires that could spread the radiation. (0406-3 [Gerleman, Douglas])

Comment: I have not personally toured the Diablo Power plant run by PG&E. however. I have been to numerous meetings where PG&E spokesmen has discussed the working of the plant and I personally know people who have gone on your tours and were very impressed by your careful handling and management of the spent fuel rods in dry cask storage and wet cask storage which they found very adequate. (0408-1 [Watson, Jeannette])

Comment: By doing so. locally stored spent fuel could be safely removed to a single or regional locations controlled by and protected by our national government. (0408-3 [Watson, Jeannette])

Comment: We live in Santa Barbara County, which is immediately downwind of the Diablo Canyon Nuclear Power Plant. We are concerned about the dangers associated with the operation of the plant and the indefinite storage of radioactive "spent" fuel at the site. The inadequacy of the NRC's studies and proposals for "spent" fuel storage at Diablo and other nuclear plants would be laughable if it weren't so downright terrifying. (0409-1 [Hanson, Lauren] [Jones, Mary])

Comment: Fuel rod storage under water in fuel pools also has the problem of radiolytic hydrogen generation which can react with the zirconium cladding and other metallic components to cause hydride embrittlement. This creates problems for the future handling of the rods in the dry cask systems because the fuel elements become fragile and can break during transfer or repackaging, thereby releasing their contents. It is unclear whether the embrittlement gets worse with continued aging in dry storage. (0410-11 [Nelson, Dennis])

Comment: For maximum safety, present supplies of spent fuel rods should be stored in dry casks on location, rather than transporting them to ad hoc centers where concentrations will be greater, and security will be compounded in new locations. In addition with storage on site, paid for by those who invested in nuclear energy, the real dangers of accidents in transportation are removed (0411-2 [Krumm, Paul])

Comment: Public meetings for the EIS should be in every reactor community and analysis must include: sabotage and terrorist acts; current and future leaks from SFPs. Hardened On Site Storage, with earthen berms to isolate casks, should be required for all High Level Reactor Waste (HLRW) cool enough to store dry. For a greater margin of safety, low density configuration of the SFP should be required for all HLRW not placed in casks. The EIS must consider the risks of pool fires. (0419-13 [Agnew, David])

Comment: The EIS must consider the risk of current dry cask storage. Lack of quality assurance for design and fabrication of dry casks cast doubt on the structural reliability of current casks, most of which are stored outdoors in plain sight, and are not designed to withstand terrorism or severe earthquakes. Accidents with dry casks have occurred. The EIS must consider seismic risks to dry cask storage. (0419-15 [Agnew, David])

Comment: Making matters far worse, years ago the NRC quietly approved burning the fuel in the reactors longer, resulting in "high burnup" waste, which turns out may not actually be safe for storage or transport. High burnup fuel, and its excessive thermal and radioactive heat accelerating the degradation of dry cask storage containers, has not been adequately addressed in the GEIS. While the NRC has licensed the storage of "normal" radioactive fuel for up to 50 years, it can't endorse the storage of high burnup fuel for even 20 years. (0423-2 [Graves, Caryn])

Comment: This rule must be revised to ensure that "high burnup" waste is safely handled and the public is completely protected from any potential injury, especially from an earthquake at San Onofre and Diablo Canyon plants. The NRC should also prohibit any more production of "high burnup" waste until the public is completely protected from any potential injury, (0424-1 [Stewart, Jim])

Comment: The spent nuclear fuel needs to be moved ASAP to a much more remote location prior to finding a permanent storage location. We cannot risk spent fuel pool leaks and spent fuel pool fires. Tsunamis from distant countries can also affect the fuel storage at San Onofre, which has very small sea walls offering poor protection to the spent nuclear fuel storage system. (0425-2 [Individual, Anonymous])

Comment: I also understand that years ago the NRC agreed to burning the nuclear fuel in the reactors longer than normally allowed. This has resulted in "high burnup" waste, that will need to be handled even more carefully in order to not have a destructive nuclear accident, which will negatively affect the 8 million residents of the surrounding area. This high burnup fuel is excessively hot and radioactive, which may cause accelerated degradation of the dry cask

storage containers. This needs to be addressed immediately. The NRC is suppose to be a protector of public safety, that we can count on to do what is right for all the local residents. (0425-3 [Individual, Anonymous])

Comment: The NRC asserts that spent fuel stored indefinitely will not leak radioactivity to the point where human lives will be endangered above allowable limits. I point out that these facilities are mostly unfiltered, surface storage. They are open to weather, endangered by terrorists, inundated by flooding and with whatever else time will impact them. (0427-1 [Lewis, Marvin])

Comment: The low levels of risk reported in the GEIS do not reflect emergent concerns about the challenge of handling high burn-up fuel. The above critique suggests that we find the GEIS approach fundamentally misconceived as a response to the Waste Confidence challenge. The stakes on applying adequate criteria to on-site storage have been raised by the revelation that high burn-up nuclear fuel has been used for an extended period at locations such as San Onofre. This fuel is hotter both thermally and radioactively, thus increasing both the risk of storage on-site and the difficulties of transport to a remote site. Marvin Resnikoff comments: We should be very concerned about the challenge of storing high burn fuel. There is the timing issue of a long cool-down period for fuel used at 67 megawatt-days per metric ton. How did San Onofre get permission to operate at this level? The question has not been analyzed and San Onofre has put little or no high burn fuel in storage. Indeed, no form of storage has yet been approved for fuel this hot. This issue needs maximum attention. We await with interest the outcome of the NRC's technical workshop on storage of high burn-up fuel, held in Washington on November 18-19, 2013. The discovery of high burn-up fuel use, until recently unknown to the concerned public, might qualify as a game-changer if it had been assumed as we do not that on-site storage of spent fuel is a viable option. This has never been the case but the challenge of handling high burn-up fuel makes inescapably obvious the inherently dubious attempt to qualify indefinite on-site storage as an environmentally responsible alternative. (0431-14 [Pascall, Glenn] [Watland, George])

Comment: Find a good place for this radioactive hazard and put this waste there. Do not permit it to sit in casks on faults next to reactors. If you can not see the folly in this approach, you are not qualified to regulate for public well being. (0436-4 [Patrick, Kay])

Comment: Not only is there no long-term solution for atomic waste in hand or on the horizon, the shorter-term programs now in place are inadequate from a public safety standpoint and do not offer the requisite confidence to allow continued generation of radioactive waste. Nothing in the NRC's Draft NUREG-2157 changes truth and fact; it only relies on crossed fingers that no accident occur and the flimsy argument that casks and pools are doing fine. (0443-7 [Sabo, Betty])

Comment: Until final geologic repositories are established and operational, remove all dry casks to remote interim ISFSI facilities away from populated areas of our country, and placed in dispersed hardened and earthen covered or buried arrays to make them less vulnerable to terrorists attacks, and reducing the consequences if attacked (0447-2-13 [Andrews, Richard])

Comment: Spent fuel can be safely stored on-site at nuclear power stations in dry cask storage. This point was well presented by Dr. Rip Anderson and Gwyneth Cravens in the DVD "Power to Save the World," as recorded by the Long Now Foundation. (0448-1 [Moncy, Charles])

Comment: Human error is no trivial consideration. A person's preoccupation with personal or other problems or incorrect reaction to a stressful occurrence can compound events rapidly into catastrophe as history has shown. (0450-5 [Bast, Nancy])

Comment: We own property and reside within Evacuation Zone 3 of the Diablo Canyon Nuclear Power plant in San Luis Obispo, CA. We are seriously concerned about the lack of appropriate, long-term storage for the highly unstable and toxic "nuclear waste" from this plant. Per NRC information at recent hearings held in San Luis Obispo, only one-third of the "nuclear waste" generated at Diablo Canyon, which should have already been transferred into dry cask storage, had been so transferred. The remaining two-thirds of the spent fuel assemblies, which should have been transferred to dry cask storage, still remain in open and overcrowded cooling pools. The Diablo Canyon plant is not only in an active earthquake zone but it is also a highly-rated terrorist target location. In our opinion, the NRC is not exercising responsible and professional oversight when it allows continued generation of nuclear waste at Diablo Canyon without enforcing the transfer of spent fuel assemblies from open pools, designed for short term, cooling period, storage, into dry cask storage until such time as the spent fuel assemblies can be moved to safe, long-term, off-site storage. (0451-1 [Rippner, Sharon] [Rippner, Thomas])

Comment: In our opinion, long term on-site storage of nuclear waste at the Diablo Canyon plant is unacceptable under any circumstances. A plan which approves storage in open pools for longer than the five-year cooling period, without requiring timely removal of the assemblies to dry cask interim storage, is irresponsible in the medium term. (0451-3 [Rippner, Sharon] [Rippner, Thomas])

Comment: Furthermore, your approval of high burnup fuel at San Onofre requires that this waste be stored on-site in crowded spent fuel pools for a minimum of twenty years instead of in safer concrete and steel dry casks. (0453-2 [Feathers, Jösan])

Comment: The dry casks are not vulnerable to the loss of coolant if electricity is disrupted by an earthquake or other natural disaster since they are passively cooled by natural air flow. Spent fuel pools at nuclear power plants are intended to house nuclear waste only until it is cool enough to be transferred to permanent storage. In the U.S., overcrowded cooling pools can contain up to forty times more nuclear material than the reactor cores. Additionally, these pools lack equivalent containment buildings and safety systems for protection. (0453-3 [Feathers, Jösan])

Comment: Dry casks are economically viable and provide a storage alternative for twenty years for high burn up fuel or until an off-site storage facility becomes available, if ever. At a minimum, the NRC should not approve higher densities of fuel assemblies in dry cask systems and should stop approving the use of high burn up fuel in existing plants. (0453-5 [Feathers, Jösan])

Comment: Consequently, the first issue to be addressed should be the reduction in the density of overcrowded spent fuel pools. These are accidents waiting to happen, given how many are now filled to far beyond their original intended capacity. There is no reason to accept this kind of unnecessary risk unless, of course, the focus is on limiting expenses for Station operators. The pools were never meant for long term storage but, given that many old plants have renewed licenses which extend their operation up to 60 years, this has become the norm. Of course, transfer to dry cask storage is not without its own long term risk. There is no doubt that for short term storage, dry casks are more reliable than Spent Fuel Pools. The events at Fukushima after the March 2011 earthquake & tsunami proved this point since there was no damage to the dry

casks present at the site at the time of the multiple accidents. The dangerous condition of the pool at unit #4 speaks volumes about the risk which overcrowding presents. (0454-5 [Waldstein, Joe])

Comment: In our comments submitted during the scoping process for this EIS, we specifically requested that the EIS address the research needs identified by the NRC staff to develop the necessary information to address the risk of long term storage of SNF. Specifically, the staff identified the following high priority research needs: NRC staff concludes that the following potential degradation • Stress corrosion cracking (SCC) of stainless steel canister body and welds; • Corrosion, SCC, embrittlement, and mechanical degradation of cask bolts; • Swelling of fuel pellets due to helium in-growth, and fuel rod pressurization due to additional fuel fragmentation, helium release, and fission gas release during accidents. The items listed in the third bullet, concerning fuel and cladding, are highlighted for early attention because if they are shown to be unlikely to compromise cladding, other cladding-related mechanisms may become less significant. NRC staff also recommends that first priority be given to the following crosscutting areas: • Thermal calculations; • Effects of residual moisture after normal drying; • Development of in-service monitoring methods for storage systems and components. These areas have significance for multiple SCCs and degradation processes. Improvements in thermal calculations, for example, can help enhance understanding of performance of system components both inside (e.g., fuel and cladding) and on the exterior (susceptibility of canisters to SCC). By the same token, residual moisture can affect potential corrosion of cladding or fuel assembly hardware during storage; the potential significance depends on the amount of moisture and how it may interact with the components. (0459-2 [Johnson, Abigail])

Comment: At worst, this dubious policy would put area residents in peril of accidents in spent fuel pools or from long-term decay of dry-cask storage. These perils have been greatly increased by the use of "high burn-up" fuel that is hotter both thermally and radioactively, making it more dangerous to handle and more difficult to store. Currently, high burn-up has no approved means of storage beyond 20 years. (0464-5 [Nelson, Pam])

Comment: We have stored large quantities of spent nuclear fuel 50 miles from where I live for over 50 years with no contamination of the surroundings. This has been the experience at hundreds of reactors worldwide. Even in the extreme case of the spent fuel pool at Fukushima #4, it now appears that the hydrogen explosion there was from hydrogen vented from the neighboring Fukushima #3 plant, not because of any defects of the #4 pool. (0466-2 [Tanner, John])

Comment: The NRC's defense of spent nuclear fuel stored in pools of water to be as safe as dry cask storage is fallacious. Spent fuel pools are vulnerable to leaks due to aging materials, to terrorist acts (dropping of explosives into pool), and to unexpected and unplanned for natural events that damage the pools. (0467-1 [Hynes, H Patricia])

Comment: Making matters far worse, years ago the NRC quietly approved burning the fuel in the reactors longer, resulting in "high burnup" waste, which turns out may not actually be safe for storage or transport. High burnup fuel, and its excessive thermal and radioactive heat accelerating the degradation of dry cask storage containers, has not been adequately addressed in the GEIS. While the NRC has licensed the storage of "normal" radioactive fuel for up to 50 years, you can't endorse the storage of high burnup fuel for even 20 years. (0472-2 [Sheridan, Paul])

Comment: At the time of its decision that it could no longer predict a precise date or time frame for when a repository will become available, the NRC also determined that it needed to look at the environmental and safety implications of storing spent fuel at reactor sites for periods beyond 60 years after plant shutdown because no such analysis had ever been conducted: The Commission, as a separate action, has directed the staff to develop a plan for a longer-term rulemaking and Environmental Impact Statement (EIS) to assess the environmental impacts and safety of long-term SNF and HLW storage beyond 120 years (SRM-SECY-09- 0090; ADAMS Accession Number ML102580229). This analysis will go well beyond the current analysis that supports at least 60 years of postlicensed life storage with eventual disposal in a deep geologic repository. The Commission believes that a more expansive analysis is appropriate because it will provide additional information (beyond the reasonable assurance the Commission is recognizing in the current rulemaking) on whether spent fuel can be safely stored for a longer time, if necessary.; 75 Fed. Reg. at 81040. In its Project Plan for the Regulatory Program Review to Support Extended Storage and Transportation of Spent Nuclear Fuel (June 15, 2010) COMSECY-10-0007, NRC Staff "developed a seven-year plan for enhancing the technical and regulatory basis for extended storage and transportation by FY 2017" to be followed by a rulemaking if warranted. However, there is no mention of that 7-year effort in the current draft GEIS and it is unclear what has happened to those carefully developed research initiatives. (0473-10-2 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The DGEIS has failed to adequately consider the potential additional adverse environmental impacts associated with the use of high burnup fuel. The increasing use of high burnup fuel at reactors is creating problems for spent fuel pools. As of 2008, the NRC allows reactors using uranium fuel to operate at the highest burnup rates of any country in the world.²⁷ [footnote 27 text: Erik Kolstad, Nuclear Fuel Behaviour in Operational Conditions and Reliability, Prepared for IPG meeting-Workshop on Fuel Behaviour, Argonne National Laboratory (Sept. 2008), at 10.] Nonetheless, NRC and others acknowledge that there are many aspects of high burnup fuel that could make their use problematic for spent fuel storage and handling. For instance: * "There is limited data to show that the cladding of spent fuel with burnups greater than 45,000 MWd/MTU will remain undamaged during the licensing period."²⁸ [footnote 28 text: U.S. Nuclear Regulatory Commission, Standard Review Plan for Spent Fuel Dry Storage Facilities, Final Report NUREG-1567 (Mar. 2000), at 6-15. <http://www.nrc.gov/reading-rm/doccollections/nuregs/staff/sr1567/sr1567.pdf>.] * "For the most part, the current licensing basis for dry storage of spent fuel is largely based on fuel examinations and dry storage performance demonstrations performed in the 1980s and 1990s. Spent fuel used in the dry storage performance demonstrations had discharge burnups of ~36 GWd/MTU, or less."²⁹ [footnote 29 text: Electric Power Institute, Dry Storage Demonstration for High-Burnup Spent Nuclear Fuel Feasibility Study (Sept. 2003) at 5-1.] * "the majority of isotopic assay measurements available to date involve spent fuel with burnups of less than 40 GWd/MTU and initial enrichments below 4 wt % 235U, limiting the ability to validate computer code predictions and accurately quantify the uncertainties of isotopic analyses for modern fuels in the high burnup domain."³⁰ [footnote 30 text: NUREG/CR-7013, G. Ilas and I.C. Gauld, Analysis of Experimental Data for High-Burnup PWR Spent Fuel Isotopic Validation— Vandellös II Reactor, ORNL/TM-2009/32 at 1. Available at <http://info.ornl.gov/sites/publications/files/Pub22621.pdf>.] * "Only limited references were found on the inspection and characterization of fuel in dry storage, and they all were performed on low-burnup fuel after 15 years or less of dry storage. Insufficient information is available yet on high- burnup fuels to allow reliable predictions of degradation processes during extended dry storage, and no information was found on inspections conducted on high-burnup fuels to confirm the predictions that have been made."³¹ [footnote 31 text: United States Nuclear Waste Technical Review Board, *Evaluation of the Technical Basis for Extended*

Dry Storage and Transportation of Used Nuclear Fuel, December 10, 2010, available at http://www.nwtrb.gov/reports/eds_execsumm.pdf (last accessed Dec. 17, 2013).] * "the technical basis for the spent fuel currently being discharged (high utilization, burnup fuels) is not well established "the NRC has not yet granted a license for the transport of the higher burnup fuels that are now commonly discharged from reactors. In addition, spent fuel that may have degraded after extended storage may present new obstacles to safe transport."32 [footnote 32 text: National Academy of Engineering, *Managing Nuclear Waste*, Summer 2012, pp 21, 31. <http://www.nae.edu/File.aspx?id=60739>.] (0473-14-4 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: This increase in radioactivity also produces an increase in decay heat as the following chart, based on information from EPRI, demonstrates for a PWR: PWR SNF Assembly Decay Heat (right axis) and Cesium Inventory (left axis) as a Function of Burnup and Cooling Time E. Supko, *Impacts Associated with Transfer of Spent Nuclear Fuel from Spent Fuel Storage Pools to Dry Storage After Five Years of Cooling*, Revision 1, Electric Power Research Institute, (Aug. 2012), Fig. 2-2, available at <http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001025206#!> (last accessed Dec. 20, 2013). The BWR has similar results for the use of high burnup fuel: E. Supko, *Impacts Associated with Transfer of Spent Nuclear Fuel from Spent Fuel Storage Pools to Dry Storage After Five Years of Cooling*, Revision 1, Electric Power Research Institute, (Aug. 2012), Fig. 2-3, available at <http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001025206#!> (last accessed Dec. 20, 2013). In terms of the risk of a zirconium fire in the spent fuel pool, increasing decay heat in spent fuel is particularly troublesome where air and steam are present: [the reaction] is strongly exothermic - that is, the reaction releases large quantities of heat, which can further raise cladding temperatures... if a supply of oxygen and or steam is available to sustain the reactions. The result could be a runaway oxidation -referred to as a zirconium cladding fire - that proceeds as a burn front (e.g., as seen in a forest fire or fireworks sparkler)...As fuel rod temperatures increase, the gas pressure inside the fuel rod increases and eventually can cause the cladding to balloon out and rupture.³³ [footnote 33 text: National Research Council, Board on Radioactive Waste Management, Committee on the Safety and Security of Commercial Spent Nuclear Fuel Storage, National Academies Press (2006), p. 38-39. Available at http://www.nap.edu/openbook.php?record_id=11263&page=38, http://www.nap.edu/openbook.php?record_id=11263&page=39 .] NRC has recognized the problem created by high burnup fuel and is not able to establish a generic analysis of it: "it was not feasible, without numerous constraints, to establish a generic decay heat level (and therefore a decay time) beyond which a zirconium fire is physically impossible."³⁴ [footnote 34 text: U.S. Nuclear Regulatory Commission, *Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants*, October 2000, p. ix. available at <http://pbadupws.nrc.gov/docs/ML0104/ML010430066.pdf>.] In addition to increasing the possibility of zirconium fires and making the calculation of their probability on a generic basis impossible, high burnup fuels are also causing problems with the integrity of the spent fuel pools themselves: as nuclear plants age, degradations of spent fuel pools (SFPs), reactor refueling cavities...are occurring at an increasing rate, primarily due to environment-related factors. During the last decade, a number of NPPs have experienced water leakage from the SFPs [spent fuel pools] and reactor refueling cavities. (0473-14-5 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: it is often hard to assess their in situ condition because of accessibility problems...Similarly, a portion of the listed concrete structures are either buried or form part of other structures or buildings, or their external surfaces are invisible because they are covered

with liners.³⁵ [footnote 35 text: U.S. Nuclear Regulatory Commission, "A Summary of Aging Effects and Their Management in Reactor Spent Fuel Pools, Refueling Cavities, TORI and Safety-Related Concrete Structures," NUREG/CR-7111 (2011) at vxiii, available at <http://pbadupws.nrc.gov/docs/ML1204/ML12047A184.pdf>. These structural problems are creating additional risks of criticality accidents at spent fuel pools: The conservatism/margins in spent fuel pool (SFP) criticality analyses have been decreasing...The new rack designs rely heavily on permanently installed neutron absorbers to maintain criticality requirements. Unfortunately, virtually every permanently installed neutron absorber, for which a history can be established, has exhibited some degradation. Some have lost a significant portion of their neutron absorbing capability. In some cases, the degradation is so extensive that the permanently installed neutron absorber can no longer be credited in the criticality analysis.³⁶ [footnote 36 text: U.S. NRC, Office of Nuclear Reactor Regulation, On Site Spent Fuel Criticality Analyses, NRR Action Plan, May 21, 2010. <http://pbadupws.nrc.gov/docs/ML1015/ML101520463.pdf>]. This problem cannot be fixed merely by adding more boron to the spent fuel pool since concrete "could be negatively impacted by adverse environments of borated water or where there is the possibility of alkali aggregate material reactivity."³⁷ [footnote 37 text: NUREG/CR-7111, supra note 35, at xiv.] And adding any equipment to the spent fuel pool (e.g., to control water chemistry or to absorb neutron) is not a viable solution because it restricts water flow in the pool and thus increases the risk of an accident from a loss of adequate cooling. In sum, the DGEIS has failed to adequately consider the potential additional adverse environmental impacts associated with the use of high burnup fuel. Relatedly, the NRC has failed to analyse the extent to which those impacts could be mitigated by, for instance, preventing further use of high burnup fuel at reactors and requiring the immediate transfer of all high burnup spent fuel that is at least 5 years old to dry casks. (0473-14-6 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The Commission has frequently relied on NUREG-0575, including waste confidence decisions.¹¹ [footnote 11 text: The initial waste confidence decision relied, in part, on NUREG-0575 to conclude that storage of spent fuel at reactor sites is acceptable. "The Commission is confident that the regulations now in place will assure adequate protection of the public health and safety and the environment during the period when the spent fuel is in storage (NUREG-0575, 'Final Generic Environmental Impact Statement on Handling and Storage of Spent Light Water Power Reactor Fuel,' Vol. 1, August 1979, at ES-12, 4-10 to 4-17)." 49 Fed. Reg. 34658.] In doing so, the Commission has never recognized that NUREG-0575 was based on several incorrect assumptions. First, it greatly underestimated the "conservative upper bound" to the length of onsite storage: The Commission announcement of September 16, 1975, outlining this study stipulated that the Staff was to examine the period through the mid-1980's. In the absence of a national policy directed to final disposition of spent fuel, the staff extended the time period of this study to year-2000. This extension provided a conservative upper bound to the interim spent fuel storage situation at a date that constituted a practical limit to the forecasting that may logically be used as a basis for today's decisionmaking. Id. at ES-1 (emphasis added). (0473-7-2 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Dry cask storage for older, cooler spent fuel has two inherent advantages over pool storage: (1) It is a passive system that relies on natural air circulation for cooling; and (2) it divides the inventory of that spent fuel among a large number of discrete, robust containers. These factors make it more difficult to attack a large amount of spent fuel at one time and also reduce the consequences of such attacks. *** NAS Study at 6, 8 and 10.; The previous NRC analyses and independent analyses of the safety of spent fuel stored at reactor sites,

particularly the safety of such storage in spent fuel pools, is directly relevant to the task NRC should be undertaking here. (0473-8-7 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Another study was done by the General Accounting Office. GAO-12-797, Spent Nuclear Fuel Accumulating Quantities at Commercial Reactors Present Storage and Other Challenges (August 2012) ("GAO Study"). This study concluded that "the key risk of storing spent fuel at reactor sites is radiation exposure from spent fuel that has caught fire when it is stored in a pool, but it is difficult to quantify the probability of such an event." Id. at 27. The GAO Study also found that "according to the analysis in a February 2001 NRC study [NUREG-1738], assuming a high release of radiation, the release of spent fuel fission products resulting from a pool fire could result in nearly 200 early fatalities, thousands of subsequent cancer fatalities, and widespread land contamination." Id. at 28. The previous NRC analyses and independent analyses of the safety of spent fuel stored at reactor sites, particularly the safety of such storage in spent fuel pools, is directly relevant to the task NRC should be undertaking here. (0473-8-8 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: [W]ell the horse is out of the barn, but how can we safely transport and permanently store the leftovers? One thing for sure, it has to be moved away from the coast and away from the seismic zone. (0474-1 [Bucklin, Christine])

Comment: The key word is PERMANENT. No "interim" storage facilities should be implemented. PERIOD. (0475-4 [Graham, Candace])

Comment: Then there is the problem of the storage of "high burnup" waste, which may not actually be safe for storage or transport at all. High burnup fuel, and it's excessive thermal and radioactive heat accelerating the degradation of dry cask storage containers, has not been adequately addressed in the GEIS. This category of fuel was caused by the NRC quietly approving burning the fuel in the reactors longer, even though the NRC doesn't endorse storing this waste for more than 20 years. (0477-2 [Tache, Jan])

Comment: This amount of radioactive material threatens too many people and too much property when stored in such a densely populated area, it needs to be secure from all threats including man made and natural. Please find another way and place to store it. (0479-1 [Sahagian-Allsopp, Ed])

Comment: Dry case storage is very dangerous, it's on the CA fault line & 90% more radioactive stuff than Chernobyl! Do your job, (0483-2 [Garvey, Lydia])

Comment: When nuclear power plants were first built, the spent fuel pool was designed as a very temporary storage site. The pools were never intended for long term storage. (0484-1 [Olsen, Steven])

Comment: Because no Government knows how to handle the spent fuel "hot potato" in the long term, the interim good solution of Dry Cask has been mostly ignored. Dry Cask everything that can be Dry Casked now. Typically spent fuels that have been cooling for 5 years can be Dry Casked. Until the fuels are put into Dry Cask, there is a risk of a regional economy killing event due to power loss/natural disaster, or terrorist action. There have been far too many close calls in the last few years, in the USA. We are flirting with disaster. Our good judgment in risk control has been decimated by lack of good choices and the hope of a Yucca mountain, always right around the corner. There is a GREAT interim solution, which creates good jobs in

America, and we need that badly, and solves much of the problem, immediately increasing our safety and reducing our risk of terrorist attack. (0484-2 [Olsen, Steven])

Comment: MOX reprocessing IS NOT an answer. MOX reprocessing is attempting to "burn up" the fuel by removing the plutonium from the spent fuel and concentrating it in new fuel rods to be burned in a nuclear plant. There are 2 problems with this. 1) It is much more expensive to process and create the MOX fuel than it is to simply cask it. A study by Princeton presented April 4, 2008 to Congress estimated that processing MOX is about 10 times more expensive than simply Dry Casking. 2) The MOX fuel is far more likely to blow up in a modified nuclear explosion called a Moderated Prompt Criticality, as did occur At Fukushima Reactor 3 which was running MOX. (0484-4 [Olsen, Steven])

Comment: The Dry Cask is proven technology, we can produce them in the USA, we can create jobs in the USA, and we can increase safety, all at an acceptable cost. Most or all of the cost should be borne by the existing utilities, since they had the obligation to decommission their plants. But I also propose that the US Government, using taxpayer dollars, assist the utilities, as it is in our common interest to Dry Cask as soon as possible, by providing 50% of the cost of the cask itself. (0484-5 [Olsen, Steven])

Comment: For the immediate and medium term, I believe that nuclear waste should be stored in a manner that minimizes the risk of its release into the environment. As there is often much more waste on the site of a reactor than active fuel within, I feel this needs to be stored inside a structure just as robust as the reactor containment itself. I also feel that while the highly radioactive isotopes decay, provisions should be made to keep the reactor and spent fuel cool during extended power outages that could be caused by a major disaster such as an earthquake. This could either be done by having backup power or designing systems so that they do not require active cooling (even better). (0488-1 [Watkins, Conor])

Comment: The NRC has confirmed that all U.S. reactors use High Burn Up waste. High Burn Up waste is too hot (radioactive) to handle and too unstable to transport or store. The DOE and NRC have not approved High Burn Up storage casks beyond 20 years. The GEIS contains inaccurate, incomplete and misleading information about High Burn Up waste. (0490-3 [Chin, Rebecca])

Comment: The NRC is surely the only regulatory body in the world that would argue that indefinite -- essentially permanent -- storage of high-level radioactive waste in fuel pools and dry casks provides "confidence" that this waste will never cause a threat to public health and safety. By their very nature, neither casks nor fuel pools are designed for permanent storage. (0491-4 [Commenters, Multiple])

Comment: Storing nuclear waste that may leak into the ground and into our rivers and drinking water is not a gamble I am willing to accept. (0492-3 [Maghakian, Carol])

Comment: There is no proven safe way to store nuclear waste. (0493-1 [Davis, Suzanne] [Davis, Tom])

Comment: I am writing to raise concern about the amount of spent fuel rods "packed" into cooling pools. The number is far beyond the recommended amount and radiation spikes are appearing all around the country, including in my state of Arizona. (0494-1 [Orlinski, Patricia])

Comment: The reality appears to be that there is no place to move the spent fuel at this time, it also appears that dry cask storage while having problems of its own would at least lower the risk of massive radiation danger of a widespread dispersal of contaminating particles should an earthquake damage the holding pool and cause loss of the cooling water with a resulting fire. (0495-2 [Grigg, Richard])

Comment: The risks and costs involved in trying to move these radioactive materials to an interim storage site are prohibitive and prolong the process of achieving safer storage conditions on-site in the short term. (0499-2 [Ramsay, Rebecca])

Comment: The only components of the four damaged reactors that survived the earthquake, tsunami, loss of coolant and reactor explosions relatively intact were that portion of the 11,000 fuel rods which were in dry cask storage. According to PG&E figures, as of this month, November 2013, 67% -- or 1,920 of the Diablo Canyon spent fuel assemblies -- are currently in spent fuel pools serving units 1 and 2. (0501-3 [Brown, Jerry])

Comment: The next issue that seems untouched in the NUREG 2157 is experiments with zirconium cladding. Zirconium cladding has been discussed in NUREG 2157, but issues such as experimental alloys, what has caused many fuel rods to be put into SF pools with little or no use, experiments with alloying, geometries caused by accidents resulting in recriticality, coolant filters packing up with fuel pellets and other debris... Will the above issues with spent fuel be resolved before the final NUREG 2157 issues? (0502-2 [Lewis, Marvin])

Comment: Nuclear waste should not be transported and stockpiled in "interim" sites around the country, as the cost to taxpayers and risk to communities of moving this deadly cargo are too great. (0507-4 [Giese, Mark M.])

Comment: Please, for the sake of future generations of humanity and all other life forms on this beautiful planet enact a safer,workable,more permanent solution to the extreme safety issue of storing spent fuel in temporary fuel pools. Increase dry cask and safer storage and research viable solutions to nuclear waste now. (0508-1 [Marsh, Kathryn])

Comment: The storage of waste generated by the nuclear power industry is one of a series of insurmountable problems for humanity that make the technology unsuitable from its inception. The proposed "determinations" of the impact statement are based on risk: that the storage pools employed by the industry are safe to operate for 60 years past the original lifetime design of the plant. The authors evidently consulted a crystal ball to support their assertion. The recent disaster at Fukushima Dai-ichi proves that nuclear materials are inherently unsafe to store, that there exists no place to securely store them for the time necessary to render them stable. (0509-1 [Longyear, John])

Comment: Nuclear energy cannot be safe and cheap. To have no repository means moving these materials. Every terrorist is now well - aware of the potential vulnerability of stored spent fuel rods. Multiple acts of nature can combine in a number of unforeseeable ways to create fuel fires and uncontrolled releases into the atmosphere of lakes, streams, rivers, aquifers, etc. (0512-3 [Bibb, William])

Comment: Dry Casking the spent fuel that can be stored that way is our best option at present. Spent Fuel pools are not safe. Look at the ongoing horrible crisis at Fukushima, Look what it has done and continues to do to the sea life in the pacific ocean. Think about the safety of your children and grandchildren. Act now while you still can. (0513-1 [Riesterer, Zita-Ann])

Comment: The methods and practices used by the US in storing spent fuel indicate that the NRC is an irresponsible agency in dealing with this issue. It is genocidal to permit the storage of fuel in such poorly protected pools at reactor sites that in most cases have enough fuel to destroy the entire planet's human population. It is suicidal to put spent fuel in places where the additional risks of reactor meltdowns can disable the safety systems to keep the fuel cooled. You apparently have your heads in the sand when it comes to both reactor and fuel safety. (0514-1 [Fahey, John])

Comment: The way spent fuel is stored is a crime against humanity and the human genome= genocide on nameless people who will pay for this incompetence with their genome damage. The spent fuel pool original capacities should be rolled back at the very least. The decision to allow some utilities to store more fuel in tighter racks is madness. To allow MOX fuel to be used and stored in common pools is madness. The pools just do not have the multiple safety systems, safe locations or reliability to safely store this deadly material. Spent fuel should NEVER be stored on reactor sites. The containment concept has been shown to be a fraud, as gasses produced during accidents can detonate and destroy containment structures, they are released instead. (0514-3 [Fahey, John])

Comment: Multiple and I mean X 5! ways to produce emergency cooling for spent fuel pools must be mandated ASAP. All pools should be underground and be offsite reactor facilities. (0514-6 [Fahey, John])

Comment: Do not allow the use of dangerous MOX fuel; (0515-8 [Stennes, Nancy])

Comment: Fukushima disaster shows the storage of spent fuel, as currently done, can have national and global radiation fallout in event of disruption of the storage process. The "60 years" mentioned as a timeline for a mined geologic repository is just kicking the can down the road in the hopes a technology will some day be created; this is currently what is occurring in Japan with their fuel storage issues and radiation damages. (0517-2 [Anonymous, JEC])

Comment: I didn't know there was or is a safe way to store spent nuclear fuel. Oh right, there isn't a way to store this menacing material. Human error always wins along with corrosion. (0519-1 [Bernstein, Patricia])

Comment: High burnup fuel, and it's excessive thermal and radioactive heat accelerating the degradation of dry cask storage containers, has not been adequately addressed in the GEIS. (0528-2 [Brown, Susan])

Comment: Years ago the NRC quietly approved burning the fuel in the reactors longer, resulting in "high burnup" waste, which turns out may not actually be safe for storage or transport. High burnup fuel, and it's excessive thermal and radioactive heat accelerating the degradation of dry cask storage containers, has not been adequately addressed in the GEIS. While the NRC has licensed the storage of "normal" radioactive fuel for up to 50 years, they can't endorse the storage of high burnup fuel for even 20 years. STOP high burn up fuel now. (0529-5 [Claybourne, Ana])

Comment: MOX reprocessing IS NOT an answer. MOX reprocessing is attempting to "burn up" the fuel by removing the plutonium from the spent fuel and concentrating it in new fuel rods to be burned in a nuclear plant. There are 2 problems with this. 1) It is much more expensive to process and create the MOX fuel than it is to simply cask it. A study by Princeton presented April 4, 2008 to Congress estimated that processing MOX including the costs of the MOX facility and decommissioning the MOX facility is about 10 times more expensive than simply Dry

Casking. 2) The MOX fuel is far more likely to blow up in a modified nuclear explosion called a Moderated Prompt Criticality. Even in the 1940's it was theorized that a nuclear explosion could happen in a nuclear reactor, and in the 1950's Argonne National Laboratory did a series of experiments that were filmed and proved that even with normal nuclear fuel rods, under the right conditions, and uncontrolled criticality could blow up the reactor. With MOX, enriched with bomb making plutonium, this type of nuclear explosion is much more likely, as Japan found out in their Reactor 3 at Fukushima, which was running MOX. The amount of Uranium detected by the EPA in Saipan, Guam, Honolulu, and California could only be caused by one thing...an explosion from within the reactor vessel, that launched the inventory into the air. MOX can turn a 80 foot tall reactor with 6" steel walls into a "Canon" which can launch the entire inventory. (0529-6 [Claybourne, Ana])

Comment: The NRC's Waste Confidence policy assumes that all nuclear waste is the same, when different fuel types, such as high-burnup fuels and MOX have different storage considerations and implications for safety. (0531-1-11 [Morgan, Sally])

Comment: The NRC's Waste Confidence policy assumes that all nuclear waste is the same, when different fuel types, such as high-burnup fuels and MOX have different storage considerations and implications for safety. (0531-2-11 [Morgan, Sally])

Comment: Using temporary storage sites around the country while waiting for a federal repository means more communities would be at risk from radioactive waste, more nuclear sites would have to be safeguarded, and reactor owners can continue making waste without being responsible for managing it. (0531-2-18 [Morgan, Sally])

Comment: Some irradiated fuel pools in the US have been found to be holding up to 9 times the amount of spent fuel for which they were designed[.] (0531-2-20 [Morgan, Sally])

Comment: An independent study should be undertaken to determine the best course of action for at-reactor storage, centralized storage, or some other configuration or location. (0534-5 [Vetter, Richard])

Comment: The NRC has confirmed that all U.S. reactors generate HIGH BURN UP waste. HIGH BURN UP waste is too hot (radioactive) to handle, too unstable to transport or store. The DOE and NRC have not approved storage casks for HIGH BURN UP beyond 20 years. The GEIS contains inaccurate, incomplete, and misleading information about HIGH BURN UP waste. (0537-3 [Commenters, Multiple])

Comment: I would like to submit my support of on site waste storage until a future alternative is found. I do not feel this is a threat to our community and support the operation of the Diablo Canyon Nuclear Power Plant. (0538-1 [Kaul, Michelle])

Comment: At worst, this dubious policy would put area residents in peril of accidents in spent fuel pools or from long-term decay of dry-cask storage. These perils have been greatly increased by the use of "high burn-up" fuel that is hotter both thermally and radioactively, making it more dangerous to handle and more difficult to store. Currently, high burn-up has no approved means of storage beyond 20 years. (0540-6 [Watland, George])

Comment: Having the highly radioactive "waste" stored in relative unprotected dry cask storage containers as well as the cooling pools not being protected by cement domes as the reactors are, leaves one with complete no confidence in the task the GEIS has attempted to fulfill. (0541-6 [Justesen, Evelyn])

Comment: Start by not whitewashing the "relative safety" of highly radio waste. Start all over again by considering the communities that are vulnerable to the dangers of this waste. Start by taking us and this problem seriously. (0541-7 [Justesen, Evelyn])

Comment: Fourth, nowhere in my state of Minnesota is a good place for a radioactive waste dump. No place in the USA is a good place for a radioactive waste dump. No place on earth is a good place for a radioactive waste dump. We do not want any more high-level radioactive wastes coming "to or through" our state. We do not want to see more high-level, long-lived radioactive waste coming to proposed "centralized interim storage" waste facilities here or anywhere else. (0543-4 [Senkiw, Sheryl])

Comment: The waste confidence documents should also be very clear that centralized interim storage financed by the Federal government (the away from reactor scenario analyzed in the subject GEIS) is not allowed under current Federal law. (0544-10 [Enriquez, Elizabeth])

Comment: Our Board appreciates the opportunity to comment on your Waste Confidence Rule update and trust that your Commission will require all nuclear plant operators to handle spent fuel in a manner most protective of the residents of the communities where these plants are located. (0548-10 [Gibson, Bruce])

Comment: We further understand that the pools at DCPD are now storing spent "high burn-up" fuel assemblies material possibly not considered in the original design. We would request a thorough examination of the thermal and mechanical consequences of high burn-up fuel being present in spent fuel pools. (0548-7 [Gibson, Bruce])

Comment: I have no doubt that the Nuclear Regulatory Commission will continue its strong, independent oversight of commercial nuclear energy facilities --the operation of existing plants, licensing new reactors, renewing the operating licenses of existing reactors, and the management, transportation and disposal of used nuclear fuel. (0549-3 [Williams, Robert])

Comment: Consolidated Storage away from reactor sites creates more problems, not solutions. In order to justify its Waste Confidence policy, NRC is relying on the federal government's plan (Senate bill 1240) that mandates transporting spent fuel away from nuclear reactors to "temporary" storage sites around the country until a central repository is built. This means more communities would be at risk from radioactive waste, more nuclear sites would have to be safeguarded, and reactor owners could continue making waste without responsibility for managing it. Temporary storage sites easily could become de facto permanent dumps if it is not politically feasible to site enough repositories to handle the waste. (0552-1-10 [Macks, Vic])

Comment: NRC's Waste Confidence policy assumes that all nuclear spent fuel is the same. This is far from the truth. The industry is moving toward new fuel types, such as MOX (mixed oxide) and high-burnup fuels, which are more radioactive, dangerous, thermally hot and difficult to store and transport safely. (0552-1-13 [Macks, Vic])

Comment: High burnup fuel problems:(citations follow): Dangerously unpredictable and unstable in storage--even short-term. Over twice as radioactive and over twice as hot. The

higher the burnup rate and the higher the uranium enrichment, the more radioactive, hotter and unstable. Requires a minimum of 7 to 20 years of cooling in spent fuel pools. San Onofre's 1123 high burnup fuel assemblies require at least 15 years to cool in the pools. Years of cooling depend on burnup rate, percent of uranium enrichment and other factors as defined in the dry cask system's technical specifications.³ Lower burnup fuel requires a minimum of 5 years in cooling pool. Requires more storage space between fuel assemblies due to the higher heat, higher radioactivity, and instability,⁴ yet the NRC approves higher densities of fuel assemblies in dry casks systems. San Onofre requested use of a new dry cask system that crowds 32 fuel assemblies into the same space that currently holds 24.⁵ This new system will increase the risks of dangerous radiation releases into the environment. The NRC should NOT approve the NUHOMS® 32PTH2 cask system for high burnup, but is considering doing so this year. Diablo Canyon now uses a 32 fuel assembly cask system. No transportation casks for high burnup are approved by the NRC,⁶ so the waste cannot be relocated. Approved for only 20 years in dry cask storage and assumptions about how high burnup fuel reacts in the first 20 years of storage are proving incorrect.⁷ Insufficient data to approve dry casks for over 20 years, per Dr. Robert Einziger, Senior Materials Scientist, NRC Division of Spent Fuel Storage and Transportation. 8 citations: 1 GAO-12-797 SPENT NUCLEAR FUEL Accumulating Quantities at Commercial Reactors Present Storage & Other Challenges, August 2012.

<http://www.gao.gov/assets/600/593745.pdf> Low-enriched uranium = up to 5% of U235

2 DOE FCRD-NFST-2013-000132, Rev. 1; Fuel Cycle Research & Development-Nuclear Fuel Storage and Transportation-2013-000132, Rev. 1, 6/15/13

<http://www.hsdll.org/?abstract&did=739345>. 3 CoC No. 1029 Technical Specifications for Advanced NUHOMS System Operating Controls and Limits, Appendix A Tables 2-9 to 2-16

<http://pbadupws.nrc.gov/docs/ML0515/ML051520131.pdf>. 4 RWMA Marvin Resnikoff, PhD: The Hazards of Generation III Reactor Fuel Wastes May 2010 <http://bit.ly/19dVRsY>. 5 Edison

request for NUHOMS 32PTH2 <http://pbadupws.nrc.gov/docs/ML1204/ML12046A013.pdf>. 6 SFPO Interim Staff Guidance 11, Rev 3 Cladding Considerations for the Transportation and Storage of Spent Fuel 11/17/2003 <http://www.nrc.gov/reading-rm/doc-collections/isg/isg-11R3.pdf>. 7 NWTRB Douglas B. Rigby, PhD: The NRC approved the initial 20 year dry cask storage based on assumptions. However, no information was found on inspections conducted on high burnup fuels to confirm the predictions that were made. U.S. Nuclear Waste Technical Review Board December 2010 report http://www.nwtrb.gov/reports/eds_rpt.pdf. 8 NRC Robert E. Einziger, PhD: insufficient data to support licensing dry casks for >20 years, March 13, 2013. <http://1.usa.gov/15E8gX5>

The Coalition to Decommission San Onofre 10/18/2013 SanOnofreSafety.org. (0552-1-14 [Macks, Vic])

Comment: Some irradiated fuel pools in the U.S. currently hold up to 9 times the amount of spent fuel for which they were designed. (Lochbaum) The pools are not protected by redundant emergency makeup and cooling systems or housed within robust containment structures having reinforced concrete walls several feet thick. (Lochbaum). Lochbaum, David, Director, Nuclear Safety Project, testimony Before the Senate Committee on Energy and Natural Resources, July 20, 2013. http://www.energy.senate.gov/public/index.cfm/files/serve?File_id=89dbc888-171c-4f77-8ecf-83a0055fcfb9 5. Principles of Safeguarding Nuclear Waste at Reactors or Hardened On-Site Storage (HOSS) <http://www.nirs.org/radwaste/policy/hossprinciples3232010.pdf>. (0552-1-22 [Macks, Vic])

Comment: NRC has not dealt with the very real risk that the irradiated nuclear fuel will so degrade with age that such transfer operations could not be carried out safely or smoothly. This is especially a risk with "high burn-up fuel," that has spent more time in an operating reactor core, and is thus significantly more radioactive and thermally hot. (0552-1-26 [Macks, Vic])

Comment: The advantages of dry cask storage over pool storage is further documented by a team of experts on the hazards of spent fuel pools which includes the current chair of the Nuclear Regulatory Commission, Allison Macfarlane.(Alvarez) There is a substantial reduction in the risk to the population if the spent fuel is transferred to casks: "The risk reduction is undeniable: the contaminated land area is reduced from 9,400 square miles to 170 square miles and the number of people displaced from their communities for a long time drops from 4,100,000 to 81,000." (Lochbaum). Robert Alvarez, Jan Beyea, Klaus Janberg, Jungmin Kang, Ed Lyman, Allison Macfarlane, Gordon Thompson, and Frank N. von Hippel, Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States, Science and Global Security, 11:1-51, 2003.

<http://mothersforpeace.org/data/20030122ReducingTheHazards?searchterm=spent+fuel+pools>. Lochbaum, David, Director, Nuclear Safety Project, testimony Before the Senate Committee on Energy and Natural Resources, July 20, 2013. http://www.energy.senate.gov/public/index.cfm/files/serve?File_id=89dbc888-171c-4f77-8ecf-83a0055fcfb9 5. Principles of Safeguarding Nuclear Waste at Reactors or Hardened On-Site Storage (HOSS) <http://www.nirs.org/radwaste/policy/hossprinciples3232010.pdf>. (0552-1-29 [Macks, Vic])

Comment: Failure to compare relative hazards of high-density pool storage with dry cask storage: Instead the authors pick a scenario which may not even reflect real world situations relative to the different storage configurations at U.S. nuclear power stations. According to estimates developed in 2007 for the Nuclear Regulatory Commission's Emergency Operation Center, for purposes of emergency planning and response, a major earthquake near the San Onofre Nuclear Generating Station in California might cause a spent fuel cladding fire releasing approximately 40 million curies of Cs-137 and causing life-threatening radiation doses to people within a 10-mile radius. By contrast, according to the same NRC document, a cask rupture would result in the release of 2,500 times less radioactivity. This is underscored by real world experience at the Fukushima Daiichi site where all the nine dry spent fuel casks were unscathed by the earthquake and tsunami. (NRC, 2007), (Talbot). U.S. Nuclear Regulatory Commission, Office of Nuclear Security and Incidence Response, RASCAL 3.0.5 Descriptions of Models and Methods, NUREG-1887, August 2007. Talbot, David, "The Case for Moving U.S. Nuclear Fuel to Dry Storage", MIT Technology Review, April 14, 2011. (0552-2-27 [Macks, Vic])

Comment: THE NRC HAS APPROVED UNSAFE HOLTEC STORAGE/TRANSPORT CASTS THAT ARE NOW DEPLOYED AND IN USE (0552-3-3 [Macks, Vic])

Comment: <http://www.gao.gov/assets/600/593745.pdf> describes complex unresolved issues regarding dry cask storage, unresolved issues regarding storage of high burn up spent fuel, dismantled cooling pools leaving no way to transfer spent fuel to new casks, casks used that are not suitable for transportation, spent fuel that can be stranded in deteriorating casks without provision for transfer to new casks, expectation of deteriorated spent fuel rods and no provision for management of such degraded spent fuel rods, and has no data base of its studies, etc. (0552-3-4 [Macks, Vic])

Comment: Federal policy makers must act now to develop consolidated facilities for interim storage, as recommended by the President's Blue Ribbon Commission on America's Nuclear Future and supported by a bipartisan group of Congressmen. (0555-4 [Contreras, Raquel])

Comment: Reactors in marine environments have a higher probability of corrosion from exposure to chloride than, obviously, those not in marine environments. (IN 2013-07 April 16, 2013 Premature Degradation Spent Fuel Storage Cask Structures and Components from Environmental Moisture) (0556-1-19 [Lampert, Mary])

Comment: Reactors vary in number of spent fuel assemblies that are defective and/or damaged. Therefore the potential storage challenges and environmental impact will differ. For example: Pilgrim has operated, and most likely will continue to operate with defective fuel assemblies. Pilgrim began operations in 1972 with defective fuel. The Massachusetts Department of Public Health's *Southeastern Massachusetts Health Study 1978-1986* stated, "Pilgrim, which began operations in 1972, had a history of emissions during the 1970s that were above currently "acceptable EPA guidelines as a result of a fuel rod problem." *Southeastern Massachusetts Health Study 1978-1986*, Morris M.S., Knorr R.S., Executive Summary, Massachusetts Department of Health (October, 1990). In the March 2005 and April 2006 Pilgrim SALP (Systematic Assessment of Licensee Performance, performed by the NRC) Reports, NRC Resident Inspector, William Raymond, stated that Pilgrim operated in 2004 and 2005 with defective radioactive fuel -- that is, fuel with perforated cladding. Fuel cladding provides the first barrier to prevent radionuclides from getting out and harming workers and the public. Degraded fuel is an ongoing issue for the industry. NRC Commissioner Merrifield has admitted nearly 1/3 reactors now have failed fuel, and the trend is increasing, not decreasing. *Briefing on Nuclear Fuel Performance*, Transcript, p.4, (February 24, 2005), <http://www.nrc.gov>. Use of degraded fuel varies and will impact the environment by increasing exposure to the public, workers and natural resources. For example, according to the NRC, 'a plant operating with 0.125 percent pin-hole fuel cladding defects showed a general five-fold increase in whole- body radiation exposure rates in some areas of the plant when compared to a sister plant with high-integrity fuel (<0.01 percent leaks). Around certain plant systems the degraded fuel may elevate radiation exposure rates even more.' United States Nuclear Regulatory Commission, Information Notice No. 87-39, *Control Of Hot Particle Contamination At Nuclear plants*, (August 21, 1987). (0556-1-37 [Lampert, Mary])

Comment: *NRC Generic Letter 94-04 Boraflex Degradation in Spent Fuel Storage racks*, June 26, 1996: Only some licensees use Boraflex as a neutron absorber in its spent fuel racks and some may not have the capability to maintain a 5percent sub-criticality margin because of current or projected future Boraflex degradation. When Boraflex is exposed to gamma radiation, the material shrinks and is subject to tears or gaps in the material. A second factor that may impact storage rack service life occurs when Boraflex is subjected to long-term exposure to gamma irradiation in the wet pool environment, the silicon polymer matrix becomes degraded and silica filler and boron carbide are released. The boron carbide loss can result in a significant increase in the reactivity of the storage racks. (GL, p. 3) Reactors with Boraflex present potential environmental impacts; and reactors vary in attention to mitigation for this problem. Plants with Boraflex are listed in the GL. (0556-1-38 [Lampert, Mary])

Comment: 10. NRC staff failed to perform a relative risk comparison with dry casks. There is not a peep from the NRC on this topic. 11. No mention that the dry casks at the Fukushima Dai-ichi site remained unscathed. 12. The Study assumes there is no risk to casks (Chapter 10) but provides no empirical justification. Casks, like spent fuel pools, are vulnerable. (Table IV-1, p., 32 above) For example, Holtec Hi-Storm 100's can be breached from a shaped charge delivered from either onsite or from off-site. The Performance of US Army Shaped Charges, M3 and M2A3 were described in Table IV-3.³¹ [footnote 31 text: Ibid]) [Table Submitted with Correspondence ML13354A021] Holtec Hi-Storm 100 casks have a 0.5" (1.27 cm) steel canister and a concrete outer wall measuring 26.75" (67.945 cm). The assemblies are protected by

68.445 cm, easily penetrable based on the capability of a shaped charge. Consequences: We know that a typical BWR cask contains approximately half the Cesium-137 that was released at Chernobyl. (0556-4-8 [Lampert, Mary])

Comment: 13. The Study never asked the important question: "Which is safer, pools or casks?" The report did not specifically answer this question but facts contained in the report actually lead to the conclusion that dry cask storage is safer and more secure than cramming more spent fuel rods into pools that weren't designed to accommodate that much material. The Study says that a fire in a densely packed spent fuel pool at the Peach Bottom plant could contaminate thousands of square miles with radioactive material, force the long-term displacement of millions of people, and cause tens of thousands of cancer deaths. Also the Earthquake Study failed to evaluate plants closer to major urban areas than Peach Bottom, such as the Indian Point plant near New York City or Pilgrim near Boston and Providence where the consequences of a similar event could be even greater. However, the Study shows that removing spent fuel older than five years from the pool could reduce the amount of radioactive cesium released by factor of 80, the number of cancers by a factor of 10, and the total amount of land that would be uninhabitable by a factor of 50. The bottom line--reinforced by the details in the NRC study--is that the public is better protected by reducing the amount of spent fuel storage in pools at U.S. reactors by moving it to dry storage. Doing so is an important defense-in-depth measure, which would significantly reduce the radiological risk to the public from spent fuel pool fires. 14. No analysis of age degradation of the pool and refueling cavity for the 60 years following license expiration. Pilgrim for example was built in the late 60's when Lyndon Johnson was President and the NRC Confidence Decision assumes that the pool would have structural integrity through 2092. There is neither industry experience to rely on nor any other basis for that determination. Engineers explain the aging phenomenon by using what is known as the "Bathtub Curve." The curve is a graph of failure rate according to age. The failure rate is relatively high in the beginning when "kinks" are being worked out; it flattens out during the middle life phase; and it rises again sharply in the end-of-life or at the "wearout phase." On average, 20 to 30 years usually marks the beginning of the wear-out phase. And the rate of corrosion is not linear over time.[FIGURE 1 - THE BATHTUB CURVE] [Figure Submitted with Correspondence ML13354A021] (0556-4-9 [Lampert, Mary])

Comment: Both the DGEIS and the Earthquake Study are key documents that provide the basis for the Proposed Waste Confidence Rule. Although the Proposed Rule explains that the Earthquake Study is not referenced in the DGEIS, it is for all practical purposes one of its foundations. It was developed side-by-side with the Proposed Rule to justify its conclusions. The authors admit that "the staff is aware of the conclusions in the draft Study and worked closely with the authors who developed the draft Study to prepare the relevant sections of the draft GEIS." (Draft Rule, p. 56783, emphasis added) PW's analyses of both the DGEIS and draft Earthquake Study show precisely why the draft rule by extension has no factual basis and why PW disagrees with its findings. (0556-5-1 [Lampert, Mary])

Comment: Dry Casks are Safer than Spent Fuel Pools • Casks have the advantage of passive cooling via airflow, unlike pools, which require mechanical functioning and human intervention to provide flow of cool water to cover the assemblies. Therefore casks are less vulnerable to natural disaster and sabotage. • Pools are not protected by redundant emergency makeup and cooling systems or housed in robust containment structures having reinforced concrete walls several feet thick. Pilgrim's pool, like other Mark I BWRs' has two feet thick external walls, where the primary containment is five feet thick. The roof is very thin, as it is designed to give in an accident. • Casks can withstand environmental disasters that pools cannot. At Fukushima the casks survived at 9.0 earthquake and the tsunami that flooded them. Pools are attractive terrorist

targets, not studied by the NRC in preparing the proposed rule. Casks are less vulnerable, also, because terrorists would have to target several casks to have the same amount of radiation released as the pool. Casks could be far safer if NRC required the casks to be spread out and surrounded by earthen berms. • Pool Accidents: NRC's economic consequence analyses (inexplicably for any reason other than the potential cost to the industry of dealing with the issue) continue to ignore the consequences of a spent fuel accident. No rational analysis could do so. • The importance of a spent fuel accident is illustrated by pointing to Pilgrim, where a spent fuel pool fire could release more than 44,010,000 curies of Cs-137, an amount 8 times more than a core release. Further, a spent fuel pool fire would result in releases going higher into the air and significantly impacting locations at greater distance with denser populations. Dr. Beyea estimated for the MA AGO the cost of a 10% release from a spent pool fire to be between \$105 and \$175 billion; and that a 100% release of C-137 would cost somewhere between \$342 and \$488 billion. (Beyea, p. 10). Entergy's LRA SAMA, based on currently approved NRC models, considered only the release of a relatively small amount of C-137 from the reactor core³⁵ [footnote 35 text: The Massachusetts Attorney General's Request for a Hearing and Petition for Leave to Intervene with Respect to Entergy Nuclear Operations Inc.'s Application for Renewal of the Pilgrim Nuclear Power Plants Operating License and Petition for Backfit Order Requiring New Design Features to Protect Against Spent Fuel Pool Accidents, Docket No. 50-293, May 26, 2006 includes a Report to The Massachusetts Attorney General on the Potential Consequences of a Spent Fuel Pool Fire at the Pilgrim or Vermont Yankee Nuclear Plant, by Jan Beyea, Ph.D., May 25, 2006.]. • Vulnerability: A wealth of government and independent reports show high-density, closed-frame spent fuel storage pools are vulnerable to catastrophic fires that may be caused by accidents or intentional attacks. NRC's safe storage finding does not qualify as a generic licensing determination under the AEA or NEPA. (0556-5-3 [Lampert, Mary])

Comment: • There is a substantial reduction in risk to the population if fuel is transferred to casks. "The risk reduction is undeniable: the contaminated land area is reduced from 9,400 square miles to 170 square miles and the number of people displaced from their communities for a long time drops from 4,100,000 to 81,000.³⁷," [footnote 37 text: David Lochbaum, Director, Nuclear Safety Project, Union of Concerned Scientists, Testimony before the Senate Committee on Energy and Natural Resources, July 20, 2013 http://www.energy.senate.gov/public/index.cfm/files/serve?File_id=89dbc888-171c4f77-Becf-83a0055fcfb9] • NRC knows that dry casks are safer than pools. In its Lessons Learned from Fukushima, NRC issued Orders regarding spent fuel pools but none for dry casks. The danger presented by spent fuel is the reason that the NRC recommended that all Americans within 50 miles of Fukushima be evacuated. (0556-5-5 [Lampert, Mary])

Comment: I am writing to address the NRC's Spent Fuel Rule. I have lived in the region of Diablo Canyon for over 27 years and as the former economic developer for our county, have a good understanding of the operations at Diablo Canyon Nuclear Power Plant. I have toured the facility and have sat in numerous detailed briefings by their staff, Pacific Gas and Electric has developed a spent fuel storage system that is well within the guidelines of the commission. They have set in place a multi-layered system of safeguards and have a comprehensive monitoring program to ensure proper safety of the region. I am convinced we are well protected by their ongoing efforts. (0557-1 [Johnson, Ray])

Comment: At the very least, all the used reactor cores (aka "spent" or "used" fuel) in California should be consolidated into ONE protected location, the best one possible, wherever we decide that is -- with DC shut down, of course, so no more waste is being produced here. There is reason for California to wait for a national repository -- it could be centuries away. The fuel should be retrievable in case a permanent national repository does become available. (0562-12 [Hoffman, Ace])

Comment: Instead, we've apparently chosen to practically randomly assign approximately 75 sites around the country to be nearly-permanent or virtually-permanent (100s of years, which only George Orwell and the NRC can call temporary) nuclear waste dumps. (0562-6 [Hoffman, Ace])

Comment: The U.S. has tens of thousands of tons of spent nuclear fuel sitting in waste storage ponds and spent fuel pools. This is a disaster in the making. It has the makings of an event of Biblical proportions. The potential consequences of the failure of one of these pools is unthinkable, and could destroy the Northern Hemisphere, if not the entire world. (0566-4 [Tocornal, John])

Comment: Do not allow the use of dangerous MOX fuel (0566-8 [Tocornal, John])

Comment: Storing spent fuel rods in a heavily populated area is social suicide! Is the NRC crazy, or just uninterested in the health and safety of the very taxpayers who feed their inoperable machine? Storing is no longer an option. (0567-1 [Taylor, Jeff])

Comment: The U.S. has many thousands upon thousands of tons of spent nuclear fuel sitting in spent fuel pools. This is a disaster, at a global scale, just waiting to happen. And for what? 19% of the power generating of the US? This is quite foolish, irrational and insane. (0569-2 [Hulstrunk, Matt])

Comment: I have NO Confidence in the continued storage of Spent Nuclear fuel because we have no Actual deep repository. (0571-1 [Young, Jane])

Comment: I am writing to support the NRC's Spent Fuel Storage Rule, and wish to say that with the NRC oversight PG&E has a very detailed and successful spent fuel management program and continues to safely store fuel via both its wet and dry cask storage systems. I am confident that layer upon layer of safeguards are in place to effectively manage and monitor the stored spent fuel. (0574-1 [French, Walter])

Comment: These fuels must be stored far away from the plants. (0580-1 [Shinker, Carol])

Comment: I think is completely to for storage as long as it is monitored and Government regulated. (0592-1 [Conrad, Chad])

Comment: We cannot pretend that leaving it where it is for 60 years is unreasonable, irrational and irresponsible and not to do everything possible to maintain if safely till it can be moved before the next quake would be the better choice. (0593-1 [Raimondi, Frank])

Comment: I'm sure that the Nuclear Regulatory Commission will continue its strong, independent oversight of commercial nuclear energy facilities--the operation of existing plants, licensing new reactors, renewing the operating licenses of existing reactors, and the management, transportation and disposal of used nuclear fuel. (0601-3 [Manfredi, Timothy])

Comment: You talk of making nuclear waste safe, having confidence in where it is buried. There is no such thing as safe nuclear waste. (0602-1 [Parks, Sheila])

Comment: Miss-Assumption Regarding Degradation Of Spent Fuel During Storage Periods. Over time, metals degrade. The more stressful the environment is, the more rapid the rate of degradation. Stress factors include thermal cycling, season following season; corrosion due to exposure to water; liquid metal embrittlement, metal creep, neutron bombardment, atmospheric

deposition corrosion, and other degradation modes upon which metallurgists could expound. These stress factors will cause some fraction of the irradiated fuel stored in casks to degrade. The degradation may cause stored waste fuel assemblies to warp and twist so that it is not possible to lift them out of an old cask and insert them into a new one. The degradation may cause fuel rod cladding to rupture, thereby causing waste fuel pellets to spill to the bottom of casks. Waste fuel pellets on the bottom of waste storage casks due to ruptured cladding may accumulate in patterns that cause criticality events. (0608-13 [Crocker, George])

Comment: Perhaps someday fuel rods can be made safer by better cladding, as preliminary studies seem to show. But "someday" isn't now. (0609-5 [Leon, Vicki])

Comment: Nationally 70,000 tons of radioactive waste is the current inventory. At the current rate each year another 2,000 tons is produced. In addition, over the past years high burn up fuel is now included in the waste inventories of nearly every reactor in the nation. (0611-4 [Shapiro, Susan])

Comment: The GEIS does not address the need reduce densely packed spent fuel pools to design basis standards. (0611-42 [Shapiro, Susan])

Comment: The GEIS does not address High Burn Up waste which takes at least seven to ten (7-10 years) to cool in the spent fuel pools, instead of the five (5) required by conventional spent fuel. Studies on High Burn Up waste are now, for the first time, being conducted by the DOE with regard to requirements for safe handling and storage of High Burn Up waste. These studies are incomplete and inconclusive, therefore not enough scientific information exists for the NRC to make an informed determination as to methodology and safety requirements necessary for storage of High Burn Up waste. What is known is that High Burn up waste is much hotter for a longer period of time, contain higher levels of radioactive isotopes than conventional spent fuel and causes embrittlement faster. (see Exhibit B: attached the Coalition to Decommission San Onofre). (0611-5 [Shapiro, Susan])

Comment: The NRC cannot rely on the current GEIS as a valid Environmental Impact Statement ("EIS") as it omits consideration of the significant waste storage issues related to High Burn Up waste. When and if scientific investigations regarding storage of high burn up waste are completed, a new or supplemental GEIS must be conducted to meet the requirements of NEPA. (0611-7 [Shapiro, Susan])

Comment: No state is a waste dump! We don't want any more high-level radioactive wastes coming "to or through" our state. The entire approach to nuclear waste endangers public and environmental health; the idea of transporting high-level, long-lived radioactive waste coming to proposed so-called "centralize interim storage" waste facilities ("parking lot dumps") is unsound. (0617-4 [Zure, Lisa])

Comment: Here is a suggestion: The government owns millions of acres of land, much of it isolated and remote, much of it on secure military facilities. There are many possibilities for temporary storage sites on such remote locations. Sites could be regional or state-specific to avoid federal issues. What is required is only a pad, not an elaborate repository. This would be designated as a temporary waste storage facility until a permanent repository is opened. (0618-6 [Johnson, Roger])

Comment: Current nuclear power plants were never designed to be long term (anything over 20 years) waste storage facilities. San Onofre especially is totally unsuitable and it cannot be turned into a long term storage facility just by changing its name. (0618-7 [Johnson, Roger])

Comment: Moving waste to remote sites has many powerful advantages: (1) Waste can be removed from tsunami and earthquake prone areas; (2) Waste can be stored far from population centers; (3) waste can be stored in secure areas away from public access; (4) waste stored in a remote temporary site would be mostly immune from terrorist threats since terrorists would not be interested in targets far from population zones. (0618-8 [Johnson, Roger])

Comment: High Burn-up Fuel: Section 2.1.1.3 provides a general description of the reactor designs (i.e., boiling water or pressurized water) and the fuel used (i.e., low burnup, high burnup, mixed oxide, etc.). The PINGP Units 1 and 2 have been using high burn-up fuel since the 1990s and it is estimated that 69 of the 98 casks that will eventually be stored on-site will contain high burnup fuel. If PINGP Units 1 and 2 are relicensed for a second renewal term, an additional 33 casks of high burnup fuel will be filled (for a total of 102 high burnup fuel casks). Page 2-7 of the draft GEIS states "For purposes of analysis in this draft GEIS, the NRC relies for impact analysis on the larger reactor lifetime amount of spent fuel discharged at low burn-ups (i.e., 1,600 MTU) unless otherwise stated in the description of environmental impact." It is further stated that this has to do with the fact the lower burn-up fuel takes up more space (i.e., more fuel, more casks, larger ISFSI). This statement ignores the potential public health impacts from the continued storage of high burn up fuel. The problems, concerns and uncertainties associated with high burnup fuel-cladding and cask component degradation, embrittlement, etc. -are well documented. The final GEIS must be revised to include a discussion of public health and environmental impacts from the high burnup fuel. (0619-1-15 [Mahowald, Philip R.])

Comment: Statements that it is feasible to safely store high-level irradiated fuel on-site, densely packed in pools of water (many perched precariously above the reactor) and in cement/steel casks (neither of which were designed for long-term storage) for 100 years provide no confidence. (0620-2 [Rivera, Evelyn])

Comment: I oppose the continued storage of spent nuclear fuel. There is no safe storage! Accidents/disasters do happen and the costs of remediation far outweigh the benefits. An example is the TEPCO's spent nuclear fuel in Fukushima, In Japan, no amount of money or existing technology can stop the ticking time bomb two years later. What folly to think we could do any better. Let their tragedy guide you in your decision-making. Please deny the continued storage of spent nuclear fuel. (0627-1 [Tognini, Dana])

Comment: Third, considering the fact that the meltdown at Chernobyl has not been safely contained and that the disaster at Fukushima-Daiichi continues to present a totally unacceptable risk to Japan, to the Pacific Ocean's ecosystem, and really to the entire world (due to radioactive fallout), any reasonably sane person would be obliged to conclude that the people running the nuclear industry and the individuals comprising the Nuclear Regulatory Commission are completely INSANE, to think that radioactive waste can be safely managed in the U.S.A. (0628-4 [Perkins, V.E.])

Comment: Spent fuel needs to be dealt with. The idea of storing spent fuel indefinitely at reactor sites obviously carries huge risk given what is currently happening at Fukushima. Cask storage would be a great start, after that store in locations that are not prone to dangerous weather situations. (0630-1 [Anonymous, Jeff])

Comment: I believe everyone agrees that nuclear spent fuel rods will be radioactive for 10's of 1000's of years. If that is the case, then how can this waste be stored "safely" above ground, either next to reactors or at some interim storage site (where "interim" is an undetermined length of time---decades, centuries??). (0633-1 [Kurz, Carol])

Comment: Spent fuel cannot be stored safely above ground in dry casks indefinitely for 100's of years--or forever. The casks do not last that long; the cost of moving the fuel to new casks would be prohibitive. The high burn up fuel being introduced doesn't last longer than 20 years in a dry cask further complicating such a scenario. (0633-3 [Kurz, Carol])

Comment: Nuclear waste is the problem. Rods have to be stored in fuel pools until they are "cool" enough for casks. Our spent fuel pools are already more crowded than Fukushima's pools. Shall we continue to create more fuel to bury? How many "holes" will we need? (0633-6 [Kurz, Carol])

Comment: There is no safe place to store waste in the interim or long-term. I am perplexed at a plan to endanger more communities. Nuclear waste has already contaminated nuclear plant sites and effected surrounding areas. (0636-2 [Bluestein, Bonnie])

Comment: We again assure you that we are dedicated to keeping the spent fuel and Greater-Than-Class-C-Waste that remains at our sites safe and secure. (0637-12 [Norton, Wayne])

Comment: Additionally, we find it inconceivable that the federal government's continued default has put the Commission and the nuclear industry in the position where Waste Confidence is only achievable with reliance on extended at reactor storage with the potential for repackaging of SNF and HLW until the Government actually meets its contractual obligation. We believe that under any test of best long-term safety and security practices and policies that one or more consolidated interim storage facilities are a necessary part of the nation's SNF/GTCC management strategy, and that all federal government entities having an official role in this matter ought to so state. (0637-4 [Norton, Wayne])

Comment: Dry cask tests have failed (e.g., at Aberdeen Proving Grounds).. But we cannot afford even one failure of a loaded dry cask. (0640-6 [Geary, B.])

Comment: Fortunately, American nuclear providers have successfully demonstrated that they can safely store nuclear waste while we wait for the federal government to enact a long-term solution. (0642-3 [Picking, Brian])

Comment: Federal policy makers must act now to develop consolidated facilities for interim storage, as recommended by the President's Blue Ribbon Commission on America's Nuclear Future and supported by a bipartisan group of Congressmen. (0642-4 [Picking, Brian])

Comment: How would you feel to see your child drink water contaminated with nuclear waste? How would you feel to know you set a plate of food before your child and it was contaminated with nuclear waste but you had nothing else to feed them even though you know they will surely get sick and possibly die. I want each one of you to think about this because you are educated people. You have been informed of how "we can safely store nuclear waste" yet each one of you read the news or watch it then turn your head. You know of the thousands of animals dead from this waste, the high rise of cancers in the areas of storage wherein your "safe nuclear waste storage facility" leaked or the nuclear plant that failed caused so much death and destruction to all people and animals, and the land is no longer safe to even walk upon. (0645-1 [Britz, Joan])

Comment: ANA supports interim storage of high-level waste and spent nuclear fuel as close to the point of generation as possible, as safely as possible. (0646-2 [Hanson, Courtney])

Comment: ANA opposes consolidated spent nuclear fuel storage facilities. Consolidated SNF storage facilities are inconsistent with the first principle of safe storage that it be as close as possible to the generation site. Consolidated storage requires nuclear waste transportation, which is costly and endangers millions of people along shipping routes. (0646-4 [Hanson, Courtney])

Comment: Consolidated storage is not disposal, but it could become de facto disposal. Consolidated storage does not "solve" SNF storage at reactors, because operating reactors will continue to generate more waste. (0646-6 [Hanson, Courtney])

Comment: What happens if the material so degrades over time as to be too dangerous or costly to handle. This is of particular concern in regard to so-called "high burn-up fuel," that has spent more time in an operating reactor core, and is thus significantly more radioactive, thermally hot and prone to actually catching fire. What manner of catastrophe exactly are the bureaucrats at the NRC so glibly bequeathing to generations far in the future? (0648-7 [Price, Scott])

Comment: Millions of your fellow citizens depend upon you doing your job of protecting our health & safety. Storage of spent nuclear fuel in earthquake prone locations is simply not logical. I implore you to remove spent fuel storage to unpopulated areas. (0654-1 [Cash, Joy])

Comment: [P]lease immediately remove all nuclear waste and nuclear power plants from any zones with seismic activity and possible tsunami threat. (0655-1 [Moffroid, Jenn])

Comment: It is a ticking time bomb to have nuclear waste stored indefinitely in high seismic zones, in densely populated areas or on the coast. San Onofre is all, so it poses a triple threat. Fukushima has already taught us that the spread of radioactivity through the ocean is something that should be prevented, period. Storing waste at San Onofre is a HUGE toxic accident just waiting to happen that would cost hundreds of billions of dollars and would likely not be containable. (0659-1 [Stanick, Kim])

Comment: This report only reinforces the growing mistrust of nuclear regulators who would play down the risk of storing nuclear waste wherever it may be presently, apparently bending to the will of the industry they are supposed to regulate. Suggesting that we will be able to rely on unproven or non-existent technology for safe storage of nuclear waste for thousands of years puts the future of our entire nation at risk. (0660-3 [Headrick, Gary])

Comment: Immediately reduce spent fuel pool density to original design standards, without exemptions[.] (0660-8 [Headrick, Gary])

Comment: Unfortunately, there are not many options and no idea is really safe everlasting forever. (0664-3 [BojeLebs, Nannette])

Comment: Plus, with our emerging understanding of high burn-up fuel WASTE with its long-term onsite storage and transporting challenges; and "the Department of Energy reports that burnups "as low as 30 GWd/MTU can present performance issues including cladding embrittlement under accident conditions as well as normal operations," DEMAND specific

research and solutions. <http://sanonofresafety.org/nuclear-waste/> and <http://sti.srs.gov/fulltext/SRNL-STI-2011-00228.pdf> (0665-4 [van Thillo, Grace])

Comment: The government must come to the aid of its population, they can no longer just gloss over or hide the ongoing dilemma that will eventually arise from continually neglecting the storage of spent fuel rods. Surely its kind of criminal to not keep the people informed as to their health and safety. (0667-1 [Mitchell, Steve])

Comment: MOVE NUCLEAR WASTE NOW!!!! (0668-4 [Gordon, Mark] [Gordon, Michelle])

Comment: All spent fuel should be put in dry cask storage on site. (0671-1 [Conley, Pam])

Comment: MOX fuel is a bad idea & should not be used or created. (0671-2 [Conley, Pam])

Comment: [R]ight now we are considering if we feel confident that nuclear waste can be handled at our reactor sites. The answer is yes. It has been done for decades and we have the technical expertise to handle our nuclear used fuel. (0674-4 [Lang, Amanda])

Comment: STARS has participated in the development of Reference 2 and endorses the comments contained therein. In particular, STARS agrees with NEI's responses to the four specific questions the NRC posed in the Federal Register Notice. Furthermore, STARS endorses the industry position that dry storage of spent fuel is a safe means for long term storage. [Letter from the Nuclear Energy Institute with Comments on Waste Confidence, to be submitted on December 20, 2013] (0675-1 [Bauer, Scott])

Comment: The State of New York recommends that before the NRC takes any further action on the proposed rule and the draft GEIS, that the Commissioners perform a transparent study to examine the durability of spent fuel assemblies (including high burnup fuel) and establish the precise lifetime and replacement cycle of ISFSI facilities, spent fuel canisters and casks, and dry transfer system buildings. (0681-12 [Peterson, Alyse])

Comment: It is not adequate to fabricate a lifetime for critical spent fuel storage systems. Most especially for the long-term storage and indefinite storage timeframes, the safety and security of spent nuclear fuel relies heavily on the storage systems containing this waste on site. The NRC is relying solely on site owners to detect the degradation of spent fuel pools, casks, and ISFSIs. Furthermore, it is irresponsible to wait for the degradation of in-use spent fuel storage systems to determine a replacement cycle. (0681-2 [Peterson, Alyse])

Comment: As presently licensed and configured, many of the Independent Spent Fuel Storage Installation facilities at the nuclear plants in New York do not have sufficient capacity to hold all the spent nuclear waste that has been generated and will be generated by those plants during extended operating license terms. That means that, absent a change in policy, at the end of a plant's commercial operation, spent nuclear fuel will remain in the plant's spent fuel pool -- and will remain in a dense storage configuration in those pools. Those ISFSIs have been designed to house the excess spent nuclear fuel that cannot fit into (full and densely-packed) fuel pools on site. Reducing the inventory of spent nuclear fuel in the densely-packed spent fuel pools will require the construction of additional independent spent fuel storage installations along with the purchase of additional dry cask storage. (0681-4 [Peterson, Alyse])

Comment: I am in complete support of the NRC's Spent Fuel Storage Rule and have witnessed firsthand that with NRC oversight PG&E has a very detailed and successful spent

fuel management program who continues to safely store fuel via both its wet and dry cask storage systems. Through my personal tour of the facility, I am confident that numerous safeguards are in place to manage and monitor the stored spent fuel. (0682-2 [Adam, Peter])

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Comment: There is no way to guarantee 100% safety when using this technology, and when it comes to materials that remain deadly dangerous for tens of thousands of years, longer than all of human history, anything less than 100% safety cannot be considered safe. We humans are not infallible, and neither is anything we produce. This means that nuclear plants cannot, simply cannot be guaranteed to be safe. And when it comes to nuclear materials, anything less than 100% safety is just not good enough. (0687-3 [Wilansky, Laura])

Comment: Furthermore, the fuel pools have an excess of rods and are severely overloaded. The failure to find a safe fuel depository is putting our entire nation at risk a la Japan and Fukushima. (0690-3 [Eisman, Val])

Comment: There is no public or scientifically demonstrated or public confidence for "temporary" or "interim" storage at reactor or away from reactor centralized storage sites that can isolate more and more nuclear waste for time frames of extending out to one hundred years and beyond, given that after more than a half century of search a likely high-level radioactive waste repository has not been established. (0691-8 [Gunter, Paul])

Comment: •An enormous backlog of spent fuel being stored on-site at nuclear reactors temporarily because there is nowhere else for it to go. In spent fuel pools, the assemblies are currently extremely overcrowded—most pools handling 3 or 4 times the amount of spent fuel the pool was originally designed for. Eventually reactor operators are forced to store spent fuel on site in dry casks, when there is no more capacity in the pools. •When reactors were licensed, no one envisioned—not the public, elected officials or reactor operators—that nuclear waste would be stored on-site for decades into the future. (0693-1-5 [Warren, Barbara])

Comment: •NRC decided that all nuclear fuel used at reactors is similar and therefore NRC did not discuss the significant differences in fuel as part of the GEIS. High burnup fuel is more radioactive and hotter, requiring a long time period in a spent fuel pool, approximately twenty years. This obviously affects the ability to transfer the material to dry casks. (0693-3-13 [Warren, Barbara])

Comment: NRC will not approve dry cask storage beyond 20 years and has not approved a transport cask for high burnup fuel. The Blue Ribbon Commission raised concerns about high burnup fuel and the need to monitor dry casks for their performance and degradation. (0693-3-14 [Warren, Barbara])

Comment: MOX fuel includes plutonium in the fuel mix, a very different fuel that NRC also did not thoroughly evaluate. (0693-3-15 [Warren, Barbara])

Comment: •Original licensing decisions included a design basis for the spent fuel pool. •Spent fuel pools in the US currently contain 3- 4 times the amount of spent fuel the pool was designed for. (0693-3-4 [Warren, Barbara])

Comment: Reactor licensees, including TVA, continue to develop and successfully use onsite SNF storage capacity in the form of SFPs and dry cask storage in a safe and environmentally sound fashion. Substantial technical understanding and decades of experience demonstrate the technical feasibility of safe storage of spent fuel in SFPs and in dry casks, based on their robust physical integrity over long periods of time. (0694-1-6 [Shea, Joseph])

Comment: The storage of SNF in any combination of SFPs or dry casks will continue as a licensed activity under regulatory controls and oversight. Regulatory oversight continues to enhance the safety of both wet and dry spent fuel storage as concerns and information evolve over time. For example, events such as the September 11, 2001 terrorist attacks and the March 2011 Fukushima Dai-ichi accident have led to numerous security and safety enhancements. Safe and environmentally-sound spent fuel storage would continue, if necessary, beyond 60 years after the end of the reactor's licensed operating life under an NRC-approved aging management program to ensure that monitoring and maintenance are adequately performed. The DGEIS assumes that, at an appropriate time, ISFSI structures, systems, and components ("SSCs") would be replaced as part of an approved aging management program. Continued experience with storing spent fuel will guide and inform aging management plans. (0694-1-7 [Shea, Joseph])

Comment: TVA has implemented the additional security measures applicable to SFPs. These activities provide additional assurances of the safety of continued storage of spent fuel. (0694-2-23 [Shea, Joseph])

Comment: [T]he WBN ISFSI will be under institutional control for the duration of SNF storage at WBN. Additionally, as demonstrated by its experience with its Browns Ferry and Sequoyah nuclear plants, TVA will demonstrate that the future WBN ISFSI will comply with relevant requirements. (0694-2-26 [Shea, Joseph])

Comment: TVA also agrees with NEI's comments that the NRC should add further discussion to the GEIS of the lessons learned from the Fukushima event regarding the robustness of SFP and ISFSI storage, and that this operating experience is significant evidence of the substantial safety assurance provided by SFPs and dry cask storage. (0694-2-28 [Shea, Joseph])

Comment: These regulatory requirements and the NRC's continued oversight and evolution of the requirements in response to new information or developments provide additional assurance that spent fuel will be stored and managed in a safe and secure manner. (0694-3-13 [Shea, Joseph])

Comment: •Reactor licensees, including Entergy, continue to develop and successfully use onsite SNF storage capacity in the form of SFPs and dry cask storage in a safe and environmentally sound fashion. Substantial technical understanding and decades of experience demonstrate the technical feasibility of safe storage of spent fuel in SFPs and in dry casks, based on their robust physical integrity over long periods of time.⁷ [footnote 7 text: See Proposed Rule, 78 Fed. Reg. at 56,799.] (0697-1-7 [Bessette, Paul] [Kuyler, Raphael])

Comment: Entergy also agrees with NEI's comments that the NRC should add further discussion to the GEIS of the lessons learned from the Fukushima event regarding the

robustness of SFP and ISFSI storage, and that this operating experience is significant evidence of the substantial safety assurance provided by SFPs and dry cask storage.⁷² [footnote 72 text: NEI Comments.] (0697-2-8 [Bessette, Paul] [Kuyler, Raphael])

Comment: One reason I do not share your confidence is because of what I learned from Commonwealth Edison/Exelon whistleblower Oscar Shirani, about the quality assurance (QA) violations involving Holtec casks. A "Summary of Oscar Shirani's Allegations of Quality Assurance Violations Against Holtec Storage/Transport Casks" is pasted in below. This Summary is also posted online at:

<http://www.nirs.org/radwaste//atreactorstorage/shiranialeg04.htm>. Although dated July 2004, to the best of my knowledge, NRC has never taken action on Oscar Shirani's revelations. In fact, quite to the contrary, NRC instead rubber-stamped the Private Fuel Storage, LLC construction and operating license in 2005-2006. Targeted at the Skull Valley Goshute Indian Reservation, a very serious environmental justice violation, PFS LLC would have deployed a whopping 4,000 Holtec casks onto the roads, rails, and/or waterways -- more shipments of high-level radioactive waste than have yet been carried out in the U.S., since the beginning of the Atomic Age in 1945. The 4,000 Holtecs that would have been de facto permanently parked on Skull Valley Goshute land would have been more than twice as many dry casks as are currently parked at U.S. atomic reactor sites presently (some 1,700). That is how flippantly NRC took Oscar Shirani's dire warnings. Fortunately, PFS LLC pulled the plug a year ago today, and will not be happening, despite NRC's ready rubber-stamp. (0698-3 [Kamps, Kevin])

Comment: Oscar Shirani was made to pay dearly for his integrity, and outspoken refusal to simply shut up about the Holtec QA violations. He endeavored to get Exelon to place a Stop Work Order on the manufacture of Holtecs. Instead, Exelon subjected him to harrassment by his own supervisors, and eventually ran him out of the company, and Exelon, and the U.S. nuclear power industry, blacklisted him for the rest of his life. Oscar Shirani alleged that he never signed off on the audit form granting Holtecs a clean bill of health. Oscar Shirani alleged that his signature on that audit report was forged. Neither the U.S. NRC nor the U.S. Department of Labor provided any support, relief, or assistance to Oscar Shirani, abandoning him to his fate, to both agencies' eternal shame. I attended, and bore witness at, a two-day NRC Office of Inspector General interview with Oscar Shirani, regarding his whistleblowing allegations concerning the Holtec casks. OIG's final report did not challenge Oscar Shirani's observations or conclusions, but it did find, incredibly, that NRC had done nothing wrong in the matter, and closed the case. Thus, no action was taken by NRC's OIG, nor by NRC itself, to defend or assist Oscar Shirani as a safety conscious whistleblower, nor to investigate the merits of his allegations against the Holtec casks, or take any safety enforcement action whatsoever. (0698-4 [Kamps, Kevin])

Comment: Oscar Shirani's QA allegations against the Holtec casks are very safety significant. Oscar Shirani questioned the structural integrity of Holtecs sitting still, going zero miles per hour, in on-site/at-reactor storage. But NRC has certified Holtecs for transport. The destructive forces they would face, traveling 60 mph, or even faster, down the rail lines, and potentially subjected to severe, high-speed crashes; long-duration, high-temperature fires; prolonged and/or deep underwater submersions; and perhaps even terrorist attacks; exacerbates the risks of Holtec QA violations even more. The significance of Oscar Shirani's QA whistleblowing against the Holtecs is even more significant, considering how widely deployed they are. On November 20, 2013, Josh Jarrell, R&D Staff, Used Fuel Systems, Nuclear Fuels Storage and Transportation, Planning Project (NFST), Oak Ridge National Laboratory, presented at the U.S. Nuclear Waste Technical Review Board meeting held in Washington, D.C. During his presentation, entitled "Integrating Standardization into the Nuclear Waste Management System," Dr. Jarrell

documented that Holtec has supplied a full 46% of the dry cask storage market in the U.S. up to the current point. Thus, the risks inherent in the QA violations revealed by Oscar Shirani are widespread across the U.S., in dry cask storage ISFSIs located throughout the country. They will increase in significance as Holtecs are transported, by barge on waterways, by heavy haul trucks on roads, or by trains on the railways, during shipments to centralized interim storage facilities, or final repositories. (0698-5 [Kamps, Kevin])

Comment: Nuclear, nuclear, nuclear waste Put it in casks There's no other place The spent fuel pools Have run out of space For the nuclear All the nuclear For the nuclear waste[.] (0699-5 [Lee, Michel])

Comment: Consolidated storage of nuclear fuel, which the Blue Ribbon Commission on America's Nuclear Future has officially recommended, would mean taking nuclear waste from the country's reactor sites to a temporary storage facility and then moving it again, decades later, to a more permanent facility. Consolidated storage is creating a bigger problem, rather than moving toward a solution. Transporting waste away from nuclear reactor sites to a temporary facility would put dangerous waste on our roads, rails and waterways and expose more communities to radioactive waste. Meanwhile, the companies producing the waste would be off the hook for managing it and the new temporary storage sites would require additional funds for security measures. High level nuclear waste should only be moved once and it should be kept as near as possible to the site that produced it. (0700-3 [Women's Action for New Direction, Georgia])

Comment: NRC's Waste Confidence policy assumes that all nuclear waste is the same, but new forms of waste, such as Mixed Oxide Plutonium fuel, slated to be produced as the Savannah River Site in South Carolina are more radioactive and dangerous as well as more difficult to transport and store. (0700-4 [Women's Action for New Direction, Georgia])

Comment: The proposed DGEIS and rule appear to countenance the stranding or storage of SNF at or near plant sites for up to 150 years or more, and contain no effective provisions to ultimately ensure the safe and proper disposal of SNF. The Commission's rule also contains a questionable premise -- that long-term SNF storage at current sites or perhaps some centralized sites (for 150 or more years) is safe and feasible merely on the basis of the limited experience involving SNF storage to date, particularly at ISFSI's, and at fewer locations with lower quantities of SNF, compared to what would exist over such a long time span. (0704-6 [Callen, Ronald C.] [Keskey, Donald L.]

Comment: There are several problems posed by high-burnup fuel and NRC must provide a detailed environmental analysis. The National Academy of Engineering of the National Academy of Sciences has expressed concern regarding the viability of long term storage and management of high-burnup fuel. The Academy noted: "the technical basis for the spent fuel currently being discharged (high utilization, burnup fuels) is not well established" the NRC has not yet granted a license for the transport of the higher burnup fuels that are now commonly discharged from reactors. In addition, spent fuel that may have degraded after extended storage may present new obstacles to safe transport.⁴² [footnote 42 text: See National Academy of Engineering, *Managing Nuclear Waste*, Summer 2012, pp 21, 31. <http://www.nae.edu/File.aspx?id=60739>.] Further, Mr. Robert Alvarez, at the Institute for Policy Studies, has authored a recent report in which he criticized the NRC for taking a "leap of faith" with respect to the safe operation of reactors and the storage and disposal of spent nuclear fuel" with higher burnup fuel.⁴³ [footnote 43 text: See *Reducing the Hazards of High-Level Radioactive Waste in Southern California: Storage of Spent Power Reactor Fuel at the San*

Onofre Nuclear Station, Robert Alvarez, (June 25, 2013) at 12. Commissioned by Friends of the Earth; http://libcloud.s3.amazonaws.com/93/22/3/3024/SONGS_Spent_Fuel_FINAL.pdf.] With the higher burn rates, Mr. Alvarez notes nuclear fuel rods undergo significant changes meriting more study and treatment under this Draft EIS. Such changes include: increasing oxidation, corrosion and hydriding (i.e., hydrogen absorption) of the fuel cladding; oxidation reduces cladding thickness, while hydrogen (H₂) absorption of the cladding to form a hydrogen-based rust of the zirconium metal from the gas pressure inside the rod can cause the cladding to become brittle and fail; higher internal rod gas pressure between the pellets and the inner wall of the cladding leading to higher fission gas release; pressure increases are typically two to three times greater; elongation or thinning of the cladding from increased internal fission gas pressure; structural damage and failure of the cladding caused by hoop (circumferential) stress; increased debris in the reactor vessel, damaging and rupturing fuel rods; cladding wear and failure from prolonged rubbing of fuel rods against grids that hold them in the assembly as the reactor operates (grid to rod fretting); a significant increase in radioactivity and decay heat in the spent fuel; a potentially larger number of damaged spent fuel assemblies stored in pools; upgraded pool storage with respect to heat removal and pool cleaning; and requiring as much as 150 years of surface storage before final disposal. *Id.* (citations found in report and omitted here). (0706-3-18 [Fettus, Geoffrey])

Comment: In short, there is significant evidence that with higher burn-ups nuclear fuel cladding may be inadequate as a primary barrier to prevent escape of radioactivity, especially during dry storage, and therefore the NRC needs to include these problems specific to high burnup fuel in the impact analysis in the draft GEIS. (0706-3-19 [Fettus, Geoffrey])

Comment: Page 2-14. Assumption of ability to move and no dual purpose dry casks have been certified. NRDC Comment[.] With the acknowledged absence of licensed dual purpose casks or canisters and no operational experience with the moving and management challenges raised by high burnup SNF, we suggest the agency has significant research for the final GEIS to provide any meaningful support for an impacts analysis. (0706-3-21 [Fettus, Geoffrey])

Comment: Page 2-18. "In January 2013, DOE published its response to the Blue Ribbon Commission recommendations titled, "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste" (DOE 2013). This strategy implements a program over the next 10 years that, with congressional authorization, will: • site, design, construct, license, and begin operation of a pilot interim storage facility by 2021 with an initial focus on accepting spent fuel from shutdown reactor sites; • advance toward the siting and licensing of a larger interim storage facility to be available by 2025 with sufficient capacity to provide flexibility in the waste-management system and allow for acceptance of enough spent fuel to reduce expected government liabilities; • make demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048. The Federal government's support for interim storage supports the NRC's decision to consider this type of facility as one of the reasonably foreseeable interim solutions for spent fuel storage pending ultimate disposal at a repository." NRDC Comment[.] The history of the nuclear waste repository program is a series of failures and demonstrates, as the DC Circuit found, there should be no assurance there will be sufficient mined geologic repository capacity.⁴⁴ [footnote 44 text: See Appendix A of these comments on the failure of the efforts to manage and dispose of nuclear waste and *How Safe is Yucca Mountain*, Remarks of Thomas B. Cochran, Senior Scientist, NRDC, At the Symposium: Uncertainty in Long-Term Planning- Nuclear Waste Management, a Case Study, Vanderbilt University, January 7, 2008; http://docs.nrdc.org/nuclear/files/nuc_08010701A.pdf.] NRDC further suggests the failure of efforts to site interim storage facilities have been at least as problematic as the failed efforts to

develop a final repository solution. See NRDC's Testimony on S. 2140, the current proposed legislation before the United States Senate Committee on Energy & Natural Resources (<http://www.nrdc.org/nuclear/gfettus-13073001.asp>). In that testimony, we noted current legislation pending before a Senate Committee (S.1240) risks sending the nation down another dead-end road by severing the link between storage and disposal and thereby allowing for a storage site to become a de facto repository. NRDC Testimony at 3. (0706-3-22 [Fettus, Geoffrey])

Comment: In the U.S. and elsewhere, the trend is to increase the burnup of fuel assemblies; this is done by extending the length of time the assemblies spend producing energy in the reactor core and/or by increasing the power levels of nuclear power plants ("NPP"). Some power uprates—"the process of increasing the licensed power level at a commercial [NPP]"⁴ [footnote 4 text: NRC, "Review Standard for Extended Power Uprates," RS-001, Revision 0, December 2003, Background.]—in the U.S. have been substantial; in 2006, the NRC approved a 20 percent power uprate for Vermont Yankee Nuclear Power Station. (0706-5-10 [Fettus, Geoffrey])

Comment: In 1999, burnup levels for spent pressurized water reactor ("PWR") fuel and spent boiling water reactor ("BWR") fuel were approximately 45 gigawatt-days thermal per metric ton⁵ [footnote 5 text: 1000 kilograms] of enriched uranium ("GW·d/t U") and 37 GW·d/t U, respectively; in the U.S., by 2021, "[b]urnup levels for spent PWR fuel are anticipated to rise to ~55 GW·d/t U [and] burnup levels for spent BWR fuel will likely increase to over 40 GW·d/t U."⁶ [footnote 6 text: IAEA, "Impact of High Burnup Uranium Oxide and Mixed Uranium-Plutonium Oxide Water Reactor Fuel on Spent Fuel Management," No. NF-T-3.8, 2011, p. 9.] (0706-5-11 [Fettus, Geoffrey])

Comment: When high burnup (and other) fuel rods are discharged from the reactor core and loaded into the SFP, the fuel cladding can have local zirconium dioxide (ZrO₂) "oxide" layers that are up to 100 microns ("µm") thick (or greater);⁷ [footnote 7 text: IAEA, "Impact of High Burnup Uranium Oxide and Mixed Uranium-Plutonium Oxide Water Reactor Fuel on Spent Fuel Management," No. NF-T-3.8, 2011, p. 30.] there can also be local crud layers on top of the oxide layers, which can sometimes also be up to 100 µm thick.⁸ [footnote 8 text: IAEA, "Impact of High Burnup Uranium Oxide and Mixed Uranium-Plutonium Oxide Water Reactor Fuel on Spent Fuel Management," No. NF-T-3.8, 2011, p. 29.] (0706-5-12 [Fettus, Geoffrey])

Comment: Local heavy oxide and/or crud layers would partly impede the local steam or air "coolant" flow through the spent fuel assemblies in a SFP boil-off accident or complete SFP LOCA, respectively, in at least the following aspects: 1) the amount of either steam or air "coolant" in the vicinity of the spent fuel cladding that had local heavy oxide and/or crud layers may be substantially less than if the cladding were clean; 2) the amount of either steam or air coolant flow past the vicinity of the spent fuel cladding that had local heavy crud and oxide layers may be substantially less than the flow past clean cladding; 3) if there were rapid oxidation, local growth of oxide layer thicknesses and increased degradation of the fuel cladding would further obstruct either the steam or air "coolant" flow. (0706-5-13 [Fettus, Geoffrey])

Comment: Partly impeded local cooling, caused by local heavy oxide and/or crud layers, could cause local fuel-cladding temperatures to increase up the point at which zirconium would begin to rapidly chemically react with steam or air—at approximately 1000°C (1832°F) or 900°C (1652°F),⁹ [footnote 9 text: Allan S. Benjamin et al., Sandia Laboratories, "Spent Fuel Heatup Following Loss of Water During Storage," NUREG/CR-0649, March 1979, p. 47.] respectively. In a SFP accident, partly impeded local cooling, caused by local heavy oxide and/or crud layers, could decrease the time to the ignition of zirconium in either steam or air. (0706-5-14 [Fettus, Geoffrey])

Comment: As stated above, when high burnup (and other) fuel rods are discharged from the reactor core and loaded into the SFP, the fuel cladding can have local zirconium dioxide (ZrO₂) "oxide" layers that are up to 100 µm thick (or greater); there can also be local crud layers on top of the oxide layers, which can sometimes also be up to 100 µm thick. (And medium to high burnup fuel cladding typically has a "hydrogen concentration in the range of 100-1000 wppm [weight parts per million];" "[z]irconium-based alloys, in general, have a strong affinity for oxygen, nitrogen, and hydrogen..."¹⁰ [footnote 10 text: K. Natesan, W.K. Soppet, Argonne National Laboratory, "Hydrogen Effects on Air Oxidation of Zirlo Alloy," NUREG/CR-6851, October 2004, (ADAMS Accession No. ML042870061), pp. iii, 3.]) (0706-5-16 [Fettus, Geoffrey])

Comment: High burnup fuel rods have thinner cladding, because a higher quantity of their zirconium content has oxidized during the operation of the reactor.¹¹ [footnote 11 text: IAEA, "Impact of High Burnup Uranium Oxide and Mixed Uranium-Plutonium Oxide Water Reactor Fuel on Spent Fuel Management," No. NF-T-3.8, 2011, pp. 29, 50.] The thermal conductivity of oxide layers and crud layers is low—especially crud layers. (It is noteworthy that an EPRI report states that "[i]n some instances, BWR rods have been known to dislodge so much crud when moved around in [SFPs] that diminished pool clarity occurred."¹² [footnote 12 text: Electric Power Research Institute, "Technical Bases for Extended Dry Storage of Spent Nuclear Fuel," 1003416, December 2002, p. 3-8.] Tenacious crud would not become dislodged from fuel rods in this fashion.) (0706-5-17 [Fettus, Geoffrey])

Comment: And, as the burnup of fuel rods increases, there is an increase in their total *internal* thermal resistance. There is greater internal thermal resistance in high burnup fuel, because: 1) the thermal conductivity of the fuel pellets degrades, partly due to cracking and 2) there is an increased release of fission gas that degrades the thermal conductivity of the gap between the fuel pellet and the cladding.¹³ [footnote 13 text: NRC, "Letter to GE-Hitachi Nuclear Energy Americas (GEH) Regarding Nuclear Fuel Thermal Conductivity Degradation Evaluation," March 23, 2012, (ADAMS Accession No. ML120680571), Enclosure 2, "NRC Staff Assessment of General Electric-Hitachi Nuclear Energy and Global Nuclear Fuel—Americas Codes and Methods with Regard to Thermal Conductivity Degradation," March 23, 2012, (ADAMS Accession No. ML120750001), pp. 1-2.] (A 2011 IAEA report states that "[t]he fission gas released from the fuel pellets to the fuel cladding gap will increase *as much as ten-fold* for high burnup fuel over lower burnup fuel"¹⁴ [footnote 14 text: IAEA, "Impact of High Burnup Uranium Oxide and Mixed Uranium-Plutonium Oxide Water Reactor Fuel on Spent Fuel Management," No. NF-T-3.8, 2011, p. 50.][emphasis added].) A 2012 NRC document states that "[t]he gap [thermal] resistance can "increase because of pellet densification (which increases the gap size) and/or degradation of the helium-gap gas conductivity by the addition of noble fission gases (xenon and krypton) released from the fuel pellets."¹⁵ [footnote 15 text: NRC, "Letter to GE-Hitachi Nuclear Energy Americas (GEH) Regarding Nuclear Fuel Thermal Conductivity Degradation Evaluation," March 23, 2012, (ADAMS Accession No. ML120680571), Enclosure 2, "NRC Staff Assessment of General Electric-Hitachi Nuclear Energy and Global Nuclear Fuel—Americas Codes and Methods with Regard to Thermal Conductivity Degradation," March 23, 2012, (ADAMS Accession No. ML120750001), pp. 1-2.] (0706-5-18 [Fettus, Geoffrey])

Comment: It is noteworthy that the fuel-cladding gap size does not necessarily increase in high burnup fuel; an October 2003 paper states that "[i]nner surface cladding oxidation and subsequent mechanical bonding between the fuel pellet and the cladding are well-known phenomena of high burnup and high duty fuels."¹⁶ [footnote 16 text: Sven Van den Berghe *et al.*, "Observation of a Pellet-Cladding Bonding Layer in High Power Fuel," presented at "Advanced

Fuel Pellet Materials and Designs for Water Cooled Reactors: Technical Committee Meeting," 20–24 October 2003, p. 307.] (0706-5-19 [Fettus, Geoffrey])

Comment: During the operation of a reactor, the thermal resistance of crud and/or oxide layers on cladding increases the internal pressure of fuel rods. Regarding this phenomenon, a 2003 NRC document states: Clad[ding] oxidation can lead to significantly increased fuel rod internal pressures. ... In addition to oxidation causing increases in rod internal pressures, crud deposition has a similar effect since crud is a poor conductor of heat. Keeping crud deposition to a minimum also reduces the impact on rod internal pressures.¹⁷ [footnote 17 text: NRC, "Safety Evaluation by the Office of Nuclear Regulation, Topical Report WCAP-15604-NP. REV. 1, 'Limited Scope High Burnup Lead Test Assemblies' Westinghouse Owners Group, Project No. 694," 2003, (ADAMS Accession No. ML070740225 (See Section A), p. 4.) (0706-5-20 [Fettus, Geoffrey])

Comment: During the operation of a reactor, the fuel-cladding gap of high burnup fuel rods may reopen "when [the] internal pressure in the [fuel] rod exceeds [the] reactor coolant system pressure."¹⁸ [footnote 18 text: NRC, "NRC Information Notice 98-29: Predicted Increase in Fuel Rod Cladding Oxidation," August 3, 98, (ADAMS Accession No. ML003730714), p.1.] When the fuel-cladding gap reopens there is also thermal resistance caused by the extremely low thermal conductivity of the gases in the fuel-cladding gap. Regarding this phenomenon, the 2012 NRC document states: Should the gap [between the fuel pellet and the cladding] reopen, the increased thermal resistance will result in higher fuel pellet temperatures, resulting in higher fission gas release. The increased fission gas release will degrade gap conductivity while increasing the rod internal pressure, thus increasing pellet temperature and widening the gas gap further. The onset of gap reopening results in a runaway process of increasing gap opening until cladding failure.¹⁹ [footnote 19 text: NRC, "Letter to GE-Hitachi Nuclear Energy Americas (GEH) Regarding Nuclear Fuel Thermal Conductivity Degradation Evaluation," March 23, 2012, (ADAMS Accession No. ML120680571), Enclosure 2, "NRC Staff Assessment of General Electric-Hitachi Nuclear Energy and Global Nuclear Fuel—Americas Codes and Methods with Regard to Thermal Conductivity Degradation," March 23, 2012, (ADAMS Accession No. ML120750001), p. 8.] (0706-5-21 [Fettus, Geoffrey])

Comment: Regarding the heating of the fuel cladding in a complete SFP LOCA, a 1979 Sandia Laboratories report states that "[v]ariations in temperature from rod to rod in an assembly might occur as a result of variations in decay heat or differences in the thickness of the oxide coating, but these factors are difficult to predict and have not been accounted for" ²⁰ [footnote 20 text: Allan S. Benjamin *et al.*, Sandia Laboratories, "Spent Fuel Heatup Following Loss of Water During Storage," NUREG/CR-0649, SAND77-1371, March 1979, (ADAMS Accession No. ML120960637), p. 40.][emphasis added]. And, discussing research and development priorities regarding the dry storage of spent fuel assemblies, which would also pertain to SFP accidents, a 2012 Pacific Northwest National Laboratory ("PNNL") report states that "[d]etermining actual clad emissivities²¹ [footnote 21 text: Emissivity is "[t]he ratio of the power per unit area radiated by a surface to that radiated by a black body at the same temperature. A black body therefore has an emissivity of 1 and a perfect reflector has an emissivity of 0." A black body is "[a] hypothetical body that absorbs all the radiation falling on it. ...While a true black body is an imaginary concept, a small hole in the wall of an enclosure at uniform temperature is the nearest approach that can be made to it in practice." See Alan Isaacs *et al.*, "A Concise Dictionary of Physics," Oxford Reference, 1990, pp. 22, 88.] as a function of oxide and crud layer thicknesses under dry storage conditions is necessary to calculate actual temperature profiles..."²² [footnote 22 text: Brady Hanson *et al.*, "Gap Analysis to Support Extended Storage of Used Nuclear Fuel." PNNL-20509, Rev. 0, Pacific Northwest National Laboratory, January 31, 2012, p. 88.] The PNNL report observes that this would be a "difficult and expensive task."²³ [footnote 23 text: *Id.*] (0706-5-22 [Fettus, Geoffrey])

Comment: In a boil-off accident, the thermal resistance of crud (corrosion products) and/or oxide layers on fuel-cladding would slightly decrease the radial heat losses of fuel assemblies to the external environment—slightly impeding the local cooling of the fuel assemblies. The thermal resistance of crud and/or oxide layers would primarily serve to decrease radial heat losses at the outer perimeters of the fuel assemblies; this effect would not be significant because the heat flux (rate of heat transfer from the fuel rods) would be relatively low. In fact, a 1979 Sandia Laboratories report states that "[a] calculation was made to determine whether a 100 micron [crud] Fe₂O₃ coating on the BWR fuel pins would affect the heatup of these pins during a pool drainage accident, and it was found that the overall effect on the fuel pin temperature was less than one degree."²⁴ [footnote 24 text: Allan S. Benjamin *et al.*, Sandia Laboratories, "Spent Fuel Heatup Following Loss of Water During Storage," NUREG/CR-0649, SAND77-1371, March 1979, (ADAMS Accession No. ML120960637), p. 78.] (0706-5-23 [Fettus, Geoffrey])

Comment: It is doubtful that the Sandia Laboratories calculation used the lowest possible value that the thermal conductivity of crud layers can have; the morphology of crud plays more of a role than its chemical content does in determining the degree of its thermal resistance²⁵ [footnote 25 text: NRC, Advisory Committee on Reactor Safeguards, Reactor Fuels Subcommittee Meeting Transcript, September 30, 2003, (ADAMS Accession No. ML032940295), p. 240.] (this was not necessarily known in 1979). It is also doubtful that a calculation done in 1979 or earlier would have accurately modeled (or attempted to model) the internal thermal resistance of spent fuel rods. (In fact, today, in 2013, the computer safety model the NRC uses for SFP accident analyses—MELCOR—does not model the gap between the fuel cladding and fuel pellets. MELCOR also replaces the thermo-physical properties of UO₂ fuel with properties of compacted magnesium oxide (MgO). In SFP-fire experiments conducted at SNL—used to benchmark MELCOR—zirconium cladding is packed with solid magnesium oxide filler.²⁶ [footnote 26 text: Jeffrey Cardoni, Sandia National Laboratories, "MELCOR Model for an Experimental 17x17 Spent Fuel PWR Assembly," SAND2010-8249, November 2010, p. 4.]) Furthermore, the burnups of spent fuel assemblies were far lower in 1979 than they are today. Nonetheless, the Sandia Laboratories calculation results are instructive: the overall effect of the degraded thermal conductivity of high burnup fuel rods in a SFP accident would be slight (unless such fuel rods were involved in a criticality accident²⁷ [footnote 27 text: Fission—the splitting of atoms in the nuclear fuel—occurs in a criticality accident.]). (0706-5-24 [Fettus, Geoffrey])

Comment: Contention 1 - Phenomena Regarding How High Burnup Fuel and High Burnup Fuel Cladding Would Affect the Progression of a SFP Accident Are Not Considered in NUREG-2157, Appendix F, "Spent Fuel Pool Fires." 5. SFPs store fuel assemblies (essentially bundles of fuel rods, comprised of zirconium alloy cladding sheathing uranium dioxide (UO₂) fuel pellets) after they are discharged from the reactor core. If there were a loss of SFP cooling, the water in the pool would be heated by the fuel assemblies' decay heat (heat generated by the radioactive decay of the fuel's fission products) until it reached the boiling point; then the water would boil away, uncovering the fuel assemblies. (0706-5-8 [Fettus, Geoffrey])

Comment: Fuel assemblies that had a higher burnup² [footnote 2 text: Burnup is the thermal energy produced per unit mass of enriched-uranium in the fuel.]—whose enriched-uranium fuel had been converted into energy to a greater extent in the reactor core—would produce greater quantities of decay heat; "[i]n general, the higher the burnup, the higher the heat load generated and the more heat rejection [cooling] capability is required."³ [footnote 3 text: IAEA, "Impact of High Burnup Uranium Oxide and Mixed Uranium-Plutonium Oxide Water Reactor Fuel on Spent Fuel Management," No. NF-T-3.8, 2011, p. 18.] (0706-5-9 [Fettus, Geoffrey])

Comment: The NRC should take immediate action to reduce the fuel assemblies in spent fuel pools, as well as analyzing the deficiencies of current dry cask storage. (0707-5 [Werner, Shahla M.])

Comment: High Burn-up[:] How can the NRC GEIS have confidence in extended storage of high burn-up (>45 GWd/MTU) highly radioactive spent nuclear fuel when the NRC currently will not approve dry cask storage beyond 20 years^{xiv} [footnote xiv text: *Status of NRC Research on High Burnup Fuel Issues* (Slide 7) Dr. Robert E. Einziger <http://1.usa.gov/15E8gX5>.] for high burn-up waste and has not approved transportation casks^{xv} [footnote xv text: NRC Interim Staff Guidance 11, rev 3, *Cladding Considerations for the Transportation and Storage of Spent Fuel* <http://www.nrc.gov/reading-rm/doc-collections/isg/isg-11R3.pdf>.] for high burnup waste? The fuel is over twice as radioactive as lower burnup fuel and is hotter, requiring up to a minimum 20 years cooling in spent fuel pools.^{xvi} [footnote xvi text: Appendix A to CoC No.1029, Technical Specifications for the Advanced Nuhoms® System (Table 2.12) <http://pbadupws.nrc.gov/docs/ML0515/ML051520131.pdf>.] The fuel is proving unstable in storage and there are no current solutions to these problems. The NRC GEIS^{xvii} [footnote xvii text: NRC Draft Waste Confidence Generic Environmental Impact Statement NUREG-2157, September 2013 <http://pbadupws.nrc.gov/docs/ML1322/ML1322A106.pdf>.] even quotes one study (Pages B-13 and B-23) regarding the problems of fuel cladding embrittlement with high burn-up waste, yet ignores the potential consequences of this - shattering of the embrittled, fragile fuel cladding, which could release radiation into the environment. (GEIS Pages B-12 and B-23)[.] (0711-10 [Olson, Mary])

Comment: How can the NRC GEIS have confidence in extended storage when the NRC and Department of Energy (DOE) have not completed their research on extended storage and transportation? The NRC does not have the research data (let alone the solutions) to analyze and validate the draft Generic EIS conclusions. The DOE has identified 94 critical technical data gaps in knowledge of "used" nuclear/irradiated fuel storage and transportation.[†] [footnote † text: DOE Review of Used Nuclear Fuel Storage and Transportation Technical Gap Analyses, 7/31/2012 <http://1.usa.gov/1bQr5xO>.] NRC and DOE extended storage and transportation research should be completed before the NRC completes their EIS. (0711-29 [Olson, Mary])

Comment: How can the NRC GEIS have confidence in extended storage of high burn-up (>45 GWd/MTU) highly radioactive spent nuclear fuel when the NRC currently will not approve dry cask storage beyond 20 years[‡] [footnote ‡ text: *Status of NRC Research on High Burnup Fuel Issues* (Slide 7) Dr. Robert E. Einziger <http://1.usa.gov/15E8gX5>.] for high burnup waste and won't approve transportation casks[§] [footnote § text: NRC Interim Staff Guidance 11, rev 3, *Cladding Considerations for the Transportation and Storage of Spent Fuel* <http://www.nrc.gov/reading-rm/doc-collections/isg/isg-11R3.pdf>.] for high burnup waste? How long does high burn-up fuel have to be actively cooled in liquid? How does burn-up impact the amount, rate and percentage of plutonium generated? How about burn-up and the other transuranics (amount, rate, percentage)? How does burn-up change the "biological effectiveness" (dose) of exposure to fuel particles? (0711-30 [Olson, Mary])

Comment: What is the profile of hydride generation in dry storage? Is there a correlation between hydride generation and burnup? Is there a correlation between hydride generation and time? (0711-34 [Olson, Mary])

Comment: CCNR [Canadian Coalition for Nuclear Responsibility] finds that NRC assurances of the safety of temporary storage measures for spent nuclear fuel under both wet and dry storage regimes are not supported by adequate analysis of the consequences of using high

burn-up fuel in commercial reactors. CCNR recommends that NRC refrain from all licensing decisions that may add to the inventory of high burn-up fuel in temporary storage pending the outcome of a public review process based on a thorough analysis of all safety implications of high burnup fuel vis-à-vis such things as accelerated cladding degradation, added criticality potential, obstacles to safe transport of spent fuel, deterioration of spent fuel handling equipment, alterations in isotopic composition (source terms), as well as increased radioactivity and heat generation in any geologic repository or surface facility. (0714-1-5 [Edwards, Gordon])

Comment: The NRC has also failed to address in an adequate manner the environmental risks associated with continuing the current management practices of wet storage in spent fuel pools and dry storage in canisters, particularly in light of the unexamined implications of NRC's decision to allow licensees to use high burnup nuclear fuel which adds significantly to the fission product inventory and heat loadings associated with the resulting irradiated fuel, thereby invalidating analyses that were carried out years ago based on lower burn-up. (0714-1-8 [Edwards, Gordon])

Comment: The inherent dangers in storing irradiated nuclear fuel have been compounded by recent practices. Since the 1990s, NRC has allowed its licensees to increase the burn-up of the uranium reactor fuel dramatically by increasing the concentration of uranium-235. The resulting irradiated nuclear fuel has a higher fission product inventory and generates significantly more decay heat. The unique characteristics of high burn-up irradiated fuel have major implications for the potential environmental consequences of storage of such nuclear waste in spent fuel pools, in dry storage casks, and even in a geologic repository, yet NRC has failed to carry out a thorough and exhaustive study of these important implications resulting from its own licensing actions over the last 2 decades. As of 2008, the NRC allows reactors using uranium fuel to operate at the highest burn-up rates of any country in the world. (0714-2-3 [Edwards, Gordon])

Comment: The NRC also has an obligation not to add to that burden [of indefinite storage of nuclear fuel] unnecessarily. For this reason the NRC policy allowing licensees to use high burn-up fuels should be thoroughly reexamined and reconsidered with an opportunity for full public input. (0714-2-6 [Edwards, Gordon])

Comment: A 2003 peer-reviewed article by Robert Alvarez, a Senior Scholar at Princeton University's Institute for Policy Studies and a former Senior Policy Advisor to the U.S. Secretary of Energy, concluded that the dense packing of spent fuel in cooling pools does not provide a sufficient safety margin in the event of a pool breach and consequent water loss from an accident or terrorist attack.³⁷ [footnote 37 text: *See Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States*, Science and Global Security, Vol. 11:1-51 ("Reducing the Hazards") (2003).] In such cases, the fuel most recently placed in the pool could heat up enough to ignite its zirconium cladding, possibly resulting in the release of large amounts of radioactivity to the environment.³⁸ [footnote 38 text: *Id.*] To reduce this risk, the Alvarez article recommended moving spent fuel that had cooled for five years to dry-cask storage.³⁹ [footnote 39 text: *Id.* at 27.] The graph below, taken from the Alvarez article, shows that several days after being removed from the reactor, nuclear fuel is releasing 100 kilowatts of radioactive heat per metric ton of uranium (kWt/tU).⁴⁰ [footnote 40 text: *Id.* at 12.] [Figure inserted] Gordon Thompson of the Institute for Resource and Security Studies has also issued reports concluding that increased storage of spent fuel in dry casks would allow lower-density packing of spent fuel pools and decrease the risk of pool fires.⁴¹ [footnote 41 text: *See, e.g.,* Gordon R. Thompson, *Environmental Impacts of Storing Spent Nuclear Fuel and High-Level Waste from Commercial Nuclear Reactors: A Critique of NRC's Waste Confidence Decision and Environmental Impact Determination*, at 49-50 (Feb. 6, 2009).] But, as yet, only 22% of spent nuclear fuel is stored in

dry casks.⁴² [footnote 42 text: Nuclear Regulatory Commission, *Spent Fuel Storage in Pools and Dry Casks Key Points and Questions and Answers* (Apr. 29, 2011). Available at: <http://www.nrc.gov/waste/spent-fuelstorage/faqs.html>.] Other scientists and engineers have raised similar points.⁴³ [footnote 43 text: *See Damages from a Major Release* (discussing accident costs at Indian Point and four other sites).] NRC disagreed with Reducing the Hazards and criticized Alvarez and the Institute for Policy Studies for questioning NRC's and industry's reliance on densely packed spent fuel pools. (0718-1-15 [Sipos, John])

Comment: Indeed, has NRC ever found any difficulties in any approach to waste handling and storage insurmountable? Now, really, not even the part where Wiley Coyote pushes the Volkswagen bus full of nuclear waste over the cliff, but Roadrunner catches it al in a hot tub full of ginger ale? Sorry, but in the face of NRC's insult to the intelligence approach thus far, I couldn't help this comparison. (0723-4 [Shadis, Raymond])

Comment: NRC chooses to declare that spent fuel pool storage are equally(that is presumably beneath regulatory concern) "safe", therefore, says NRC, there is no urgency whatsoever in moving spent fuel from over-packed spent fuel pools to dry cask storage. At the same time, an NRC taskforce is grimly engaging in recalculating the risk of criticality accidents should neutron absorbing materials required in over-packed spent fuel pools fail. I would ask NRC to consult with NUREG – 1738 – Spent Fuel Pool Accident Risk in Decommissioning Nuclear Power Plants and the NRC studies that precede it and feed into it. NUREG-1738 advises in reference tables that as many as 25,000 latent fatalities out to a distance of 500 miles may result from a spent fuel pool fire –even if the emergency planning zone is 95% evacuated. NUREG-1738 advises a rapid oxidation reaction may occur no matter how long fuel has cooled. NUREG-1738 advises that a BWR Mark I containment would present no substantial obstacle to aircraft penetration (these being commercial aircraft of modest weight and speed). NUREG-1738 advises that the probabilities of acts of terror or sabotage are incalculable. NUREG-1738 advises that BWR Mark I spent fuel pools (Vermont Yankee, in particular, could under severe seismic shock tear open laterally corner to corner. Or, in a most severe event, the entire bottom could simply drop out. I say, the intense radiation from a mass of unshielded fuel would then preclude adding water until robotic equipment could be brought to play; by then too late to stop an exothermic reaction. NUREG-1738 advises that an exothermic reaction in a spent fuel pool could, if uninterrupted, propagate through the entire mass of fuel – in many reactors-the equivalent of five or more full reactor cores. No such propagation capability exists for dry cask storage. How then can NRC credibly equate risk for wet and dry storage? (0723-8 [Shadis, Raymond])

Comment: It is extremely unsafe to continue to store the Spent Nuclear Fuel at the San Onofre site because of the vulnerability of the site location at the ocean's edge and the lack of adequate storage at the site. What could possibly happen would affect approximately 7.5 million residents and Southern California's major cites and render uninhabitable vast lands of the area and all of the wildlife. I strongly support finding a safe and permanent storage elsewhere. (0725-1 [Barker, Lauren])

Comment: Immediately reduce spent fuel pool density to original design standards, without exemptions[.] (0728-6 [Anonymous, Anonymous])

Comment: Radioactive waste is dangerous, and needs to be stored properly. Fukushima is a glowing example of danger of nuclear materials. People have died, and now talking about it has been ruled to be criminal. We can only make so many STUPID moves as a human race in the future. Storing nuclear fuel in a poor manner cannot be one of these moves .Even our sailors

who assisted during Fukushima meltdown are now sick - just after a few days being around the area. Find a better storage - period. (0732-2 [Green, Jeane])

Comment: In particular, storing nuclear waste next to rivers such as the Altamaha and the Savannah Rivers in Georgia is a very bad idea, and shuffling radioactive waste around to "interim" storage facilities is even worse. (0739-2 [Quartermann, John S.])

Comment: Immediately reduce spent fuel pool density to original design standards, without exemptions[.] (0741-3 [Giese, Mark M.])

Comment: Dry cast storage systems are manufactured by several competitive vendors in the United States, including AREVA. The competition in the market fosters a cycle of innovation and development, which continues to drive technological progress for evolving systems with increased safety margins. The statement "improvement based on research and operating experience, and licensee compliance with regulatory requirements is important to the continued safe storage of spent nuclear fuel" (78 Fed. Reg. 56,788) represents a substantial underrepresentation of the basis and market for continued safe spent fuel storage options available today. AREVA requests that the staff augment this statement to better reflect and represent the existing competitive market for spent fuel storage. (0745-3 [Kelley, Devin])

Comment: I urge you to store nuclear waste in dry casks and safely keep in the nuclear plant site. (0751-2 [Temlock, Ayumi])

Comment: In 2011 I had an opportunity to tour Diablo Canyon Nuclear Power Plant. I am confident that the spent fuel storage area provided by PG& E is safe and acceptable based on what I saw and the information I was provided during that tour. (0753-2 [Devitt, Andrea])

Comment: Other issues such as water storage and onsite rod storage have been nightmares in disguise that due to the Fukushima Japan event are clear and present dangers. (0755-4 [Calnan, Christopher])

Comment: How can the NRC GEIS have confidence in extended storage when the NRC and the Department of Energy (DOE) have not completed their research on extended storage and transportation? The NRC does not have the research data (let alone the solutions) to validate the draft Generic EIS conclusions. The DOE has identified 94 critical technical data gaps in knowledge of spent nuclear fuel (SNF) storage and transportation.¹ [footnote 1 text: DOE Review of Used Nuclear Fuel Storage and Transportation Technical Gap Analyses, 7/31/2012, <http://1.usa.gov/1bQr5xO>] NRC and DOE extended storage and transportation research should be completed before the NRC completes their EIS. (0756-1 [Gillmore, Donna])

Comment: The NRC has not approved short-term storage and transportation because numerous scientific reports have shown these high burnup fuel problems: •Unstable and unpredictable in storage [.] •The protective Zirconium metal cladding around the low enriched (up to 5% U-235) uranium fuel is becoming brittle, making it fragile and subject to shattering. If the radiation breaches the cladding, it can also breach the steel canister and cement cask, release radiation into the environment. •High burnup fuel reacts with the Zirconium cladding resulting in hydrides, adding the risk of a hydrogen explosion. •Hotter and over twice as radioactive •Requires up to a minimum cooling of 20 years in spent fuel pools (instead of 5 years for lower burnup fuel).¹⁰ [footnote 10 text: No. 1029 Technical Specifications for Advanced NUHOMS® System Operating Controls and Limits, Appendix A Table 2-12 (page 2-16) <http://pbadupws.nrc.gov/docs/ML0515/ML051520131.pdf>.] Fuel cladding temperature must be

400 C (752° F) or less before moving fuel assemblies to dry storage.¹¹ [footnote 11 text: NRC Spent Fuel Project Office Interim Staff Guidance - 11, Revision 3, Cladding Considerations for the Transportation and Storage of Spent Fuel, Nov 17, 2003 <http://www.nrc.gov/reading-rm/doc-collections/isg/isg-11R3.pdf>.] •Requires over double the storage space (of lower burnup fuel) in a permanent geological repository and there are no geological repository designs for high burnup fuel.¹² [footnote 12 text: RWMA Marvin Resnikoff, PhD: The Hazards of Generation III Reactor Fuel Wastes May 2010 <http://bit.ly/19dVRsY>.] The NRC has known for decades of high burnup fuel problems,¹³ [footnote 13 text: NRC Agency Program Plan for High-Burnup Fuel, To NRC Commissioners, July 6, 1998 <http://bit.ly/19R1i2L>.] yet continues to approve use of this fuel. In some cases, it has approved burnup levels up to 75 GWd/MTU.¹⁴ [footnote 14 text: Catawba Nuclear Station, Environmental Assessment & Finding of No Significant Impact, Federal Register Vol 75, No. 142, Docket 50-413 & 50-414; NRC-2010-0260, 7/26/10 <http://www.gpo.gov/fdsys/pkg/FR-2010-07-26/html/2010-18241.htm>.] (0756-10 [Gilmore, Donna])

Comment: The independent U.S. Nuclear Waste Technical Review Board December 2010 report, *"Evaluation of Technical Basis for Extended Dry Storage and Transportation of Used Nuclear Fuel,"*¹⁵ [footnote 15 text: U.S. Nuclear Waste Technical Review Board (NWTRB) *Evaluation of Technical Basis for Extended Dry Storage and Transportation of Used Nuclear Fuel*, December 2010 <http://bit.ly/1jfl1Sn>.] states *"Argonne scientists reported high burn-up fuels may result in fuel rods becoming more brittle over time." And "...insufficient information is available on high burnup fuels to allow reliable predictions of degradation processes during extended dry storage."* It also states *Only limited references were found on the inspection and characterization of fuel in dry storage, and they all were performed on low-burnup fuel after only 15 years or less of dry storage. Insufficient information is available on high-burnup fuels to allow reliable predictions of degradation processes during extended dry storage, and no information was found on inspections conducted on high-burnup fuels to confirm the predictions that have been made. The introduction of new cladding materials for use with high-burnup fuels has been studied primarily with respect to their reactor performance, and little information is available on the degradation of these materials that will occur during extended dry storage.* (0756-11 [Gilmore, Donna])

Comment: There is no technology to monitor conditions inside dry casks.¹⁶ [footnote 16 text: Fancy New Lids for Nuclear Waste Casks, As Contents Get Hotter, Jeff McMahon, May 2, 2013 <http://www.forbes.com/sites/jeffmcmahon/2013/05/02/fancy-new-lids-for-nuclear-waste-casks-as-contents-get-hotter/?view=pc> Division of Spent Fuel Storage and Transportation Interim Staff Guidance-24, Revision 0, *The Use of a Demonstration Program as Confirmation of Integrity for Continued Storage of High Burnup Fuel Beyond 20 Years* <http://pbadupws.nrc.gov/docs/ML1305/ML13056A516.pdf>; *Briefer on the DOE's High Burn-Up Used Fuel Demonstration Project*, John Kessler EPRI, Power Engineering 10/11/2013 <http://www.power-eng.com/articles/npi/print/volume-6/issue-5/departments/nuclear-world/briefer-on-the-doe-s-high-burn-up-used-fuel-demonstration-project.html>.] According to Argonne scientists, this requires sensors with (1) the ability to endure temperatures above 200 degrees C, (2) the ability to endure radiation levels higher than 1000 rads per hour, (3) a means of "harvesting" the energy inside the container, and (4) batteries that will power the sensors for more than 10 years, and (5), a way to wirelessly transmit the sensor data out of the cask. Statistics from the Nuclear Energy Institute (NEI): - High burnup fuel has been stored in dry casks in the U.S. since 2003 •Approximately 200 loaded-casks contain high burn-up fuel •Most fuel in pools for future loading is high burn-up.¹⁷ [footnote 17 text: Cask Storage of High Burn-up Fuel, NEI, Marc Nichol 7/25/2012 presentation Slide 3 <http://sanonofresafety.files.wordpress.com/2013/06/nei-highburnupslide2012-07-25.pdf>.] (0756-12 [Gilmore, Donna])

Comment: How can the NRC GEIS have confidence in extended storage of high burnup (>45 GWd/MTU) spent nuclear fuel (SNF) when the NRC states they have insufficient data to support dry cask licensing for more than an initial 20 years for high burnup SNF? See Division of Spent Fuel Storage and Transportation Interim Staff Guidance-24, Revision 0, *The Use of a Demonstration Program as Confirmation of Integrity for Continued Storage of High Burnup Fuel Beyond 20 Years*² [footnote 2 text: Division of Spent Fuel Storage and Transportation Interim Staff Guidance-24, Revision 0, *The Use of a Demonstration Program as Confirmation of Integrity for Continued Storage of High Burnup Fuel Beyond 20 Years*, <http://pbadupws.nrc.gov/docs/ML1305/ML13056A516.pdf>; *Status of NRC Research on High Burnup Fuel Issues* (Slide 7) Dr. Robert E. Einziger <http://1.usa.gov/15E8gX5> Hear 3/13/2013 Conference session on Storage and Transportation of High Burnup Fuel. Dr. Einziger's presentation starts at minute 39:50. <http://www.nrc.gov/public-involve/conference-symposia/ric/past/2013/docs/audio/w24.mp3>.] (0756-2 [Gilmore, Donna])

Comment: How can the NRC GEIS have confidence in extended storage of SNF when their own Interim Staff Guidance 11, rev 3, *Cladding Considerations for the Transportation and Storage of Spent Fuel* excludes approval of transportation casks for high burnup SNF (except on a case by case basis)?³ [footnote 3 text: NRC Interim Staff Guidance 11, rev 3, *Cladding Considerations for the Transportation and Storage of Spent Fuel* <http://www.nrc.gov/reading-rm/doc-collections/isg/isg-11R3.pdf>.] The fuel is over twice as radioactive as lower burnup fuel and is hotter, requiring up to a minimum 20 years cooling in spent fuel pools.⁴ [footnote 4 text: Appendix A to CoC No.1029, Technical Specifications for the Advanced Nuhoms® System (Table 2.12) <http://pbadupws.nrc.gov/docs/ML0515/ML051520131.pdf>.] The fuel is proving unstable in storage and there are no current solutions to these problems. The NRC GEIS⁵ [footnote 5 text: *NRC Draft Waste Confidence Generic Environmental Impact Statement NUREG-2157*, September 20 <http://pbadupws.nrc.gov/docs/ML1322/ML13224A106.pdf> <http://www.nrc.gov/waste/spent-fuel-storage/wcd/pub-involve.html>.] quotes one study (Pages B-13 and B-23) regarding the problems of fuel cladding embrittlement with high burnup SNF, yet ignores the potential consequences of this - shattering of the embrittled fragile fuel cladding, which could release radiation into the environment. (See Attachment A for details). (0756-3 [Gilmore, Donna])

Comment: How can the NRC GEIS have confidence in extended storage of SNF when the independent U.S. Nuclear Waste Technical Review Board (NWTRB) December 2010 report, "Evaluation of Technical Basis for Extended Dry Storage and Transportation of Used Nuclear Fuel,"⁶ [footnote 6 text: U.S. Nuclear Waste Technical Review Board (NWTRB) *Evaluation of Technical Basis for Extended Dry Storage and Transportation of Used Nuclear Fuel*, December 2010 <http://bit.ly/1jfl1Sn>] states "Argonne scientists reported high burn-up fuels may result in fuel rods becoming more brittle over time." And "...insufficient information is available on high burnup fuels to allow reliable predictions of degradation processes during extended dry storage." The NRTWB report also states: *Only limited references were found on the inspection and characterization of fuel in dry storage, and they all were performed on low-burnup fuel after only 15 years or less of dry storage. Insufficient information is available on high-burnup fuels to allow reliable predictions of degradation processes during extended dry storage, and no information was found on inspections conducted on high-burnup fuels to confirm the predictions that have been made. The introduction of new cladding materials for use with high-burnup fuels has been studied primarily with respect to their reactor performance, and little information is available on the degradation of these materials that will occur during extended dry storage.* (0756-4 [Gilmore, Donna])

Comment: Why did the NRC GEIS choose to ignore information about how the level of burnup negatively impacts extended storage in both dry casks and spent fuel pools? Most of the cases made in the GEIS are for lower burnup fuel. Information for high burnup fuel is consistently ignored or downplayed. Here is one example. See Attachment A for details on this example and other examples. In the paragraph starting on Line 22 of Page B-8, the GEIS cherry picks a paragraph of a 1998 IAEA report⁷ [footnote 7 text: IAEA-TECDOC-1012 Durability of spent nuclear fuels and facility components in wet storage, April 1998, http://www-pub.iaea.org/MTCD/Publications/PDF/te_1012_prn.pdf] and concludes "*the database for zirconium alloys supports a judgment of satisfactory wet storage in the time frame of 50 to 100 years or more.*" However, in the same paragraph of that 1998 IAEA report (Summary, Page 1), the GEIS chose to exclude this caution about high burnup fuel and details about Zircaloy cladding corrosion. *However, it is necessary to place into perspective the advancing corrosion that has occurred on Zircaloy clad uranium metal fuel from the Hanford N Reactor. The otherwise durable Zircaloy was mechanically damaged during reactor discharge, exposing uranium metal, that is vulnerable to aqueous corrosion in the temperature range encountered in wet storage environments. An additional issue involves advancing corrosion and hydriding of zirconium alloy cladding subject to extended burnup. Diminished low temperature ductility imposes the need for additional care in spent fuel handling operations to avoid any mechanical impact that may cause cladding fracture.* In addition, see attached document "*High Burnup Nuclear Fuel: No short-term storage or transport solutions*", SanOnofreSafety.org. More information is available at <http://sanonofresafety.org/nuclear-waste/>.] (0756-5 [Gilmore, Donna])

Comment: The NRC should stop approving high burnup fuel. The NRC should not approve the Waste Confidence Generic Environmental Impact Statement, since they do not have sufficient data on extended storage of high burnup to have confidence this waste can be safely stored or transported. (0756-6 [Gilmore, Donna])

Comment: The DOE and NRC should take a leadership role in finding both short and long term storage and transport solution for high burnup spent fuel, and not depend on the nuclear industry to put safety over profits. This should take priority over research for new reactors and nuclear waste reprocessing. Congress should provide adequate funding to find a solution that puts safety above industry profits. (0756-7 [Gilmore, Donna])

Comment: The Nuclear Regulatory Commission (NRC) states they have no safe short-term storage or transportation solutions for high burnup^{1,2} [footnote 1 text: Low enriched uranium (up to 5% U-235) fuel that has burned over 45 gigawatt-days per metric ton of uranium is high burnup (>45 GWd/MTU). Spent fuel assemblies with average burnups exceeding 45 GWd/MTU are only approved for transport on a case-by-case basis. NRC Spent Fuel Project Office Interim Staff Guidance - 11, Revision 3, Cladding Considerations for the Transportation and Storage of Spent Fuel, Nov 17, 2003 <http://www.nrc.gov/reading-rm/doc-collections/isg/isg-11R3.pdf>; footnote 2 text: Division of Spent Fuel Storage and Transportation Interim Staff Guidance-24, Revision 0, *The Use of a Demonstration Program as Confirmation of Integrity for Continued Storage of High Burnup Fuel Beyond 20 Years* <http://pbadupws.nrc.gov/docs/ML1305/ML13056A516.pdf>; NRC Dr. Robert E. Einziger: insufficient data to support licensing dry casks for >20 years, (slide 7) Status of NRC Research on High Burnup Fuel Issues, March 13, 2013 Regulatory Information Conference session on W24-Storage and Transportation of High Burnup Fuel. Dr. Einziger is Senior Materials Scientist, NRC Division of Spent Fuel Storage & Transportation <http://1.usa.gov/15E8gX5>, Audio of Dr. Einziger's presentation starts at minute 39:50: <http://www.nrc.gov/public-involve/conference?symposia/ric/past/2013/docs/audio/w24.mp3>.] spent nuclear fuel: •Insufficient data to approve high burnup dry cask storage for over 20 years,³ [footnote 3

text: Ibid] and •No approved transportation casks to safely move high burnup spent nuclear fuel offsite. Exceptions approved on a case-by-case basis.⁴ [footnote 4 text: NRC Spent Fuel Project Office Interim Staff Guidance - 11, Revision 3, Cladding Considerations for the Transportation and Storage of Spent Fuel, Nov 17, 2003 <http://www.nrc.gov/reading-rm/doc-collections/isg/isg-11R3.pdf>.] San Onofre⁵ [footnote 5 text: NRC Inspection Report: San Onofre Independent Spent Fuel Storage Installation (ISFSI), May 20, 2011. Attachment 2 LOADED CASKS AT THE SONGS ISFSI (last 3 pages of document). <http://pbadupws.nrc.gov/docs/ML1114/ML111430612.pdf>.] and Diablo Canyon⁶ [footnote 6 text: NRC Inspection Report: Diablo Canyon Independent Spent Fuel Storage Installation (ISFSI), May 20, 2013. Attachment 2 LOADED CASKS AT THE DIABLO CANYON POWER PLANT ISFSI (last 2 pages of document) <http://pbadupws.nrc.gov/docs/ML1314/ML13140A430.pdf>.] nuclear power plants both use high burnup fuel as do other U.S. nuclear power plants.⁷ [footnote 7 text: DOE Inventory and Description of Commercial Reactor Fuels within the United States, March 31, 2011 (Table 7) <http://sti.srs.gov/fulltext/SRNL-STI-2011-00228.pdf>.] The NRC approved high burnup fuel about 15 years ago.⁸ [footnote 8 text: GAO-12-797 SPENT NUCLEAR FUEL: Accumulating Quantities at Commercial Reactors Present Storage and Other Challenges, August 2012 <http://www.gao.gov/assets/600/593745.pdf>.] (0756-8 [Gilmore, Donna])

Comment: High burnup fuel stays in the reactor longer, thus increasing industry profits, but makes us less safe. The NRC defines "high burnup" as fuel that has burned over 45 gigawatt-days per metric ton of uranium (>45 GWd/MTU). However, according to a June 15th, 2013 Department of Energy (DOE) report, experimental data suggests fuel with burnup as low as 30 GWd/MTU shows signs of premature failure.⁹ [footnote 9 text: DOE FCRD-NFST-2013-000132, Rev. 1; Fuel Cycle Research & Development-Nuclear Fuel Storage and Transportation-2013-000132, Rev. 1, June 15, 2013 <http://www.hsd.org/?abstract&did=739345>.] (0756-9 [Gilmore, Donna])

Comment: [I believe the NRC must:] Immediately reduce spent fuel pool density to original design standards, without exemptions[.] (0757-14 [Lynch, Laura])

Comment: No state is a waste dump! We don't want any more high-level radioactive wastes coming "to or through" our states. We do not want to see more high-level, long-lived radioactive waste coming to proposed so-called "centralized interim storage" waste facilities (a.k.a., "parking lot dumps") here or anywhere else. (0757-8 [Lynch, Laura])

Comment: No state is a waste dump! We don't want any more high-level radioactive wastes coming "to or through" our state. I do not want to see more high-level, long-lived radioactive waste coming to proposed so-called "centralized interim storage" waste facilities (a.k.a., "parking lot dumps") here or anywhere else. I want to feel confident and comfortable encouraging my children to have children. I want to believe our voices will be heard. I want to believe those making these laws are awake enough to make proper decisions. I want to believe we have acknowledged how much damage we have already done to the human race and life as we've known it, and that we will stop the madness. (0763-4 [Freeman, Susan])

Comment: HIGH BURNUP FUEL - Too hot to handle[.] No short-term storage or transportation solutions for high burnup fuel waste. •The NRC and DOE are concerned with the instability of high burnup nuclear waste in both storage and transport, yet the NRC continues approving this dangerous fuel for U.S. reactors. •The NRC won't approve high burnup dry cask storage over 20 years because they have NO CONFIDENCE it can be stored longer without releasing radiation into the environment, even though it must be safely stored for tens of thousands of years. •The NRC won't approve transportation of high burnup used fuel because they have NO

CONFIDENCE it can be transported without releasing radiation into the environment. •San Onofre's high burnup used fuel is so hot and radioactive, it requires up to a MINIMUM 20 YEARS cooling in the crowded spent fuel pools, instead of the minimum 5 years for lower burnup fuel. (0764-2 [Gilmore, Donna])

Comment: As a resident of South Orange County I feel it is entirely unacceptable to store nuclear waste permanently at a facility so close to this highly populated and desirable area. A failure in the storage containers with any kind of failure in the future could produce disastrous effects to one of the most lovely areas in North America. This must not be done. (0765-1 [Tucker, Alison])

Comment: If a company undertakes to use nuclear material to produce energy it must have a SAFE method of disposing of it, not near the ocean or any other area which might affect the people and ecosystem in close proximity. The waste must be MOVED and disposed of SAFELY. (0765-2 [Tucker, Alison])

Comment: After seeing what has happened to Fukushima, it is clear that the storage of spent fuel rods within a reactor is pure folly. Actually, nuclear is pure folly, but that's for another discussion. At least for now, spent fuel needs to be put in dry cask. (0772-1 [Bogdan, Andrew])

Comment: The waste is not safe in the spent fuel pools nor far below in the ground in big amounts. (0773-2 [Dupont, Alice])

Comment: This report only reinforces the growing mistrust of nuclear regulators who would play down the risk of storing nuclear waste wherever it may be presently, apparently bending to the will of the industry they are supposed to regulate. Suggesting that we will be able to rely on unproven or non-existent technology for safe storage of nuclear waste for thousands of years puts the future of our entire nation at risk. (0774-3 [Revilla, Oscar])

Comment: Immediately reduce spent fuel pool density to original design standards, without exemptions. (0774-8 [Revilla, Oscar])

Comment: No state is a waste dump! We don't want any more high-level radioactive wastes coming "to or through" our state. The entire approach to nuclear waste endangers public and environmental health; the idea of transporting high-level, long-lived radioactive waste coming to proposed so-called "centralize interim storage" waste facilities ("parking lot dumps") is unsound. (0775-4 [Zure, Lisa])

Comment: 1) It's more costly to process and create the MOX fuel than to cask it. A study by Princeton presented April 4, 2008 to Congress estimated that processing MOX including the costs of the MOX facility and decommissioning the MOX facility is about 10 times more expensive than simply Dry Casking! 2) The MOX fuel is far more likely to explode in a Moderated Prompt Criticality. In the 1950's Argonne National Lab conducted a series of experiments that proved that even with normal nuclear fuel rods, an uncontrolled criticality could blow up the reactor. With MOX, enriched with bomb making plutonium, this type of nuclear explosion is much more likely, as occurred in Japan @ Fukushima Daiichi unit 3 which was running MOX. The amount of Uranium detected by the EPA in Saipan, Guam, Honolulu and California could only be caused by one thing...an explosion from within the reactor vessel that launched the inventory into the air. MOX is too dangerous! MOX can turn a 80 foot tall reactor with 6" steel walls into a "Canon" which can launch the entire inventory. (0778-2 [Sorgen, Phoebe])

Comment: The Dry Cask is proven technology that can be produced in the USA, creating jobs in the USA and increasing safety, all at an affordable cost, which should be covered by the utilities because they had the obligation to decommission the reactors. If necessary, the US Government could assist the utilities by providing half the cost of the cask. (0778-3 [Sorgen, Phoebe])

Comment: The Draft GEIS should also add while the NRC has experience with licensing and spent fuel storage from the 1950's, dry cask storage has not extended back that far and the technology associated with higher burn rates for fuel assemblies has changed. A Draft GEIS should specifically reference that the storage being determined by the Draft GEIS was never contemplated and therefore is unique in both analysis and application. (0783-2-3 [Harlan, Thomas])

Comment: Lastly, the repository for the spent fuel has never approved and it appears as though it never will be. The waste should be transferred to dry cask storage and moved away from this heavily populated area to a location away from the coast ASAP. Please don't allow this Southern California coastal community to live with the thread of a nuclear disaster a day longer than absolutely necessary. (0785-4 [Korsen, Alan])

Comment: There needs to be a long term storage solution or nuclear power is just an accident waiting to happen. It isn't acceptable to continue to store the spent fuel on site in either wet or dry storage. Not only is it a environmental concern, it is also a national security nightmare waiting to happen. And though these plants need a coolant to keep them from overheating, another way should be found as we risk our water supply and the associated health problems of introducing additional radioactive materials into our environment. (0786-1 [Dew, Jane])

Comment: Nuclear waste needs to be stored in an area MADE for waste storage. Leaving it in an area that is not made for storage is inexcusable. Have you imagined if a terrorist got hold of waste? Send it somewhere built out and protected. PROTECT US! (0787-1 [Iwashita, Thomas])

Comment: Immediately reduce spent fuel pool density to original design standards, without exemptions[.] (0789-3 [Salto, Don])

Comment: No state is a waste dump! I don't want any more high-level radioactive wastes coming "to or through" our state. I do not want to see more high-level, long-lived radioactive waste coming to proposed so-called "centralized interim storage" waste facilities here or anywhere else. (0791-4 [Mierzwicki, Tony])

Comment: My understanding is this high burn-up fuel is going to be stored in dry casks for decades to come at San Onofre. But this has never been done before and thus is an ongoing experiment. This puts the city at an unnecessary risk. We have opposed the presence of this plutonium generating facility since before it was ever constructed, and now we are expected to accept its waste indefinitely anyway. The land on which the plant sits is useless because of this. The risk of even a small scale hydrogen gas explosion or fire from electrolysis of any moisture that ever gains entry into the casks is unacceptable. The material needs to be placed in a safer facility a substantial distance from populated areas, a substantial distance from earthquake faults, and a substantial distance from any shoreline. (0793-2 [Sauerheber, Richard])

Comment: I am especially concerned about the proposed plan for storing nuclear waste. The high burnup fuel used at San Onofre is twice as radioactive as lower burnup fuel, and there is

no approved method for safely storing it in dry casks for more than 20 years. Nor is there any approved method for transporting it. (0796-2 [Hanna, Helen])

Comment: To allow any reactor in the US to store this waste in fuel pools is irresponsible and reckless and now is the time to force industry to deal with the waste permanently. (0798-3 [deBruler, Gregory])

Comment: The menace of enormous amounts of highly radioactive materials in insecure locations is an unacceptable risk to the United States and the entire world. If anything would cause the breakdown of the storage system, especially on the west coast of the United States, a giant swath of our country would no longer be inhabitable and millions of people would die or be severely impacted. We will lose giant acreages of agricultural land and our economy would be devastated. You must take your responsibility seriously to protect America from even a remote possibility of release of radioactive materials from our power plants. (0800-1 [Renzoni, Dante])

Comment: End the madness of the overstocked spent fuel pools. The spent fuel pools should contain only the minimum inventory required for safe operation of the NPP, plus the inventory that is less than 5 years old and is too hot to remove. This should be made an operating requirement. (0801-5 [Magyar, Michael])

Comment: Require that the spent fuel pool situation begin improving immediately. Regulate the industry so that any refueling activity must result in a net improvement of the situation. Require that for each kilogram of new fuel delivered to the NPP site, 2 kilograms of spent fuel must be taken out of the spent fuel pool and put in dry cask storage. (0801-6 [Magyar, Michael])

Comment: First, NextEra believes that its strong record of safely storing spent nuclear fuel, along with that of the rest of the nuclear industry, is compelling evidence that spent fuel can and will be stored safely and securely in the period following a reactor's period of licensed operations. The NRC's proposed TSR revision accurately reflects this high level of assurance in its finding that it is "feasible to safely store spent nuclear fuel following the licensed life for operation of a reactor." (0808-1 [Petro, James])

Comment: I am writing to support the NRC's Spent Fuel Storage Rule, and wish to say that with NRC oversight PG&E has a very particular and successful spent fuel management program. PG&E continues to safely store fuel via both its wet and dry cask storage systems. I am confident that regulations of safeguards are in place to effectively manage and monitor the stored spent fuel. (0812-1 [Souza, Celine])

Comment: First, it [spent fuel] should be passively safe. The waste should remain safe without relying on electricity, cooling water or a human crew. This does not apply to continued storage in spent fuel pools, which require a continuous flow of cooling water and other active maintenance. (0815-4 [Gunter, Keith] [Izant, Carol])

Comment: Third, the waste should be decentralized; that is, stored on the sites of nuclear plants, not at a centralized facility, and dispersed around each reactor site if possible. (0815-6 [Gunter, Keith] [Izant, Carol])

Comment: Despite NRC's assurances that dry cask storage is safe for up to 100 years, problems began surfacing almost immediately with dry casks. The NRC allowed manufacturers to build casks before issuing a certificate of compliance. There have been numerous quality control and quality assurance problems as well as documented departures from design and

technical specifications, use of potentially inferior materials, structural integrity issues, weld failures, problems with the concrete pads, themselves, and their location on unstable, sandy, erosion-prone soils etc. etc.. Perhaps the most serious and disturbing issues have involved the "hydrogen ignition incidents" (explosions) and problems with the VSC-24 casks. Here in Ohio at Davis Besse, fully loaded NUHOMS casks were built below technical specifications with poor quality aggregate in the outer concrete shells, and the shells, themselves, were ground too thin. At the Surry plant in Virginia, a loaded Transnuclear TN-32 cask developed six inch long cracks in its outer concrete shield, loose bolts, and a helium leak. (0819-12 [Kline, Connie])

Comment: If an arid, unpopulated, desert location like Yucca Mountain is unsuitable for permanent disposal of reactor spent fuel, how can reactors that don't meet the siting requirements for LLRW disposal because they are located on potable and environmentally sensitive bodies of water, on high groundwater tables, in seismic and geologically unstable areas subject to erosion, flooding, earthquakes etc. possibly be considered as permanent spent fuel repositories??? Let's be realistic here for a moment. These are the least suitable sites for nuclear power plants PERIOD! Only the NRC's faulty, illogical, circular reasoning could conclude, based on unsubstantiated assumptions, that it is perfectly acceptable to leave spent fuel permanently in defacto dumps on reactor sites. (0819-22 [Kline, Connie])

Comment: This problem will only worsen with the increased use of high burn-up fuel and the continued corrosion and disintegration of pipes, unless the NRC orders every reactor to locate and replace the miles-long maze of buried, leaking pipes so they can be inspected and monitored, and contamination can be contained. (0819-9 [Kline, Connie])

Comment: The refusal of the NRC to require existing wet pool storage to be returned to design level densities destroys the credibility of the DGEIS as recognizing an immediate safety concern that must be solved to allow continued operation of some reactor designs. (0821-7 [Paddock, Brian])

Comment: Now are you going to be part of the problem that continues or are you going to be part of the solution that says no more! We can no longer afford to utilize this Nuclear Waste and we certainly can not afford to store it because there is no man made container that can isolate and keep any isotope from doing harm. Since the containers will eventually leak there WILL BE MORE HARM and instead of continuing in such way I use my vote to find another better way! (0822-2 [Soldier, Wolf])

Comment: The French tout their ability to recycle their nuclear waste, but only 1% can be reprocessed into plutonium (MOX) fuel, per Sierra Club, John Muir Chapter's *Nuclear Energy: A Bad Bargain for Wisconsin*, 2013. MOX fuel is the most dangerous and the most insidious ionizing isotopes with the greatest safety problems and with the longest lifespans. (0823-15 [Michetti, Susan])

Comment: Reactor owners have increased the risk of serious environmental threat by using high-density storage racks in fuel pools. Decreasing the risk of environmental threat requires decreasing the fuel density stored in pools. Spent fuel in high density pools is accumulating dangerously at every nuclear power plant site in the USA. Such waste pools pose a serious risk of catastrophic fire. It is irrational to continue this practice after the Fukushima catastrophic fires that continue to rage out-of-control for nearly three years now. Pertinent to safety of on-site storage pools, unacceptable safety problems exist during plant operation and generation of the fuel waste with insufficient oversight and enforcement. Natural earthquakes, volcano eruptions, tsunamis, hurricanes, tornados, and high winds are points of vulnerability that can damage

nuclear plant facilities or take down the electric grid upon which these nuclear reactors and fuel pools depend to prevent threats to the public. It is insufficient for the NRC to claim that these dangerous high density stacked fuel pools, which, in turn, require continual energy to cool, are being permitted to continue for 60 years after the operation ends, without scientific proof that they will be ever be safe during this period as well as throughout their cumulative half-lives life spans that far exceed this arbitrary time period. (0823-31 [Michetti, Susan])

Comment: Keep it in the place where it was generated and have the companies who make it pay for the sequestering of it for the thousands of years it will be toxic. (0824-3 [Ingram, Gwen])

Comment: The surrounding community should not be forced to live with another 50 years of spent nuclear fuel residing in pools because the owner/operator sees a centralized high level waste facility being built 50 years from now averting the costs associated with building dry cask storage systems. The suggestion is to make the owner/operator transfer all the spent fuel on site into dry casks before the owner/operator gains access to decommissioning funds will reduce the surrounding community's exposure to a potential catastrophic nuclear accident. Its bad enough to have to impact the surrounding community with on-site dry cask storage for up to 200+ years but to allow the plant owner to keep spent fuel pools operational for half a century in a speculative venture is not fair to the surrounding community and has national security risks. The NRC must not allow the spent fuel pools to become part of the owner/operator's short-term (60 year) spent fuel storage strategy. (0826-18 [Morgal, Rick])

Comment: The operation of the nation's nuclear power plants has evolved over the last fifty years. Initially, a reactor's spent fuel pool was designed and built to hold a single core's worth of spent nuclear fuel with the stated operational procedure involving the removal of the spent fuel core before the next core was depleted. Historically this rarely, if ever, happened due to the US nuclear industry's inability to determine how to manage spent fuel. Now these same spent fuel pools, built years ago, have new racks allowing them to hold six to eight times as much nuclear waste as initially designed to hold. A typical spent fuel pool in the US holds more than one million of pounds of spent fuel. These pools must actively water-cool their contents to prevent the nuclear fuel from spontaneously combusting when in prolonged contact with air. The above-described incremental changes in the nation's nuclear spent fuel management policies negatively impact communities near nuclear power plants by significantly increasing the quantities of spent nuclear fuel stored at each nuclear power plant site. (0826-7 [Morgal, Rick])

Comment: NEI also agrees with NRC's statement that the current regulatory framework is adequate for multiple cask renewal periods.⁴⁷ [footnote 47 text: 78 Fed. Reg. at 56,782.] In accordance with this framework, industry has conducted and will continue to conduct confirmatory studies as necessary to support future license renewals so that existing casks may remain in service for as long as needed - even if their use extends to hundreds of years. Examples of these studies include the Idaho National Laboratory Dry Storage Characterization Project completed in 2001,⁴⁸ [footnote 48 text: "Dry Storage Characterization Project - Phase I: CASTOR V/21 Cask Opening and Examination," INEEL/EXT-0100183, August 2001.] ongoing canister inspections being conducted by EPRI at a number of sites,⁴⁹ [footnote 49 text: Regulatory Issue Resolution Protocol Screening Form and Resolution Plan for Chloride-Induced Stress Corrosion Cracking (RIRP-N-10-01), May 31, 2013.] and the ongoing DOE/EPRI High Burn-up Dry Storage Cask Research and Development Project.⁵⁰ [footnote 50 text: DOE Contract No. DE-NE-0000593, April 16, 2013.] Dry storage casks are robust concrete and steel structures with no moving parts. Multiple barriers provide defense-in-depth protection. Over 100 tons of concrete and steel forms a precisely engineered structure to protect every 10 tons of spent fuel. Over the last 30 years the nuclear industry has safely loaded over 1700 dry cask

storage systems. All of these systems are still in service today and there has been no release of their radioactive contents. As long as these systems continue to be licensed for storage, their owners will continue to meet NRC requirements by following strict aging management plans. (0827-2-3 [Ginsberg, Ellen])

Comment: The GEIS appropriately addresses concerns being raised by staff about the integrity of high burnup fuel in storage as an example of the diligence in assuring long-term safety that is inherent in the regulatory process. The significant efforts that industry has already taken, and is continuing to take, to address these concerns should also be mentioned. Specifically, NEI's March 22 letter to NRC (*Industry Analysis and Confirmatory Information Gathering Program to Support the Long-Term Storage of High Burnup Fuel*, ML13084A045), information provided by Calvert Cliffs and Prairie Island in support of their ISFSI license renewal applications, and the joint DOE/EPRI High Burn-up Dry Storage Cask Research and Development Project (DOE Contract No.: DE-NE-0000593) should be referenced. The body of work contained in these references rules out gross degradation of high burnup fuel (HBF) cladding⁹⁰ [footnote 90 text: Electric Power Research Institute, *R&D Insights and Perspectives on Storage and Transportation of High Burnup Fuel*, Albert J. Machiels, presentation to RIC 2013, March 13, 2013.] and provides significant technical basis for the further evaluation of cladding performance over time. The DOE demonstration program is intended to gather confirmatory data on actual high burnup fuel in storage in support of this evaluation. Industry is committed to continually apply the results of ongoing scientific programs such as this to further assure the safety of high burnup fuel in storage and transportation, through aging management programs that support the renewal of storage system licenses. For example, in response to NRC questions asked as part of the license renewal process for the ISFSI at the Calvert Cliffs site, Constellation Energy outlined a two-pronged approach to long term storage of HBF. This approach consisted of an aging management program involving the aforementioned DOE demonstration program and documentation of the "substantial" safety margin that exists to assure *that fuel currently in storage is at low risk of suffering from the aging mechanisms associated with HBF during the additional time that will be required for the DOE program to conduct the first HBF inspection."⁹¹ [footnote 91 text: Calvert Cliffs Nuclear Plant, *Response to Request for Additional Information, RE: Calvert Cliffs Independent Spent Fuel Storage Installation License Renewal Application*, Material License No. SNM-2505, Docket 72-8, Letter Gellrich to NRC Document Control Desk, April 24, 2013.] (0827-3-7 [Ginsberg, Ellen])

Comment: NRC should add a discussion of the lessons learned from the March 2011 events at Fukushima Daiichi regarding the robustness of spent fuel in storage. Due to the fact that there were rumors about the condition of spent fuel at the Fukushima site during the event that later proved to be false, there is considerable misunderstanding on this topic. This continuing misunderstanding was evident in a number of statements made at the public meetings held during the comment period. On the day the earthquake and tsunami struck Japan, there were 10,149 spent fuel assemblies at the Daiichi site in seven pools and nine dry casks.⁹² [footnote 92 text: Tokyo Electric Power Company, *Operating Experience in Spent Fuel Storage Casks*, IAEA-CN-178/KN27 June 3, 2010.] All of these pools were subject to the full force of the earthquake and three of them were inside buildings that were catastrophically damaged by hydrogen explosions associated with the reactor accidents. The dry casks were also over-washed by the tsunami. Yet, observations conducted since the accident consistently confirm that the stored spent fuel was largely unaffected by these occurrences and is still safely containing its radioactive inventory. The spent fuel that was of greatest concern during the accident, which was contained in the Unit 4 pool, remains in good condition and is suitable for handling using normal means. Accordingly, it is now being transferred out of the badly damaged building into another pool on site. The manner in which spent fuel withstood the effects of that

tragic accident is perhaps the most dramatic evidence yet of the robust safety assurance provided by the spent fuel pool and dry cask storage. (0827-3-8 [Ginsberg, Ellen])

Comment: The SOC should continue to express reasonable assurance that safe disposal of high-level radioactive waste and spent nuclear fuel in a mined geologic repository is technically feasible. This conclusion tracks to prior Finding 1 and is supported by the prior WCDs. As stated in the SOC for the proposed rule, no new information challenges this conclusion. Although NEI's recommended rule language would state the Commission's reasonable assurance that a repository can be available "when necessary," the SOC (and draft GEIS) should continue to express the Commission's conclusion that it is reasonable to assume that a mined geologic repository will be available within 60 years beyond the licensed life for operating and planned new reactors.¹¹⁶ [footnote 116 text: The record supports the Commission's belief that the availability of a geologic repository within this timeframe is very likely. However, as discussed above, given the societal and political uncertainties surrounding the establishment of a repository, the rule would express the Commission's reasonable assurance that a mined geologic repository can be available when necessary.] This conclusion tracks to prior Finding 2 and is supported by international and national experience that the time period needed to develop a repository is approximately 25-35 years. (0827-6-4 [Ginsberg, Ellen])

Comment: The SOC for the rule should also clearly articulate the basis for the Commission's conclusion of reasonable assurance that spent fuel can continue to be safely managed in spent fuel pools and dry casks until a geologic repository is available. This basis includes technical studies and industry experience to date. The SOC could additionally acknowledge - as it does currently - that regulatory oversight further ensures that aging management programs continue to be updated to address the monitoring and maintenance of structures, systems, and components that are important to safety. This conclusion tracks to prior Finding 3. (0827-6-5 [Ginsberg, Ellen])

Comment: RULE Discussion, C.3.a, 56795, Col. 3: NRC appropriately addresses concerns being raised by staff about Stress Corrosion Cracking (SCC) of dry storage canisters, citing the manner in which these concerns are being resolved as an example of how the regulatory process responds to changes and new information. The significant efforts that industry has already taken, and is continuing to take, to address this concern and assure the longevity of these canisters should also be mentioned. Specifically, actions being taken in accordance with Regulatory Issue Resolution Protocol N-10-01¹¹⁹ [footnote 119 text: "Regulatory Issue Resolution Protocol Screening Form and Resolution Plan for Chloride-Induced Stress Corrosion Cracking (RIRP-N-10-01)," Letter from R. McCullum (NEI) to D. Pstrack (NRC), May 31, 2013.], information provided by Calvert Cliffs in support of their ISFSI license renewal application, and EPRI's comprehensive Failure Modes and Effects Analysis effort should be referenced. (0827-7-20 [Ginsberg, Ellen])

Comment: Each State needs to take care of their own nuclear waste. Don't send it to other states! (0830-1 [Sanders, John])

Comment: We shouldn't storage high radioactive spent fuels at San Onofre Nuclear Generating station. It is within such high density populated areas in Southern California. Also, it's within Tsunami zone and San Andreal fault near by. California is a earthquake state. (0831-1 [Collins, Yoko])

Comment: I've seen what happened at reactor #4 at Fukushima Daiichi nuclear power plant where had spent fuel cooling pool and the building had exploded 2 years and 9 months ago.

We, public know about its danger, even just storing high radioactive nuclear fuels. We can't take a chance. We need to remove the spent fuels from the SONGS as soon as possible. We can't wait 20 or more years to remove them. (0831-2 [Collins, Yoko])

Comment: Vitrification only lasts 100 years in most cases and when it breaks down all the waste will pool together and perhaps achieve criticality. (0834-2 [Thabit, Nick])

Comment: The recently proposed "temporary" waste storage sites will become permanent, once the waste is sited there; no one will have the political leverage to get it moving again, once all the construction and transportation contracts are fulfilled. (0834-4 [Thabit, Nick])

Comment: It is a good point, what is the difference between a deep geologic repository and the NWOs that you propose to scatter around the country? Is there a reason the experts have pushed for a site like Yucca Mountain and have not proposed leaving it in casks, exposed to the elements and wartime or terrorist attack? Of course there is, but if you use the logic of this GEIS, the fuel will never be moved to such a repository, because you say that there is no problem with leaving it where it is. YOUR DOCUMENT MUST REVEAL THESE DANGERS! (0836-21 [Davis, Anonymous])

Comment: There is not any viable solution for the Standard Spent Fuel and the High Burnup Nuclear Fuel is much more dangerous. (0836-3 [Davis, Anonymous])

Comment: The independent U.S. Nuclear Waste Technical Review Board December 2010 report, "Evaluation of Technical Basis for Extended Dry Storage and Transportation of Used Nuclear Fuel,"15 states "Argonne scientists reported high burn-up fuels may result in fuel rods becoming more brittle over time." And "...insufficient information is available on high burnup fuels to allow reliable predictions of degradation processes during extended dry storage." It also states Only limited references were found on the inspection and characterization of fuel in dry storage, and they all were performed on low-burnup fuel after only 15 years or less of dry storage. Insufficient information is available on high-burnup fuels to allow reliable predictions of degradation processes during extended dry storage, and no information was found on inspections conducted on high-burnup fuels to confirm the predictions that have been made. The introduction of new cladding materials for use with high-burnup fuels has been studied primarily with respect to their reactor performance, and little information is available on the degradation of these materials that will occur during extended dry storage. There is no technology to monitor conditions inside dry casks. According to Argonne scientists, this requires sensors with (1) the ability to endure temperatures above 200 degrees C, (2) the ability to endure radiation levels higher than 1000 rads per hour, (3) a means of "harvesting" the energy inside the container, and (4) batteries that will power the sensors for more than 10 years, and (5), a way to wirelessly transmit the sensor data out of the cask. (0836-4 [Davis, Anonymous])

Comment: Page 2-26, Lines 32+, you consider "aging effects" and list a few that are related only to the canisters, casks, and overpacking, but not the aging of the fuel assemblies and fuel contained by them. The use of "high burnup fuel" is extremely prevalent and the implications in terms of aging are really unknown. This is yet another example of a pesky "issue that requires resolution"... we really don't know what will happen to the fuel assemblies after 100 years (or even 20 years) of containment in a ISFSI, but they certainly must be contained in your list of aging issues. (0836-44 [Davis, Anonymous])

Comment: We must continue to point out that a NWO DOES DIFFER from a deep geologic repository. YOU NEED TO DESCRIBE THAT DIFFERENCE AND BE HONEST ABOUT THE RISKS! (0836-48 [Davis, Anonymous])

Comment: The document sidesteps the key issue... These NWOs are not as safe as a deep geologic repository due to the obvious risk of terrorist or wartime attack. THIS ISSUE CANNOT BE LEFT OUT! And if you are honest, you will decide that there is no way we can continue to license new plants and extend the licenses of old plants, particularly those with Mark-I containments, which have fuel pools above grade and much easier to attack and cause a problem than one that is built at ground level. (0836-68 [Davis, Anonymous])

Comment: The DOE and NRC should take a leadership role in finding both short and long term storage and transport solution for high burnup spent fuel, and not depend on the nuclear industry to put safety over profits. This should take priority over research for new reactors and nuclear waste reprocessing. Congress should provide adequate funding to find a solution that puts safety above industry profits. (0836-7 [Davis, Anonymous])

Comment: We do not know how to contain nuclear waste. We do not know how to store it so it does not harm our natural environment because every environment we put it into it irreparably alters and changes that environment. Let's be responsible with that knowledge first and foremost, before we listen to all the great projects coming down the pike. Thank you for being super smart, responsible people of the highest ethical calling and let's do this right. (0838-9 [Clermont, Elaine])

Comment: NRC's Waste Confidence policy assumes that all nuclear waste is homogeneous. The reality is that the use of MOX and high burn-up fuels are more radioactive, dangerous, thermally hot, and difficult to store and transport safely. These realities do nothing less than undermine confidence that waste can be safely handled and stored. (0840-4 [Taylor, Tom])

Comment: No state is a waste dump! We don't want any more high-level radioactive wastes coming "to or through" our state. We do not wish to share our highways, roadways and oceans with nuclear waste. Storing it in hospital basements and on the edge of small towns is terrible. The entire approach to nuclear waste endangers public and environmental health; the idea of transporting high-level, long-lived radioactive waste coming to proposed so-called "centralize interim storage" waste facilities ("parking lot dumps") is unsound. (0844-4 [Anonymous, Anonymous])

Comment: In 2012, the National Academy of Sciences raised concern about the increasing use of high-burnup fuels currently being discharged because of reduced cladding integrity.⁶ [footnote 6 text: National Academy of Engineering, Managing Nuclear Waste, Summer 2012, pp 21, 30. <http://www.nae.edu/File.aspx?id=60739>] This complicates storage and transport, as does aging. And it is not the NRC's or the nuclear industry's problem because the ownership of the fuel is transferred to the DOE and will be funded by taxpayers. (0851-8 [Thatcher, Tami])

Comment: A consolidated interim storage just requires "concrete, steel and fences" according to some nuclear boosters. But even predominantly Republican Utah would not accept an interim spent fuel storage facility in their state despite one being licensed by the Nuclear Regulatory Commission in Skull Valley. And symbolically, the DOE's Citizens Advisory Board at the Savannah River Site in South Carolina recently voted against being a potential interim storage site, fearing their site could become the permanent home for the waste.⁷ [footnote 7 text: "Advisory panel votes not to store nuclear waste at Savannah River Site"]

<http://www.timesfreepress.com/news/2013/jul/24/advisory-panel-votes-not-store-nuclear-waste-savan/> and more discussion at <http://www.nukewatch.org/media2/postData.php?id=2873>] (0851-9 [Thatcher, Tami])

Comment: I oppose any plan for transportation and/or "temporary storage" of existing nuclear waste. We do not at this time have -- or reasonably foresee -- any technology to make transport or storage safe. We do know that moving nuclear waste through an area, and siting it in an area, will inflict life-destroying damage that is for all intents and purposes permanent. (0852-1 [Ein, Mark])

Comment: My family lives in San Clemente, California, approximately 6 miles from the San Onofre Nuclear Generating Station. I am writing to thank you for shutting down the nuclear plant, and to implore you to move the tons of radioactive waste accumulating on site to a safer location far from population centers. (0855-1 [Holloway, Patricia])

Comment: Immediately reduce spent fuel pool density to original design standards, without exemptions (0860-8 [Headrick, Gary])

Comment: NRC proposed plans call for the movement of spent nuclear fuel to dry cask storage systems (DCSS) if storage is necessary for more than 60 years after the end of operating licenses. The long term safety and security of DCSS is therefore essential to the proposed rule system update. The response of new or mildly aged dry casks to a wide range of external events is very well understood^{3, 4}, [footnote 3 text: United States Nuclear Waste Technical Review Board. *Evaluation of the Technical Basis for the Extended Dry Storage and Transportation of Used Nuclear Fuel*. (December 2010) Retrieved from <http://www.nwtrb.gov/reports/eds-final.pdf>] [footnote 4 text: Saegusa, Toshiaki et al. *Experimental Studies on Safety of Dry Cask Storage Technology of Spent Fuel: Allowable Temperature of Cladding and Integrity of Cask under Accidents*. (March 1996)] and the best available technical analysis and experimental evidence indicate that continued storage of spent nuclear fuel can be made acceptably safe by use of dry cask storage systems and appropriate schedules of inspection, repair, and replacement (SIRR)⁵ [footnote 5 text: American Physical Society Nuclear Energy Study Group. *Consolidated Interim Storage of Spent Nuclear Fuel*. (February 2007) Retrieved from <http://www.aps.org/policy/reports/popa-reports/upload/Energy-2007-ReportInterimStorage.pdf>]. The proposed NRC updates accurately reflect this technical consensus that dry cask storage systems can be used to safely store spent nuclear fuel. (0863-3 [Brinton, Samuel] [Curtis, Daniel])

Comment: Many uncertainties in the analysis of dry cask aging and lifetimes remain poorly quantified. The uncertainty on the overall safe lifetime of DCSS in different environments, or with different levels of stored fuel burnup, requires additional research to more effectively quantify. This research could make substantial strides in the short term, given currently available experimental results, technical analysis, and performance data. The results could be used to establish appropriate margins for schedules of inspection, repair, and replacement with greater confidence. Ongoing research is necessary to analyze dry cask system performance data over time and reduce the uncertainties described above. The Nuclear Waste Technical Review Board has already called for similar research in their recent technical basis evaluation³. [footnote 3 text: United States Nuclear Waste Technical Review Board. *Evaluation of the Technical Basis for the Extended Dry Storage and Transportation of Used Nuclear Fuel*. (December 2010) Retrieved from <http://www.nwtrb.gov/reports/eds-final.pdf>] (0863-6 [Brinton, Samuel] [Curtis, Daniel])

Comment: And finally, ongoing research is needed to quantify and reduce the uncertainties associated with the lifetimes of dry cask storage systems. (0863-9 [Brinton, Samuel] [Curtis, Daniel])

Comment: As we saw at Fukushima, the dry casks survived-they did not explode, burn, or leak as the fuel pools did. In addition, dry casks do not need a continual inflow of liquid to prevent further destruction; they are instead passively cooled by airflow. (0864-10 [Gellert, Sally Jane])

Comment: In addition, new technologies create new risks; for the past 16 years you have allowed "high-burn-up fuel", which burns longer and hotter in the reactor; when removed, this fuel needs up to twice as long in cooling pools as well as more space between fuel rods in the already-crowded pool. When a colleague asked about the percentage of high-burn-up fuel at Indian Point, it was suggested to her that that information might not be released for reasons of "national security". However, local security must also be considered: without enough of an estimate to understand whether the irradiated fuel rods are being stored safely, I am concerned that Woodcliff Lake and the area surrounding Indian Point and other reactors are even more at risk than they inherently are simply because of the nuclear reactors. I therefore request that this information be made public and that priority be given to ensuring that neighbors of these installations have all the information we need to ensure that all that can be done to protect our health and property is in fact being done. (0864-5 [Gellert, Sally Jane])

Comment: There is currently not a realistic plan for centralized national storage, and I would prefer to see efforts being spent not on trying to create one, but instead on providing the safest possible storage on site at reactors across the country. I realize that this means permanent storage of Indian Point waste less than 50 miles from my home, but that is a consequence of decisions made that cannot be reversed. (0864-7 [Gellert, Sally Jane])

Comment: Spent fuel is currently eligible to be removed from a fuel pool and moved into dry storage after five years. The NRC here assumes that there will be money, equipment, available expertise and an ISFSI capable of handling the waste. Additionally, the NRC assumes waste can be safely held in the fuel pool for 55 years. The reality is that fuel pools are filling or full to capacity and everyday operations create more and more inventory that must be addressed in the near future. (0867-2-6 [Griffin, William])

Comment: The DGEIS assumes that spent fuel remains intact as time passes. This may not be the case. Recent work prepared by the Pacific Northwest Laboratory (PNL) indicates that the properties of spent nuclear fuel are not well understood at the current levels of burnup (exceeding 45 gigawatt-days per metric ton of uranium [GWd/MTU]). The report concluded that: "Because limited information is available on the properties of high burnup fuel, and because much of the fuel currently discharged from today's reactors exceeds this burnup threshold, a particular emphasis of this program is on high burnup fuels assumptions that are not appropriate for generic appraisal" (PNL p. viii). The fuel being discharged from operating nuclear power plants has properties that are not currently well understood. It is not clear that the NRC has a basis for making future projections about the indefinite handling of spent nuclear fuel, given the absence of reliable technical information. (0867-3-14 [Griffin, William])

Comment: The proposed interim storage sites until a final solution is found makes no sense either. It would just double the shipments and exposure to accidents. This temporary solution would also take decades to implement. Keeping the waste on site in dry casks also is not a good solution but seems the best alternative for now to moving the waste multiple times. (0883-2 [McArdle, Ed])

Comment: Of course, some sites are not appropriate for cask storage such as the Palisades nuclear station where they are placed on unstable sand dunes. It should be realized that there is a special problem at Fermi 2. They are unable to transfer the radiated waste from the fuel pools to casks because of defects in the original construction. (0883-4 [McArdle, Ed])

Comment: Meanwhile, the NRC continues to allow waste to be stored in the fuel pools way beyond the design capacity. There is now over 620 tons of the most dangerous substances on earth stored in a pool five stories above. This is more irradiated fuel there than all the Fukushimas put together. (0883-5 [McArdle, Ed])

Comment: The author attached the following reports she referred to in the 00328-14 Minnetonka transcript: McKinnon, M.A. 1995. "Spent Fuel Integrity During Dry Storage." PNL-SA-25969, Pacific Northwest Laboratory, Richland, WA. Nuclear Regulatory Commission. 2013. "Premature Degradation of Spent Fuel Storage Cask Structures and Components from Environmental Moisture." NRC Information Notice 2013-07, Washington, D.C. Available at <http://pbadupws.nrc.gov/docs/ML1232/ML12320A697.pdf>. And 2 Idaho National Environmental Laboratory reports concerning a stuck fuel assembly: "Experiences in Transfer of Canisters from the TN-24P Cask to the VEC-17 Concrete Cask" (1990); (unreadable microfiche). "Evaluation of Options, Associated Costs, and Recommendations for (A) The "Stuck" Fuel Canister in the TN-24P Cask (B) Related Cask Move Operations, and (C) Resolution of VSC-17 Pressure Behavior" (1990); (unreadable microfiche). (0884-1 [Overland, Carol])

Comment: I am writing to support the NRC's Spent Fuel Storage Rule. In my view, with NRC oversight, PG&E has a very detailed and successful spent fuel management program for its Diablo Canyon nuclear power plant (Diablo). PG&E continues to safely store fuel via both its wet and dry cask storage systems. Without the federal government providing a permanent geologic storage facility, as required by law, PG&E has designed and implemented an interim, on-site system for the interim storage of the spent fuel assemblies. After removal from the reactors, the used fuel is placed in storage pools to cool for approximately five (5) years. After sufficient cooling, the used fuel assemblies are placed in sealed, Helium-filled canister and set inside a 20 foot tall, concrete-filled, steel storage cask. The storage casks are stored in a secure protected area proximate to the plant. Unlike other nuclear plants, the casks in the storage area are bolted to a seven and-a-half-foot thick steel-reinforced concrete pad to ensure it is seismically stable. This system has proved safe and effective. There is no reason to believe that this interim storage system would not remain viable after the Diablo plant's licensing period. I am confident that layer upon layer of safeguards are in place to effectively manage and monitor the stored spent fuel. (0885-1 [Anderson, Cody])

Comment: I am writing to support the NRC's Spent Fuel Storage Rule. PG&E has been a vital and crucial part of the community here on the Central Coast of California for decades with an impeccable safety record. I believe that with NRC oversight PG&E has a very detailed and successful spent fuel management program that continues to safely store fuel via both its wet and dry cask storage systems. I am confident that with multiple layers of safeguards in place stored spent fuel is being handled in a safe manner. (0886-1 [Lind, Jeff])

Comment: In fact, the DGEIS flouts both NEPA and the Court's application of NEPA in *New York*, 681 F.3d 481 (D.C. Cir. 2012) in multiple ways: The DGEIS' analysis of the environmental impacts of extended spent fuel storage ignores the fact that NRC knows very little about the behavior of spent fuel in long-term or indefinite storage conditions, especially the potentially significant effects of long-term dry cask storage on high burnup fuel integrity. In violation of

NEPA, the NRC makes no attempt to quantify these uncertainties. (0897-1-9 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: It will take a long time, potentially well over a decade, to collect the data needed to make scientifically valid impact analyses for high burnup fuel stored for long periods. Necessary research tasks include development of a sound database for a scientifically valid evaluation of the environmental impacts of prolonged storage of spent fuel, including high burnup spent fuel up to 62.5 GWd/MTU and MOX spent fuel. In addition, there are essentially no data available for high burnup spent fuel that has been stored in dry casks for extended periods of time. The deficiencies in the NRC's understanding of spent fuel characteristics and behavior under long-term storage conditions are further addressed in the attached declaration of Dr. Arjun Makhijani, pars. 4.1-4.35. (0897-2-20 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In his declaration, Dr. Makhijani lists a number of spent fuel degradation phenomena that could affect the safety of spent fuel during long-term storage. Safety parameters that could be compromised include confinement, criticality, retrievability, shielding, structural, and thermal. Makhijani Declaration, par. 4.18. Impacts of spent fuel degradation could be serious enough to result in environmental releases during spent fuel inter-cask transfer and could result in more severe impacts in cases of accidents. *Id.* For instance, little is known about the extent to which microbiologically induced corrosion could corrode seals and/or the cask body that affect containment. Laboratory work and examination of spent fuel of different levels of burnup stored for long periods in spent fuel pools followed by long-term storage in dry casks is needed. Makhijani Declaration, par. 4.19. Other phenomena that may cause degradation include stress corrosion cracking, delayed hydride cracking, and low temperature creep. The NRC Draft Report on Technical Information Needs notes that "All three mechanisms depend on a source of stress that would come from pellet swelling. If the stress is not present, the mechanisms become benign. If operative, these mechanisms could increase the source term and increase cladding stress. The latter could affect containment, especially if other degradation processes have compromised the canister." Makhijani Declaration (quoting Draft Report at 6-2). In other words, the NRC does not know at present whether corrosion of seals or the canister body may occur to an extent that compromises containment. Damage to canisters could set the stage for severe releases either during inter-cask transfer or because the canister itself degrades. Makhijani Declaration, par. 4.20. (0897-4-10 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Dr. Makhijani also observes that high burnup fuels tend to build up much thicker levels of oxide during the in-reactor period as well as much higher levels of hydrogen in the cladding. Figure 2 of Dr. Makhijani's declaration shows that the typical increase in outer oxide layer thickness increases from about 20 microns at 30 GWd/MTU to about 100 microns at about 62 or 63 GWd/MTU at discharge from the reactor. Moreover, the spread in the oxide layer thickness increases with burnup, indicating that some fraction of fuel rods may be at a much greater risk of failure. Makhijani Declaration par. 4.21 (citing NWTRB 2010, Figure 20). (0897-4-11 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The NWTRB has issued the following caution about prolonged spent fuel pool storage: Cladding may already have some small defects like tiny holes or hairline cracks, internal and external corrosion that has decreased the original metal wall-thickness, absorbed hydrogen, and hydride precipitation; however, it is very rare that new defects are detected while in the pool. Significant cladding defects can be detected during wet storage by monitoring stack off-gas for fission product gas leaks; if leaks are found, then assemblies are further inspected and breached fuel-rods are canned if necessary. Generally, a visual inspection is made of

assemblies to identify fuel assemblies that may need to be classified as damaged and require special handling. If the cladding is functionally undamaged, there is an insignificant risk of expected fuel oxidation [at the time of transfer to dry storage]. Given undamaged cladding and the visible transfer of assemblies into and out of wet storage, the fuel-assembly containment criterion is deemed satisfied. Thus, during wet pool storage, used fuel is not expected to experience significant deterioration before dry storage. *If pool storage of fuel is continued for an extended period, it will be necessary to assess and evaluate the effects on intact or damaged fuel.*⁸ [footnote 8 text: NWTRB 2010, p. 60, italics in the original.] Makhijani Declaration, par. 4.23 (citing NWTRB 2010, p. 60). Although the DGEIS assumes that pool storage could continue for periods approaching 140 years (the first spent fuel discharged during 80 years of licensed operation, plus 60 years of post-operating license storage), it has not included any uncertainty analysis relating to impacts of damage that may occur in some fraction of the spent fuel during such prolonged storage. *Id.* (0897-4-12 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The NWTRB has identified hydriding, creep and stress corrosion cracking to be “[t]he most significant potential degradation mechanisms affecting the fuel cladding during extended storage.” Makhijani Declaration, par. 4.25 (quoting NWTRB 2010, p. 10). These phenomena can lead to “failed fuel” under certain conditions. Fuel failure occurs when there is a rupture in the fuel cladding, allowing fuel pellets direct contact with the environment around the fuel, the reactor coolant, spent fuel pool water, the canister environment, or the general environment during inter-cask transfer of failed fuel. If detected during cask loading, failed fuel is normally put in a “can,” which is a special sleeve, prior to loading into the cask. But if failure occurs after dry storage commences, some fuel pellets could be exposed to the environment during transfer. The NRC has refused to state how it would transfer failed spent fuel. It plans to figure it out when the problem arises. Makhijani Declaration, par. 4.24. The DGEIS concludes that the phenomena leading to failed fuel (*i.e.*, hydriding, creep and stress corrosion cracking) are unlikely to cause significant problems in the “short-term.” DGEIS at B-13. With respect to long-term storage, the NRC claims to be ignorant of any studies “that would cause it to question the technical feasibility of continued safe storage of spent fuel in dry casks.” *Id.* But the Draft Study of Technical Needs admits that the level of knowledge regarding galvanic corrosion, stress corrosion cracking, low-temperature creep and propagation of existing flaws is “low”; and that knowledge of delayed hydride cracking is only “medium.” The NRC’s amnesia regarding its own study undermines the credibility and integrity of the DGEIS. Makhijani Declaration, par. 4.25. Incredibly, the only explicit mention of failed fuel in the DGEIS is in the context of spent fuel pool leaks: Impacts from spent fuel pool leakage occur from radionuclide contaminants present in spent fuel pool water. The sources of radionuclide contaminants in spent fuel pool water are activation products and fission products. Activation products are elements formed from the neutron bombardment of a stable element and fission products are elements formed as a byproduct of a nuclear reaction and radioactive decay of other fission products. *The sources of activation products are corrosion and wear deposits (including corrosion films on the fuel bundle surfaces).* Fission products come from bundles with rods that failed in-reactor or from intact bundles that adsorbed circulating fission products.⁹ [footnote 9 text: DGEIS at E-10 (emphasis added).] DGEIS at E10 (emphasis added). The NRC’s limitation of its consideration of failed fuel to short-term storage conditions is grossly insufficient, given that the principal long-term risks are likely to arise after prolonged storage has resulted in serious fuel degradation of some fraction of the fuel rods, notably in the case of high burnup spent fuel. Makhijani Declaration, par. 4.26. (0897-4-13 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The NRC’s failure to address the effects of failed fuel on safety and environmental risk is all the more remarkable in the context of the NRC’s own admission that it does not yet know how it will transfer such failed spent fuel. The NRC has no experience in transferring

failed fuel from one cask to another. By NRC's own admission, it has not even developed the procedures to do so. Makhijani Declaration, par. 4.27. The NRC also has no basis in data or experience in estimating how much additional damage could be done to failed fuel by transferring it between casks. This would apply even to damaged medium burnup fuel stored for short or moderate periods of time (up to two or three decades) in dry casks. It is a *fortiori* true of high burnup spent fuel that has been stored for many decades or even a few hundred years, given the considerations about such spent fuel discussed in the rest of this section. Makhijani Declaration, par. 4.28. Indeed, in this context, Dr. Makhijani observes that no spent fuel bundle, damaged or not, has ever been transferred from one dry cask to another. Further, while the DGEIS postulates a Dry Transfer System for fuel inspection, repackaging and transfer, such a facility has never been built in the United States. The NRC even refuses to say how it would handle and repackage failed fuel. This makes the lack of discussion of the impacts of the transfer of failed spent fuel bundles even more problematic since the NRC lacks sufficient empirical basis for estimating the probabilities and consequences of the spread of radioactivity during transfers in the normal case. Makhijani Declaration, par. 4.29. In failing to address the issue of failed spent fuel inter-cask transfers, the NRC also has ignored the fact that failed spent fuel bundles are already stored in dry casks, but have never had to undergo inter-cask transfers. For instance, there are 95 failed spent fuel bundles stored in 15 dry casks at San Onofre Nuclear Generating Station alone. Makhijani Declaration, par. 4.30. (0897-4-14 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: As discussed above, NWTRB has proposed an extended research program to address the lack of data regarding spent fuel characteristics. It is also important to have dry storage performance data on the newer cladding materials that have been developed to enable high fuel burnup, which is a relatively recent practice (since about the turn of the century). There are practically no such data. Indeed, even the research has been focused mainly on in-reactor behavior of high burnup fuels rather than on degradation during prolonged storage. Makhijani Declaration, par. 4.31. (0897-4-15 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Safety and environmental risks of storing other forms of spent fuel are ignored or tossed off with scant attention in the DGEIS. For instance, the U.S. is building a MOX plant to convert weapons grade plutonium into commercial reactor fuel. There is no significant experience with irradiation of such MOX fuel in a commercial reactor in the United States. Only lead test assemblies have been irradiated. Therefore there is essentially no experience with storage of commercial MOX spent fuel in the United States in wet or dry storage for any length of time. France, which has the most experience with MOX spent fuel, stores it in pools and has no dry storage. The DGEIS simply assumes away the problem of MOX spent fuel with the following statement: Because the MOX fuel that would be generated at the Mixed Oxide Fuel Fabrication Facility is substantially similar to existing light water reactor fuel and is, in fact, intended for use in existing light water reactors in the United States, MOX fuel from this project is within the scope of this DGEIS.¹⁰ [footnote 10 text: DGEIS at 2-8.] Contrary to the claim in the DGEIS MOX fuel is decidedly *not* "substantially similar to existing light water reactor fuel." In the former the fissile material is plutonium, which has different nuclear characteristics (a smaller delayed neutron fraction, for instance) than current low-enriched uranium reactor fuel. Even more importantly for the present purposes, the characteristics of the spent fuel will be different. For instance, uranium spent fuel from a PWR with initial 4.25 percent enrichment and burnup of 50 GWd per metric ton would have about 1 percent plutonium isotopes in it at discharge, including about half-a-percent plutonium-239. For the same burnup MOX fuel would typically have 8.46 percent total plutonium to start with. The spent fuel from a PWR would have about five times as much total plutonium, and about three- and-half-times as much plutonium-239. Makhijani Declaration, par. 4.32. In the example provided (50 GWd per metric ton burnup in a

PWR), the MOX spent fuel would have about six-and-a-half-times the amount of plutonium-241 as the uranium spent fuel. Plutonium-241 decays into americium-241 relatively rapidly with a half-life of just 14.4 years. Americium-241 has a half-life of 432 years.¹¹ [footnote 11 text: Properties of radionuclides, including half-lives and dose conversion factors can be found in FGR 13 CD 2002.] Unlike plutonium-239 and plutonium-241, americium-241 is a powerful gamma radiation emitter; it would pose special problems during spent fuel transfer, long after the main gamma-emitting fission product, cesium-137 (half-life about 30 years), would have decayed away. These problems associated with americium-241 gamma radiation dose would extend to post-accident recovery in case of release of radionuclides from the spent fuel. Makhijani Declaration, par. 4.33. It stretches credulity that the NRC staff is not aware of these critical differences that would make a significant difference between impacts of MOX spent fuel and uranium spent fuel. In any case, the DGEIS assertion that there the two are substantially similar is wrong. A specific impact analysis is needed for MOX spent fuel. Makhijani Declaration, par. 4.34. (0897-4-16 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Similarly, the DGEIS pays little heed to the environmental impacts of extended storage of stainless steel fuel cladding. As Dr. Makhijani points out, stainless steel was used as fuel cladding early in the history of U.S. commercial reactors. By 1994, only one reactor had any stainless steel clad fuel in its core. By 1992, a total of 679 metric tons of spent fuel (uranium heavy metal content) had been generated from the stainless steel clad fuel. Further, the use of stainless steel cladding was discontinued partly because of in-reactor degradation of stainless steel cladding. For instance, the stainless steel cladding in the Connecticut Yankee reactor "experienced a number of fuel element failures" between 1977 and 1980, even though it had performed well in this regard prior to that time. The degradation characteristics of stainless steel fuel are different than zircaloy fuel and needed to be explicitly considered in the DGEIS. The DGEIS catalogs the amount of stainless steel spent fuel but does not discuss the failed fuel or its transfer from one dry cask to another. It does not discuss whether accidents involving such failed fuel would have more or less severe consequences than failed zircaloy-clad fuel. Makhijani Declaration, par. 4.35. (0897-4-17 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The DGEIS cites just one study (Billone et al. 2013) that has evidence about the deterioration of high burnup spent fuel during drying and subsequent storage. DGEIS at B-13. Even so, the lessons contained in this study, such as the implications of degradation for accident consequences or the differences between risks of various zirconium alloys used as cladding material are not discussed in the Draft GEIS. (0897-4-2 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The DGEIS omits any mention of the fact that elsewhere, the NRC has acknowledged that it has a serious lack of information about the behavior of spent fuel stored for long periods. Makhijani Declaration, par. 4.8. In May 2012, the NRC published a *Draft Report for Comment: Identification and Prioritization of the Technical Information Needs Affecting Potential Regulation of Extended Storage and Transportation of Spent Nuclear Fuel* ("Draft Report on Technical Information Needs" or "Draft Report"). This report catalogs what is known, as well as the gaps in knowledge, of spent fuel degradation mechanisms. Some of the gaps will require extensive new data and a considerable amount of time to fill. The Draft Report on Technical Information Needs was based on a number of prior reports, data from physical examination of some "lower burnup" spent fuel, and extrapolation from this data to 80 years. Based on this data, the Draft Report concluded:The current regulatory framework supports at least the first 80 years of dry cask storage (i.e., a 40-year initial licensing term, followed by a license renewal for a term of up to 40 years, although many of the existing facilities were licensed for an initial term of 20 years under the regulations in place at the time). The technical

basis for the initial licensing and renewal period is supported by the results of a cask demonstration project that *examined a cask loaded with lower burnup fuel* (approximately 30 GWd/MTU [gigawatt-days per metric ton uranium] average; all fuel burnup in this paper is given as peak rod average value). Following 15 years of storage, the cask internals and fuel did not show any significant degradation (Einziger et al., 2003). The data from this study can be extrapolated to maintain a licensing safety finding that *low burnup SNF* can be safely stored in a dry storage mode for at least 80 years with an appropriate aging management program that considers the effects of aging on systems, structures, and components (SSCs). (0897-4-3 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Makhijani Declaration, par. 4.8 (emphasis added). Note that the existing licensing and license extension procedures are based on examination of a single cask of relatively low burnup uranium dioxide spent fuel that had been in dry storage for only 15 years. The Draft Report lists data extensive requirements for extending this analysis to: • high burnup spent fuel that would be stored from 120 years to 300 years; • spent fuel burnups up to about 62.5 GWd/MTU; • mixed oxide (MOX) spent fuel (which has plutonium-239 instead of uranium-235 as the fissile material that sustains the chain reaction); and • new cladding, fuel compositions, and assembly designs that have been and will continue to be put into use. Makhijani Declaration, par. 4.9 & Table 6-1. In the Draft Report, the NRC proposed to undertake a seven-year study of the phenomena identified in the Draft Report; but the plan was deferred when resources were diverted to the preparation of the Waste Confidence DGEIS. Makhijani Declaration, par. 4.12. As Dr. Makhijani observes, the NRC's failure to mention in the DGEIS the agency's own previously expressed concerns about the data gaps essential to understanding high burnup and MOX spent fuel and spent fuel with new cladding materials is an egregious technical omission. The missing data are critical to assessing the health and environmental impacts of spent fuel; gathering the data will need extensive additional research. Whenever a scientist lacks sufficient information to evaluate an issue, it is essential to identify the missing information and, at the very least, conduct an uncertainty analysis. Neither of those steps was taken by the NRC in the DGEIS. On the contrary, the one study that the NRC cited to justify its conclusion that impact accident consequences would be low explicitly did not consider uncertainties. The NRC's failure to mention its own documented concerns about spent fuel characteristics seriously compromises the scientific integrity of the DGEIS. Makhijani Declaration, par. 4.12. (0897-4-4 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The NRC's failure to acknowledge the amount of information that is lacking regarding spent fuel behavior over the long-term is all the more disturbing in light of the fact that the Nuclear Waste Technical Review Board ("NWTRB") has expressly acknowledged the dearth of information regarding spent fuel integrity and degradation. Makhijani Declaration, par. 4.13. NWTRB confirms that at present no U.S. data are available for high burnups (up to 62.5 GWd/MTU) for any of the NRC's storage scenarios, or for periods of storage anywhere comparable to the long timeframe of hundreds of years that the NRC will have to consider in its Waste Confidence EIS in one or more scenarios. Predictions, estimates or projections that the NRC may make of the effects of high burnup spent fuel storage, particularly over long-term periods, in its Waste Confidence EIS cannot be validated with scientific data or observations with presently available information. Such validation is essential for reliable and scientifically acceptable estimates of the environmental and health impacts of long-term storage and transportation. Makhijani Declaration, par. 4.13. (0897-4-5 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The NWTRB also commented on the lack of information about interactions between different degradation mechanisms as well as the possible effect of high burnup on those

interactions: These [degradation] mechanisms and their interactions are not well understood. New research suggests that the effects of hydrogen absorption and migration, hydride precipitation and reorientation, and delayed hydride cracking may degrade the fuel cladding over long periods at low temperatures, affecting its ductility, strength, and fracture toughness. *High-burnup fuels tend to swell and close the pellet-cladding gap, which increases the cladding stresses and can lead to creep and stress corrosion cracking of cladding in extended storage.* Fuel temperatures will decrease in extended storage, and cladding can become brittle at low temperatures.⁷ [footnote 7 text: NWTRB 2010, p. 11, italics added.] Makhijani Declaration, par. 4.14 (quoting NWTRB Report, p. 11, italics added). Hence, high burnup could possibly combine with other factors to create conditions that would result in severe, if not catastrophic, releases of radioactivity. This possibility must be studied. *Id.* (0897-4-6 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Besides the NRC staff's 2012 proposal, the NWRTB has also proposed an extended research program to address the problem of the lack of data. The NWTRB research and development recommendations include: • Understanding the ultimate mechanical cladding behavior and fuel-cladding degradation mechanisms potentially active during extended dry storage, including those that will act on the materials introduced in the last few years for fabrication of high-burnup fuels • Understanding and modeling the time-dependent conditions that affect aging and degradation processes, such as temperature profiles, in situ material stresses, quantity of residual water, and quantity of helium gas • Modeling of age-related degradation of metal canisters, casks, and internal components during extended dry storage • Inspection and monitoring of fuel and dry-storage systems to verify the actual conditions and degradation behavior over time, including techniques for ensuring the presence of helium cover gas • Verification of the predicted mechanical performance of fuel after extended dry storage during cask and container handling, normal transportation operations, fuel removal from casks and containers, off-normal occurrences, and accident events • Design and demonstration of dry-transfer fuel systems for removing fuel from casks and canisters following extended dry storage (0897-4-7 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Dr. Makhijani also points out that other institutions have also analyzed the critical data gaps regarding high burnup degradation and its implications for storage, transport and disposal. For instance, a 2012 paper published by the National Academy of Engineering noted the following: Based on its assessment, the study board concluded that the technical basis for the spent fuel currently being discharged (high utilization, burnup fuels) is not well established and that the possibility of degradation mechanisms, such as hydriding, will require more study. The NWTRB recommended periodic examinations of representative amounts of spent fuel to ensure that degradation mechanisms are not in evidence. (0897-4-8 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In fact, the available evidence suggests that both long-term storage and disposal of spent fuel could pose significant safety and environmental risks. Further, the costs of long-term storage and disposal could run into hundreds of billions of dollars. The NRC should prepare a new Draft GEIS that meaningfully examines these risks. (0898-1-11 [Curran, Diane] [Makhijani, Arjun])

Comment: The study cited by the NRC for public health impact only considered spent fuel stored in a pool for 10 years followed by dry storage for 20 years.⁵¹ [footnote 51 text: Billone et al. 2013, p. 431] The experiments of Billone et al. on high burnup fuel – the only study cited in the Draft GEIS regarding damage to spent fuel as a result of high burnup – showed significant damage to high burnup fuel upon drying: Pre-storage drying-transfer operations and early stage

storage subject cladding to higher temperatures and much higher pressure-induced tensile hoop stresses relative to in-reactor operation and pool storage. Under these conditions, radial hydrides may precipitate during slow cooling and provide an additional embrittlement mechanism as the cladding temperature decreases below the ductile-to-brittle transition temperature (DBTT).⁵² [footnote 52 text: Billone et al. 2013, p. 431] Photographs in Billone et al. show clear damage, including significant cracks in the cladding. The Draft GEIS statement that this “could influence the approach used for repackaging spent fuel” is so limited in scope as to provide almost no insight into the environmental impacts during accidents, further degradation during prolonged storage, and during handling and transfer operations. Repackaging is far from the only or even the most important issue from the environmental point of view. We note that the NRC has yet to demonstrate how it will transfer damaged spent fuel from one cask to another (see paragraph 4.27 below). Figure 1 shows the trends in burnup for PWRs and BWRs. It shows that high burnup fuel (more than 45 GWd per metric ton) started being discharged from reactors only around the turn of the century. Most of this is still in spent fuel pools. Examination of high burnup spent fuel after dry storage of 15 years, as was done for low burnup Surry fuel,⁵³ [footnote 53 text: Einziger et al. 2003] is not yet possible, though some experimental work with high burnup fuel cladding has been done.⁵⁴ [footnote 54 text: Billone et al. 2013] **(0898-1-16** [Curran, Diane] [Makhijani, Arjun])

Comment: The Draft GEIS assumes that spent fuel bundles can be stored for millennia and repeatedly transferred hundreds of times from one cask to another without large releases of radioactivity. But the Draft GEIS contains almost no information about spent fuel characteristics that could cause adverse safety risks and environmental impacts in case of long-term or indefinite storage, both during storage and during the many transfers that must take place. As noted in paragraph 4.5 above, even drying upon removal from the spent fuel pool and early dry cask storage drying induce significant embrittlement in high burnup spent fuel. Further, Billone et al. also found that the degradation is dependent upon the specific zirconium alloy used in the cladding material. Specifically, there was a significant difference in radial hydriding and the ductile-to-brittle transition temperature between ZIRLO and zircaloy-4 cladding subjected to high burnup.⁵⁵ [footnote 55 text: Billone et al. 2013, p. 446] The Draft GEIS says nothing about the significance of these findings for accident impacts, inter-cask transfer operations, or transportation risks. Further, little-understood factors affecting the safety of spent fuel storage include the degree to which spent fuel and its host containers corrode and degrade over a prolonged period of time, the phenomenon of “failed fuel,” and the effect of high burnup fuel on the integrity of cladding and storage containers. The Draft GEIS contains no analysis of how spent fuel characteristics may contribute to the risk of an accidental release of radioactivity during extended storage of dry casks; or how these factors may contribute to accident risks during the many transfers that would take place over an extended period of time, i.e., transfers between pools and casks, transfers between storage casks, transfers between storage and transportation casks, and transfers between transportation casks and casks used for ultimate disposal of spent fuel. **(0898-1-17** [Curran, Diane] [Makhijani, Arjun])

Comment: The NRC has cited just one study (Billone et al. 2013) that has evidence about the deterioration of high burnup spent fuel during drying and subsequent storage.⁵⁶ [footnote 56 text: NRC 2013a, p. B-13. Two of the four other studies cited, Bare et al. 2001 and Einziger et al. 2003, deal with low burnup fuel that has been stored – in fact, they relate to an examination of the same low burnup fuel from the Surry plant in Virginia. The third, IAEA 2006, makes a general assertion that international experience indicates that dry storage is satisfactory and only “a few” rod failure have been detected by sampling of cover gases. The study also refers to the same Surry cask examination as the other two as evidence of storage (IAEA 2006, p. 21). It does not deal explicitly with safety issues that might arise with high burnup fuel, though it notes

that there is “a strong interest in extending the technical basis to license storage of power reactor fuel assemblies with burnups above 45 000 MW•d/MTU.” (IAEA 2006, p. 21). The fourth, EPRI 1998, was prepared early in the high burnup era. Even so it flagged concerns about high burnup spent fuel at several points, including at the very start: “As the utilities push to higher and higher burnups, eventually the behavior of the fuel in storage of any duration will need to be considered.” The document goes on to identify a number of concerns (EPRI 1998, p. iv). The EPRI study notes that high burnup spent fuel had not been studied “to date.” (EPRI 1998, p. 6-7).] Even so, the lessons contained in this study, such as the implications of degradation for accident consequences or the differences between risks of various zirconium alloys used as cladding material are not discussed in the Draft GEIS. (0898-1-18 [Curran, Diane] [Makhijani, Arjun])

Comment: However, the NRC has acknowledged elsewhere that it has a serious lack of information about the behavior of spent fuel stored for long periods. In May 2012, the NRC published a *Draft Report for Comment: Identification and Prioritization of the Technical Information Needs Affecting Potential Regulation of Extended Storage and Transportation of Spent Nuclear Fuel* (Draft Report on Technical Information Needs).⁵⁷ [footnote 57 text: NRC 2012a] This report catalogs what is known, as well as the gaps in knowledge, of spent fuel degradation mechanisms. Some of the gaps will require extensive new data and a considerable amount of time to fill. 4.8. The Draft Report on Technical Information Needs was based on a number of prior reports, data from physical examination of some “lower burnup” spent fuel, and extrapolation from this data to 80 years. Based on this data, the Draft Report concluded as follows:The current regulatory framework supports at least the first 80 years of dry cask storage (i.e., a 40-year initial licensing term, followed by a license renewal for a term of up to 40 years, although many of the existing facilities were licensed for an initial term of 20 years under the regulations in place at the time). The technical basis for the initial licensing and renewal period is supported by the results of a cask demonstration project *that examined a cask loaded with lower burnup fuel* (approximately 30 GWd/MTU [gigawatt-days per metric ton uranium] average; all fuel burnup in this paper is given as peak rod average value). Following 15 years of storage, the cask internals and fuel did not show any significant degradation (Einziger et al., 2003). The data from this study can be extrapolated to maintain a licensing safety finding that *low burnup SNF* can be safely stored in a dry storage mode for at least 80 years with an appropriate aging management program that considers the effects of aging on systems, structures, and components (SSCs).⁵⁸ [footnote 58 text: NRC 2012a, p. 1-1, italics added] (0898-1-19 [Curran, Diane] [Makhijani, Arjun])

Comment: Note that the existing licensing and license extension procedures are based on examination of a single cask of relatively low burnup uranium dioxide spent fuel that had been in dry storage for only 15 years. The paper lists data requirements for extending this analysis to: • high burnup spent fuel that would be stored from 120 years to 300 years⁵⁹ [footnote 59 text: NRC 2012a, p. 1-2] – that is from about six times to about 16 times longer than the total 19-year storage time (15 years of dry storage plus four years of wet storage) of the spent fuel that was examined in Einziger et al. 2003;⁶⁰ [footnote 60 text: The wet storage time was about 3.7 years (Einziger et al. 2003, p. 6); it has been rounded to four years for this calculation.] • spent fuel burnups up to about 62.5 GWd/MTU,⁶¹ [footnote 61 text: NRC 2012a, p. 3-1] about double the irradiation of the spent fuel that was examined; • mixed oxide (MOX) spent fuel (which has plutonium-239 instead of uranium-235 as the fissile material that sustains the chain reaction), even though there are hardly any data on MOX fuel degradation after dry storage; MOX fuel may be “more susceptible” to some forms of degradation, according to the Nuclear Waste Technical Review Board;⁶² [footnote 62 text: NRC 2012a, p. A2-2, A2-4, and A4-3, for instance] • “new cladding, fuel compositions, and assembly designs that have been and will continue to be put into use.”⁶³ [footnote 63 text: NRC 2012a, p. 3-1] (0898-1-20 [Curran, Diane] [Makhijani, Arjun])

Comment: The data requirements are extensive even by the NRC staff's own accounting. According to Table 6-1 in the Draft Report on Technical Information Needs, there are 23 different degradation phenomena that have a ranking of "high" in terms of "the need for further research"⁶⁴ [footnote 64 text: NRC 2012a, p. 6-1 and Table 6-1] in addition to the data available from the lower burnup/short storage time evaluations. (0898-1-21 [Curran, Diane] [Makhijani, Arjun])

Comment: The NRC's failure to mention in the Draft GEIS the agency's own previously expressed concerns about the data gaps essential to understanding high burnup and MOX spent fuel and spent fuel with new cladding materials is an egregious technical omission. The missing data are critical to assessing the health and environmental impacts of spent fuel; gathering the data will need extensive additional research, which appears essential for a credible impact analysis, including placing operationally meaningful uncertainty bounds on impacts. Without this basic information, the NRC has an inadequate foundation for scientifically sound predictive safety findings regarding the behavior of high burnup spent fuel in long-term storage conditions. The Draft GEIS made no attempt to place uncertainty bounds on impacts. On the contrary, as noted in paragraph 4.4 above, the one study that the NRC cited to justify its conclusion that impact accident consequences would be low explicitly did *not* consider uncertainties. The explicit reason cited in that study for not estimating uncertainties was that "the uncertainty of the database" was such that it "may introduce large errors..." in the analysis.⁶⁶ [footnote 66 text: NRC Pilot 2007, p. D-19, italics added] The data gaps relevant to long-term storage of high burnup fuel are much greater than those considered in the Pilot Study. The problem of putting bounds on the impacts is therefore much more serious, in light of the issues listed in Table 6-1 above. The NRC's failure to mention its own documented concerns about spent fuel characteristics seriously compromises the scientific integrity of the Draft GEIS. (0898-1-22 [Curran, Diane] [Makhijani, Arjun])

Comment: In addition, the Draft GEIS contains almost no information about spent fuel characteristics that could cause adverse safety risks and environmental impacts during long-term or indefinite storage. That is perhaps due to the fact that, in other contexts, the NRC itself has acknowledged that it currently lacks sufficient information to reach informed conclusions about the behavior of spent fuel in storage over the long term. Little-understood factors affecting the safety of spent fuel storage include the degree to which spent fuel and its host containers corrode and degrade over a prolonged period of time, the phenomenon of "failed fuel," and the effect of high burnup fuel on the integrity of cladding and storage containers. (0898-1-3 [Curran, Diane] [Makhijani, Arjun])

Comment: For instance, although high burnup fuel now makes up a significant portion of spent fuel inventories, there is no explicit consideration of long-term dry storage and disposal of failed high-burnup fuel. The cladding of such fuel degrades much more during reactor operation than low burnup fuel; continued degradation appears likely during prolonged storage. The NRC currently has little or no empirical data regarding its behavior under extended dry storage conditions. The NRC itself identified the data gaps in a Draft Study of Technical Needs in 2012¹³ [footnote 13 text: NRC 2012a] but failed to note these gaps in the Draft GEIS. The NRC's amnesia regarding its own study undermines the credibility and integrity of the Draft GEIS. The Draft GEIS contains no analysis of how high burnup spent fuel characteristics may contribute to the risk of an accidental release of radioactivity from spent fuel that has been stored for a long period in dry casks, preceded by prolonged (60 to 120 years) of storage in spent fuel pools; or how degradation may contribute to accidental releases and radiation exposure risks during the many transfers that would take place in case of long-term or indefinite storage. The NRC should factor in its own prior acknowledgement of the potential for degradation of high burnup spent

fuel and the low state of knowledge of a number of critical factors prior to declaring its confidence in the safety of long-term or indefinite spent fuel storage.¹⁴ [footnote 14 text: The Draft GEIS makes just one explicit substantive statement about degradation of high burnup fuel and that related to the “short-term” time frame: “This [reduced ductility] phenomenon could influence the approach used for repackaging spent fuel but the NRC is not aware of information that would require it to conclude that high-burnup fuel would need to be repackaged during the short-term timeframe defined in the Draft GEIS. Should spent fuel cladding be more brittle, greater care could be required during handling operations, regardless of when repackaging would occur, to limit the potential for damage to spent fuel assemblies that could affect easy retrievability of the spent fuel and complicate repackaging operations.” (NRC 2013a, p. B-13) (0898-1-4 [Curran, Diane] [Makhijani, Arjun])

Comment: The NRC’s failure to acknowledge the amount of information that is lacking regarding spent fuel behavior over the long-term is all the more disturbing in light of the fact that the Nuclear Waste Technical Review Board (NWTRB) has expressly acknowledged the dearth of information. In 2010, NWTRB reported with respect to spent fuel integrity and degradation: Only limited references were found on the inspection and characterization of fuel in dry storage, and they all were performed on low-burnup fuel after only 15 years or less of dry storage. *Insufficient information is available on high-burnup fuels to allow reliable predictions of degradation processes during extended dry storage, and no information was found on inspections conducted on high-burnup fuels to confirm the predictions that have been made.*⁶⁷ [footnote 67 text: NWTRB 2010, p. 11, italics added] Thus, NWTRB confirms that at present no U.S. data are available for high burnups (up to 62.5 GWd/MTU) for any of the NRC’s storage scenarios, or for periods of storage anywhere comparable to the long time frame of hundreds of years that the NRC will have to consider in its waste confidence GEIS in one or more scenarios. Predictions, estimates or projections that the NRC may make of the effects of high burnup spent fuel storage, particularly over long-term periods, in its waste confidence GEIS cannot be validated with scientific data or observations with presently available information. Such validation is essential for reliable and scientifically acceptable estimates of environmental and health impact of long-term storage and transportation. (0898-2-1 [Curran, Diane] [Makhijani, Arjun])

Comment: The Draft GEIS cites an at-reactor dry storage facility at Surry as a successful example of dry storage.⁷³ [footnote 73 text: NRC 2013a, p. B-12] The spent fuel from Surry that was examined after about 15 years of dry storage was found upon inspection to be functionally undamaged.⁷⁴ [footnote 74 text: Einziger et al. 2003, p. ix] Hence one can safely assume that the spent fuel was also functionally undamaged at the time of transfer from wet to dry storage. The results of the Surry study are unlikely to be applicable to fuel that has developed some damage during irradiation, for instance, due to higher burnup, or during spent fuel pool storage. Lack of damage during much more prolonged dry storage of high burnup fuel also cannot be assumed based on the Surry study. The NWTRB has issued the following caution about prolonged spent fuel pool storage: Cladding may already have some small defects like tiny holes or hairline cracks, internal and external corrosion that has decreased the original metal wall-thickness, absorbed hydrogen, and hydride precipitation; however, it is very rare that new defects are detected while in the pool. Significant cladding defects can be detected during wet storage by monitoring stack off-gas for fission product gas leaks; if leaks are found, then assemblies are further inspected and breached fuel-rods are canned if necessary. Generally, a visual inspection is made of assemblies to identify fuel assemblies that may need to be classified as damaged and require special handling. If the cladding is functionally undamaged, there is an insignificant risk of expected fuel oxidation [at the time of transfer to dry storage]. Given undamaged cladding and the visible transfer of assemblies into and out of wet storage,

the fuel-assembly containment criterion is deemed satisfied. Thus, during wet pool storage, used fuel is not expected to experience significant deterioration before dry storage. *If pool storage of fuel is continued for an extended period, it will be necessary to assess and evaluate the effects on intact or damaged fuel.*⁷⁵ [footnote 75 text: NWTRB 2010, p. 60, italics in the original] Though Draft GEIS assumes that pool storage could continue for periods approaching 140 years (the first spent fuel discharged during 80 years of total licensed operation, plus 60 years of post-operating license storage), it has not included any uncertainty analysis relating to impacts of damage that may occur in some fraction of the spent fuel during such prolonged storage. (0898-2-10 [Curran, Diane] [Makhijani, Arjun])

Comment: Fuel failure occurs when there is a rupture in the fuel cladding, allowing fuel pellets direct contact with the environment around the fuel, the reactor coolant, spent fuel pool water, the canister environment, or the general environment during inter-cask transfer of failed fuel. If detected during cask loading, failed fuel is normally put in a "can," which is a special sleeve, prior to loading into the cask. But if failure occurs after dry storage commences, some fuel pellets could be exposed to the environment during transfer. The NRC has refused to state how it would transfer failed spent fuel. It plans to figure it out then, as noted in paragraph 4.27 below. (0898-2-11 [Curran, Diane] [Makhijani, Arjun])

Comment: In the NWTRB study described above, NWTRB identified hydriding, creep, and stress corrosion cracking to be "[t]he most significant potential degradation mechanisms affecting the fuel cladding during extended storage."⁷⁶ [footnote 76 text: NWTRB 2010, p. 10] These phenomena can lead to "failed fuel" under certain conditions.⁷⁷ [footnote 77 text: NRC 2012a, pp. A1-6 and A1-7] The Draft GEIS concludes that these phenomena are unlikely to cause significant problems in the "short-term."⁷⁸ [footnote 78 text: NRC 2013a, p. B-13] With respect to long-term storage, the NRC claims to be ignorant of any studies "that would cause it to question the technical feasibility of continued safe storage of spent fuel in dry casks."⁷⁹ [footnote 79 text: NRC 2013a, p. B-13] But Table 6-1 of the Draft Study of Technical Needs admits that the level of knowledge regarding galvanic corrosion, stress corrosion cracking, low-temperature creep, and propagation of existing flaws is "low"; and that knowledge of delayed hydride cracking is only "medium." The NRC's amnesia regarding its own study undermines the credibility and integrity of the Draft GEIS. (0898-2-12 [Curran, Diane] [Makhijani, Arjun])

Comment: The only explicit mention of failed fuel in the Draft GEIS is in the context of spent fuel pool leaks: Impacts from spent fuel pool leakage occur from radionuclide contaminants present in spent fuel pool water. The sources of radionuclide contaminants in spent fuel pool water are activation products and fission products. Activation products are elements formed from the neutron bombardment of a stable element and fission products are elements formed as a byproduct of a nuclear reaction and radioactive decay of other fission products. *The sources of activation products are corrosion and wear deposits (including corrosion films on the fuel bundle surfaces).* Fission products come from bundles with rods that failed in-reactor or from intact bundles that adsorbed circulating fission products.⁸⁰ [footnote 80 text: NRC 2013a, p. E-10, italics added] This is grossly insufficient, since the principal long-term risks are likely to arise after prolonged storage has resulted in serious fuel degradation of some fraction of the fuel rods, notably in the case of high burnup spent fuel. (0898-2-13 [Curran, Diane] [Makhijani, Arjun])

Comment: The NRC's failure to address the effects of failed fuel on safety and environmental risk is all the more remarkable in the context of the NRC's own admission that it does not yet know how it will transfer such failed spent fuel. The NRC has no experience in transferring failed fuel from one cask to another. By NRC's own admission, it has not even developed the procedures to do so, as illustrated by the following 2001 decision by the NRC's technical staff:

The NRC staff believes that the petitioner has identified a valid concern regarding the potential recovery of fuel assemblies that unexpectedly degrade during storage. However, in this unlikely event, the NRC staff has concluded that there is reasonable assurance that a licensee can safely unload degraded fuel or address other problems. This conclusion is based on the NRC's defense-in-depth approach to safety that includes requirements to design and operate spent fuel storage systems that minimize the possibility of degradation; requirements to establish competent organizations staffed with experienced, trained, and qualified personnel; and NRC inspections to confirm safety and compliance with requirements. The NRC staff finds acceptable these procedures for detecting degraded fuel through sampling and, on the basis of the sample results, the implementation of appropriate recovery provisions that reflect the ALARA (as low as is reasonably achievable) requirements. The NRC staff's acceptance of this approach is based on the fact that the spent fuel storage cask can be maintained in a safe condition *during the time needed to develop the necessary procedures and to assemble the appropriate equipment before proceeding with cask unloading.* The NRC staff also relies on the considerable radiological safety experience available in the nuclear industry in its assessment that appropriately detailed procedures can be prepared for the specific circumstances in a timely manner.⁸¹ [footnote 81 text: NRC 2001, p. 9058, italics added] While this "kicking the can down the road" may have been a legally valid response to the petition, it can no longer be sustained in the context of the waste confidence GEIS. The issue is material to environmental impacts, which the NRC is obliged to estimate. (0898-2-14 [Curran, Diane] [Makhijani, Arjun])

Comment: The NRC also has no basis in data or experience in estimating how much additional damage could be done to failed fuel by transferring it between casks. This would apply even to damaged medium burnup fuel stored for short or moderate periods of time (up to two or three decades) in dry casks. It is *a fortiori* true of high burnup spent fuel that has been stored for many decades or even a few hundred years, given the considerations about such spent fuel discussed in the rest of this section. (0898-2-15 [Curran, Diane] [Makhijani, Arjun])

Comment: In failing to address the issue of failed spent fuel inter-cask transfers, the NRC has ignored the fact that failed spent fuel bundles are already stored in dry casks, but have never had to undergo inter-cask transfers. For instance, there are 95 failed spent fuel bundles stored in 15 dry casks at San Onofre Nuclear Generating Station alone.⁸² [footnote 82 text: NRC 2011b, p. 11] (0898-2-17 [Curran, Diane] [Makhijani, Arjun])

Comment: As discussed above, NWTRB has proposed an extended research program to address the lack of data regarding spent fuel characteristics. It is also important to have dry storage performance data on the newer cladding materials that have been developed to enable high fuel burnup, which is a relatively recent practice (since about the turn of the century⁸³ [footnote 83 text: NWTRB 2010, p. 72]). There are practically no such data. Indeed, even the research has been focused mainly on in-reactor behavior of high burnup fuels rather than on degradation during prolonged storage: Because of the more severe conditions created by burning fuel to higher levels, new cladding materials have been developed for in-reactor service and employed by vendors such as Areva's M5 alloy, Westinghouse's optimized ZIRLO, Siemen's Duplex, and Mitsubishi's M-MDA material. Currently there is much more behavioral data available on Zircaloy-2 and -4 cladding, but work is ongoing to study the new cladding materials (mostly proprietary). From the limited information reviewed it appears new cladding research is focused primarily on in-reactor behavior and not behavior during extended storage.⁸⁴ [footnote 84 text: NWTRB 2010, p. 52] (0898-2-18 [Curran, Diane] [Makhijani, Arjun])

Comment: The NWTRB also commented on the lack of information about interactions between different degradation mechanisms as well as the possible effect of high burnup on those

interactions: These [degradation] mechanisms and their interactions are not well understood. New research suggests that the effects of hydrogen absorption and migration, hydride precipitation and reorientation, and delayed hydride cracking may degrade the fuel cladding over long periods at low temperatures, affecting its ductility, strength, and fracture toughness. *High-burnup fuels tend to swell and close the pellet-cladding gap, which increases the cladding stresses and can lead to creep and stress corrosion cracking of cladding in extended storage.* Fuel temperatures will decrease in extended storage, and cladding can become brittle at low temperatures.⁶⁸ [footnote 68 text: NWTRB 2010, p. 11, italics added] Hence, high burnup could possibly combine with other factors to create conditions that would result in severe, if not catastrophic, releases of radioactivity. This possibility must be studied. (0898-2-2 [Curran, Diane] [Makhijani, Arjun])

Comment: Besides the NRC staff's 2012 proposal, the NWTRB has also proposed an extended research program to address the problem of the lack of data. The NWTRB research and development recommendations include:⁶⁹ [footnote 69 text: The bullet points are quoted from NWTRB 2010, p. 14] • Understanding the ultimate mechanical cladding behavior and fuel-cladding degradation mechanisms potentially active during extended dry storage, including those that will act on the materials introduced in the last few years for fabrication of high-burnup fuels • Understanding and modeling the time-dependent conditions that affect aging and degradation processes, such as temperature profiles, in situ material stresses, quantity of residual water, and quantity of helium gas • Modeling of age-related degradation of metal canisters, casks, and internal components during extended dry storage • Inspection and monitoring of fuel and dry-storage systems to verify the actual conditions and degradation behavior over time, including techniques for ensuring the presence of helium cover gas • Verification of the predicted mechanical performance of fuel after extended dry storage during cask and container handling, normal transportation operations, fuel removal from casks and containers, off-normal occurrences, and accident events • Design and demonstration of dry-transfer fuel systems for removing fuel from casks and canisters following extended dry storage[.] As discussed above, a valid impact analysis requires collection of this information at least to a sufficient extent to make a central estimate of impacts and to put meaningful uncertainty bounds on those impacts. (0898-2-3 [Curran, Diane] [Makhijani, Arjun])

Comment: Other institutions have also analyzed the critical data gaps regarding high burnup degradation and its implications for storage, transport and disposal. For instance, a 2012 paper published by the National Academy of Engineering noted the following: Based on its assessment, the study board concluded that the technical basis for the spent fuel currently being discharged (high utilization, burnup fuels) is not well established and that the possibility of degradation mechanisms, such as hydriding, will require more study. The NWTRB recommended periodic examinations of representative amounts of spent fuel to ensure that degradation mechanisms are not in evidence.⁷⁰ [footnote 70 text: Kadak 2012, p. 30] As concerning as the serious data gaps is the fact that as recently as 2012 neither the NRC nor the nuclear power industry had implemented the periodic examinations of spent fuel recommended by the NWTRB in 2010. (0898-2-4 [Curran, Diane] [Makhijani, Arjun])

Comment: In Table 6-1 above (reproduced in paragraph 4.9 from the NRC Draft Report on Technical Information Needs (NRC 2012a)), all of the categories of "regulatory significance" of the 23 degradation phenomena -- confinement, criticality, retrievability, shielding, structural, and thermal -- are relevant to estimating environmental impacts, some of which could be serious. Such impacts could arise because some of the spent fuel could be degraded badly enough to result in (i) environmental releases during spent fuel inter-cask transfer and (ii) more severe impacts in cases of accidents. (0898-2-6 [Curran, Diane] [Makhijani, Arjun])

Comment: For instance, in the case of microbiologically induced corrosion, Table 6-1 states that "little is known" about the conditions under which it "could corrode seals and/or the cask body that affect containment." Laboratory work and examination of spent fuel of different levels of burnup stored for long periods in spent fuel pools followed by long-term storage in dry casks is needed. It is only on this basis that models to extrapolate the environmental impacts of storage, followed by transportation (and in all but one scenario) disposal can be evaluated and extrapolated in a manner that can be scientifically validated. (0898-2-7 [Curran, Diane] [Makhijani, Arjun])

Comment: As another example, consider phenomena listed near the top of Table 6-1: stress corrosion cracking, delayed hydride cracking, and low temperature creep. The NRC Draft Report on Technical Information Needs notes that "[a]ll three mechanisms depend on a source of stress that would come from pellet swelling. If the stress is not present, the mechanisms become benign. If operative, these mechanisms could increase the source term and increase cladding stress. The latter could affect containment, especially if other degradation processes have compromised the canister."⁷¹ [footnote 71 text: NRC 2012a, p. 6-2] In other words, the NRC does not know at present whether corrosion of seals or the canister body may occur to an extent that compromises containment. Damage to canisters could set the stage for severe releases either during inter-cask transfer or because the canister itself degrades. This is an example of a case where the present state of knowledge is so low that the uncertainties appear to be so large as to be operationally meaningless. (0898-2-8 [Curran, Diane] [Makhijani, Arjun])

Comment: Figure 3 shows that the maximum wall thickness hydrogen content increases from 200 ppm to 800 ppm at discharge over approximately the same burnup range as in Figure 2. In both cases the variability is also much greater at the higher burnup. For instance, Figure 3 shows oxide layer thicknesses for a burnup of 30 GWd/metric ton ranging from roughly 12 microns to (at most) 35 microns -- a spread of 23 microns. At 63 GWd per metric ton the thickness range from about 70 microns to 130 microns, a spread of 60 microns. In fact these data show that the *variability* in oxide layer thickness at 63 GWd/MT burnup is almost *twice as large as the maximum* thickness at 30 GWd/MT. The oxidation and hydriding in-reactor data point to (i) a higher probability of failure and (ii) more severe failures in some fraction of the rods in cases when failures occur upon prolonged spent fuel pool and dry storage for high burnup spent fuel. High oxide and hydrogen levels in cladding create a host of vulnerabilities in spent fuel, including increased brittleness upon drying, high hoop stresses, and other phenomena that could cause fuel to fail -- that is, to develop cracks and fissures that are significant enough to cause release of fission products. Reasonable confidence in the integrity of spent fuel after long periods of storage would not only require examination of typical high burnup fuel rods but also the ones at the higher levels of initial degradation that are clearly indicated by currently available information of in-reactor performance. (0898-2-9 [Curran, Diane] [Makhijani, Arjun])

Comment: The United States is building a MOX plant to convert weapons-grade plutonium into commercial reactor fuel. There is no significant experience with irradiation of such MOX fuel in a commercial reactor in the United States. Only lead test assemblies have been irradiated. There is essentially no experience with storage of commercial MOX spent fuel in the United States in wet or dry storage for any length of time. France, which has the most experience with MOX spent fuel, stores it in pools and has no dry storage. The Draft GEIS simply assumes away the problem of MOX spent fuel with the following statement: Because the MOX fuel that would be generated at the Mixed Oxide Fuel Fabrication Facility is substantially similar to existing light water reactor fuel and is, in fact, intended for use in existing light water reactors in the United States, MOX fuel from this project is within the scope of this draft GEIS.⁸⁵ [footnote 85 text: NRC 2013a, p. 2-8] Contrary to the claim in the Draft GEIS, MOX fuel is decidedly not "substantially

similar to existing light water reactor fuel." In the former the fissile material is plutonium, which has different nuclear characteristics (a smaller delayed neutron fraction, for instance) than current low-enriched uranium reactor fuel. Even more importantly for the present purposes, the characteristics of the spent fuel will be different. For instance, uranium spent fuel from a PWR with initial 4.25 percent enrichment and burnup of 50 GWd per metric ton would have about percent plutonium isotopes in it at discharge, including about half-a-percent plutonium-239. For the same burnup MOX fuel would typically have 8.46 percent total plutonium to start with. The spent fuel from a PWR would have about five times as much total plutonium and about three-and-half-times as much plutonium-239.⁸⁶ [footnote 86 text: IAEA 2007, Tables 18 and 25, pp. 65 and 70 respectively. The MOX fuel in this case started with reactor-grade plutonium. MOX fuel made with weapon-grade plutonium would have a somewhat different mixture of plutonium isotopes in the spent fuel, but it would, in any case, be much higher than the total plutonium in uranium dioxide spent fuel.] (0898-3-1 [Curran, Diane] [Makhijani, Arjun])

Comment: In the example provided (50 GWd per metric ton burnup in a PWR), the MOX spent fuel would have about six-and-half-times the amount of plutonium-241 as the uranium spent fuel. Plutonium-241 decays into americium-241 relatively rapidly with a half-life of just 14.4 years. Americium-241 has a half-life of 432 years.⁸⁷ [footnote 87 text: Properties of radionuclides, including half-lives and dose conversion factors can be found in FGR 13 CD 2002.] Unlike plutonium-239 and plutonium-241, americium-241 is a powerful gamma radiation emitter; it would pose special problems during spent fuel transfer, long after the main gamma-emitting fission product, cesium-137 (half-life about 30 years), would have decayed away. These problems associated with americium-241 gamma radiation dose would extend to post-accident recovery in case of release of radionuclides from the spent fuel. (0898-3-2 [Curran, Diane] [Makhijani, Arjun])

Comment: It stretches credulity that the NRC staff is not aware of these critical differences that would make a significant difference between impacts of MOX spent fuel and uranium spent fuel. In any case, the Draft GEIS assertion that the two are substantially similar is wrong. A specific impact analysis is needed for MOX spent fuel. (0898-3-3 [Curran, Diane] [Makhijani, Arjun])

Comment: Stainless steel fuel cladding was used as fuel cladding early in the history⁸⁸ [footnote 88 text: EIA 1994, p. 23] of U.S. commercial reactors. By 1994, only one reactor had any stainless steel clad fuel in its core.⁸⁹ [footnote 89 text: EIA 1994, p. 23] By 1992, a total of 679 metric tons spent fuel (uranium heavy metal content) had been generated from the stainless steel clad fuel.⁹⁰ [footnote 90 text: EIA 1994, Table 9 (p. 27) and Table 10 (p. 28)] Further, the use of stainless steel cladding was discontinued partly because in-reactor degradation of stainless steel cladding. For instance, the stainless steel cladding in the Connecticut Yankee reactor "experienced a number of fuel element failures" between 1977 and 1980, even though it had performed well in this regard prior to that time.⁹¹ [footnote 91 text: Rivera and Meyer 1980, p.1] The degradation characteristics of stainless steel fuel are different than zircaloy fuel and needed to be explicitly considered in the Draft GEIS. The Draft GEIS catalogs the amount of stainless steel spent fuel but does not discuss the failed fuel or its transfer from one dry cask to another. It does not discuss whether accidents involving such failed fuel would have more or less severe consequences than failed zircaloy-clad fuel. (0898-3-4 [Curran, Diane] [Makhijani, Arjun])

Comment: NUREG/CR-6835 considered risks only from uranium spent fuel with various enrichment levels up to 5 percent.⁹⁴ [footnote 94 text: NUREG/CR-6835 (2003), p. 3] It did not consider MOX spent fuel. As noted in paragraph 4.32 and 4.33, MOX spent fuel contains several times more plutonium-239 than uranium spent fuel with the same burnup. Since the

Draft GEIS includes MOX spent fuel in its scope, it should address criticality risks of such spent fuel in dry storage and during transportation as well. (0898-3-7 [Curran, Diane] [Makhijani, Arjun])

Comment: I provide some examples of impacts that were ignored in the Yucca Mountain EIS loss of institutional control scenario that must be included in the waste confidence GEIS.[...] The Yucca Mountain EIS was completed before any physical evaluation of high burnup fuel that had been in dry storage for any length of time. This aspect needs to be included in the waste confidence GEIS. (0898-4-6 [Curran, Diane] [Makhijani, Arjun])

Comment: The Draft GEIS contains almost no information about spent fuel characteristics that could cause adverse safety risks and environmental impacts during long-term or indefinite storage. In other contexts, the NRC itself has acknowledged that it currently lacks sufficient information to reach informed conclusions about the behavior of spent fuel in storage over the long term. Yet, it failed to note the data gaps identified as recently as 2012 in its Draft GEIS. The NRC's amnesia regarding its own study undermines the credibility and integrity of the Draft GEIS. Little-understood factors affecting the safety of spent fuel storage include the degree to which spent fuel and its host canisters corrode and degrade over a prolonged period of time, and the effect of high burnup fuel on the integrity of cladding and storage canisters. (0898-5-15 [Curran, Diane] [Makhijani, Arjun])

Comment: For instance, although high burnup fuel now makes up a significant portion of spent fuel inventories, there is no explicit consideration of long-term dry storage and disposal of failed high-burnup fuel. The NRC currently has little or no empirical data regarding its behavior under extended dry storage conditions. The Draft GEIS contains no analysis of how high burnup spent fuel characteristics may contribute to the risk of an accidental release of radioactivity during extended storage in pools, followed by long-term storage in dry casks. The one study of high burnup spent fuel degradation that the Draft GEIS cites (Billone et al. 2013) found that different high burnup fuel cladding material degrade at markedly different rates. The Draft GEIS took no account of this finding, which indicates that a generic analysis may not be sufficient to estimate impacts unless it is designed to be bounding, having taken such differences explicitly into account. (0898-5-16 [Curran, Diane] [Makhijani, Arjun])

Comment: In view of the lack of factual and analytical basis for assessing the impacts of long-term or indefinite storage of high burnup spent fuel, the NRC should not permit the further production of high burnup spent fuel until such a time that it is able to evaluate the long-term spent fuel management issues related to that fuel. (0898-5-28 [Curran, Diane] [Makhijani, Arjun])

Comment: In addition, Table S-3 does not cover MOX fuel use, though the waste confidence rule purports to cover it.¹³⁵ [footnote 135 text: NRC 2013a, p. xxix] It is clear that Table S-3 does not give the NRC the basis for a waste confidence statement that includes MOX spent fuel. (0898-5-4 [Curran, Diane] [Makhijani, Arjun])

Comment: Dry casks are only guaranteed for 20 years so monitor for a million as it costs twice as much to have it in pools and dry casks are the part that withstood Fukushima. (0901-2 [Anderson, Janet M.])

Comment: I am writing to you today to show support for PG&E's successful spent fuel management program and the NRC's Spent Fuel Storage Rule. As a 6th generation San Luis Obispo County resident, I take great pride in knowing that PG&E is actively taking precaution to keep us safe and their site at Diablo Canyon safe for both residents and their work force for generations to come. With NRC oversight, PG&E has a very detailed and successful spent fuel

management program and continues to safely store fuel via both its wet and dry cask storage systems. I am confident that layer upon layer of safeguards are in place to effectively manage and monitor the stored spent fuel. (0909-1 [Johnson, Amber])

Comment: On Page 2-16, in the discussion of dry cask use and description, WHY HAVE OUR INQUIRIES RESULTED IN INFORMATION THAT PALISADES NOW HAS BOTH VERTICAL AND HORIZONTAL DRY CASKS IN USE? WHY?? WHAT ARE COMPARATIVE FACTS SHOWING OF SAFETY/PERMANENCE/REPLACEMENTS [100 YEARS.... HOW, WITH CASK 4 STILL NOT REPLACED/RELOADED BECAUSE OF THE CRACK, OR OTHER?? (0910-11 [Carey, Corinne])

Comment: I am writing to you today to show support for PG&E's successful spent fuel management program and the NRC's Spent Fuel Storage Rule. As a sixty-six year San Luis Obispo County resident, I take great pride in knowing that PG&E is actively taking precaution to keep us safe and their site at Diablo Canyon safe for both residents and their work force for generations to come. With NRC oversight, PG&E has a very detailed and successful spent fuel management program and continues to safely store fuel via both its wet and dry cask storage systems. I am confident that layer upon layer of safeguards are in place to effectively manage and monitor the stored spent fuel. (0911-1 [Stork, Gilbert])

Comment: Consolidated, temporary, interim away-from-reactor storage must be available by the end of the Short-Term period, pending the availability of the geologic repository. Consolidated storage presents an overall safer storage environment and a more economical approach to the storage problem by eliminating significant duplication of costly construction (for example, at-reactor Dry Transfer Systems [DTS]) and staffing that will increase costs. Consolidated Storage will reduce the added burden to State and local governments supporting these long term activities. (0913-2 [Bevill, Bernard])

Comment: Aging Management Program[:] The draft GEIS indicates that an aging management program is required by the NRC, however, no specifics are provided. *Recommendation:* Provide information on facility/storage aging management program on specifically how: (i) the integrity of dry storage system components will be monitored during a 100year storage time frame, and (ii) the potential emissions specific to dry storage systems will be monitored during the 100-year storage time frame. (0915-10 [Bromm, Susan E.])

Comment: The draft GEIS discusses cladding degradation issues of high burnup fuel and, should cladding degradation occur, notes that "greater care could be required during handling operations" (p. B13). However, the draft GEIS does not provide information to clarify what specific measures would be taken during handling operations. Furthermore, we expect that cladding conditions of some assemblies would be such that it would not be safe to transfer fuel without cladding rupture, regardless of any additional handling measures. In this case, it may be safer to leave the fuel in the "old" cask instead of risking the spread of radioactive materials due to cladding rupture. EPA believes that such a "leave as is" sub-scenario is not speculative because: (i) the data on fuel conditions exists only for 12 rods after 15 years of storage in a fully controlled experimental environment while the draft GEIS assumes a 100-year long storage period, (ii) there are significant uncertainties concerning the potential for future accidents and off-normal conditions during loading and transfers at a storage site, and (iii) there is no data on fuel conditions after long-term storage that is similar to the data for low burnup fuel. Accidents and off-normal conditions may cause beyond the design basis conditions, i.e., beyond those for which the storage systems are licensed. One example is an assembly mislead caused by a human error, which can lead to cladding temperatures increasing beyond the design basis limit.

In addition, with hundreds of thousands of assemblies to be loaded and transferred, even a low frequency of misload events may cause a release of radioactive materials during the lifetime of one or several independent spent fuel storage installations (ISFSIs). (0915-14 [Bromm, Susan E.]

Comment: High Burnup Fuel[:] The draft GEIS states that it is expected that industry will utilize fuel to higher burnups in the near future, but does not distinguish low and high burnup fuels in its analyses, except for pool fires. The draft GEIS indicates that its analyses are for low burnup fuel because these fuels will require more space for storage in the future. This position would not have much significance if the condition of the high burn up fuel deteriorates significantly more than low burnup fuel in long-term storage. However, while data exists for low burnup fuel conditions after 15 years of dry storage, no data exists for high burnup fuel after 15-years of dry storage. We recognize that high burnup fuel studies are on-going (Billone, 2013) and that no definitive results are currently available. *Recommendation:* Discuss how forthcoming information on high bumup fuel conditions after long-term storage will be addressed in future licensing actions. (0915-2 [Bromm, Susan E.]

Comment: The draft GEIS states that studies performed to date have not identified any issues that would call into question the technical feasibility of the long-term use of dry storage for low burnup spent fuel, however, it is not clear that long-term storage would be feasible for high-burnup fuel. *Recommendation:* Provide information on the projected amount of high-bumup fuel that will be stored, repackaged, and transferred at DTS/ISFSI facilities for the three scenarios. In addition, provide information on whether there are any potential issues regarding the technical feasibility of long-term use of dry storage for high burnup spent fuel. (0915-3 [Bromm, Susan E.]

Comment: The NRC's Interim Staff Guidance "The Use of a Demonstration Program as Confirmation of Integrity for Continued Storage of High Burnup Fuel Beyond 20 Years" (NRC ISG-24 (2013)) indicates that data supporting readily retrievable storage of high-burnup fuel beyond 20 years is not presently available. The guidance also recommends that a demonstration program could provide an acceptable method for an applicant to demonstrate compliance with regulations for storage of high-burnup fuel for periods of greater than 20 years. This demonstration program appears to require a cladding inspection at the end of 20 years. If a reactor license is terminated and a pool is not available, this cladding inspection is likely to include cutting the canisters open and inspecting the cladding for degradation, which would then potentially require construction and operation of a DTS for all three time frame scenarios. *Recommendation:* Provide information on whether high-burnup fuel will likely be inspected every 20 years. If this is the case, discuss how such inspections and associated operations and transfers may impact the assumption that no DTS is needed for 100-year storage period, especially when reactor licenses are terminated and pools are no longer available. (0915-4 [Bromm, Susan E.]

Comment: (XII-3) The most effective option in Table XII-1 is to re-equip the pool with low-density, open-frame racks. In the case of BWR fuel, a corollary action could be the removal of channel boxes from the fuel. When nuclear power plants in the present US fleet first entered service, their spent-fuel pools were equipped with low-density, open-frame racks. The margin of safety provided by this configuration was lost when the nuclear industry adopted high-density racks as a way to minimize short-term costs. (0916-3-15 [Curran, Diane] [Thompson, Gordon R.]

Comment: As woefully inadequate as NRC shipping container safety regulations are, NRC's storage-only container safety regulations are even worse. Thus, an earthquake plunging one or more storage-only casks underwater at Palisades is even more problematic a risk than a barge

shipment sinking a transport cask, at least in terms of the safety standards applied to each type of container for survival of an underwater submersion, that is. To drive the point home, I attended an NRC-industry technical meeting several years ago, regarding the risks of underwater submersion to the particular casks in use at Palisades (as well as at Point Beach nuclear power plant on the Wisconsin shoreline of Lake Michigan, as well as at Arkansas Nuclear One, ANO, nuclear power plant), namely, VSC-24s (for Ventilated Storage Casks holding 24 Pressurized Water Reactor irradiated nuclear fuel assemblies). (0919-1-16 [Kamps, Kevin])

Comment: In fact, NRC's WC DGEIS, at Table G-4, "ISFSIs with General Licenses under Part 72," Pages G-9 to G-11, confirms that VSC-24s are in use at Palisades (as well as at Point Beach and ANO). The industry representatives at the meeting represented cask vendor BNG Fuel Solutions (as confirmed in WC DGEIS Table G-4), which acquired ownership of the VSC-24 license from Sierra Nuclear. BNG Fuel Solutions is now a part of EnergySolutions of Salt Lake City, Utah. NRC staff had 65 RAIs (Requests for Additional Information) for EnergySolutions regarding the risk of inadvertent criticality in VSC-24s due to underwater submersion. Thus, it became clear to me that the earthquake risk described by Dr. Landsman as early as 1994 is quite significant. Dr. Landsman, now retired from NRC, served as NIRS and Don't Waste Michigan's expert witness in the Palisades license extension proceeding. (0919-1-17 [Kamps, Kevin])

Comment: There is no permanent repository for the nuclear waste which would be generated at Palisades after 2010. (0919-1-8 [Kamps, Kevin])

Comment: At Page 2-7 (lines 24-27) to 2-8 (lines 1-2), NRC states "For purposes of analysis in this draft GEIS, the NRC relies for impact analysis on the larger reactor lifetime amount of spent fuel discharged at low burnups (i.e. 1,600 MTU), unless otherwise stated in the description of environmental impacts. This is because many of the environmental impacts (e.g., land use, geology and soils, and terrestrial resources) will depend upon the greater amount of space needed to store the larger amounts of spent fuel that would be generated a low burnups." The aspect that NRC seems to not comprehend is that high burnup irradiated fuel very likely will require, as compared to low burnup fuel, more space and time in the storage pool for sufficient thermal cooling and radioactive decay; and/or more space and time in dry cask storage - perhaps with enhanced features, such as added cooling features, and/or radiation shielding; and/or more space in a repository setting. This, due to the added heat and radioactivity emanating from high burnup fuel. (0919-3-12 [Kamps, Kevin])

Comment: Re: NRC's Section 3.8.3, Wildlife, what about wildlife being attracted to the warmth given off by ISFSIs? What about the risk to the stored irradiated fuel by wildlife nesting in or near ISFSIs, to take advantage of the warmth? Could the convection current flow paths be blocked, as by nesting debris? In North Korea, at the Yongbyon nuclear power plant, frogs and other wildlife were reported to be inhabiting the indoor irradiated fuel pool. Is there a risk of U.S. irradiated fuel storage pools being neglected to such a point during the post-reactor operations timeframe? (0919-5-16 [Kamps, Kevin])

Comment: Please find attached a three-page fact sheet I wrote in January 2012 entitled "Catastrophic Risks of GE BWR Mark I High-Level Radioactive Waste Storage Pools." (0926-1 [Kamps, Kevin])

Comment: A lesson to be learned from Fukushima Daiichi is that dense storage of irradiated nuclear fuel in storage pools, as done in the U.S., is a mega-catastrophe just waiting to happen,

whether sparked by a natural disaster, accident (such as heavy load drop), or intentional attack (in this sense, these pools are unimaginably large dirty bombs in our backyards. At this point, NRC is guilty of a cover up, and complicity with industry, regarding the mega-risk represented by densely-packed pools filled to capacity with ultra-hazardous, high-level radioactive waste, pools that NRC does not even require be connected to back-up power for running cooling water circulation pumps. Although NRC is considering requiring it, incredibly, even at this late point in time, nearly three years after the Fukushima Daiichi catastrophe began, with its horrific images or helicopters dropping water, and fire trucks spraying water, in desperate, ad hoc attempts to ensure cooling water was present in severely damaged, catastrophically vulnerable high-level radioactive waste storage pools, NRC still does not yet require that storage pools here even have in place make-up water supplies or capacities. (0926-4 [Kamps, Kevin])

Comment: Require a low-density, open-frame layout for fuel pools: fuel pools were originally designed for temporary storage of a limited number of irradiated fuel assemblies in a low density, open frame configuration. As the amount of waste generated has increased beyond the designed capacity, the pools have been reorganized so that the concentration of fuel in the pools is nearly the same as that in operating reactor cores. If water is lost from a densely packed pool as the result of an attack or an accident, cooling by ambient air would likely be insufficient to prevent a fire, resulting in the release of large quantities of radioactivity to the environment. A low density, open-frame arrangement within fuel pools could allow enough air circulation to keep the fuel from catching fire. In order to achieve and maintain this arrangement within the pools, irradiated fuel must be transferred from the pools to dry storage within five years of being discharged from the reactor. (0927-6 [Kamps, Kevin])

Comment: In support of public comments I just filed by email to Rulemaking.Comments@nrc.gov at 4:40PM, Dec. 20, 2013 [subject line: Docket ID No. NRC-2012-0246, public comments on NRC WC DGEIS --Oscar Shirani's whistleblowing revelations on Holtec dry cask QA violations], please find attached a copy of a three-page Memorandum, from Dr. Ross Landsman, now-retired NRC dry cask storage inspector for NRC Region 3, to his superior, Bruce Jorgenson, Chief, Decommissioning Branch. In the memorandum, Dr. Landsman expresses his full support for Commonwealth Edison/Exelon whistleblower Oscar Shirani, and Shirani's quality assurance allegations against the Holtec storage/transport casks. (0928-1 [Kamps, Kevin])

Comment: I do not share your confidence, expressed in your Waste Confidence Draft Generic Environmental Impact Statement (WC DGEIS, NUREG-2157), that dry cask storage of irradiated nuclear fuel is currently safe and sound, and will remain so not only for up to 80 years of reactor operations, up to 60 years beyond reactor operations during so-called "short-term storage," up to 100 years beyond that during so-called "long-term storage," and up to forevermore beyond that, during so-called "indefinite storage" (infinite storage?!). (0929-1 [Kamps, Kevin])

Comment: Manufacturers of dry cask systems must go through the NRC's "certificate of compliance" (CoC) process. This covers a host of issues, including the development of the cask design technical specifications, operational limits, maximum radiation dose limits and the condition of irradiated fuel that can be stored inside. As of Feb. 5, 2003, NRC had approved 16 different dry cask storage systems for general use at or away from reactors (see <http://www.nrc.gov/waste/spent-fuel-storage/designs.html>). NRC cask certification is valid for 20 year intervals, with reviewed extensions available. NRC has stated that dry cask storage is safe and reliable for up to 100 years. However, problems with dry casks have surfaced not after decades or a century, but almost immediately in the first few years, raising serious questions

about the NRC cask certification process itself. Evidence documents that the NRC's CoC process has been taken over by cask manufacturers' and nuclear utilities' profit-driven pressure for expediency. The consequent lack of rigorous regulatory oversight has resulted in a complete lack of field testing of cask designs, NRC approval for exemptions allowing manufacturers to build casks before receiving the certificate of compliance, and mounting evidence of poor quality assurance and quality control of cask manufacturing. In fact, a whistleblower fired by the largest nuclear utility in the U.S. alleges major quality assurance (QA) violations involving Holtec storage/transport containers. Oscar Shirani served as a lead QA inspector for Commonwealth Edison/Exelon of Chicago for many years, earning impeccable credentials. A consortium of nuclear utilities invited Shirani to lead a QA inspection of Holtec cask design and manufacturing in 2000. Shirani identified 9 major QA violations (such as unauthorized welding, large numbers of departures from design specifications, and use of potentially shoddy materials), leading him to question the structural integrity of the containers, especially under severe transportation accident conditions. Shirani's discovery followed an NRC-led QA inspection just months earlier that had identified no problems with the Holtec casks, casting huge doubt upon the competence and credibility of NRC's QA regulatory oversight. Shirani sought a "stop work order" against the manufacture of the Holtec casks until the QA violations were rectified. Instead, Exelon harassed and ultimately fired him. Shirani has been blacklisted from the nuclear industry ever since, and his allegations have never been addressed. Frighteningly, Holtec casks are already in use at 33 U.S. nuclear reactors (see locations under "Spent Fuel Systems Division" at <http://www.holtecinternational.com/>). Numerous technical problems with fully loaded dry casks are popping up around the country at an alarming rate, leading to charges from concerned citizens living nearby that ISFSI's (pronounced "is-IF-sees") are very "iffy," and represent "nuclear experiments" in their backyard. (0929-10 [Kamps, Kevin])

Comment: The explosion within the VSC-24 took place immediately above 24 irradiated fuel assemblies already loaded into the cask, containing the equivalent amount of long-lasting radioactivity released by 240 Hiroshima-sized atomic bombs; the nearby "spent" fuel pool held the full inventory of high-level radioactive waste generated at that plant over the course of decades. Although the NRC and utility reported that no radiation was released, no damage was done to the irradiated fuel assemblies in the cask, and no one was injured by the blast, the forceful explosion occurred near the plant's "spent" fuel pool, not a place to "play with fire" or make mistakes with objects weighing many tons. Loaded dry storage casks, weighing more than 100 tons, are among the heaviest loads moved within a reactor during power operation. Human error and equipment failure raise issues of worker and public safety during cask handling and moving activities. Dropping either a loaded or unloaded cask inside the fuel pool building can severely damage plant safety equipment, jeopardizing reactor operation and the cooling of irradiated fuel in the storage pond. On May 13, 1995 a loaded TN-40 cask became stuck in the hoisted position above the Prairie Island, Minnesota plant's irradiated fuel storage pool for 16 hours. This incident occurred just after NRC had granted Northern States Power (now Xcel Energy) an exemption from regulatory requirements for reviewing cask loading procedures. Over 120 tons of metal storage cask and irradiated fuel assemblies dangled precariously over 22 years' worth of the reactor's accumulated irradiated fuel assemblies in the pool below—many hundreds of tons of deadly nuclear waste. This dangling "sword of Damocles" risked dropping back into the pool, damaging irradiated fuel stored there, or punching a hole in the pool leading to a loss of coolant accident and potentially catastrophic consequences. Luckily, nothing happened—that time. Some reactor designs, such as in G.E. boiling water reactors, have placed the irradiated fuel storage pools several stories up in the reactor building. Consequently, cask movement can place heavy loads up to ten stories high inside the reactor building. A cask drop would send the heavy load crashing down through several floors of the building which house vital safety systems, with untold consequences. (0929-12 [Kamps, Kevin])

Comment: These widespread problems make clear that NRC's high-level waste storage and handling regulations are dangerously inadequate and in need of comprehensive review. Despite this, NRC continues to expedite ISFSI licenses: there are scores of nuclear power reactors in dozens of states planning to open ISFSI's in the next several years due to the fact that their indoor storage pools are completely filling up. In addition, NRC continues to allow vendors to manufacture casks before they have received their certificates of compliance. Once casks are already built, the pressure is on NRC to help "fix" any problems that surface via an "efficient and effective" (i.e., quick, cheap and easy) CoC amendment process, which again locks out involvement of concerned citizens, and leads to changes on the casks that leave NRC itself unsure that its "Safety Evaluation Report" still applies. The nuclear industry has even pushed for NRC permission to "fix" cask problems without even notifying the federal agency charged with protecting public health and safety and the environment! As more and more utilities quickly run out of pool space and seek to store fuel in dry casks or even to transport fuel off-site, NRC certification of cask designs is accelerating: in February, 2000 alone, NRC was engaged in certifying five new cask designs, and beginning review of an additional three applications for cask certification. As Bill Brach, director of the NRC's Spent Fuel Project Office (which is in charge of cask certification) cheerfully reported to the NRC Commissioners in February, 2000, "We've been extremely busy." Given the history of past mistakes and the current rush job, future certification, manufacturing, and operational mistakes are inevitable. (0929-13 [Kamps, Kevin])

Comment: Incredibly, not a single dry storage cask, once loaded, has ever been unloaded in the U.S. This has led critics to charge that no safe unloading procedure exists. In May, 1993 local environmental groups and the State of Michigan filed for an injunction in federal court against the loading of VSC-24's at Palisades, alleging that there was no proven safe method for unloading the casks. The NRC and Consumers Energy assured the court that in an emergency, casks could be safely unloaded simply by reversing the loading procedure. The court denied the injunction and allowed the casks to be loaded. Just over a year later, in August, 1994 Consumers Energy discovered that its fourth loaded VSC-24 dry cask had weld flaws. To demonstrate its commitment to public safety and the environment, as well as to live up to its promise to the court, Consumers announced it would unload the irradiated fuel in the cask back into the storage pool. Only then were the difficulties discovered. Reintroducing the 400 degree Fahrenheit fuel assemblies back into the 100 degree fuel pool water would result in a radioactive steam flash hazardous to workers, and would thermally shock the fuel assemblies threatening to further degrade them. Also, the welded-shut inner canister would have to be cut open in a timeframe of less than 50 hours, for the cooling process could not be maintained during the unloading procedure and the fuel within would begin to overheat. In addition, there was no procedure yet developed to remove steel shims that were pressure fit inside the cask lid. Rather than leading to a pause for reflection, however, Consumers rushed to immediately load nine more VSC-24's, a move taken by local concerned citizens to be in very bad faith. Ten years after Consumers announced it would unload the defective cask #4, it still sits fully loaded on the Lake Michigan shoreline, alongside two dozen more fully loaded VSC-24's of questionable structural integrity. The failure to safely unload dry casks has concerned other neighbors next to reactors. The Prairie Island Mdewakanton Dakota Tribe in Minnesota petitioned the NRC to prohibit Northern States Power from loading any more TN-40 casks until a safe unloading procedure had been demonstrated, but to no avail. 17 dry casks sit fully loaded just several hundred yards from the nearest homes and a tribal child care center on this tiny island on a flood plain in the middle of the Mississippi River. Recently, Xcel Energy pressured the Minnesota state legislature to permit it to load scores more casks at Prairie Island, violating an agreement made in 1994 to limit the number of casks to 17. Adding further to worries about cask unloading, corrosion between the metallic inner canister and the metallic lining of the outer shell of VSC-24's could cause a bonding together that would be very difficult to pry apart. Even

if the casks were to malfunction, or the waste to leak, or a repository to open that could accept the wastes, it remains unclear whether dry casks could be safely unloaded back into fuel storage pools or into transport casks for shipment off-site. (0929-14 [Kamps, Kevin])

Comment: High-level nuclear waste presents us with an unprecedented dilemma--poisons that remain deadly for hundreds of thousands of years. If dry cask storage is so problematic, why not keep the wastes in wet storage pools? Wastes are dangerous there too, for cooling pumps must operate 24 hours per day, 7 days per week, for decades. Without pumps circulating cooling water, the thermally hot waste could boil away the pool water in a matter of hours. A recent NRC report admitted that even decades-cooled irradiated fuel could spontaneously combust if overheated or put in contact with air. A pool fire could release disastrous amounts of radioactivity to the environment. A puncture of a pool and consequent loss of water could lead to similar catastrophic consequences. So could a simple loss of power, causing the cooling and water circulation pumps to stop working. A raccoon at the Fermi reactor in Michigan once caused such a loss of power to the cooling pumps. For these reasons, many see dry cask storage as safer than wet pool storage. Dry casks have no moving parts, and individually contain smaller amounts of high-level waste than cram-packed pools. The word "safer" is relative, for high-level nuclear waste is dangerous no matter how or where it is stored. (0929-15 [Kamps, Kevin])

Comment: A May 28, 1996 explosion at the Point Beach reactor in Wisconsin jolted public confidence in the dry cask storage program. While sealing shut a VSC-24 (a Ventilated Storage Cask built by Sierra Nuclear Corporation (SNC) holding 24 irradiated fuel assemblies; this cask design has now been taken over by British Nuclear Fuels, Ltd.), a welding torch ignited pent up hydrogen gas with enough force to dislodge the cask's 4,000 pound shield lid several inches in the air and tilt it ajar on top of the cask. After allowing SNC to manufacture several VSC-24 units even before its CoC, NRC certified the cask design in May, 1993. The explosion was later determined to result from an electro-chemical reaction between an anti-corrosion zinc liner within the cask and the borated "spent" fuel pool water. The chemical reaction between zinc and boric acid to generate explosive hydrogen gas--familiar to many high school chemistry students--somehow escaped the notice of all the "experts" at NRC, the cask manufacturer, and the nuclear utility company. Over a dozen VSC-24 casks had already been loaded around the country before the explosion. Utility employees had observed bubbles in the "spent" fuel pools during these loadings, yet had failed to understand that they were flammable hydrogen gas and did not report them to the NRC. In fact, a blue flame was observed burning within another VSC-24 loaded at Point Beach previous to the explosion, but had been shrugged off by employees as resulting from excess cleaning solvents and went unreported. The explosion led to NRC inspecting SNC's cask manufacturing facility, revealing confusion, inadequate testing, and poor quality control. It also led to a three year halt on the loading of VSC-24's in the U.S. so that the NRC, nuclear utilities, and the cask manufacturer could get a grip on the situation. However, the next VSC-24 to be loaded, at Palisades in June, 1999 again experienced two separate "hydrogen ignition incidents." Again there was a breakdown in administrative controls. The NRC inspectors, thinking all was in order, had already gone home for the day before the "burns" occurred. A welder ignited a "burn" but did not report it, which led inevitably to a welder on the next shift igniting a second "burn". Days passed before NRC was notified. Just the next week later, a suspicious fire in the dry cask storage administrative office trailer at Palisades destroyed many documents, including those about the recent "burns". Concerned citizens cried foul, but NRC did not cite Palisades for any violations of regulations. In 2001, Palisades officials admitted to the NRC that the very same irradiated fuel that was involved in the hydrogen "burns" had actually cooled for less than five years in the storage pool. Loading it in dry casks had been in violation of the casks' technical design specifications, and thus federal regulations. Suspiciously,

the less-than-five-years-cooled fuel had been evenly distributed between a number of casks, leading critics to charge that the "mistake" had in fact been intentional. However, records pertaining to the suspect loading procedure had been destroyed in the earlier suspicious office fire (for which fire inspectors never ruled out the possibility of arson). Shortly thereafter, a VSC-24 cask loading at the Trojan nuclear plant in Oregon had to be suspended when so many hydrogen bubbles were generated in the fuel pool that workers could not see well enough to complete the job. In June, 2000 NRC cited the VSC-24's new owner, British Nuclear Fuels, for poor quality control and assurance in cask manufacturing and maintenance. Obviously, four years since the Point Beach explosion (1996-2000) was not long enough for NRC and industry to resolve problems with the VSC-24. (0929-19 [Kamps, Kevin])

Comment: A March, 1997 NRC inspection report revealed another defect with VSC-24's: delayed cracking in welds supposed to seal shut the multiple shield lids on casks at Palisades, Point Beach, and Arkansas One nuclear plants. Such cracks can allow the inert helium gas within the cask to escape, making the irradiated fuel assemblies vulnerable to contact with air, oxidation, and deterioration. Such degradation could lead to serious irradiated fuel handling and transportation problems in the future. Again, weld failure in shield lids was unanticipated and unanalyzed by industry and the NRC. Over the past several years, NRC has identified serious problems in other dry cask systems. Three NUHOMS casks, manufactured by VECTRA Technologies (now owned by Transnuclear, Inc., a subsidiary of the French nuclear giant COGEMA) and fully loaded at the Davis-Besse nuclear plant in Ohio, were discovered to have been built below technical specifications: the aggregate used to fabricate the casks' outer concrete shells was poor quality, and the shells themselves were ground too thin. In January, 2000 NRC reported that a TN-32 cask (manufactured by Transnuclear, containing 32 irradiated fuel assemblies) at the Surry nuclear plant in Virginia had developed six inch long cracks in its outer concrete shield, loose bolts, and a helium leak. In late May, 2000 NRC discovered an unreported flaw with the neutron shielding material supplied to New Jersey-based cask manufacturer Holtec International by Nuclear Assurance Corporation. Holtec hopes to deploy no less than 4,000 HI-STORM dry casks for use at the proposed Private Fuel Storage, LLC high-level nuclear waste dump targeted at the tiny impoverished Skull Valley Goshutes Indian Reservation in Utah. Transportation of irradiated fuel rods to Utah in Holtec HI-STAR containers-the first dual purpose storage/transport cask to be certified by NRC--from Eastern, Southeastern, and Midwestern reactors would traverse dozens of States, past the homes of millions of Americans, raising unprecedented safety concerns. In April, 2001 the Sacramento Municipal Utility District halted loading its first Transnuclear West Nuhoms dry storage cask at the Rancho Seco reactor in California due to an unexpected mishap. A faulty O-ring leaked air underwater in the irradiated fuel storage pool during loading operations, threatening to contaminate the fuel-holding inner canister with radioactive pool water. In Sept., 2001 an Exelon Corporation spokesman at the Dresden nuclear reactors in Illinois admitted to a visiting group of nuclear power officials touring the plant's new dry cask storage facility that the NRC had granted Dresden an exemption when its recently, poorly poured dry cask storage concrete pad did not meet specifications. (0929-20 [Kamps, Kevin])

Comment: Please find attached an 8-page fact sheet [Get the Facts on High-Level Atomic Waste Storage Casks!] I first wrote in 2000, but updated, as you will see, on July 15, 2004. It lists many problems with dry cask storage that I was aware of at that time. Of course, the fact sheet needs to be updated. Many more problems with dry cask storage have been documented since 2004. But to the best of my knowledge, the problems I cited in 2004 have yet to be adequately addressed by NRC, if they have been addressed -or even acknowledged -at all. So please explain to me how you can have such confidence in dry cask storage, from now until the

end of time, as you do in your WC DGEIS, given the many problems documented in the attached fact sheet? (0929-4 [Kamps, Kevin])

Comment: "Spent" nuclear fuel is a misleading term. Irradiated nuclear fuel rods discharged from commercial nuclear power plants are highly radioactive, a million times more so than when they were first loaded into a reactor core as fresh fuel. If unshielded, irradiated nuclear fuel just removed from a reactor core could deliver a lethal dose of beta, gamma and neutron radiation to a person standing three feet away in just seconds. Even after decades of radioactive decay, a few minutes unshielded exposure time would be enough to deliver a lethal dose. Certain radioactive elements (alpha emitters such as plutonium-239) in "spent" fuel will remain hazardous to humans and other living beings for hundreds of thousands of years. Military high-level radioactive wastes--the highly radioactive liquid and sludge "leftovers" from reprocessing irradiated fuel rods to extract the uranium and plutonium for making nuclear bombs--has the same hazardous characteristics as "spent" commercial fuel. Irradiated fuel rods and high-level nuclear wastes are perhaps the most hazardous poisons ever created. There is the added danger that fissile materials still present in highly radioactive wastes will form a "critical mass," causing an inadvertent nuclear chain reaction that could radiate a deadly beam of neutrons and possibly even generate enough heat to melt through the container within which it is held. Thus, these wastes must be shielded for centuries, prevented from going critical, and isolated from the living environment for hundreds of millennia. (0929-5 [Kamps, Kevin])

Comment: With every operational cycle of 18 to 24 months at a U.S. nuclear power plant, the reactor is shut down and approximately one-quarter to one-third of its now extremely radioactive fuel assemblies are removed. These thermally hot and highly radioactive fuel assemblies are then transferred into the plant's irradiated fuel storage pool. These large, indoor water-filled storage ponds shield much of the high radiation underwater, and allow the assemblies to thermally cool down from the reactor's high operational temperatures. These pools were originally designed for temporary storage only. Nuclear utilities assumed their high-level wastes would be shipped off for reprocessing to extract fissionable uranium and plutonium for making new fuel rods, or else transported for dumping at a "permanent geologic disposal site" --an underground national sacrifice area. However, reprocessing of commercial wastes was abandoned in the 1970's as economically unfeasible and a threat of nuclear weapons proliferation (not to mention a source of serious radioactive pollution into water and air), and geologic disposal remains mired in technical and political controversy. Consequently, high-level waste inventories at commercial U.S. nuclear reactors have dramatically mounted in storage pools. After decades of "re-racking" to cram pools as full as possible, growing numbers have filled to capacity. This has complicated continued operations and waste generation at certain reactors, while at the growing number of closed down reactors, irradiated fuel assemblies sit in their storage pools even while the plant sites are dismantled and "decommissioned" around them. (0929-6 [Kamps, Kevin])

Comment: As pools have filled, the nuclear industry and the U.S. Nuclear Regulatory Commission (NRC) have developed dry cask storage systems, or Independent Spent Fuel Storage Installations (ISFSI's), to expand "interim" storage of wastes both on-site at plants and away from reactors. As of March, 2003 there were 28 operating licensed ISFSI's located in 22 different States. Numerous additional potential ISFSI sites in many more States may open in the near future (see U.S. Nuclear Regulatory Commission Spent Fuel Project Office's March, 2003 map of ISFSI locations at <http://www.nrc.gov/waste/spent-fuel-storage/locations.html>, as well as its "Nuclear Fuel Pool Capacity" graph at <http://www.nrc.gov/waste/spent-fuel-storage/nuc-fuel-pool.html>, showing the growing number of pools filling to capacity, an indication of impending moves to opening ISFSI's at those reactors). After a minimum of five years of thermal cooling in

"wet" storage pools, irradiated fuel assemblies can be transferred to NRC certified "dry" storage casks made of concrete, steel alloy, and neutron shielding materials. Resembling a giant metallic thermos (solid on one end, open on the other), inner canisters are loaded underwater (to shield workers from the high radiation). The pool water is then pumped out, multiple shield lids are welded or bolted on to seal shut the open end, and the interior of the canister is filled with inert gas (such as helium) intended to prevent deterioration of the fuel rods from oxidation with air, as well as to conduct heat away from the waste. These canisters are then transported to concrete storage pads either immediately nearby the reactor (an on-site ISFSI), or else away from the reactor at an off-site ISFSI. They are loaded into either horizontal "bunkers" or vertical silos (depending on the dry cask system design) made of concrete, which provide shielding against the gamma and neutron rays that emanate out from within the surprisingly thin metallic inner canister. Natural convection through vents in the concrete silo or "bunker" provides passive air cooling, but the inner metal canister can still reach temperatures of 400 degrees Fahrenheit or higher due to the waste's on-going radioactive decay. NRC approved ISFSI sites can accept irradiated fuel from more than one reactor. (0929-7 [Kamps, Kevin])

Comment: It is a good point, what is the difference between a deep geologic repository and the NWOs that you propose to scatter around the country? Is there a reason the experts have pushed for a site 2 3 4 like Yucca Mountain and have not proposed leaving it in casks, exposed to the elements and wartime or terrorist attack? Of course there is, but if you use the logic of this GEIS, the fuel will never be moved to such a repository, because you say that there is no problem with leaving it where it is. YOUR DOCUMENT MUST RE.EAL THESE DANGERS. (0930-1-14 [Lutz, Ray])

Comment: Page 2-26, Lines 32+, you consider "aging effects" and list a few that are related only to the canisters, casks, and overpacking, but not the aging of the fuel assemblies and fuel contained by them. The use of "high burnup fuel" is extremely prevalent and the implications in terms of aging are really unknown. This is yet another example of a pesky "issue that requires resolution"... we really don't know what will happen to the fuel assemblies after 100 years (or even 20 years) of containment in a ISFSI, but they certainly must be contained in your list of aging issues. (0930-2-18 [Lutz, Ray])

Comment: We must continue to point out that a NWO DOES DIFFER from a deep geologic repository. YOU NEED TO DESCRIBE THAT DIFFERENCE AND BE HONEST ABOUT THE RISKS. (0930-2-22 [Lutz, Ray])

Comment: It is expected that the fuel pool will be the storage site for a hundred years, destined to remain a waste dump. And an overloaded pool is an added risk for a fire which could be catastrophic. (0933-8 [Anonymous, Janet])

Comment: The NEI's scoping comments termed as "speculative" the possibility of analyzing an alternative with a centralized interim storage area for radwaste. However, given that the Yucca Mountain earlier-proposed repository is in an active volcanic and seismic area along the Ghost Dance Fault, and seeing that I have not heard of any progress being made toward a geologic repository for commercial nuclear power spent fuel waste at another location, thus I contend that it is at least as speculative to claim that there will be a permanent geologic repository for this kind of radwaste. (0937-25 [Campbell, Bruce])

Comment: There was concern that the "Mobile Chernobyl" bill might be brought up in in D.C. in December, but it was put off until the new year. Establishing centralized interim storage is taking legislative form while the push for a geologic repository is lagging. Thus, one could conclude

that in the next few decades it is much more likely to have centralized interim storage than a geologic repository that isn't in that horrible location in an active volcanic and seismic area in Nevada. Thus, the arguments that centralized interim storage is speculative is poorly supported. (0937-26 [Campbell, Bruce])

Comment: Despite what the producers of this document were told by their guiding lawyers, there is clearly and inherently a serious risk in the short, mid, and long-term storage of radioactive wastes whether in spent fuel cooling ponds, in racks, in dry casks, or in other arrangements wherever they may be at a nuclear reactor site, at some centralized or regional locale which is supposed to be awaiting a more permanent solution, or awaiting or eventually being placed in a more permanent geologic repository. (0937-29 [Campbell, Bruce])

Comment: High BurnUp Fuel -The DGEIS must be redone. Not fully evaluated in DGEIS and There is no determination of isolation from other waste, amount and location, or studies to address the problems. Must stay 20 years in pools Only 20 years in casks No transport allowed Reference:

<http://sanonofresafety.files.wordpress.com/2013/11/wasteconcommentsdgilmoreshubmitted2013-12-19docketnrc-2012-0246.pdf> (0938-14 [Sondheim, Steven])

Comment: The EIS must also compare the variety of possible methods for storing the more than 150,000 tons of highly radioactive irradiated/spent fuel that will be created and housed at nuclear power reactors by 2050. (0938-3 [Sondheim, Steven])

Comment: The storage and transport of high-burnup fuel must be fully evaluated in the EIS. (0938-6 [Sondheim, Steven])

Comment: No state is a waste dump! I don't want any more high-level radioactive wastes coming "to or through" my state. I do not want to see more high-level, long-lived radioactive waste coming to proposed so-called "centralized interim storage" waste facilities (a.k.a., "parking lot dumps") here or anywhere else. (0939-4 [Marschak, Cheryl])

Comment: Exelon believes that the NRC appropriately addresses concerns being raised about Stress Corrosion Cracking (SCC) of dry storage canisters by citing the manner in which these concerns are being resolved as an example of how the regulatory process responds to emerging events. The significant efforts that the industry has already taken, and is continuing to take, to address this concern and assure the longevity of these canisters should also be mentioned. (0942-7 [Helker, David P.])

Comment: Exelon considers that dry used fuel storage and transportation are among the safest of all industrial activities, as tens of thousands of tons of used fuel have been stored and shipped around the world in many thousands of storage and transportation packages, without a radiation-induced injury or fatality. Used fuel and radioactive material packages have a unique characteristic among all other hazardous material packages (i.e., the need for gamma radiation shielding). Gamma-shielding materials are dense and strong, and since the shielding, by regulation, must remain attached even following accident conditions, it therefore, provides enhanced robustness with larger structural safety margins than other packages. (0942-8 [Helker, David P.])

Comment: At best, permanent on-site storage would take these sites out of use for any purpose other than housing waste storage in above ground concrete "mausoleums." At worst, this dubious policy would put area residents in peril of accidents in spent fuel pools or from long-

term decay of dry-cask storage. These perils have been greatly increased by the use of "high burn-up" fuel that is hotter both thermally and radioactively, making it more dangerous to handle and more difficult to store. Currently, high burn-up has no approved means of storage beyond 20 years. (0944-7 [Pascall, Glenn] [Watland, George])

Comment: I am writing in full support of the NRC's Spent Fuel Storage Rule, and wish to say that with NRC oversight PG&E has a very detailed and successful spent fuel management program and continues to safely store fuel via both its wet and dry cask storage systems. I am confident that layer upon layer of safeguards are in place to effectively manage and monitor the stored spent fuel. (0949-1 [Commenters, Multiple])

Comment: PG&E has a very detailed and regulated spent fuel management program in place to safely store the fuel until such time as the federal government acts on its responsibility to take ownership and remove the spent fuel to a repository or allows for it to be recycled and reused. (0949-3 [Commenters, Multiple])

Comment: The wet storage pools, where the solid (not liquid) spent fuel is immediately housed after being removed from the reactors, were built with seismic-safety in mind and are constructed out of steel-reinforced concrete built into bedrock, with steel liners serving as an added safety barrier. They are an integral part of the storage process, giving the used fuel an opportunity to cool from its reactor temperature to a more modest temperature before being transported to dry cask storage. When the spent fuel assemblies are ready to be moved from wet storage, they are taken to a seismically reinforced dry cask storage facility located on-site. Here the assemblies are stored in a secure, protected area until they can be transferred to a federal government location or to a recycler for reprocessing and ultimate reuse as a fuel source (a process that is currently not being utilized in the United States). These two on-site interim storage methods are part of a safe, effective, and regulated system that follows industry best-standards. (0949-5 [Commenters, Multiple])

Comment: I am writing to support the NRC's Spent Fuel Storage Rule. In my view, with NRC oversight, PG&E has a very detailed and successful spent fuel management program for its Diablo Canyon nuclear power plant (Diablo). PG&E continues to safely store fuel via both its wet and dry cask storage systems. Without the federal government providing a permanent geologic storage facility, as required by law, PG&E has designed and implemented an interim, on-site system for the interim storage of the spent fuel assemblies. After removal from the reactors, the used fuel is placed in storage pools to cool for approximately five (5) years. After sufficient cooling, the used fuel assemblies are placed in sealed, Helium-filled canister and set inside a 20 foot tall, concrete-filled, steel storage cask. The storage casks are stored in a secure protected area proximate to the plant. Unlike other nuclear plants, the casks in the storage area are bolted to a seven and-a-half-foot thick steel-reinforced concrete pad to ensure it is seismically stable. This system has proved safe and effective. There is no reason to believe that this interim storage system would not remain viable after the Diablo plant's licensing period. I am confident that layer upon layer of safeguards are in place to effectively manage and monitor the stored spent fuel. (0949-6 [Commenters, Multiple])

Comment: Then we need strong regulations for on-site storage and for transporting waste. (0996-2 [Donaldson, John])

Comment: On-site storage in cooling pools is a bad idea because it leaves the radioactive materials spread across dozens of sites in poorly-secured locations, and requires that power be available - without significant interruption - to the cooling water pumps. (0998-4 [Rosanelli, Donald])

Comment: It is impossible to state that the NRC or anyone else for that matter can guarantee 100% that radioactive waste can safely be stored, any where, any how. The problem will only get worse when other countries try and solve their nuclear waste problem. Nature will have a way of making it impossible. (0999-1 [Kirschbaum, Saran])

Comment: The NRC is surely the only regulatory body in the world that would argue that indefinite -- essentially permanent -- storage of high-level radioactive waste in fuel pools and dry casks provides "confidence" that this waste will never cause a threat to public health and safety. MORE NRC CRIMINALITY. AND THE DELUSIONAL NRC JUST KEEP ON KILLING. (1004-6 [Dimondstein, Carla])

Comment: While on-site fuel ponds are clearly the more dangerous choice and dry cask storage would be incrementally preferable, neither provides adequate assurance of acceptable risk to public health and safety, and neither is designed for permanence. (1007-1 [Diamond, Jim])

39. Comments Concerning Spent Fuel Pool Fires

Comment: NRC downplays the risks of pool fires by assuming that surrounding populations will be successfully evacuated. But nuclear utilities are allowed to store HLRW in pools for many decades after reactors permanently shutdown, in order to defer the costs of dry cask storage as far off into the future as possible, despite the inherent risks. At the same time, NRC allows utilities, via exemptions from regulations, to do away with 10-mile radius emergency planning zones (EPZs) within as soon as 12 to 18 months post-reactor shutdown. This, despite the lingering risk of storing HLRW in pools at such shutdown reactor sites. How can populations be evacuated, if EPZs have been dismantled?! (0002-6 [Commenters, Multiple])

Comment: NRC also downplays the risks of pool fires by assuming that a pool drain down accident (or attack) involves the complete drain down of the pool. However, as environmental coalition expert witness Dr. Gordon Thompson of the Institute for Resource and Security Studies (IRSS) has pointed out, any technically competent person paying attention to the issue should have known since 1979 that a partial drain down of the pool is actually a worse-case scenario, for the leftover water in the bottom of the pool would block convection current air flow which would help cool the irradiated nuclear fuel, leading to faster heat up to the ignition point. (0002-7 [Commenters, Multiple])

Comment: Metal containment casings for nuclear fuel rods will burn spontaneously if exposed to air. When the outside burns, the inside burns and releases the radioactivity. If a water-storage fuel pool drains down, it will burn. A HRLW fire could cause huge latent cancer fatalities as far as 500 miles downwind. (0023-9 [Bridges, Martha])

Comment: I'd like to talk about the metallurgy of zirconium, Zircaloy, and fires. First of all, yes, it's true we've been very lucky with controlling fires and we've been very, very lucky with controlling fires in spent fuel pools. We don't know what's going to happen with these spent fuel pools, but now that we've got the higher compaction due to the fact that we don't have any place to put this spent fuel, the radioactive waste -- and we do not really -- I have looked at the data that the NRC has gotten on zirconium, Zircaloy, and fires. They don't look at surface conditions. They don't look at alloying, accidental alloying, or alloying at the surface very much. And there's a chance that instead of a small fire, we can go to a different kind of fire. In other words, instead of having water react with the zirconium to release hydrogen and zirconium oxide, we can go to a very fast, much faster fire where due to temperature and pressure the zirconium can react with the oxygen and air at a much, much faster rate. And I do not know if that actually happened

at Fukushima. All I saw in the news was the roof tops heading out toward a higher altitude and I do not know which kind of fire and whether the higher rate of fire was actually occurring there. (0030-14-4 [Lewis, Marvin])

Comment: In terms of the risks of pool fires, Fukushima Daiichi Unit Number 4 is the most obvious example of the potentially catastrophic risks of pool fires. If that building were to collapse, lose its cooling water supply, and catch fire, the magnitude would be an order of magnitude or greater than what we have already seen in terms of radioactivity releases at Fukushima Daiichi. (0030-2-7 [Kamps, Kevin])

Comment: I agree with NRC Chairwoman Allison Macfarlane when she wrote, along with a team of authors, in 2003 that the risks of pool fires at commercial nuclear power plants in the United States are so great that expedited transfer into hardened onsite storage dry casks is a very important national security priority. (0030-2-8 [Kamps, Kevin])

Comment: [T]he spent fuel pool fires, I think the most relevant piece of data there is what is in NRC's most recently issued spent fuel pool study, which showed that the fuel is only hot enough to burn -- even if you drain all of the water out of the pool -- I mean, you can noodle the scenarios about what causes it to drain or what doesn't cause it to drain, but it is only hot enough to burn for the first two months after it comes out of the reactor. That's not the time periods we're interested in here. (0030-6-5 [McCullum, Rod])

Comment: The EIS is inadequate in that it does not really fully analyze the -- what the Court required, an analysis of the fire scenario, what would cause a fire, and simply because your guess is that your estimate -- expert estimate is that it is unlikely, the full consequences of a fire are not really analyzed. They are analyzed for one specific reactor, but it's not an adequate scenario for a situation like Indian Point or places that have very high populations. (0030-8-4 [D'Arrigo, Diane])

Comment: I join with NRC Chairwoman Allison Macfarlane, who, along with a team of authors, published a study in 2003 warning about the potentially catastrophic risks of storage pool fires, and calling for the wastes to be transferred to dry cask storage on an expedited basis. (0034-5 [Wagner, Jim and Virginia])

Comment: From all that I have read, I believe that there is significant risk of fire in storing spent fuel in densely packed pools, particularly those in pools above ground. We all know that the pools were designed to hold many fewer rods but have been allowed to hold many more since we don't have a national storage facility. Fukushima showed us the danger in losing pumps to circulate the water around the spent fuel pool rods. This could happen here! (0048-1 [Davidson, Judith])

Comment: U.S. Congressman Edward Markey has sought to understand the lessons of Fukushima. Here are some facts about the inadequate regulation of U.S. spent fuel storage pools Rep. Markey and his staff have uncovered, in the report Fukushima Fallout: Regulatory Loopholes at U.S. Nuclear Plants; (<http://markey.house.gov/docs/05-12-11reportfinalsmall.pdf>) Spent fuel pools contain no protection from hydrogen explosions such as the hardened vents that the NRC misleadingly pretended made US reactors invulnerable to hydrogen explosions (Fukushima reactors had hardened vents too, but the loss of electrical power made them inoperable!). NRC does not require any form of hydrogen mitigation at spent fuel pools. Spent fuel pools at offline reactors (such as those undergoing refueling) require no secondary emergency generating capacity. Thus the conditions that led to the Fukushima Unit 4 fuel pool

meltdown are legal under NRC regulations. NRC has no requirement that reactor hardened vents must be operable, and there has never been a requirement in place for hardened vents in spent fuel pool buildings. US fuel pools are holding, on average, 4 times more spent fuel than they are designed for and are densely compacted. (0089-5 [Shaw, Sally])

Comment: In 1997 a report for the NRC by Brookhaven National Laboratory found that a severe pool fire could render about 188-square miles uninhabitable, cause as many as 28,000 cancer fatalities, and cause 59 billion -- cost \$59 billion in damage. Based on a technical study of spent fuel pool accident risk at decommissioning nuclear power plants in 2000, the U.S. NRC conceded that the possibility of a Zirconium fire cannot be dismissed even many years after a final reactor shutdown. Yet the NRC is confident that what has happened at three reactors in Japan due to loss of power, loss of cooling capability, and hydrogen explosions could never happen here in reactors of nearly identical age and design. And because they think it could never happen they do not really consider the consequences. This is faith-based science. (0112-18-1 [Shaw, Sally])

Comment: The risks are incredibly low on both sides. The spent fuel study, so called earthquake study [NRC-2013-0136], that has been cited here on several occasions the fundamental conclusion of this study is that after a couple months out of the reactor the fuel is coolable in air. And you can vary the assumption to that study and months can become days. But over the time periods we're not worried. It's not a big concern for these time periods. (0112-25-6 [McCullum, Rod])

Comment: The problems with the earthquake study [NRC-2013-0136] are multiple. I would refer you to the analysis by Dr. Gordon Thompson submitted by Diane Curran. The highlights of what's wrong are as follows: The study did not consider geometry. It didn't look at or compare high-density to low-density storage, which is very important element. It's limited in its consideration of water loss. Looks at complete water loss. And in actuality, NUREG-1738 that was put out in 2000, finally, and I see admitted the total drainage was the most -- was not the most severe, rather partial drainage. But the study doesn't look at partial drainage. It's limited in consideration of initiating events. It doesn't consider an attack, only earthquake. It makes no linkages amongst reactor accident and pool accident. There's no analysis of cask drops. Misleading statements about mitigating actions. It simply says that adding water or reshuffling how the assemblies are in the pool. But it gives no data how many reactors have water-spray systems. How did they test whether adding water at a certain point to a burning assembly would exacerbate fire, not correct it? As far as duration goes, it only considers up to seven days of a boil fire accident. Has nobody figured Fukushima? (0112-3-4 [Lampert, Mary])

Comment: Also it [NRC-2013-0136] uses MELCOR. And there's been no demonstration that MELCOR has -- is able to look at heat transfer and other important elements to do a real empirical study, not start with a conclusion and pretend to have a study. (0112-3-5 [Lampert, Mary])

Comment: For residents nearby, the possibility of a fire in a spent fuel pool is hardly inconsequential. It would be disastrous. (0163-20-4 [Gellert, Sally Jane])

Comment: I will be submitting comments on the spent fuel fires issue, which Chairman Macfarlane has co-authored a study stating that the densely packed fuel pools at Indian Point, for example, are at great risk of fire. (0163-7-8 [Shapiro, Susan])

Comment: Experts Agree NRC should Ignore Staff Recommendation and Follow NRC Chair's 2003 Call to Curb Risk of Nuclear Reactor Pool Fire Catastrophe, noting that Reactor Fire Danger is Far Greater Than Reactor Meltdown. A Press Release by Alex Frank (afrank@hastingsgroup.com) indicated that NRC Chair Allison MacFarlane and two co-authors prepared an important 2003 Report (Dr. Gordon R. Thompson and Robert Alvarez); "Reducing the Hazard from Stored Spent Power-Reactor Fuel in United States, Science and Global Security, 11:1-51 2003). In this 2003 Report, authors acknowledge the danger of a terrorist attack, and warned effects of a pool fire could be worse than the Chernobyl accident. The paper further proposed that "to reduce both consequences and probability of a spent-fuel pool fire, all spent fuel should be transferred from wet to dry storage within five years of discharge". Now a decade later after the Fukushima disaster, NRC is about to decide whether to require licensees to halt their use of high-density spent fuel pools, and instead use open-frame pool storage combined with dry storage, which would significantly decrease risk of a pool fire. Unlike reactors, spent fuel pools are not protected by a containment dome or structure to prevent escape of radioactivity, and are not required to have independent redundant cooling. Dr. Thompson recently indicated (October 2, 2013), that NRC staff is proposing to rely on a "Draft Consequence Study" to recommend against expediting transfer of spent fuel out of high-density storage pools into low density open racks and dry storage. But the Draft Consequence Study is totally inadequate for that purpose, because it is too narrow in scope, and because it lacks scientific rigor or integrity. The Draft Consequence Study should be scrapped, and NRC should start again with an actual science based study of pool fire risks. NRC admits that storing spent fuel in dry casks pose far less hazards. However, NRC staff argues that a switch to dry storage would impose a major expense for America's again reactor fleet, now facing stiff competition from other electricity sources. As recently as October 2, 2013, these two expert co-authors just recently reaffirmed the following findings from the 2003 Report co-authored by Chair Macfarlane:

- >In it, NRC chair joined the view that terrorist attacks are a significant threat to fuel pools, but the Draft Consequence Study does not consider that threat.
- >Chair Macfarlane joined the view that consequences of a pool fire are so great that NRC should not forego action based on probability calculations alone.
- >Chair Macfarlane joined the view that NRC should take steps to reduce density of fuel stored in pools.
- >Chair Macfarlane joined the view that NRC should be held accountable for failure to take action on risks posed by pool fires. (0218-3 [Borchmann, Patricia])

Comment: The EIS must consider the risks of pool fires. (0230-11 [Garb, James])

Comment: The dangers include just simply dropping one of these heavy loads through the floor of the pool as Linda mentioned. The scenario of partial drain-down is the worst case scenario where you have no air cooling whatsoever. And you could have radioactive inferno in just a few hours time which would dwarf what we've seen at Fukushima Daiichi thus far. (0245-13-4 [Kamps, Kevin])

Comment: Is it true that the hazards and its security of pool storage are so great that they must sacrifice security? Could anyone possibly believe that redacted material supports NRC's finding of those significant impacts? We require a much larger margin of safety about spent fuel pool fire to make better decisions about plutonium, NRC should perform Court-ordered analysis. (0245-24-7 [Conn, Corey])

Comment: We are very concerned about risks of fuel and a fire in fuel pools. (0246-16-8 [Michetti, Susan])

Comment: In addition to the dangers of a fuel fire, which are not adequately addressed -- they are simply documented and then dismissed by saying it is low probability -- that the radiation effects from routine operations, from routine release, and through routine management of fuel, as well as from the long-term or the more devastating impacts from accidents, are not fully, adequately being assessed. And this looks like a rubber stamping saying that there is low impacts when, in fact, we don't really know, and more likely, there will be. (0246-2-7 [D'Arrigo, Diane])

Comment: The study failed to fully consider the vulnerability of high-density spent fuel storage pools to catastrophic fire or the risks of undetected leakage from pools and other reactor components. The GEIS must include a full examination of these risks. This is what the Court intended and that is what is required for the EIS to be in compliance with NEPA. (0246-22-4 [Fisher, Allison])

Comment: Not all nuclear waste is the same. It's highly flammable[.] (0250-29-7 [Rivard, Betsey])

Comment: Remember while flooding and risk of leakage threatens our vital drinking water supplies, we must also be concerned about water loss from earthquakes, dropping of fuel casks, aircraft impact, accidental fires, and explosions. Any and all of these threats could easily lead to an irradiated fuel fire. (0250-40-3 [Kerr, Beverly])

Comment: Everyone agrees there's no argument that a radiological release from a pool fire could dwarf that of a nuclear meltdown[.] (0250-40-4 [Kerr, Beverly])

Comment: Attached article entitled "EXPERTS: NRC SHOULD IGNORE STAFF AND FOLLOW CHAIR'S 2003 CALL TO CURB RISK OF NUCLEAR REACTOR POOL FIRE CATASTROPHE--Cutting Corners for Uncompetitive U.S. Nuclear Industry? Nuclear Regulatory Commission Draft Staff Report Urges Action Directly Contradictory to 2003 Paper by Chair Macfarlane; Reactor Fire Danger Far Greater Than Meltdown, Could Displace 4 Million Americans" was submitted anonymously. EXPERTS: NRC SHOULD IGNORE STAFF AND FOLLOW CHAIR'S 2003 CALL TO CURB RISK OF NUCLEAR REACTOR POOL FIRE CATASTROPHE Cutting Corners for Uncompetitive U.S. Nuclear Industry? Nuclear Regulatory Commission Draft Staff Report Urges Action Directly Contradictory to 2003 Paper by Chair Macfarlane; Reactor Fire Danger Far Greater Than Meltdown, Could Displace 4 Million Americans. Listen to the 10.02.13 news event here ... WASHINGTON, D.C.-October 2, 2013 -A pending Nuclear Regulatory Commission (NRC) staff recommendation that the beleaguered U.S. nuclear power industry should be allowed to continue packing already high-density fuel reactor pools should be rejected in favor of the safer approach of "dry" cask storage embraced in a 2003 paper by then MIT researcher Allison Macfarlane, who is now chair of the NRC. Two of her coauthors of the 2003 paper are urging the NRC to scrap an inadequate draft study of the spent-fuel storage issue and to go back to the drawing board. That was the call today from Macfarlane's 2003 report co-authors: Dr. Gordon R. Thompson and Robert Alvarez. Dr. Thompson is executive director of the Institute for Resource and Security Studies, Cambridge, MA. He also serves as a senior research scientist at the George Perkins Marsh Institute, Clark University, Worcester, Massachusetts. Alvarez is senior scholar at the Institute for Policy Studies, where he is focused on nuclear disarmament, environmental, and energy policies. From 1993 to 1999, Alvarez served as a senior policy advisor to the Secretary of Energy and Deputy Assistant Secretary for National Security and the Environment. The 2003 paper in question is Alvarez et al., Reducing the Hazard from Stored Spent Power-Reactor fuel in the United States, Science and Global Security, 11:1-51, 2003. In it, Macfarlane and her co-authors acknowledged the danger of a terrorist attack and warned that the effects of a pool fire could be

worse than the Chernobyl accident. Further, the paper proposed that "[t]o reduce both the consequences and probability of a spent-fuel-pool fire," all spent fuel should be "transferred from wet to dry storage within five years of discharge." The paper is available online at https://www.princeton.edu/sgs/publications/sgs/pdf/11_1Alvarez.pdf. A decade later in the wake of the Fukushima disaster, the NRC is about to decide whether to require licensees to halt their use of high-density spent fuel pools and instead use open-frame pool storage combined with dry storage, which would significantly decrease the risk of a pool fire. Spent fuel is currently stored in high-density pools at every reactor in the U.S. Originally intended for short-term cooling of five years or less, reactor pools now hold four to-five times more than their original designs and contain some of the largest concentrations of artificial radioactivity in the world. [ARTICLE CONTINUED IN NEXT COMMENT] (0281-1 [Individual, Anonymous])

Comment: [CONTINUATION OF ARTICLE ENTITLED: "EXPERTS: NRC SHOULD IGNORE STAFF AND FOLLOW CHAIR'S 2003 CALL TO CURB RISK OF NUCLEAR REACTOR POOL FIRE CATASTROPHE" submitted anonymously.] Spent fuel pools are susceptible to accidents -such as Fukushima -and are prime targets for terrorists. Unlike reactors, spent fuel pools are not protected by a containment structure to prevent the escape of radioactivity and are not required to have independent redundant cooling. NRC admits that a pool fire could release far more radioactivity than a meltdown and displace more than four million people from their homes. After both 9/11 and the Fukushima accident, the NRC recognized the potential for a catastrophic pool fire. Furthermore, the NRC's Office of Nuclear Security and Incident Response uses a predictive tool to aid emergency responders during nuclear accidents which indicates that the radiological release from a pool fire following an earthquake would dwarf that of a reactor meltdown. It also indicates that the consequence of the breach of a dry cask is thousands of times less severe. The NRC admits that storing spent nuclear fuel in dry casks pose far less hazards. However, NRC staff argues that a switch to dry storage would impose a major expense for America's aging reactor fleet, now facing stiff competition from other electricity sources. Thompson said: "The NRC staff is proposing to rely on a 'Draft Consequence Study' to recommend against expediting the transfer of spent fuel out of high-density storage pools into low-density open racks and dry storage. But the Draft Consequence Study is totally inadequate for that purpose, because it is too narrow in scope and because it lacks scientific rigor or integrity. The Draft Consequence Study should be scrapped and the NRC should start again with an actual science-based study of pool fire risks." Alvarez said: "The NRC staff study lacks integrity because it examines only complete drainage of a pool and ignores the more severe case of partial drainage-despite being warned about this hazard by the National Academy of Sciences in 2004. It's a remarkable coincidence the NRC staff comes up with assumptions it has already adopted for several years without the benefit of its current scientific analysis. By reverting to the discredited assumption that complete pool drainage is the worst case, the NRC undermines the credibility of the Study. The Study also is too narrow because it significantly underestimates risk by considering only one type of initiating event- an earthquake -and ignoring other credible initiating events that are at least as probable. For instance, the Study ignores the impacts of aging and the potential for an attack on a pool and/or adjacent reactor to initiate a pool fire. Vulnerability of spent fuel storage pools to terrorist attack is perhaps the greatest risk of all and cannot be defined away by probability statistics or cost-benefit analysis" Diane Curran, attorney, Harmon, Curran, Spielberg & Eisenberg, L.L.P., said: "The NRC Commissioners have stated that they intend to make a decision this fall. The NRC Staff's Draft Consequence Study is supposed to provide the primary technical basis for the Commission's decision. Our purpose today is to discuss the reasons we believe the Staff's analysis is seriously deficient, and inconsistent with a previous independent technical study by the NRC's current chair, Allison Macfarlane, while she was affiliated with MIT. We are calling upon Dr. Macfarlane to apply her expertise and lead the Commission to a decision that protects

the public and the environment from the unacceptable. risk of a pool fire." [CONTINUED IN NEXT COMMENT] (0281-2 [Individual, Anonymous])

Comment: [CONTINUATION OF ARTICLE ENTITLED: "EXPERTS: NRC SHOULD IGNORE STAFF AND FOLLOW CHAIR'S 2003 CALL TO CURB RISK OF NUCLEAR REACTOR POOL FIRE CATASTROPHE" submitted anonymously.] Thompson and Alvarez noted that the NRC has never conducted a valid scientific study of pool fire risks, although it has had the capability since prior to 1990. Instead, over a period exceeding three decades, NRC published one bad analysis after another that ignored important characteristics and behavior of high-density fuel storage pools and falsely concluded the pools were safe. Early in 2001, the NRC admitted that it had not fully understood the potential for a catastrophic pool fire. Yet, after the 9/11 attacks, the NRC systematically hid its analyses behind a veil of secrecy. The Draft Consequence Study is the first public study the NRC has released since before September 11 -but it simply perpetuates the same bad science of the period before 9/11. In calling for the Draft Consequence Study to be scrapped in favor of a bona fide scientific review of the pool fire issue, Thompson and Alvarez noted the following about the 2003 paper co-authored by Chair Macfarlane: -In it, the NRC chair joined the view that terrorist attacks are a significant threat to fuel pools- but the Draft Consequence Study does not consider that threat. -Chair Macfarlane joined the view that the consequences of a pool fire are so great that the NRC should not forego action based on probability calculations alone. -Chair Macfarlane joined the view that the NRC should take steps to reduce density of fuel stored in pools. -Chair Macfarlane joined the view that the NRC should be held accountable for failure to take action on risks posed by pool fires. MEDIA CONTACT: Alex Frank, (703) 276-3264 or afrank@hastingsgroup.com. EDITOR'S NOTE: A streaming audio replay of a related news event will be available on the Web at <http://bit.ly/reactorpoolfire> as of 5 p.m. EDT on October 2, 2013. (0281-3 [Individual, Anonymous])

Comment: Before the public meeting began, I spoke with Paul Michalak (NRC- Generic DEIS Manager), about my questions regarding Executive Summary, page 1ix, Section ES. 16.2 Spent Fuel Pool Fires. The Executive Summary concludes the "risk of a spent fuel fire is low because even though the consequence would be high, the probability would be low." This conclusion by NRC is in contrast to a press release by Alex Frank (703 276-3264, or afrank@hastingsgroup.com, dated 10-02-13. I've enclosed a copy of this 3-page press release by Alex Frank (attached), titled "Experts: NRC Should Ignore Staff and Follow Chair's 2003 Call to Curb Risk of Nuclear Reactor Pool Fire Catastrophe" On page 1, paragraph 6, first sentence states- "NRC admits that a pool fire could release far more radioactivity than a meltdown, and displace more than four million people from their homes." (0284-13 [Borchmann, Patricia])

Comment: Experts Agree NRC should Ignore Staff Recommendation and Follow NRC Chair's 2003 Call to Curb Risk of Nuclear Reactor Pool Fire Catastrophe, noting that Reactor Fire Danger is Far Greater Than Reactor Meltdown. A Press Release by Alex Frank (afrank@hastingsgroup.com) indicated that NRC Chair Allison MacFarlane and two co-authors prepared an important 2003 Report (Dr. Gordon R. Thompson and Robert Alvarez); "Reducing the Hazard from Stored Spent Power-Reactor Fuel in United States, Science and Global Security, 11:1-51 2003). In this 2003 Report, authors acknowledge the danger of a terrorist attack, and warned effects of a pool fire could be worse than the Chernobyl accident. The paper further proposed that "to reduce both consequences and probability of a spent-fuel pool fire, all spent fuel should be transferred from wet to dry storage within five years of discharge". Now a decade later after the Fukushima disaster, NRC is about to decide whether to require licensees to halt their use of high-density spent fuel pools, and instead use open-frame pool storage combined with dry storage, which would significantly decrease risk of a pool fire. Unlike reactors, spent fuel pools are not protected by a containment dome or structure to prevent

escape of radioactivity, and are not required to have independent redundant cooling. Dr. Thompson recently indicated (October 2, 2013), that NRC staff is proposing to rely on a "Draft Consequence Study" to recommend against expediting transfer of spent fuel out of high-density storage pools into low density open racks and dry storage. But the Draft Consequence Study is totally inadequate for that purpose, because it is too narrow in scope, and because it lacks scientific rigor or integrity. The Draft Consequence Study should be scrapped, and NRC should start again with an actual science based study of pool fire risks. NRC admits that storing spent fuel in dry casks pose far less hazards. However, NRC staff argues that a switch to dry storage would impose a major expense for America's aging reactor fleet, now facing stiff competition from other electricity sources. As recently as October 2, 2013, these two expert co-authors just recently reaffirmed the following findings from the 2003 Report co-authored by Chair Macfarlane: In it, NRC chair joined the view that terrorist attacks are a significant threat to fuel pools, but the Draft Consequence Study does not consider that threat. Chair Macfarlane joined the view that consequences of a pool fire are so great that NRC should not forego action based on probability calculations alone. Chair Macfarlane joined the view that NRC should take steps to reduce density of fuel stored in pools. Chair Macfarlane joined the view that NRC should be held accountable for failure to take action on risks posed by pool fires. (0284-3 [Borchmann, Patricia])

Comment: Spent fuel is highly flammable as well as about one million times more reactive than when placed in the reactor, yet is primarily stored in densely packed pools of water that contain several times more fuel than the nuclear reactor itself. If a fuel pool is damaged or loses its cooling system, fuel rods could be exposed, overheat, and catch fire, releasing massive quantities of radioactive material, creating a far greater disaster than a meltdown of the reactor. (0319-10 [Nichols, John])

Comment: According to a report by Robert Alvarez entitled, it's kind of a long title, "Reducing the Hazards of High-Level Radioactive Waste in Southern California," published by the Friends of the Earth that, "If an airplane was successful in starting a spent fuel pool fire in one of the two cooling pools at San Onofre and only 30 percent of the pool's contents were to burn, the radioactive release from this event would be comparable to 10 Chernobyls." That's what is there right now. I read the Generic Environmental Impact Statement or study and it estimates that the largest number of early -- of fatalities to be 191 people for a spent fuel accident. Latent fatalities are estimated to be 20,000 to 27,000 people. These data points have been taken from the NRC document NUREG-1738 and put into this Environmental Impact Statement. That Nuclear Regulatory 1738 was published in January 2001 before September 11th, 2001. Repeatedly, people have challenged this, including the Attorney General of California, and the Attorney General of Massachusetts. And the NRC states that this report, 1738, is valid, 191 people. Crazy. Clearly, there's a huge difference in opinion on what could happen based on this concept of probability of an event occurring. I believe the NRC is aware of the possibility of a catastrophic event occurring from a spent fuel pool fire, but the NRC is unwilling to entertain the fact that this probability is anything but an extremely remote possibility. (0325-22-2 [Morgal, Richard])

Comment: The NRC downplays the risks of pool fires by assuming that surrounding populations will be successfully evacuated. But nuclear utilities are allowed to store HLRW in pools for many decades after reactors permanently shutdown in order to defer the costs of dry cask storage as far off into the future as possible, despite the inherent risks. At the same time, the NRC allows utilities, via exemptions from regulations, to do away with 10-mile radius emergency planning zones (EPZs) within as soon as 12 to 18 months post-reactor shutdown,

despite the lingering risks of storing HLRW in pools at such shutdown reactor sites. How can populations be evacuated, if EPZs have been dismantled?! (0336-10 [Lish, Christopher])

Comment: The NRC also downplays the risks of pool fires by assuming that a pool drain down accident (or attack) involves the complete drain down of the pool. However, as Dr. Gordon Thompson of the Institute for Resource and Security Studies has pointed out, any technically competent person paying attention to the issue should have known since 1979 that a partial drain down of the pool is actually a worse-case scenario, for the leftover water in the bottom of the pool would block convection current air flow which would help cool the irradiated nuclear fuel, leading to faster heat up to the ignition point. (0336-11 [Lish, Christopher])

Comment: 3. The decision to allow DCNPP's spent fuel pools getting filled to high density capacity has unnecessarily added two more potential sources for major nuclear disasters. Pool fires are now a possibility where there were none before. (0358-5 [Schumann, Klaus])

Comment: Hi, attached are comments in the form of a Powerpoint regarding the Waste Confidence issue. This Powerpoint is a slide show originally done to show how a meltdown and fuel pool fire would affect agricultural areas that we buy organic grapes from to make into wine. It may be educational regarding waste confidence rulemaking. Similar fallout could happen from each nuclear power plant near where you live. [Power Point slides attached to comment-ML13345A069] (0366-1 [Frey, Paul])

Comment: Health and Economic Impacts Of Extended Loss of Water In Spent Fuel Pools Like Limerick's: Limerick's design is similar to reactors in meltdowns at Fukushima. Roof-top fuel pools are highly vulnerable to loss of power and cooling water from an earthquake or other natural disasters, in addition to a variety of attacks by terrorists (0377-3-6 [Cuthbert, Lewis])

Comment: NRC downplays risks of pool fires by erroneously assuming that surrounding populations will be successfully evacuated. (0377-6-2 [Cuthbert, Lewis])

Comment: NRC also downplays risks of fuel pool fires by inaccurately assuming that a drain down accident (or attack) involves the complete drain down of the fuel pool. -Dr. Gordon Thompson, Institute for Resource and Security Studies (IRSS) pointed out, any technically competent person should have known since 1979 that a partial drain down of the pool is actually a worsecase scenario, for the leftover water in the bottom of the pool would block convection current air flow which would help cool the irradiated nuclear fuel, leading to faster heat up to the ignition point (0377-6-4 [Cuthbert, Lewis])

Comment: Fuel rods in cooling pools suffer from the same vulnerability as those in a reactor accident. Any sustained loss of electrical power could result in a loss of cooling, evaporation of the cooling water, exposure of the fuel assemblies to air, spontaneous ignition of the zirconium cladding and widespread dispersion of radioactive particles. Once contamination of the surrounding area has occurred it becomes virtually impossible to perform damage control to prevent further escalation of the event and to conduct remediation and clean-up efforts because of the high ambient radiation levels. This is particularly problematic if there are several contiguous facilities which may contaminate each other when impacted by the same event. Different radioisotopes have different volatilities and therefore different propagation characteristics in the event of a fire. The size of the particles also determines the distance they travel in the event of an accidental release. (0410-8 [Nelson, Dennis])

Comment: The draft report contains some serious estimated consequences for the volatile ruthenium group of radionuclides in fuel newly removed from the reactor if it should be released by a spent fuel fire. The NRC attempts to rationalize this into a less serious event by postulating an early and complete evacuation of people after the accident. (0410-9 [Nelson, Dennis])

Comment: NRC downplays the risks of pool fires by assuming that surrounding populations will be successfully evacuated. But nuclear utilities are allowed to store HLRW in pools for many decades after reactors permanently shutdown, in order to defer the costs of dry cask storage as far off into the future as possible, despite the inherent risks. At the same time, NRC allows utilities, via exemptions from regulations, to do away with 10-mile radius emergency planning zones (EPZs) within as soon as 12 to 18 months post-reactor shutdown. This, despite the lingering risk of storing HLRW in pools at such shutdown reactor sites. How can populations be evacuated, if EPZs have been dismantled?! (0412-1 [Individual, Anonymous])

Comment: Even partially loss of cooling water or pool level could create a disastrous radioactive plume, and a zirconium fuel rod cladding oxidation fire releasing far more radioactivity than exists in the reactor core. In NRC reports, as much as 100% of the Cs-137 is estimated to be vulnerable to release from the inventory of SNF in a storage pool. These are documented facts available in many NRC publications, and in independent studies, including one co-authored by the current chairperson Allison Madfarlane of the NRC (Alvarez et al, 2003). (0447-1-16 [Andrews, Richard])

Comment: A subsequent report by Robert Alvarez (IPS, May 2011) published shortly after the Fukushima disaster began further supports the potentially disastrous consequences of a spent fuel fire. New modeling was not performed in this report but the reality of Fukushima catastrophe and the actual destruction of the SNF structures and buildings should serve as a lesson. (0447-1-17 [Andrews, Richard])

Comment: I have recently completed a RASCAL 4.3 modeling of a spent fuel pool release for the Indian Point Unit 2 spent fuel pool inventory under a drained-uncovered pool fuel scenario. This plant was chosen as representative of a plant in proximity to a major high population density urban setting. The current inventory of SNF at Unit #1, 2 and 3 of Indian Point is estimated to be approximately 234 million Curies (Alvarez, IPS 2011; Yucca Mtn DOE/EIS-0250), about 94 million Curies as Cesium-137, approximately 40% of the total radioactive source. My extrapolated estimate of Unit #2 Nov 2013 SNF inventory is about 1487 fuel assemblies, actually 113 more than original design pool capacity, increasing at the rate of about 38 assemblies per year. Status of non-operating Unit #1 spent fuel pool is not known, nor is amount of SNF that has moved to ISFSI dry cask. Total estimated Unit #2 pool radioactive source is approximately 133 million Curies total and 53 million Curies of Cs-137. The RASCAL 4.3 (Sept 2013) database and summary of activity released to the atmosphere by the model is 26 million Curies total and 15 million Curies of Cs-137, reflecting built in model assumptions of release factor reductions from an uncovered and drained pool fire event. In other words the RASCAL model does not assume 100% of the spent fuel radioactive inventory is released in a fire. According to the model documentation the release factor is assumed at 0.3 for Cs and Rb. The model also reduces effective inventory loss and radioactivity by age categories since off loading from the core. For the RASCAL model assumed wind speeds were ranging from 6 to 9 mph, predominantly from north 15 degrees down the Hudson River. A fresh off-load of spent fuel from the core was assumed to have been made. The source term release was assumed to happen over an approximate 24 hour period, zirconium cladding fire and failure assumed to initiate 2 hours after drained pool condition occurred and fuel temperatures reach 1200 F. Using EPA defined Protective Action Guide (PAG) dose action ranges for Total Effective Dose

Equivalents (TEDE), the model impact zone areas were 247S sq miles(> 2 rem), and 3300 sq miles for >0.2 rem, for 1st year phase. For the 2nd year phase, impact areas were 3,87S and 1,775 sq miles for > zero and >5 rem TEDEs, respectively. For Cs137 surface contamination at levels greater than 15 uCi/m2 the impact area was 2850 sq miles. For Cs-137 surface contamination greater than SO uCi/m2, the impacted area was 2,200 sq miles. To put this in perspective, the Chernobyl permanent evacuation zone of the radiation control area was set at Cs137 contamination of >15 uCi/m2, and encompassed a land area of approximately 3,860 sq miles (10,000 km2),; calculated out to a radius of 36 miles. For Chernobyl the zone at >50uCi/m2 is reported as an area with >0.7% chance of radiation caused cancer deaths from a lifetime external radiation exposure. For Chernobyl the area greater than SO uCi/m2 was determined to be approximately 1,200 sq miles (3,100 km2). This is not understood to include other exposures such as internal ingestion of contaminated foods, or water, so the hazards are much higher. The Chernobyl disaster was actually much smaller in impact contamination and land areas than the possible impacts from a single spent nuclear fuel pool release from any of the U.S. nuclear power plant sites, particularly when one considers the conservative aspects of the RASCAL model regarding reduced magnitude of spent fuel source terms and other model assumptions. (0447-1-19 [Andrews, Richard])

Comment: Now consider that this area of CS-137 surface concentrations covers virtually all of New York City metropolitan area, major parts of Long Island, major parts of New Jersey, eastern Pennsylvania, and even Western parts of Connecticut, with significant fallout into the Atlantic seaboard oceans, estuaries, and bays. Slightly different meteorological conditions with more northeasterly winds could blanket contaminate nearly all of New Jersey and Philadelphia as well, or with westerly winds the contamination plume could cover nearly all of Connecticut, Rhode Island, Massachusetts, and the southern parts of Vermont and New Hampshire and Maine. In the present model the plume of greater than 100 uCi/m2 Cs-137 contamination actually goes well beyond the 100 mile radius from the Indian Point plant down into Delaware, but the model cuts off at 100 miles in its calculations. The impacts and consequences from such an event are simply hard to fathom they are so devastating to one of the most dense population areas of the United States. I have not made estimates of numbers of people impacted but it is likely 10s of millions, nor have I estimated the immediate deaths and lifelong health and fatality effects due to insufficient time in preparing this analysis and comments, but this could be done using U.S. census data and local land/property value, and land use data overlaid on the modeled plume contours. In effect, such an event would dwarf most displaced person and refugee events experienced in major wars experienced in the last half century. But the effects of a radiological land contamination event are much longer in duration, certainly many decades long until long half life isotopes decay such as Cs-137, to essentially permanent for some land and human occupancy uses, and for impacts on natural biological systems and agricultural lands. The wind direction and meteorological conditions, coupled with the immediately fresh off load of spent fuel from the core do make this case study a near worst case scenario, but for an intelligent and committed terrorist, that person may just select his target and timing and weather conditions to do the most damage he can inflict. Due to certain conservative aspects of the RASCAL model on assumed percentage release of SNF inventory from a SNF fire, the actual contamination levels and doses may be much larger than calculated by the RASCAL model. Also the duration of the release from such a fire is considered to be relatively brief, measured in a few hours beyond the assumed initial 2 hours to reach zirconium cladding ignition temperatures, and consequently insufficient time to allow for an orderly mass evacuations to occur. The Fukushima disaster involving spent fuel pool at Unit 4 may however lead us to understand that the source material release duration could be much longer, and could involve conditions nearly impossible to bring under any control once initiated for very long time frames, also leading to greater total radioactive material releases to the atmosphere, soil, water, and

general environment. As another conservative assumption, this RASCAL modeled case only involves Unit #2 SNF pool at Indian Point, not the SNF stored in Unit #1 or Unit #3 pools, or materials in dry storage casks, nor any releases from the reactor cores. The status of Unit #1 pool is unknown to this author since that reactor discontinued power output in the 1970s. (0447-1-20 [Andrews, Richard])

Comment: To illustrate the radioactive dispersion impact areas attached are several of the map overlays of contamination plume patterns for the RASCAL 4.3 model of an Indian Point Unit 2 spent fuel pool fire event and associated radionuclide source term release. Included are maps of total effective dose equivalent (TEDE) zones at various concentration ranges and phases of exposure (immediate, 1 year, 2 year and 50 year), surface contamination (total and Cs-137), and thyroid committed dose equivalent. Please take the time to study these maps and visualize the land areas and people affected. (0447-1-21 [Andrews, Richard])

Comment: The June 2013 NRC report on how earthquakes could affect BWR Mark I SFPs claims that in the event of a complete SFP LOCA, the fuel assemblies would not be air coolable for 10 percent of a two year operating cycle (the approximate time interval between the loading of each reactor core discharge into the SFP); that is, the fuel assemblies would not be air coolable for 73 days. However, the June 2013 NRC report states that in a partial BWR Mark I SFP LOCA, the airflow could be impeded if there were channeled fuel assemblies in the SFP, which would “*increase the time to coolability*”⁵⁶ [footnote 56 text: NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” Appendix B, p. B-10.] [emphasis added]. Elsewhere, the June 2013 NRC report states that a partial BWR Mark I SFP LOCA is *assumed not* to be air coolable for an entire two year operating cycle (730 days).⁵⁷ [footnote 57 text: Id., Appendix D, p. D-13.] In other words, partial BWR Mark I SFP LOCAs, in which “the rack baseplate is not cleared and airflow is impeded,”⁵⁸ [footnote 58 text: Id.] are *assumed not* to be air coolable during a reactor’s entire life of operation, in which reactor core discharges would be loaded into the SFP every two years. As stated, the baseplates also would not be cleared in SBO boil-off accidents—another reason such accidents could lead to SFP fires. (0463-1-10 [Leyse, Mark])

Comment: According to the Electric Power Research Institute (“EPRI”), in a boil-off accident, “the temperature on the operating floor of the SFP...would also, at best, be tolerable from the standpoint of temperature and humidity for only a short period even with the help of protective clothing;”⁵⁹ [footnote 59 text: Electric Power Research Institute (“EPRI”), “Severe Accident Management Guidance Technical Basis Report,” Volume 2: “The Physics of Accident Progression,” 1025295, October 2012, Appendix EE, p. EE-2.] which “may require a special suit and a breathing apparatus.”⁶⁰ [footnote 60 text: Robert E. Henry, Fauske & Associates, “Additions and Changes to TBR Volume 2: Physics of Accident Progression,” NRC Briefing on SAMG TBR, November 7, 2012, (ADAMS Accession No: ML12318A080), p. 66.] EPRI also states: [T]he possibility of increased radiation levels on the refueling floor would be a key concern since some emergency actions could involve installing hoses or pipes on the refueling floor to refill the pool. From the safety perspective, the SFP water depth absorbs the gamma rays emitted by the decay heat from reactor fuel. The gamma rays are attenuated exponentially as a function of the water depth...; [I]f the initial water depth is decreased by a factor of two [50 percent], the radiation intensity would increase by 300 to 1000 times [from typical values]. When the radiation level increases to this extent, only minimal time should be spent on the refueling floor. Furthermore, the radiation level will increase exponentially with a further decrease in the SFP water level.⁶¹ [footnote 61 text: EPRI, “Severe Accident Management Guidance Technical Basis Report,” Volume 2: “The Physics of Accident Progression,” 1025295, Appendix EE, pp. EE-1, EE-2.]; In fact, personnel access “should be limited when the [SFP water] level is

significantly reduced and prohibited when the water level is below one-half of the nominal value.”⁶² [footnote 62 text: Id., Appendix EE, p. EE-2.] (0463-1-11 [Leyse, Mark])

Comment: Station Blackout Boil-Off Scenarios Could Lead to Spent Fuel Pool Fires. SFPs store fuel assemblies (essentially bundles of fuel rods, comprised of zirconium alloy cladding sheathing uranium dioxide (UO₂) fuel pellets) after they are discharged from the reactor core. (See Figure 1.) If there were a loss of SFP cooling, the water in the pool would be heated by the fuel assemblies’ decay heat (heat generated by the radioactive decay of the fuel’s fission products) until it reached the boiling point; then the water would boil away, uncovering the fuel assemblies.; [See Figure 1. Fuel Assembly, Fuel Rod, and Uranium Dioxide Fuel Pellets in Original Letter in NRC Adams Database ML13351A310]⁷¹ [footnote 71 text: NRC, Image from “Fact Sheet: Storage of Spent Nuclear Fuel.”]; SFPs have various depths; PWR and BWR SFPs typically have depths in a range from 38.0 feet to 40.0 feet.⁷² [footnote 72 text: NRC, “Regulatory Analysis for the Resolution of Generic Issue 82, ‘Beyond Design Basis Accidents in Spent Fuel Pools’,” NUREG-1353, April 1989, (ADAMS Accession No. ML082330232), p. 4.5.] And spent fuel assemblies typically have heights of approximately 13 feet 4 inches,⁷³ [footnote 73 text: EPRI, “Severe Accident Management Guidance Technical Basis Report,” Volume 2: “The Physics of Accident Progression,” 1025295, October 2012, Appendix EE, p. EE-8.] so there is typically less than 27 feet of water above the top of the fuel assemblies in SFPs. (In BWR Mark I and II designs, SFPs are typically located at the level of the operating floor, approximately 100 to 150 feet above ground level; and in PWR and BWR Mark III designs, SFPs are typically located at ground level.⁷⁴) [footnote 74 text: NRC, “Regulatory Analysis for the Resolution of Generic Issue 82, ‘Beyond Design Basis Accidents in Spent Fuel Pools’,” NUREG-1353, p. 4.6.] (0463-1-14 [Leyse, Mark])

Comment: A number of factors would determine the “heat load” in the SFP, including how recently some of the fuel assemblies stored there had been discharged from the reactor core, because the amount of heat generated by decay heating progressively declines (nonetheless, decay heating remains a significant heat source for years). A 2011 IAEA report states that “[t]he heat load in spent fuel soon after irradiation is primarily due to the fission products [that is, primarily due to the decay heat generated by the fission products]. Much later in life it is due to the decaying actinides,”⁷⁵ [footnote 75 text: IAEA, “Impact of High Burnup Uranium Oxide and Mixed Uranium-Plutonium Oxide Water Reactor Fuel on Spent Fuel Management,” No. NF-T-3.8, 2011, p. 18.] predominantly uranium, a small percentage of plutonium, and traces of other actinides. And the NRC states that the heat load in the SFP decreases rapidly over time from its peak value.”⁷⁶ [footnote 76 text: NRC, “Review Standard for Extended Power Upgrades,” RS-001, Revision 0, December 2003, Attachment 2 to Matrix 5, (located at <http://www.nrc.gov/reactors/operating/licensing/powerupgrades/rs-001-rev-0-dec2003.pdf>), p. 2.] The length of time prior to commencing movement of the fuel assemblies from the reactor core after shutdown to the SFP should also be considered in accessing SFP accidents. At some NPPs, the time before commencing fuel movement after shutdown has been reduced; for example, in 2002, PSEG Nuclear, the owner of Salem Nuclear Generating Station, Units 1 and 2, requested that the time prior to commencing fuel movement after shutdown at Salem be *reduced from 168 hours to 100 hours*.⁷⁷ [footnote 77 text: D.F. Garchow, PSEG Nuclear, “Request for Changes to Technical Specifications for Refueling Operations: Fuel Decay Time Prior to Commencing Core Alterations or Movement of Irradiated Fuel at Salem Nuclear Generating Station, Units 1 and 2,” June 28, 2002, (ADAMS Accession No. ML021920053), p. 1.] Of course, the heat load in the SFP would also be determined by the quantity of fuel assemblies stored in the SFP. With high-density storage there are greater heat loads. If there were a loss of SFP cooling, the heat load in the SFP would affect how long it took for the water to reach the boiling point and boil away, uncovering the fuel assemblies. As an accident

progressed, *local* heat up rates would be affected by fuel rack loading patterns—how the most recently discharged fuel assemblies were arranged with ones discharged over a year previously. In the SFP, fuel assemblies might be arranged within checkerboard configurations; there may be one more recently discharged fuel assembly out of every four cells; the other three could contain older fuel assemblies. In *certain* boil-off scenarios, the water in a “typical” SFP⁷⁸ [footnote 78 text: Generic analyses of SFPs are limited. See J.H. Jo, P.F. Rose, S.D. Unwin, V.L. Sailor, Brookhaven National Laboratory, “Value/Impact Analyses of Accident Preventive and Mitigative Options for Spent Fuel Pools,” NUREG/CR-5281, March 1989, (ADAMS Accession No. ML071690022), p. 5.] that had been loaded five days prior with a 1/3 core discharge, would heat from 51.7°C (125°F) to 100°C (212°F) in 11.2 hours and boil dry in 125.0 hours; and a typical SFP that had been loaded five days prior with a full core discharge, would heat from 66°C (150°F) to 100°C (212°F) in 3.1 hours and boil dry in 49.3 hours. (All of these values are for a SFP already stocked with 20 years of accumulated core discharges.)⁷⁹ [footnote 79 text: NRC, “Regulatory Analysis for the Resolution of Generic Issue 82, ‘Beyond Design Basis Accidents in Spent Fuel Pools’,” NUREG-1353, p. 4-25.] (0463-1-15 [Leyse, Mark])

Comment: In a SBO boil-off accident, if there were partial uncovering of the fuel assemblies, the water level would be above the baseplates, essentially blocking the flow of air through the fuel assemblies and impeding the transfer of heat away from the fuel; the poor heat transfer conditions would cause “the fuel to heat up at a higher rate than if natural circulation [were] occurring.”⁸³ [footnote 83 text: Zachary I. Franiewski et al., Pennsylvania State University, “Spent Fuel Pool Analysis of a BWR-4 Fuel Bundle Under Loss of Coolant Conditions Using TRACE,” p. v.] A March 1979 report, NUREG/CR-0649, observes that in partial-uncovering scenarios, the “heat transfer advantages...gained by converting decay heat to boiling energy would be minimal,” because the (boiling) water level would be “far” below the elevations of the fuel assemblies that had the maximum fuel-cladding temperatures and heatup rates.⁸⁴ [footnote 84 text: Allan S. Benjamin et al., Sandia Laboratories, “Spent Fuel Heatup Following Loss of Water During Storage,” NUREG/CR-0649, March 1979, p. 40.] There would also be partial cooling of the fuel cladding from the steam that was generated by the boiling water;⁸⁵ [footnote 85 text: NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” p. 118.] saturated steam would enhance the natural convection of heat away from the fuel assemblies because it has a high heat capacity.⁸⁶ [footnote 86 text: Allan S. Benjamin et al., Sandia Laboratories, “Spent Fuel Heatup Following Loss of Water During Storage,” NUREG/CR-0649, March 1979, p. 40.] However, in partial-uncovering scenarios, the heat-transfer benefits of steam would be minimal compared to how the blockage of air flow through the fuel assemblies would impede the transfer of heat away from the fuel rods; in terms of heat transfer, partial uncovering is considered “the worst case scenario.”⁸⁷ [footnote 87 text: Zachary I. Franiewski et al., Pennsylvania State University, “Spent Fuel Pool Analysis of a BWR-4 Fuel Bundle Under Loss of Coolant Conditions Using TRACE,” p. v.] (0463-1-16 [Leyse, Mark])

Comment: (In a complete SFP LOCA, complete uncovering of the fuel assemblies (with the water level dropping far enough below the bottom of the SFP baseplates,⁸⁸ [footnote 88 text: “[T]he distance between the pool floor liner and the bottom of the rack baseplate is...on average...26 centimeters (cm) (10.25 in.), depending on adjustments made to the leveling pad during installation.” See NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” p. 76, Footnote 1.] which have holes) would enable air to flow through the fuel assemblies, entering at the base and exiting at the top. NUREG/CR-0649, states that, in complete SFP LOCA scenarios, “the baseplate hole size can exert a marked effect on the heatup of the spent fuel, since a small baseplate hole tends to constrict the flow at the inlet to the fuel assembly. ...if the

temperature of self-sustaining clad oxidation is not attained, the peak clad temperature tends to reach a steady-state maximum value that remains essentially invariant with time. If a sufficiently high temperature is achieved, however, the clad oxidation reaction can become self-sustaining, leading to a temperature divergence that results in local clad melting. The temperature at which clad oxidation becomes self-sustaining is a function of the storage configuration, but tends to occur around 900°C.”⁸⁹ [footnote 89 text: Allan S. Benjamin et al., Sandia Laboratories, “Spent Fuel Heatup Following Loss of Water During Storage,” NUREG/CR-0649, SAND77-1371, March 1979, p. 47.] (0463-1-17 [Leyse, Mark])

Comment: A June 2013 NRC report on how earthquakes could affect BWR Mark I SFPs claims that in the event of a complete SFP LOCA, the fuel assemblies would not be air coolable for 10 percent of a two year operating cycle (the approximate time interval between the loading of each reactor core discharge into the SFP); that is, the fuel assemblies would not be air coolable for 73 days. However, the same June 2013 NRC report states that a partial BWR Mark I SFP LOCA “with channeled fuel could impede airflow and increase *the time to coolability*”⁹⁰ [footnote 90 text: NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” Appendix B, p. B-10.] [emphasis added]. (The same poor heat transfer conditions would occur in a SBO boil-off accident, if there were partial uncovering of the fuel assemblies.) Elsewhere, the June 2013 NRC report states that a partial BWR Mark I SFP LOCA is assumed not to be air coolable for an entire two year operating cycle (730 days).⁹¹ [footnote 91 text: Id., Appendix D, p. D-13.] In other words, partial BWR Mark I SFP LOCAs, in which “the rack baseplate is not cleared and airflow is impeded,”⁹² [footnote 92 text: Id.] are assumed not to be air coolable during a reactor’s entire life of operation, in which reactor core discharges would be loaded into the SFP every two years. As stated, the baseplates also would not be cleared in SBO boil-off accidents. (0463-1-18 [Leyse, Mark])

Comment: A 2013 PSU report, “Spent Fuel Pool Analysis of a BWR-4 Fuel Bundle Under Loss of Coolant Conditions Using TRACE,” states that “[t]he time required for a SFP to reach temperatures high enough [827°C (1520°F)]⁹³ [footnote 93 text: Zachary I. Franiewski et al., Pennsylvania State University, “Spent Fuel Pool Analysis of a BWR-4 Fuel Bundle Under Loss of Coolant Conditions Using TRACE,” p. 2.] to result in fuel overheating could range from several days to weeks.”⁹⁴ [footnote 94 text: Id., p. 1.] The 2013 PSU report is referring to partial SFP LOCAs; however, the same applies to SBO boil-off scenarios. (0463-1-19 [Leyse, Mark])

Comment: For certain boil-off scenarios, after the fuel assemblies were partly uncovered, the upper exposed elevations of the cladding of the fuel rods would initially heat up very slowly, at local rates possibly lower than 0.01°C/sec (0.018°F/sec) (lower than 36°C/hour (64.8°F/hour)).⁹⁵ [footnote 95 text: Id., p. 19.] (These values are based on results of computer simulations conducted with the NRC TRACE computer safety model. The TRACE simulations were conducted to help Sandia National Laboratories (“SNL”) develop a full-scale boil-off experiment, simulating a rapid partial SFP LOCAs, in which “the water level in the SFP drains below the top of the fuel bundle.”⁹⁶ [footnote 96 text: Id., p. 1.] In the TRACE simulations of *particular* SFP LOCAs, with particular accident parameters, the initial temperature of the fuel cladding is 27°C (80°F); in a slower SBO boil-off scenario the initial temperature of the fuel cladding would be approximately 100°C (212°F) at the water surface. In the TRACE simulations, the local fuel-cladding temperature heated up from 27°C (80°F) to 827°C (1520°F) in less than 25 hours.⁹⁷ [footnote 97 text: Id., p. 19.] (See Figure 2.) [See Figure 2. Local Cladding Temperature vs. Time in the TRACE Simulation in Original Letter in NRC Adams Database ML13351A310]⁹⁸ [footnote 98 text: Graph from “Spent Fuel Pool Analysis of a BWR-4 Fuel Bundle Under Loss of Coolant Conditions Using TRACE;” see Zachary I. Franiewski et al., Pennsylvania State

University, “Spent Fuel Pool Analysis of a BWR-4 Fuel Bundle Under Loss of Coolant Conditions Using TRACE,” p. 19.] (0463-1-20 [Leyse, Mark])

Comment: According to EPRI, for certain PWR boil-off scenarios, after the fuel assemblies—with a decay heat of 42,334 watts per assembly—were partly uncovered, the upper exposed elevations of the cladding of the fuel rods would have local heatup rates of approximately 0.13°C/sec (0.23°F/sec).⁹⁹ [footnote 99 text: EPRI, “Severe Accident Management Guidance Technical Basis Report,” Volume 2: “The Physics of Accident Progression,” 1025295, Appendix EE, p. EE-10.] This is still a relatively slow heatup rate; however, it is more than 10 times faster than that of the TRACE simulation example. If the local fuel-cladding heatup rate were 0.13°C/sec (0.23°F/sec), (without considering any additional heat that would be contributed by the zirconium-steam reaction) local fuel-cladding temperatures would heat from 100°C (212°F) to 827°C (1520°F) in approximately 1.6 hours. (0463-1-21 [Leyse, Mark])

Comment: EPRI SFP accident guidance states that in a SBO boil-off accident, “should the water level decrease to 2/3 of the [spent fuel assembly] height, the overheating of the top of the fuel assemblies would approach 2000°F (1093°C).”¹⁰¹ [footnote 101 text: EPRI, “Severe Accident Management Guidance Technical Basis Report,” Volume 2: “The Physics of Accident Progression,” 1025295, October 2012, Appendix EE, p. EE-17.] In a SBO boil-off accident, a SFP fire would possibly commence (*in a steam atmosphere*) if the fuel cladding reached local temperatures between approximately 1000°C (1832°F) and 1200°C (2192°F). *In air*, a SFP fire would most likely commence if the fuel cladding reached local temperatures between approximately 827°C (1520°F)¹⁰² [footnote 102 text: Zachary I. Franiewski et al., Pennsylvania State University, “Spent Fuel Pool Analysis of a BWR-4 Fuel Bundle Under Loss of Coolant Conditions Using TRACE,” pp. iv, 2, 3, 8, 13.] and 900°C (1652°F).¹⁰³ [footnote 103 text: Allan S. Benjamin et al., Sandia Laboratories, “Spent Fuel Heatup Following Loss of Water During Storage,” NUREG/CR-0649, March 1979, p. 47.] (0463-1-22 [Leyse, Mark])

Comment: In a SBO, EDGs are inoperable and “reactor cooling is *temporarily provided* by systems that do not rely on ac power, such as turbine-driven pumps that are driven by steam from the reactor. Batteries also are used to provide direct current (dc) power to control the turbine-driven pumps and to power instrumentation”³⁵ [footnote 35 text: NRC, “Modeling Potential Reactor Accident Consequences,” NUREG/BR-0359, January 2012, (ADAMS Accession No: ML12026A470), p. 11.] [emphasis added]. Backup batteries would become depleted in four hours—for some reactors, eight hours. Without a timely restoration of ac power, a SBO will lead to a reactor core meltdown at each affected NPP unit, as occurred at Fukushima Dai-ichi. And, if there were freshly discharged fuel assemblies in a spent fuel pool (“SFP”), its water could heat up and boil off in 49.3 hours or 125.0 hours (depending on whether there had been a 1/3 or full core discharge, five days prior);³⁶ [footnote 36 text: NRC, “Regulatory Analysis for the Resolution of Generic Issue 82, ‘Beyond Design Basis Accidents in Spent Fuel Pools’,” NUREG-1353, April 1989, (ADAMS Accession No. ML082330232), p. 4-25.] pools densely-packed with fuel assemblies would be likely to incur SFP fires. “Fukushima Fallout,” also states that “[a] review of the NRC’s Standard Technical Specifications for nuclear power plants³⁷ [footnote 37 text: “Fukushima Fallout: Regulatory Loopholes at U.S. Nuclear Plants” (p. 13, note 46) states “[s]ee for example ‘Standard Technical Specifications General Electric Plants, BWR/4’ and ‘Standard Technical Specifications for Westinghouse Plants.’”] indicates that spent fuel pools at nuclear reactors whose cores do not contain nuclear fuel (for example, because they [are] in the process of being refueled) do NOT require the presence of operable secondary emergency generation capacity” [emphasis not added], explaining that “licensees often perform maintenance on their [EDGs] when the reactors are undergoing refueling outages.”³⁸ [footnote 38 text: The Staff of Congressman Edward J. Markey,

“Fukushima Fallout: Regulatory Loopholes at U.S. Nuclear Plants,” May 12, 2011, p.13. “Fukushima Fallout” (p. 13, note 47) states that the sources of this information are from “[p]rivate communications from an individual working inside an operating nuclear power plant obtained by Rep. Markey’s office and discussions with nuclear safety experts.”] (0463-1-5 [Leyse, Mark])

Comment: Large-scale, long-term power outages would lead to SBO scenarios in which the water in the pools heated up and boiled off, uncovering the fuel assemblies; severe earthquakes would lead to different scenarios. NUREG-2157 states that in the event of a beyond-design-basis earthquake with a magnitude significantly larger than what a SFP could withstand that “water would rapidly drain out of the pool. Only a small amount of water would remain and the spent fuel would be uncovered and exposed to the air.”⁵¹ [footnote 51 text: Id., p. 4-81.] Contrary to NUREG-2157, a May 2013 Pennsylvania State University (“PSU”) report claims that it is *unlikely* in the event of a SFP loss-of-coolant accident (“LOCA”) that all the water would rapidly drain, except a small amount, completely uncovering the fuel assemblies and exposing them to air over their entire length.⁵² [footnote 52 text: Zachary I. Franiewski et al., Pennsylvania State University, “Spent Fuel Pool Analysis of a BWR-4 Fuel Bundle Under Loss of Coolant Conditions Using TRACE,” NucE431W S2013, May 2013, p. 3.] The 2013 PSU report opines that *partial* SFP LOCAs—in which “the water level in the SFP drains below the top of the fuel bundle”⁵³ [footnote 53 text: Id., p. 1.]—would be more likely. (0463-1-7 [Leyse, Mark])

Comment: In a SFP LOCA, partial fuel assembly uncover would be a greater threat to safety than complete uncover of the fuel assemblies. Complete uncover of the fuel assemblies (with the water level dropping far enough below the bottom of the SFP baseplates,⁵⁴ [footnote 54 text: “[T]he distance between the pool floor liner and the bottom of the rack baseplate is...on average...26 centimeters (cm) (10.25 in.), depending on adjustments made to the leveling pad during installation.” See NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” p. 76, Footnote 1.] which have holes) would enable air to flow through the fuel assemblies, entering at the base and exiting at the top. This would help cool the fuel assemblies. There would not be the same advantage if there were partial uncover of the fuel assemblies. If the water level remained above the baseplates, it would essentially block the flow of air through the fuel assemblies and “effectively reduce the heat transfer rates from the fuel, causing the fuel to heat up at a higher rate than if natural circulation [were] occurring.”⁵⁵ [footnote 55 text: Zachary I. Franiewski et al., Pennsylvania State University, “Spent Fuel Pool Analysis of a BWR-4 Fuel Bundle Under Loss of Coolant Conditions Using TRACE,” p. v.] (0463-1-8 [Leyse, Mark])

Comment: SBO boil-off accidents resemble partial SFP LOCAs in that in both accidents there would be times in which there was partial uncover of the fuel assemblies; the water level would be above the baseplates, essentially blocking the flow of air through the fuel assemblies and impeding the transfer of heat away from the fuel. The poor heat transfer conditions of SBO boil-off accidents make it more probable that they would lead to SFP fires. (0463-1-9 [Leyse, Mark])

Comment: III.E. Spent Fuel Pool Zirconium Fires in Steam and Air: Regarding the initiation and consequences of a SFP zirconium fire, a September 2013 NRC document, NUREG-2157, states: If cooling of the spent fuel were not reestablished, the fuel could heat up to temperatures on the order of 1,000°C (1,832°F). At this temperature, the spent fuel’s zirconium cladding would begin to react with steam or air in a highly exothermic chemical reaction called a runaway zirconium oxidation reaction or autocatalytic ignition. This accident scenario is often referred to as a “spent fuel pool zirconium fire.” Radioactive aerosols and vapors released from the damaged spent fuel could be carried throughout the spent fuel pool building and into the

surrounding environment. This release could lead to exposures of the surrounding population and contamination of property (e.g., land or structures) in the vicinity of the site.¹⁸⁰ [footnote 180 text: NRC, "Waste Confidence Generic Environmental Impact Statement: Draft Report for Comment," NUREG-2157, September 2013, (ADAMS Accession No. ML13224A106), Appendix F, p. F-2.] (Runaway zirconium oxidation would be more likely to commence in steam at local fuel-cladding temperatures between approximately 1000°C (1832°F) and 1200°C, (2192°F); and to commence in air at lower local fuel-cladding temperatures of 827°C (1520°F)¹⁸¹ [footnote 181 text: Zachary I. Franiewski et al., Pennsylvania State University, "Spent Fuel Pool Analysis of a BWR-4 Fuel Bundle Under Loss of Coolant Conditions Using TRACE," pp. iv, 2, 3, 8, 13.] or 900°C (1652°F).¹⁸² [footnote 182 text: Allan S. Benjamin et al., Sandia Laboratories, "Spent Fuel Heatup Following Loss of Water During Storage," NUREG/CR-0649, March 1979, p. 47.]) (See Figure 4.) [See Figure 4. Zirconium Fuel Rod Simulators that Incurred Runaway Oxidation in NRC Adams Database ML13351A310] (0463-2-11 [Leyse, Mark])

Comment: III.E.1. In a Spent Fuel Pool Boil-Off Accident, a Zirconium Fire Could Ignite in Steam if Fuel-Cladding Temperatures Reached 1000°C (1832°F) In a SBO boil-off accident, if the fuel assemblies were uncovered, the fuel cladding's zirconium content would initially chemically react with the steam produced by the boiling water in the SFP.¹⁸³ [footnote 183 text: Randall Gauntt et al., Sandia National Laboratories "Fukushima Daiichi Accident Study: Status as of April 2012," SAND2012-6173, August 2012, p. 183.] And if the water level in the SFP decreased to an elevation at approximately 66 percent of the height of the fuel assemblies, local fuel-cladding temperatures in the upper regions of the fuel assemblies would approach 2000°F (1093°C).¹⁸⁴ [footnote 184 text: EPRI, "Severe Accident Management Guidance Technical Basis Report," Volume 2: "The Physics of Accident Progression," 1025295, Appendix EE, p. EE-17.] When local fuel cladding temperatures increased to approximately 1000°C (1832°F), the fuel cladding would incur significant additional heating from the exothermic (heat-generating) zirconium-steam reaction. The zirconium-steam reaction produces zirconium dioxide, hydrogen, and energy; the equation for the reaction is written as $\text{Zr} + 2\text{H}_2\text{O} \rightarrow \text{ZrO}_2 + 2\text{H}_2 + \text{energy}$. The energy (heat) generated by the reaction is approximately 6.45 megajoules per kilogram (kg) of Zr reacted.¹⁸⁵ [footnote 185 text: NRC, "Compendium of ECCS Research for Realistic LOCA Analysis," NUREG-1230, 1988, (ADAMS Accession No. ML053490333), p. 8-2.] When zirconium reacts in steam it is possible for the reaction to become steam-starved, which occurs when hydrogen produced by the zirconium-steam reaction locally replaces steam (to varying degrees) at the surface of a fuel rod. This will mitigate oxidation rates or completely prevent oxidation. (0463-2-12 [Leyse, Mark])

Comment: The fuel-cladding outer surfaces of spent fuel assemblies are coated with varying thicknesses of zirconium dioxide layers (oxide layers). Oxide layers form on the fuel rods' cladding over the course of three or more years of operation in the reactor core, at elevated temperatures: typical BWR and PWR coolant temperatures are 540-550°F and 540-620°F, respectively.¹⁸⁶ [footnote 186 text: IAEA, "Assessment and Management of Ageing of Major Nuclear Power Plant Components Important to Safety: BWR Pressure Vessels," IAEA-TECDOC-1470, October 2005, p. 7; and IAEA, "Assessment and Management of Ageing of Major Nuclear Power Plant Components Important to Safety: PWR Pressure Vessels," IAEA-TECDOC-1120, October 1999, p. 5.] There are also local crud (corrosion products) deposits on the outer surfaces of fuel cladding. Higher burnup fuel cladding typically has thicker oxide layers, and a higher hydrogen content. In a SFP accident the outer fuel-cladding oxide layer can function as a protective layer; the oxidation of zirconium at elevated temperatures *could* be "controlled by the diffusion of oxygen through the oxide [layer, with] the reaction rate [being] inversely proportional to the oxide thickness."¹⁸⁷ [footnote 187 text: S. Hagen, H. Malauschek, S. O. Peck, K.P. Wallenfels, "Temperature Escalation in PWR Fuel Rod simulator Bundles due

to the Zircaloy-Steam Reaction: Test ESBU-1: Test Results Report,” KfK-3508, December 1983, p. 4.] However, if the cladding temperature increases, the temperature may become the dominating factor that drives the zirconium-oxidation reaction, causing a rapid cladding-temperature escalation.¹⁸⁸ [footnote 188 text: Id., p. 5.] (In the PHEBUS B9R-2 test—conducted with a pre-oxidized test bundle—oxide layers did not prevent a rapid fuel cladding temperature escalation from commencing in steam at a relatively low temperature: 1027°C (1880°F); PHEBUS B9R-2 is discussed in Section F.2.a.) (In air, nitrogen-related breakaway oxidation behavior would cause the protective oxide layer to degrade at approximately 800°C; and oxidation rates would begin accelerating.¹⁸⁹ [footnote 189 text: C. Duriez, T. Dupont, B. Schmet, F. Enoch, “Zircaloy-4 and M5 High Temperature Oxidation and Nitriding in Air,” Journal of Nuclear Materials 380 (2008), pp. 30, 39, 40, 43, 44.]) (0463-2-13 [Leyse, Mark])

Comment: A SFP fire is *primarily a zirconium fire*: the *runaway* chemical reaction between zirconium and steam (or zirconium and air): *runaway zirconium oxidation*. Runaway zirconium oxidation causes *thermal runaway*, because zirconium oxidation is exothermic: the heat produced by the zirconium-steam reaction increases the local fuel-cladding temperature, which in turn increases the reaction rate, further increasing the local fuel-cladding temperature, and so on. Once runaway zirconium oxidation commences in steam (typically at local fuel-cladding temperatures between approximately 1000°C (1832°F) and 1200°C (2192°F), local fuel-cladding temperatures increase rapidly, leading to temperature increases of tens of degrees Fahrenheit per second. Hence, local fuel-cladding temperatures can escalate up to the point where zirconium melts—above 1816°C (3300°F)¹⁹⁰ [footnote 190 text: NRC, “Feasibility Study of a Risk-Informed Alternative to 10 CFR 50.46, Appendix K, and GDC 35,” June 2001, (ADAMS Accession No: ML011800519), p. 3-1.]—within a few minutes. (0463-2-14 [Leyse, Mark])

Comment: III.E.2. In a SFP Boil-Off Accident, a Zirconium Fire Might Not Ignite in Steam if Fuel-Cladding Temperatures Reached 1000°C (1832°F) or Greater; In SBO boil-off accident, it is possible that there would not be a temperature escalation, if local fuel-cladding temperatures increased to approximately 1000°C (1832°F), because the initial heatup rate of the fuel cladding would be very slow, as discussed in Section C. After the fuel cladding were uncovered it would *initially* heat up *very slowly*, in some scenarios, at local rates lower than 0.01°C/sec (0.018°F/sec);¹⁹¹ [footnote 191 text: Zachary I. Franiewski et al., Pennsylvania State University, “Spent Fuel Pool Analysis of a BWR-4 Fuel Bundle Under Loss of Coolant Conditions Using TRACE,” p. 19.] in other scenarios, local heatup rates would be approximately 0.13°C/sec (0.23°F/sec).¹⁹² [footnote 192 text: EPRI, “Severe Accident Management Guidance Technical Basis Report,” Volume 2: “The Physics of Accident Progression,” 1025295, Appendix EE, p. EE-10.] Regarding the zirconium-steam reaction in the reactor core, a 1999 paper, “Current Knowledge on Core Degradation Phenomena, a Review,” states that if the initial fuel-cladding temperature heat-up rate is 0.2°C/sec or lower, the heat-up rate will become 3.0°C/sec or lower if fuel-cladding temperatures reach 1200°C, because of the heat that would be contributed from the exothermic zirconium-steam reaction. The same paper also states that if the initial fuel-cladding temperature heat-up rate is 1.0°C/sec or greater, the heat-up rate will become 10.0°C/sec or greater if fuel-cladding temperatures reach 1200°C, because of the heat that would be contributed from the exothermic zirconium-steam reaction.¹⁹³ [footnote 193 text: P. Hofmann, “Current Knowledge on Core Degradation Phenomena, a Review,” Journal of Nuclear Materials, 270, 1999, p. 205.] An initial fuel-cladding temperature heat-up rate of 1°C/sec or greater means that there will be a thinner oxide thickness on the fuel cladding *for a particular temperature*; hence, oxidation rates become greater at fuel-cladding temperatures at which the exothermic zirconium-steam reaction contributes significant heat (6.45 megajoules per kg of Zr reacted).¹⁹⁴ [footnote 194 text: R. R. Hobbins, D. A. Petti, D. J. Osetek, and D. L. Hargman, Idaho National Engineering Laboratory, EG&G Idaho, Inc., “Review of Experimental Results on

LWR Core Melt Progression,” in NRC “Proceedings of the Eighteenth Water Reactor Safety Information Meeting,” NUREG/CP-0114, Vol. 2, 1990, (ADAMS Accession No. ML042250131), p. 7.] (0463-2-15 [Leyse, Mark])

Comment: (It is noteworthy that if there were one or more criticality accidents in a SBO boil-off accident, after the fuel assemblies were uncovered, the heat generated from fission would cause rapid local fuel-cladding temperature increases.¹⁹⁵ [footnote 195 text: Zachary I. Franiewski et al., Pennsylvania State University, “Spent Fuel Pool Analysis of a BWR-4 Fuel Bundle Under Loss of Coolant Conditions Using TRACE,” NucE431W S2013, May 2013, pp. 1-2.] Hence, it would be possible for initial heatup rates of the fuel cladding to be 1.0°C/sec or greater. If fuel-cladding temperatures that had initial heatup rates of 1.0°C/sec or greater were to increase to between approximately 1000°C (1832°F) and 1200°C (2192°F) *in a steam environment*, runaway zirconium oxidation would most likely commence.) (0463-2-16 [Leyse, Mark])

Comment: Regarding the fact that the CORA experiments conducted with lower heat-up rates did not have temperature escalations, a 1996 European Commission report states: The CORA experiments performed with lower heat-up rates demonstrated clearly that no temperature escalation took place. The chemical interaction energy evolved caused only an increased heat-up rate between [1200°C (2192°F)] and [1800°C (3272°F)] of about [1.0°C/sec (1.8°F/sec)]. The oxide layer which has formed on the cladding outer surface during heat-up delays the chemical interactions between Zircaloy and steam since the diffusion of oxygen through the ZrO₂ layer is the reaction rate-determining step. The Zircaloy will be almost completely oxidized, or at least converted into .-Zr(O), before reaching the melting point of oxygen-poor (as-received) Zircaloy at about [1760°C (3200°F)]¹⁹⁶ [footnote 196 text: Zirconium melts at temperatures above 1816°C (3300°F). See NRC, “Feasibility Study of a Risk-Informed Alternative to 10 CFR 50.46, Appendix K, and GDC 35,” June 2001, (ADAMS Accession No: ML011800519), p. 3-1.]].¹⁹⁷ [footnote 197 text: T.J. Haste et al., “In-Vessel Core Degradation in LWR Severe Accidents,” European Commission, Report EUR 16695 EN, 1996, p. 27.] The PHEBUS B9 test is an example of an experiment that did *not* have a rapid fuel-cladding temperature escalation that commenced at relatively low fuel-cladding temperatures, because *it had a low initial heatup rate*. In PHEBUS B9, conducted in December 1986, the initial fuel-cladding temperature heatup rate was 0.2°C/sec (0.36°F/sec); the test bundle heated up to 1547°C (2816°F) at a very slow rate, without a rapid fuel-cladding temperature escalation. At 1547°C (2816°F) a fuel-cladding temperature escalation of 5°C/sec commenced.¹⁹⁸ [footnote 198 text: C. Gonner et al., “PHEBUS Severe Fuel Damage Program Main Experimental Results and Instrumentation Behavior,” Proceedings of the Seminar of the Phebus-FP (Fission Product) Project, Chateau Cadarache, St. Paul-Lez-Durance, France, June 5-7, 1991, p. 113.] (0463-2-17 [Leyse, Mark])

Comment: The CORA-2 test is an example of an experiment that *had* a rapid fuel-cladding temperature escalation that commenced at relatively low fuel-cladding temperatures, because *it did not have a low initial heatup rate*. CORA-2 had an initial fuel-cladding temperature heatup rate of approximately 1.0°C/sec (1.8°F/sec). In CORA-2, a PWR-type test conducted with 25 fuel rods (16 heated and 9 unheated rods), an “uncontrolled temperature escalation started at about [1100°C (2012°F)].”¹⁹⁹ [footnote 199 text: T.J. Haste et al., “In-Vessel Core Degradation in LWR Severe Accidents,” European Commission, Report EUR 16695 EN, pp. 15, 16.] And the LOFT LP-FP-2 experiment is another example of an experiment that *had* a rapid fuel-cladding temperature escalation that commenced at relatively low fuel-cladding temperatures, because *it did not have a low initial heatup rate*. LOFT LP-FP-2, heated with “actual fission-product decay heating of the core,”²⁰⁰ [footnote 200 text: S. R. Kinnersly, et al., “In-Vessel Core Degradation in LWR Severe Accidents: A State of the Art Report to CSNI,” p. 3.23.] had an initial fuel-cladding

temperature heatup rate of approximately 1.0°C/sec (1.8°F/sec).²⁰¹ [footnote 201 text: T. J. Haste et al., “Degraded Core Quench: A Status Report,” August 1996, p. 13.] In LOFT LP-FP-2, “[t]he first recorded and qualified rapid temperature rise associated with the rapid reaction between Zircaloy and water occurred at ...1400 K [1127°C (2060°F)] on a guide tube.” Hence, an analysis of LOFT LP-FP-2 “concluded from examination of the recorded temperatures that the oxidation of Zircaloy by steam becomes rapid at temperatures in excess of 1400 K (2060°F).”²⁰² [footnote 202 text: J. J. Pena, S. Enciso, F. Reventos, “Thermal-Hydraulic Post-Test Analysis of OECD LOFT LP-FP-2 Experiment,” International Agreement Report, NUREG/IA-0049, April 1992, (ADAMS Accession No: ML062840091), pp. 30, 33.] (0463-2-18 [Leyse, Mark])

Comment: III.E.2.a. The PHEBUS B9R Test had a Low Initial Heatup Rate and a Rapid Fuel-Cladding Temperature Escalation at Relatively Low Temperatures. It needs to be clarified that even if there were a low initial heatup rate of the fuel cladding, it is still possible for a rapid fuel-cladding temperature escalation to commence at relatively low fuel-cladding temperatures. The PHEBUS B9R-2 test is an example of an experiment that *had* an unexpected rapid fuel-cladding temperature escalation that commenced at relatively low fuel-cladding temperatures, even though *it had a low initial heatup rate*. The PHEBUS B9R test was conducted in a light water reactor—as part of the PHEBUS severe fuel damage program—with an assembly of 21 UO₂ fuel rods. The B9R test was conducted in two parts: the B9R-1 test and the B9R-2 test.²⁰³ [footnote 203 text: G. Hache, R. Gonzalez, B. Adroguer, Institute for Protection and Nuclear Safety, “Status of ICARE Code Development and Assessment,” in NRC “Proceedings of the Twentieth Water Reactor Safety Information Meeting,” NUREG/CP-0126, Vol. 2, 1992, (ADAMS Accession No: ML042230126), p. 311.] A 1996 European Commission report states that the B9R-2 test had an unexpected fuel-cladding temperature escalation in the mid-bundle region; the highest temperature escalation rates were from 20°C/sec (36°F/sec) to 30°C/sec (54°F/sec).²⁰⁴ [footnote 204 text: T.J. Haste et al., “In-Vessel Core Degradation in LWR Severe Accidents,” European Commission, Report EUR 16695 EN, p. 33.] Discussing PHEBUS B9R-2, the 1996 European Commission report states: The B9R-2 test (second part of B9R) illustrates the oxidation in different cladding conditions representative of a pre-oxidized and fractured state. This state results from a first oxidation phase (first part name B9R-1, of the B9R test) terminated by a rapid cooling-down phase. During B9R-2, an unexpected strong escalation of the oxidation of the remaining Zr occurred when the bundle flow injection was switched from helium to steam while the maximum clad temperature was equal to 1300 K [1027°C (1880°F)]. *The current oxidation model was not able to predict the strong heat-up rate observed even taking into account the measured large clad deformation and the double-sided oxidation (final state of the cladding from macro-photographs). ... No mechanistic model is currently available to account for enhanced oxidation of pre-oxidized and cracked cladding*²⁰⁵ [footnote 205 text: Id., p. 126.] [emphasis added]. (0463-2-19 [Leyse, Mark])

Comment: The fact that PHEBUS B9R-2 was conducted with a pre-oxidized test bundle makes its results particularly applicable to SFP fires. The results of PHEBUS B9R-2 indicate that it is unpredictable as to whether or not rapid fuel-cladding temperature escalations would commence *in steam*, in a SFP accident, at relatively low fuel-cladding temperatures. Spent fuel rods would also be “pre-oxidized”: when high burnup (and other) fuel rods are discharged from the reactor core and loaded into the SFP, the fuel cladding can have local zirconium dioxide (ZrO₂) “oxide” layers that are up to 100 µm thick (or greater); there can also be local crud layers on top of the oxide layers, which can sometimes also be up to 100 µm thick. And medium to high burnup fuel cladding typically has a “hydrogen concentration in the range of 100-1000 wppm [weight parts per million];” “[z]irconium-based alloys, in general, have a strong affinity for oxygen, nitrogen, and hydrogen...”²⁰⁶ [footnote 206 text: K. Natesan, W.K. Soppet, Argonne

National Laboratory, "Hydrogen Effects on Air Oxidation of Zirlo Alloy," NUREG/CR-6851, October 2004, (ADAMS Accession No: ML042870061), p. iii, 3.] (0463-2-20 [Leyse, Mark])

Comment: According to an October 2000 OECD Nuclear Energy Agency report, the initial heatup rate in PHEBUS B9R-2 was less than 0.1°C/sec up to 727°C (1340°F) (during the pure helium phase of the experiment).²⁰⁷ [footnote 207 text: OECD Nuclear Energy Agency, "In-Vessel Core Degradation Code Validation Matrix Update 1996-1999," NEA/CSNI/R(2000)21, October 2000, p. 97.] However, according to a graph with a plot of fuel-cladding temperature values at the 0.6 meter "hot level" of the PHEBUS B9R-2 test bundle, the initial heatup rate in PHEBUS B9R-2 was approximately 1.0°C/sec up to 727°C (1340°F); however, the heatup rate decreases to lower than 0.2°C/sec between approximately 877°C (1610°F) and 1002°C (1835°F).²⁰⁸ [footnote 208 text: G. Hache, R. Gonzalez, B. Adroguer, Institute for Protection and Nuclear Safety, "Status of ICARE Code Development and Assessment," in NRC "Proceedings of the Twentieth Water Reactor Safety Information Meeting," NUREG/CP-0126, Vol. 2, 1992, (ADAMS Accession No: ML042230126), p. 312.] (See Figure 5.) As stated, the cladding-temperature escalation commenced at approximately 1027°C (1880°F). [See Figure 5. Local Cladding Temperature vs. Time in the PHEBUS B9R-2 Test in NRC Adams Database ML13351A310]²⁰⁹ [footnote 209 text: Id.] (0463-2-21 [Leyse, Mark])

Comment: (It is noteworthy that a September 2013 NRC document, NUREG-2157, states that if local fuel-cladding temperatures were to increase to approximately 1000°C (1832°F) in a SFP accident, a runaway zirconium oxidation reaction—a *SFP zirconium fire*—would commence *in steam*.²¹⁰ [footnote 210 text: NRC, "Waste Confidence Generic Environmental Impact Statement: Draft Report for Comment," NUREG-2157, Appendix F, p. F-2.] However, regarding zirconium alloy fuel-cladding behavior *in steam*, in a reactor LOCA, in October 2012, the NRC stated that "autocatalytic [zirconium oxidation] reactions have not occurred at temperatures less than 2200 degrees F,"²¹¹ [footnote 211 text: NRC, "Draft Interim Review of PRM-50-93/95 Issues Related to Conservatism of 2200 degrees F, Metal-Water Reaction Rate Correlations, and 'The Impression Left from [FLECHT] Run 9573' ," October 16, 2012, (ADAMS Accession No: ML12265A277), p. 2.] that is, runaway zirconium oxidation reactions have not commenced in experiments when fuel-cladding temperatures were lower than 1204.4°C (2200°F). (0463-2-22 [Leyse, Mark])

Comment: Hence, the NRC claims that runaway zirconium oxidation would commence at 1000°C (1832°F) *in steam*, in SFP accidents, which would have low initial heatup rates (except in certain criticality accident scenarios). Nonetheless, the NRC also claims that runaway zirconium oxidation would *not* commence below 1204.4°C (2200°F) *in steam*, in reactor LOCAs, which could have *high* initial heatup rates, exceeding 5.6°C/sec (10.0°F/sec). Perhaps the NRC's statement regarding runaway zirconium oxidation in steam, in reactor LOCAs, is influenced by the fact that the NRC requires the maximum fuel-cladding temperature in a postulated reactor LOCA to not exceed 2200°F— 10 C.F.R. § 50.46(b)(1) peak fuel-cladding temperature limit. If the NRC acknowledged that runaway zirconium oxidation *in steam* could commence in reactor LOCAs at fuel cladding temperatures below 2200°F, the NRC might realize that it needed to lower its Section 50.46 peak fuel-cladding temperature limit.²¹² [footnote 212 text: Full disclosure: in November 2009, the author of this report submitted a rulemaking petition (PRM-50-93) to the NRC, requesting that the NRC revise 10 C.F.R. § 50.46(b)(1) to require that the calculated maximum fuel element cladding temperature, in a reactor LOCA, not exceed a limit based on data from multi-rod (assembly) severe fuel damage experiments. The author argued that data from multi-rod (assembly) severe fuel damage experiments (for example, the LOFT LP-FP-2 experiment) indicates that the current 10 C.F.R. § 50.46(b)(1) PCT limit of 2200°F is non-conservative.]) (0463-2-23 [Leyse, Mark])

Comment: III.E.3. In a Spent Fuel Pool Boil-Off Accident, a Zirconium Fire Would Most Likely Ignite in Air if Fuel-Cladding Temperatures Reached 900°C (1652°F) or Lower. In a SFP boil-off accident, after the fuel assemblies were uncovered, the fuel cladding's zirconium content would initially chemically react with the steam produced by the boiling water in the SFP. At some point, as more water boiled off and the water level decreased further (below the elevation at 66 percent of the height of the fuel assemblies), the fuel cladding would be exposed to local mixtures of steam and air. When zirconium is exposed to local mixtures of steam and air, the zirconium-oxygen reaction will dominate.²¹³ [footnote 213 text: C. Bals et al., "Modelling of Accelerated Cladding Degradation in Air for Severe Accident Codes," The 3rd European Review Meeting on Severe Accident Research (ERMSAR-2008), Bulgaria, September 23-25, 2008, pp. 4, 5.] Then, as the water level dropped down even closer to the baseplates, the upper regions of the fuel assemblies would predominately be exposed to air. (After the fuel assemblies were uncovered there would be various local conditions; for example, there could be local steam starvation and local oxygen starvation.) If there had been initial heatup rates that were very low (that is, if there had not been any criticality accidents that caused faster initial heatup rates) and a zirconium fire had not commenced *in steam*, a zirconium fire would most likely commence *in air*, provided water covered the baseplates at the lower end of the fuel assemblies. (If "water [is] above the base plate of the racks...the water at the bottom of the pool acts as a "plug," which prevents cooling of the assemblies by natural air circulation."²¹⁴ [footnote 214 text: Randall Gauntt et al., Sandia National Laboratories "Fukushima Daiichi Accident Study: Status as of April 2012," SAND2012-6173, August 2012, p. 183.]) (0463-2-24 [Leyse, Mark])

Comment: III.E.4. Exothermic Reactions in Air: Zirconium Oxidation and Zirconium Nitriding: Runaway zirconium oxidation commences *in air* at lower local fuel-cladding temperatures—827°C (1520°F)²¹⁵ [footnote 215 text: Zachary I. Franiewski et al., Pennsylvania State University, "Spent Fuel Pool Analysis of a BWR-4 Fuel Bundle Under Loss of Coolant Conditions Using TRACE," pp. iv, 2, 3, 8, 13.] or 900°C (1652°F)²¹⁶ [footnote 216 text: Allan S. Benjamin et al., Sandia Laboratories, "Spent Fuel Heatup Following Loss of Water During Storage," NUREG/CR-0649, March 1979, p. 47.]—than it does in steam; and the zirconium-oxygen reaction in air produces approximately twice as much energy (per kg of Zr reacted) as the zirconium-steam reaction. The zirconium-oxygen reaction in air produces zirconium dioxide and energy; the equation for the reaction is written as $\text{Zr} + \text{O}_2 \rightarrow \text{ZrO}_2 + \text{energy}$. The energy (heat) generated by the reaction is approximately 12.0 megajoules per kg of Zr reacted.²¹⁷ [footnote 217 text: National Research Council, Committee on the Safety and Security of Commercial Spent Nuclear Fuel Storage, "Safety and Security of Commercial Spent Nuclear Fuel Storage: Public Report," 2005, p. 38.] And the zirconium-nitrogen reaction produces approximately 30 percent of the quantity of energy (per kg of Zr reacted) produced by the zirconium-oxygen reaction in air. The zirconium-nitrogen reaction produces zirconium nitride and energy; the equation for the reaction is written as $\text{Zr} + 1/2\text{N}_2 \rightarrow \text{ZrN} + \text{energy}$. The energy (heat) generated by the reaction is approximately 3.76 megajoules per kg of Zr reacted.²¹⁸ [footnote 218 text: V. L. Sailor et al., Brookhaven National Laboratory, "Severe Accidents in Spent Fuel Pools in Support of Generic Safety Issue 82," NUREG/CR-4982, July 1987, p. 109.] In *April 2000*, the ACRS told the NRC Staff that "nitrogen from air depleted of oxygen will interact exothermically with zircaloy cladding. The reaction of zirconium with nitrogen is exothermic by about 86,000 calories per mole of zirconium reacted. Because the heat required to raise zirconium from room temperature to melting is only about 18,000 calories per mole, the reaction enthalpy with nitrogen is ample" ²¹⁹ [footnote 219 text: Dana A. Powers, Chairman of ACRS, Letter to Richard A. Meserve, Chairman of NRC, Regarding ACRS Recommendations for Improvements to the NRC Staff's "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," April 13, 2000, (ADAMS Accession No. ML003704532), pp. 3-4.] [emphasis added]. (A July 1987 NRC document, NUREG/CR-4982,

states that the reaction of zirconium and nitrogen releases approximately 82,000 calories per mole of zirconium reacted.²²⁰ [footnote 220 text: V. L. Sailor et al., “Severe Accidents in Spent Fuel Pools in Support of Generic Safety Issue 82,” NUREG/CR-4982, p. 109.] An August 2012 SNL report, “Fukushima Daiichi Accident Study” states that “[i]f inadequate cooling is provided, then the cladding will heat up and will rapidly oxidize (i.e., burn) and to a lesser extent, nitride (i.e., combine with nitrogen if no oxygen or steam are available). *Since the oxidation and nitride processes are exothermic*, the fuel rods could heat to melting conditions and structurally degrade”²²¹ [footnote 221 text: Randall Gauntt et al., Sandia National Laboratories “Fukushima Daiichi Accident Study: Status as of April 2012,” SAND2012-6173, August 2012, p. 183.] [emphasis added]. (0463-2-25 [Leyse, Mark])

Comment: III.E.5. Nitrogen Accelerates the Oxidation and Degradation of Zirconium Fuel-Cladding in Air. The nitrogen gas (in air) affects the oxidation of zirconium in air.²²² [footnote 222 text: K. C. Wagner, R. O. Gauntt, Sandia National Laboratories, Analysis and Modeling Division, “Mitigation of Spent Fuel Pool Loss-of-Coolant Inventory Accidents and Extension of Reference Plant Analyses to Other Spent Fuel Pools,” SANDIA Letter Report, Revision 2, November 2006, (ADAMS Accession No. ML120970086), p. 12; and L. Fernandez-Moguel, J. Birchley, European MELCOR User’s Group, “PSI air oxidation model in MELCOR: Part 2: Analysis of experiments and model assessment,” Stockholm, May 2013, which states: “Neither MELCOR nor SCDAP [a severe accident computer safety model] are able to predict a nitride reaction.”] The presence of nitrogen accelerates the oxidation (burning) and degradation of zirconium fuel-cladding *in air*,²²³ [footnote 223 text: J. Stuckert, M. Große, Z. Hózer, M. Steinbrück, Karlsruhe Institute of Technology, “Results of the QUENCH-16 Bundle Experiment on Air Ingress,” KIT-SR 7634, May 2013, p. 1; and O. Coindreau, C. Duriez, S. Ederli, “Air Oxidation of Zircaloy-4 in the 600-1000°C Temperature Range: Modeling for ASTEC Code Application,” Journal of Nuclear Materials 405, 2010, p. 208.] which would affect the progression and severity of a SFP accident, including radioactive releases, “most notabl[y] ruthenium.”²²⁴ [footnote 224 text: J. Stuckert et al., “Results of the QUENCH-16 Bundle Experiment on Air Ingress,” p. 1.] (“Ruthenium has a biological effectiveness equivalent to that of Iodine-131;”²²⁵ [footnote 225 text: Dana A. Powers, Chairman of ACRS, Letter to Richard A. Meserve, Chairman of NRC, Regarding ACRS Recommendations for Improvements to the NRC Staff’s “Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants,” April 13, 2000, (ADAMS Accession No. ML003704532), p. 2.] Ruthenium-106 has half-life of 373.6 days.) (0463-2-26 [Leyse, Mark])

Comment: A 2010 Journal of Nuclear Materials paper observes that “[t]he complexity of air oxidation of Zircaloy arises out of the simultaneous oxidation and nitriding processes.”²²⁶ [footnote 226 text: O. Coindreau, C. Duriez, S. Ederli, “Air Oxidation of Zircaloy-4 in the 600-1000°C Temperature Range: Modeling for ASTEC Code Application,” p. 207.] And a May 2013 report, “Results of the QUENCH-16 Bundle Experiment on Air Ingress,” discusses experimental data demonstrating that porous nitrides form inside oxide layers *under local or full oxygen-starvation conditions*.²²⁷ [footnote 227 text: J. Stuckert et al., “Results of the QUENCH-16 Bundle Experiment on Air Ingress,” p. 10.] (When zirconium reacts in air it is possible for the reaction to become oxygen-starved; however, if zirconium is locally oxygen-starved in air, nitrogen will react with it.) The porous, degraded condition of an oxide layer facilitates accelerated oxidation rates if additional oxygen becomes locally available; and any additional oxygen will react with the zirconium nitride (ZrN) within an existing oxide layer and form zirconium dioxide (ZrO₂) in a fast exothermic reaction.²²⁸ [footnote 228 text: Emilie Beuzet et al., “Modelling of Zry-4 Cladding Oxidation by Air Under Severe Accident Conditions using MAAP4 Code,” International Conference Nuclear Energy for New Europe 2009, Slovenia, September 2009, p. 3.] (0463-2-27 [Leyse, Mark])

Comment: A 2008 Journal of Nuclear Materials paper, “Zircaloy-4 and M5 High Temperature Oxidation and Nitriding in Air,” explains that “once initiated, the nitride-assisted degradation will be a self-sustaining process, because ZrN conversion into oxide leaves nitrogen trapped in the oxide scale and available for further nitriding, and because the oxide formed is undoubtedly non-protective. Where nitriding has initiated, the bright α -Zr(O) layer is thin, confirming the faster progression of the oxidation front there. The self-sustainability of the nitriding-reoxidation sequence may also favor the lateral progressive propagation of the breakaway.”²²⁹ [footnote 229 text: C. Duriez, T. Dupont, B. Schmet, F. Enoch, “Zircaloy-4 and M5 High Temperature Oxidation and Nitriding in Air,” Journal of Nuclear Materials 380 (2008), p. 43.] Regarding nitrogen-induced breakaway oxidation, the 2008 Journal of Nuclear Materials paper explains that “[b]reakdown and loss of the dense scale protective effect occur and result in an accelerated degradation;” furthermore, the transition to nitrogen-induced breakaway oxidation occurs *earlier with pre-oxidized fuel cladding than with fresh non-oxidized fuel cladding*—“nitriding is favored by the ‘corrosion’ scale.”²³⁰ [footnote 230 text: Id., p. 44.] (0463-2-28 [Leyse, Mark])

Comment: It is clear that in air, in a SFP accident, a significant degree of zirconium oxidation would occur, because spent fuel rods would be “pre-oxidized.” When high burnup (and other) fuel rods are discharged from the reactor core and loaded into the SFP, the fuel cladding can have local zirconium dioxide (ZrO₂) “oxide” layers that are up to 100 μ m thick (or greater); there can also be local crud layers on top of the oxide layers, which can sometimes also be up to 100 μ m thick. And medium to high burnup fuel cladding typically has a “hydrogen concentration in the range of 100-1000 wppm [weight parts per million];” “[z]irconium-based alloys, in general, have a strong affinity for oxygen, nitrogen, and hydrogen...”²³¹ [footnote 231 text: K. Natesan, W.K. Soppet, Argonne National Laboratory, “Hydrogen Effects on Air Oxidation of Zirlo Alloy,” NUREG/CR-6851, October 2004, (ADAMS Accession No: ML042870061), p. iii, 3.] Regarding the fact that air oxidation causes a fast progression of the oxidation front, the 2008 Journal of Nuclear Materials paper states: At 800°C and above, continuous acceleration is observed, as the consequence of a complex process involving nitride formation and re-oxidation, as well as dissolution of nitrogen in the zirconia anion sub-lattice. Important volume mismatches of the ZrO₂ and ZrN compounds, together with zirconia phase transformations lead to *growth of a highly cracked, porous, non-protective oxide. It results in fast progression of the oxidation front, as well as strong deformation of the cladding.* The barrier against fission product release provided by the fuel cladding is lost much earlier than during accident under steam atmosphere²³² [footnote 232 text: C. Duriez, T. Dupont, B. Schmet, F. Enoch, “Zircaloy-4 and M5 High Temperature Oxidation and Nitriding in Air,” Journal of Nuclear Materials 380 (2008), p. 44.] [emphasis added].; And regarding the fact that cladding degradation can be even much faster in oxygen starved situations (in air), the 2008 Journal of Nuclear Materials paper states: Kinetic data of this study have been obtained mainly in high air flow conditions. *In real accidental situations, where oxygen starved situations are likely to occur, cladding degradation can be even much faster than predictable from these high air flow data*, because of early initiation of the nitriding process, as shown by the few tests performed at the highest temperatures with insufficient air flow rate. All in all, more experimental investigations are required to address the various conditions that can be encountered in accidental situation.²³³ [footnote 233 text: Id., p. 44.] (0463-2-29 [Leyse, Mark])

Comment: III.E.6. The Axial and Radial Propagation of a Spent Fuel Pool Fire; Regarding the axial propagation of the zirconium-steam reaction from its point of initiation, a 1990 Karlsruhe report, KfK 4378, states: [T]he temperature escalation starts at the hottest position in the bundle [of fuel rod simulators], at an elevation above the middle. From there, slowly moving fronts of bright light, which illuminated the bundle, were seen, indicating the spreading of the temperature

escalation upward and downward.²³⁴ [footnote 234 text: S. Hagen, P. Hofmann, G. Schanz, L. Sepold, “Interactions in Zircaloy/UO₂ Fuel Rod Bundles with Inconel Spacers at Temperatures above 1200°C (Posttest Results of Severe Fuel Damage Experiments CORA-2 and CORA-3),” Forschungszentrum Karlsruhe, KfK 4378, September 1990, p. 41.]; And regarding axial and radial propagation of the zirconium-oxygen reaction (in steam and/or air), a September 2013 NRC document, NUREG-2157, states: Under certain conditions, the high temperature runaway zirconium oxidation reaction occurring in one part of the pool could also spread to other spent fuel in the pool. The proximity of fuel assemblies to one another, combined with the effects of [radiative] heat transfer when these assemblies are at very high temperatures, could allow the runaway oxidation reaction to spread from spent fuel with high decay heat to spent fuel with lower decay heat that would otherwise not have begun burning.²³⁵ [footnote 235 text: NRC, “Waste Confidence Generic Environmental Impact Statement: Draft Report for Comment,” NUREG-2157, p. F-2.]; As fuel rods heated up to melting temperatures, “the steel racks supporting the fuel assemblies will also heat due to convection and radiation from the fuel assemblies.”²³⁶ [footnote 236 text: K. C. Wagner, R. O. Gauntt, Sandia National Laboratories, Analysis and Modeling Division, “Mitigation of Spent Fuel Pool Loss-of-Coolant Inventory Accidents and Extension of Reference Plant Analyses to Other Spent Fuel Pools,” SANDIA Letter Report, Revision 2, p. 12.] In the worst-case scenario, a SFP fire would propagate “throughout the entire spent fuel inventory in the pool”²³⁷ [footnote 237 text: J.H. Jo, P.F. Rose, S.D. Unwin, V.L. Sailor, Brookhaven National Laboratory, “Value/Impact Analyses of Accident Preventive and Mitigative Options for Spent Fuel Pools,” NUREG/CR5281, March 1989, (ADAMS Accession No. ML071690022), p. 8.]; The zirconium-air reaction would propagate away from its point of initiation more rapidly than the propagation of the zirconium-steam reaction, because: 1) the heat produced by zirconium oxidation in air is greater than that in steam; 2) the nitrogen content in air would accelerate zirconium oxidation in air; and 3) heat would also be contributed by the exothermic zirconium-nitrogen reaction. (0463-3-1 [Leyse, Mark])

Comment: MELCOR Does Not Model How Nitrogen Accelerates the Oxidation and Degradation of Zirconium Fuel-Cladding in Air: MELCOR also *does not simulate* how nitrogen gas (in air) affects the oxidation of zirconium in air.²⁵⁸ [footnote 258 text: K. C. Wagner, R. O. Gauntt, Sandia National Laboratories, Analysis and Modeling Division, “Mitigation of Spent Fuel Pool Loss-of-Coolant Inventory Accidents and Extension of Reference Plant Analyses to Other Spent Fuel Pools,” SANDIA Letter Report, Revision 2, p. 12; and L. Fernandez-Moguel, J. Birchley, European MELCOR User’s Group, “PSI air oxidation model in MELCOR: Part 2: Analysis of experiments and model assessment,” Stockholm, May 2013, which states: “Neither MELCOR nor SCDAP [a severe accident computer safety model] are able to predict a nitride reaction.”] This is a serious flaw because the presence of nitrogen accelerates the oxidation (burning) and degradation of zirconium fuel-cladding *in air*,²⁵⁹ [footnote 259 text: J. Stuckert, M. Große, Z. Hózer, M. Steinbrück, Karlsruhe Institute of Technology, “Results of the QUENCH-16 Bundle Experiment on Air Ingress,” KIT-SR 7634, May 2013, p. 1; and O. Coindreau, C. Duriez, S. Ederli, “Air Oxidation of Zircaloy-4 in the 600-1000°C Temperature Range: Modeling for ASTEC Code Application,” p. 208.] which would affect the progression and severity of a SFP accident, including radioactive releases, “most notabl[y] ruthenium.”²⁶⁰ [footnote 260 text: J. Stuckert et al., “Results of the QUENCH-16 Bundle Experiment on Air Ingress,” p. 1.] (“Ruthenium has a biological effectiveness equivalent to that of Iodine-131,”²⁶¹ [footnote 261 text: Dana A. Powers, Chairman of ACRS, Letter to Richard A. Meserve, Chairman of NRC, Regarding ACRS Recommendations for Improvements to the NRC Staff’s “Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants,” p. 2.] Ruthenium-106 has half-life of 373.6 days.) Hence, the NRC’s MELCOR simulations of SFP accidents *under-predict* the severity of such accidents. (0463-3-10 [Leyse, Mark])

Comment: A 2010 Journal of Nuclear Materials paper observes that “[t]he complexity of air oxidation of Zircaloy arises out of the simultaneous oxidation and nitriding processes.”²⁶² [footnote 262 text: O. Coindreau, C. Duriez, S. Ederli, “Air Oxidation of Zircaloy-4 in the 600-1000°C Temperature Range: Modeling for ASTEC Code Application,” p. 207.] And a May 2013 report, “Results of the QUENCH-16 Bundle Experiment on Air Ingress,” discusses experimental data demonstrating that porous nitrides form inside oxide layers *under local or full oxygen-starvation conditions*.²⁶³ [footnote 263 text: J. Stuckert et al., “Results of the QUENCH-16 Bundle Experiment on Air Ingress,” p. 10.] (When zirconium reacts in air it is possible for the reaction to become oxygen-starved; however, if zirconium is locally oxygen-starved in air, nitrogen will react with it.) The porous, degraded condition of an oxide layer facilitates accelerated oxidation rates if additional oxygen becomes *locally* available; and any additional oxygen will react with the zirconium nitride (ZrN) within an existing oxide layer and form zirconium dioxide (ZrO₂) in a fast exothermic reaction.²⁶⁴ [footnote 264 text: Emilie Beuzet et al., “Modelling of Zry-4 Cladding Oxidation by Air Under Severe Accident Conditions using MAAP4 Code,” International Conference Nuclear Energy for New Europe 2009, Slovenia, September 2009, p. 3.] (0463-3-11 [Leyse, Mark])

Comment: As quoted above, an April 2000 ACRS letter states that “[m]uch more is known now about air interactions with cladding;”²⁶⁵ [footnote 265 text: Dana A. Powers, Chairman of ACRS, Letter to Richard A. Meserve, Chairman of NRC, Regarding ACRS Recommendations for Improvements to the NRC Staff’s “Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants,” p. 3.] however, a 2008 Journal of Nuclear Materials paper, “Zircaloy-4 and M5 High Temperature Oxidation and Nitriding in Air,” states: Oxidation of zirconium alloys at high temperature for severe accident analysis has been widely studied in steam, however, the existing data regarding air oxidation in the temperature range of interest are scarce. ...the exact role of zirconium nitride on the cladding degradation process is poorly understood. It remains unclear to [what] extent the nitrogen effect is responsible for the kinetic acceleration of the oxidation process that has been observed by these authors. Further[more], it should be stressed that most of the existing data have been obtained with bare [non-oxidized] samples.²⁶⁶ [footnote 266 text: C. Duriez, T. Dupont, B. Schmet, F. Enoch, “Zircaloy-4 and M5 High Temperature Oxidation and Nitriding in Air,” Journal of Nuclear Materials 380 (2008), p. 30.] Regarding nitrogen-induced breakaway oxidation, the 2008 Journal of Nuclear Materials paper explains that “[b]reakdown and loss of the dense scale protective effect occur and result in an accelerated degradation;” furthermore, the transition to nitrogen-induced breakaway oxidation occurs *earlier with pre-oxidized fuel cladding* than with fresh *non-oxidized fuel cladding*—“nitriding is favored by the ‘corrosion’ scale.”²⁶⁷ [footnote 267 text: Id., p. 44.] (0463-3-12 [Leyse, Mark])

Comment: It is clear that *in air*, in a SFP accident, a significant degree of zirconium oxidation would occur, because spent fuel rods would be “pre-oxidized.” When high burnup (and other) fuel rods are discharged from the reactor core and loaded into the SFP, the fuel cladding can have local zirconium dioxide (ZrO₂) “oxide” layers that are up to 100 µm thick (or greater); there can also be local crud layers on top of the oxide layers, which can sometimes also be up to 100 µm thick. And medium to high burnup fuel cladding typically has a “hydrogen concentration in the range of 100-1000 wppm [weight parts per million];” “[z]irconium-based alloys, in general, have a strong affinity for oxygen, nitrogen, and hydrogen...”²⁶⁸ [footnote 268 text: K. Natesan, W.K. Soppet, Argonne National Laboratory, “Hydrogen Effects on Air Oxidation of Zirlo Alloy,” NUREG/CR-6851, October 2004, (ADAMS Accession No. ML042870061), p. iii, 3.] (0463-3-13 [Leyse, Mark])

Comment: Regarding limitations of air oxidation models, the May 2013 report, “Results of the QUENCH-16 Bundle Experiment on Air Ingress,” states that “[t]he models for air oxidation do not yet cover the whole range of representative conditions. The main aims of new bundle tests should be the investigation of areas where data [are] mostly missing.”²⁶⁹ [footnote 269 text: J. Stuckert et al., “Results of the QUENCH-16 Bundle Experiment on Air Ingress,” p. 1.] And, a 2009 paper, regarding needed development for MELCOR *in the area of air ingress*, states that “air oxidation cannot be reliably predicted (or even described conservatively) by any of the models used in the currently available codes. A new modeling approach and an appropriate database are therefore necessary.”²⁷⁰ [footnote 270 text: S. Guntay, J. Birchley, “MELCOR Further Development in the Area of Air Ingress and Participation in OECDNEA SFP Project to Be Performed in the Time Frame 2009-2012,” April 2009, p. 4.] Additionally, information about the French Mozart Program to study the zirconium-air reaction states that “[b]ibliographic reviews reveal wide scattering of the existing kinetic data concerning the oxidation of Zircaloy-4 by air in the temperature range concerned [600°C to 1200°C]. *For recent alloys, such as M5 and Zirlo, there is virtually no data published in the open literature*”²⁷¹ [footnote 271 text: IRSN, website description of the Mozart Program; available at: <http://www.irsn.fr/EN/Research/Research-organisation/Research-programmes/SOURCE-TERM/MOZART/Pages/The-MOZART-programme-on-the-PWR-fuel-cladding-oxidation-in-air-3238.aspx> (last visited 10/22/13).] [emphasis added]. (0463-3-14 [Leyse, Mark])

Comment: In a June 2013 document, the NRC explained that a new air oxidation kinetics model was added to MELCOR version 1.8.6 (2005) that is based on data from *isothermal*²⁷² [footnote 272 text: The tests ANL were *isothermal tests*, in which “a [zirconium alloy] specimen was held at constant temperature and the weight gain associated with oxidation as a function of time was measured.” See NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” p. 93.] air zirconium-oxidation experiments conducted at Argonne National Laboratory (“ANL”). The ANL data (published in 2004) demonstrated that “air oxidation can be observed at temperatures as low as 600 K [327°C (620°F)];” and that the breakaway phenomenon that occurs when zirconium is oxidized in air causes “a sharp increase” in reaction and heatup rates in the post-breakaway regime. Apparently, MELCOR version 1.8.6 “provide[s] a better prediction of the measured data, including a transition to accelerated post-breakaway oxidation kinetics.”²⁷³ [footnote 273 text: NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” pp. 93-94.] (0463-3-15 [Leyse, Mark])

Comment: MELCOR version 1.8.6 may provide a “better prediction” of the measured air oxidation data, than older versions. However, the Paul Scherrer Institute (“PSI”) recently assessed MELCOR 1.8.6’s ability to predict fuel-cladding behavior in accidents involving air ingress into the reactor vessel—which is pertinent to MELCOR’s ability to predict zirconium-air reaction rates in SFP accidents—and “concluded that development of MELCOR was needed *to capture the accelerated cladding oxidation that can take place under air ingress conditions* (characterized by transition from formation of a protective oxide film to non-protective ‘breakaway’ oxidation at a significantly higher rate)”²⁷⁴ [footnote 274 text: S. Guntay, J. Birchley, “MELCOR Further Development in the Area of Air Ingress and Participation in OECDNEA SFP Project to Be Performed in the Time Frame 2009-2012,” April 2009, p. 2.] [emphasis added]. PSI has also explained: Although there was not, [in] the 1980’s, any systematic treatment of air oxidation, correlations had been developed on the basis of limited data²⁷⁵ [footnote 275 text: A. Benjamin et al., “Spent Fuel Heatup following Loss of Water during Storage,” NUREG/CR-0649, SAND77-1371, March 1979, (ADAMS Accession No. ML120960637); and V. Sailor et al., “Severe Accidents in Spent Fuel Ponds in Support f

Generic Issue 82”, NUREG/CR-4982, July 1987.] and these had been adapted for use in MELCOR in [an] attempt to provide a conservative statement of the thermal response to an air ingress scenario. A feature of all these correlations was that the controlling processes were similar to those which govern steam oxidation. The US-NRC later commissioned experimental studies²⁷⁶ [footnote 276 text: K. Natesan, W.K. Soppet, Argonne National Lab (ANL), "Air Oxidation Kinetics for Zr-Based Alloys," NUREG/CR-6846, July 2004, (ADAMS Accession No. ML041900069).] [the ANL isothermal experiments] to obtain data with which to establish a credible physical basis for using the correlations. *More recent experiments*²⁷⁷ [footnote 277 text: These recent experiments are discussed in the four following reports: 1) M. Steinbrueck, U. Stegmeier, T. Ziegler, "Prototypical Experiments on Air Oxidation of Zircaloy-4 at High Temperature," FZK 7257, January 2007; 2) G. Schanz et al., "Results of QUENCH-10 Experiment on Air Ingress," FZKA 7057, May 2006; 3) Ch. Duriez et al., "Separate effect Tests on Zirconium Cladding Degradation in Air Ingress Situations," Proceedings of 2nd ERMSAR Conference, Karlsruhe, Germany, 2007; and 4) A. Auvinen et al., "Progress on ruthenium release and transport under air ingress Conditions," Nuclear Engineering and Design, 238, 2008, pp. 3418–3428.] *demonstrated that the processes that govern air oxidation are quite different from those which apply to steam oxidation*²⁷⁸ [footnote 278 text: S. Güntay, J. Birchley, "MELCOR Further Development in the Area of Air Ingress and Participation in OECDNEA SFP Project to Be Performed in the Time Frame 2009-2012," p. 4.] [emphasis added]. (0463-3-16 [Leyse, Mark])

Comment: Clearly, the NRC’s conclusions from its Post-Fukushima MELCOR simulations are non-conservative and misleading, because their conclusions underestimate the probabilities of large radiological releases from SFP accidents. By overlooking the deficiencies of its Post-Fukushima MELCOR simulations, the NRC undermines its own philosophy of defense-in-depth, which requires the application of conservative models.²⁷⁹ [footnote 279 text: Charles Miller et al., NRC, "Recommendations for Enhancing Reactor Safety in the 21st Century: The Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," SECY-11-0093, July 12, 2011, (ADAMS Accession No. ML111861807), p. 3.] (0463-3-17 [Leyse, Mark])

Comment: The NRC’s Recent Non-Conservative Post-Fukushima MELCOR Simulations; A recent NRC Post-Fukushima MELCOR (version 1.8.6 of the code²⁸⁰ [footnote 280 text: The SFP models in MELCOR versions 1.8.6 and 2.1 are functionally the same. See NRC, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report," pp. 92-93.]) simulation of *a particular* BWR Mark I SFP fire scenario ("Unsuccessful Deployment of Mitigation for Moderate Leak (OCP3) Scenario"²⁸¹ [footnote 281 text: NRC, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report," p. 142.]) found that in the central area of the SFP, "Radial Ring 1"—where the newly discharged, hottest, fuel assemblies were stored—the peak fuel-cladding temperature would reach approximately 1800 K (1527°C) (2780°F) at "Axial Level 4."²⁸² [footnote 282 text: For MELCOR "[t]he core is nodalized into a number of axial levels and radial rings (each ring represents a collection of assemblies)," and "MELCOR core models were originally designed for the reactor core. Because of the code flexibility, the same modeling approach can be used for the spent fuel pool (with the addition of the rack as a separate component)." See NRC, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report," p. 95, and p. 95, Note 12.] However, the same simulation also found that "[a]fter the peak temperature [is reached] at [Axial] Level 4, the peak temperature in the zirconium fire front decreases with each successive [axial] level. Radial heat transfer²⁸³ [footnote 283 text: "MELCOR attempts to model a multidimensional geometry with a simplified two-surface radiation model." See NRC, "Consequence Study of a Beyond-Design-

Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” p. 110, Note 23.] from the fuel racks to the SFP wall..., *the buildup of the oxide layer on the fuel, and the depletion of the oxygen in the reactor building...cause the clad temperature to decrease*. After 24 hours, the fuel temperatures in [Radial] Ring 1 are relatively stable”²⁸⁴ [footnote 284 text: NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” pp. 142-143.] [emphasis added]. (In this scenario there is a depletion of the oxygen in the reactor building, because the reactor building was *not* breached by a hydrogen explosion (a total of four reactor buildings were breached by hydrogen explosions in the Fukushima Dai-ichi accident²⁸⁵ [footnote 285 text: In the Fukushima Dai-ichi accident, hydrogen detonated in and essentially destroyed the secondary containments of Units 1, 3, and 4, causing large releases of radiation. And the secondary containment of Unit 2 was breached: a hydrogen explosion that occurred in the Unit 1 reactor building “caused a blowout panel in the Unit 2 reactor building to open, which resulted in a loss of secondary containment integrity.” See INPO, “Special Report on the Nuclear Accident at the Fukushima Dai-ichi Nuclear Power Station,” INPO 11-005, November 2011, p. 24.])). This recent NRC MELCOR simulation—in which there is a depletion of the oxygen in the reactor building—would have had *different results* if it had modeled: 1) how nitriding would degrade the fuel-cladding’s “protective” oxide layer and accelerate the zirconium oxidation, which would contribute additional heat; 2) the nitriding of zirconium under oxygen-starvation conditions; and 3) the significant additional heat that would be contributed from the exothermic nitrogen-zirconium reaction. (0463-3-18 [Leyse, Mark])

Comment: In other recent NRC MELCOR simulations of BWR Mark I SFP accident/fire scenarios, the reactor buildings were breached by hydrogen explosions, so there was more available oxygen to facilitate zirconium oxidation. However, those simulations would have had *different results* if they had modeled: 1) how nitriding would degrade the fuel-cladding’s “protective” oxide layer and accelerate the zirconium oxidation, which would contribute additional heat and 2) the significant additional heat that would be contributed from the exothermic nitrogen-zirconium reaction.²⁸⁶ [footnote 286 text: NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report.”] In actual SFP fires, there would be quicker fuel-cladding temperature escalations, releasing more heat, and quicker axial and radial propagation of zirconium fires than MELCOR indicates. (0463-3-19 [Leyse, Mark])

Comment: Zirconium Hydriding: It is widely known that hydrogen can detonate in air; hydrogen can also chemically react with zirconium. The reaction between hydrogen and zirconium *is exothermic*. Zirconium hydriding “can occur with [a] hydrogen-rich atmosphere and at [a] moderate temperature... The exothermic reaction is able to lead to *severe temperature escalations* in the temperature range of [627°C (1160°F) to 1127°C (2060°F)]”²³⁸ [footnote 238 text: T.J. Haste et al., “In-Vessel Core Degradation in LWR Severe Accidents,” European Commission, Report EUR 16695 EN, 1996, p. 36.] [emphasis added]. (This information is based on data from an experiment—PHEBUS SFD C3—that was conducted under conditions very different than those that would occur in a SFP accident. PHEBUS SFD C3 “was performed with...high pressure (3.5 MPa [508 psia]), pure steam-starved conditions (pure hydrogen coolant) and very low cladding oxidation.”²³⁹ [footnote 239 text: Id., p. 33.]); Hydriding can occur when there are steam-starved conditions; however, there can also be simultaneous oxidation and hydriding.²⁴⁰ [footnote 240 text: Id., pp. 70-71.] In a SFP accident, hydriding would primarily occur at locations of the spent fuel rods that had freshly exposed zirconium as a result of fuel rod ballooning and rupturing; oxide layers inhibit hydrogen uptake. (0463-3-2 [Leyse, Mark])

Comment: Recent Sandia National Laboratory Spent Fuel Pool Accident Experiments Are Unrealistic because They Were Conducted with Clean Non-Oxidized Cladding. Recent Sandia National Laboratory (“SNL”) SFP accident experiments are unrealistic because they have been conducted with clean non-oxidized bundles of zirconium fuel rod simulators;²⁸⁷ [footnote 287 text: E. R. Lindgren, Sandia National Laboratory, “Characterization of Thermal-Hydraulic and Ignition Phenomena in Prototypic, Full-Length Boiling Water Reactor Spent Fuel Pool Assemblies After a Postulated Complete Loss-of-Coolant Accident,” NUREG/CR-7143, March 2013, (ADAMS Accession No. ML13072A056).] the spent fuel assemblies stored in SFPs have oxide layers. When high burnup (and other) fuel rods are discharged from the reactor core and loaded into the SFP, the fuel cladding can have local zirconium dioxide (ZrO₂) “oxide” layers that are up to 100 µm thick (or greater); there can also be local crud layers on top of the oxide layers, which can sometimes also be up to 100 µm thick. And medium to high burnup fuel cladding typically has a “hydrogen concentration in the range of 100-1000 wppm [weight parts per million];” “[z]irconium-based alloys, in general, have a strong affinity for oxygen, nitrogen, and hydrogen...”²⁸⁸ [footnote 288 text: K. Natesan, W.K. Soppet, Argonne National Laboratory, “Hydrogen Effects on Air Oxidation of Zirlo Alloy,” NUREG/CR-6851, October 2004, (ADAMS Accession No: ML042870061), p. iii, 3.] Regarding nitrogen-induced breakaway oxidation, the 2008 Journal of Nuclear Materials paper explains that “[b]reakdown and loss of the dense scale protective effect occur and result in an accelerated degradation;” furthermore, the transition to nitrogen-induced breakaway oxidation occurs *earlier with pre-oxidized fuel cladding than with fresh non-oxidized fuel cladding*—“nitriding is favored by the ‘corrosion’ scale.”²⁸⁹ [footnote 289 text: C. Duriez, T. Dupont, B. Schmet, F. Enoch, “Zircaloy-4 and M5 High Temperature Oxidation and Nitriding in Air,” Journal of Nuclear Materials 380 (2008), p. 44.] It is clear that *in air*, in a SFP accident, there would be a significant degree of zirconium oxidation, because the spent fuel rods in the pool would be “pre-oxidized.” This phenomenon of nitrogen attacking pre-oxidized zirconium alloy cladding is not simulated in SNL’s experiments. Hence, data from SNL’s SFP accident experiments is inadequate for benchmarking MELCOR. Benchmarking a computer safety model with data gathered from unrealistic experiments undermines the NRC’s philosophy of defense-in-depth, which requires the application of conservative models.²⁹⁰ [footnote 290 text: Charles Miller et al., NRC, “Recommendations for Enhancing Reactor Safety in the 21st Century: The Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident,” SECY-11-0093, p. 3.] (0463-3-20 [Leyse, Mark])

Comment: Oxidation Models Are Not Able to Predict the Fuel-Cladding Temperature Escalation that Commenced at “Low Temperatures” in the PHEBUS B9R Test: As stated above, the PHEBUS B9R test was conducted in a light water reactor—as part of the PHEBUS severe fuel damage program—with an assembly of 21 UO₂ fuel rods. The B9R test was conducted in two parts: the B9R-1 test and the B9R-2 test.²⁹¹ [footnote 291 text: G. Hache, R. Gonzalez, B. Adroguer, Institute for Protection and Nuclear Safety, “Status of ICARE Code Development and Assessment,” in NRC “Proceedings of the Twentieth Water Reactor Safety Information Meeting,” NUREG/CP-0126, Vol. 2, 1992, (ADAMS Accession No: ML042230126), p. 311.] A 1996 European Commission report states that the B9R-2 test had an unexpected fuel-cladding temperature escalation in the mid-bundle region; the highest temperature escalation rates were from 20°C/sec (36°F/sec) to 30°C/sec (54°F/sec).²⁹² [footnote 292 text: T.J. Haste et al., “In-Vessel Core Degradation in LWR Severe Accidents,” European Commission, Report EUR 16695 EN, 1996, p. 33.] Discussing PHEBUS B9R-2, the 1996 European Commission report states: The B9R-2 test (second part of B9R) illustrates the oxidation in different cladding conditions representative of a pre-oxidized and fractured state. This state results from a first oxidation phase (first part name B9R-1, of the B9R test) terminated by a rapid cooling-down phase. During B9R-2, an unexpected strong escalation of the oxidation of the remaining Zr occurred when the bundle flow injection was switched from helium to steam while the maximum

clad temperature was equal to 1300 K [1027°C (1880°F)]. *The current oxidation model was not able to predict the strong heat-up rate observed* even taking into account the measured large clad deformation and the double-sided oxidation (final state of the cladding from macro-photographs). ... *No mechanistic model is currently available to account for enhanced oxidation of pre-oxidized and cracked cladding*²⁹³ [footnote 293 text: Id., p. 126.] [emphasis added]. Today, in 2013, oxidation models still cannot accurately predict the local fuel-cladding temperature escalation that commenced in PHEBUS B9R when local fuel-cladding temperatures were 1027°C (1880°F). The PHEBUS B9R results indicate that the currently used zirconium-steam reaction correlations, such as the Cathcart-Pawel and Urbanic-Heidrick correlations, are inadequate for use in computer safety models like MELCOR. (0463-3-21 [Leyse, Mark])

Comment: “Low Temperature” Oxidation Rates Are Under-Predicted for the CORA16 Experiment: When Oak Ridge National Laboratory (“ORNL”) investigators compared the results of the CORA-16 experiment—a BWR core severe fuel damage test, simulating a meltdown, conducted with a multi-rod zirconium alloy bundle—with the predictions of computer safety models, they found that the zirconium-steam reaction rates that occurred in the experiment were under-predicted. The investigators concluded that the “application of the available Zircaloy oxidation kinetics models [zirconium-steam reaction correlations] causes the low-temperature [1652-2192°F] oxidation to be underpredicted.”²⁹⁴ [footnote 294 text: L. J. Ott, Oak Ridge National Laboratory, “Report of Foreign Travel of L. J. Ott, Engineering Analysis Section, Engineering Technology Division,” ORNL/FTR-3780, October 16, 1990, p. 3.] (0463-3-22 [Leyse, Mark])

Comment: It has been postulated that cladding strain—ballooning—was a factor in increasing the zirconium-steam reaction rates that occurred in the CORA-16 experiment.²⁹⁵ [footnote 295 text: L. J. Ott, W. I. van Rij, “In-Vessel Phenomena—CORA: BWR Core Melt Progression Phenomena Program, Oak Ridge National Laboratory,” CONF-9105173-3-Extd.Abst., Presented at Cooperative Severe Accident Research Program, Semiannual Review Meeting, Bethesda, Maryland, May 6-10, 1991.] However, it is unsubstantiated that cladding strain actually increased reaction rates. To help explain how cladding strain could have been a factor in increasing the zirconium-steam reaction rates that occurred in CORA-16, the NRC has pointed out that an NRC report, NUREG/CR-4412,²⁹⁶ [footnote 296 text: R. E. Williford, “An Assessment of Safety Margins in Zircaloy Oxidation and Embrittlement Criteria for ECCS Acceptance,” NUREG/CR-4412, April 1986, (ADAMS Accession No: ML083400371).] “explain[s] that under *certain* conditions ballooning and deformation of the cladding can increase the available surface area for oxidation, thus enhancing the apparent oxidation rate”²⁹⁷ [footnote 297 text: NRC, “Draft Interim Review of PRM-50-93/95 Issues Related to the CORA Tests,” August 23, 2011, (ADAMS Accession No: ML112211930), p. 3.] [emphasis not added]. Regarding this phenomenon, NUREG/CR-4412 states: Depressurization of the primary coolant during a LB LOCA or [severe accident] will permit [fuel] cladding deformation (ballooning and possibly rupture) to occur because the fuel rod internal pressure may be greater than the external (coolant) pressure. In this case, oxidation and deformation can occur simultaneously. This in turn may result in an apparent enhancement of oxidation rates because: 1) ballooning increases the surface area of the cladding and permits more oxide to form per unit volume of Zircaloy and 2) the deformation may crack the oxide and provide increased accessibility of the oxygen to the metal. However deformation generally occurs before oxidation rates become significant; i.e., below [1832°F]. Consequently, the lesser importance of this phenomenon has resulted in a relatively sparse database.²⁹⁸ [footnote 298 text: R. E. Williford, “An Assessment of Safety Margins in Zircaloy Oxidation and Embrittlement Criteria for ECCS Acceptance,” p. 27.] (0463-3-23 [Leyse, Mark])

Comment: NUREG/CR-4412 states that there is a *relatively sparse database* on the phenomenon of cladding strain enhancing zirconium-steam reaction rates.²⁹⁹ [footnote 299 text: Id., pp. 27, 30.] NUREG/CR-4412 also explains that “it is possible to make a very crude estimate of the expected average enhancement of oxidation kinetics by deformation;”³⁰⁰ [footnote 300 text: Id., p. 30.] the report provides a graph of the “rather sparse”³⁰¹ [footnote 301 text: Id.] data. The graph indicates that the general trend is for cladding strain enhancements of zirconium-steam reaction rates to *decrease as cladding temperatures increase*.³⁰² [footnote 302 text: Id., p. 29.] NUREG/CR-4412 has a brief description of the rather sparse data; in one case, two investigators (Furuta and Kawasaki), who heated specimens up to temperatures between 1292°F and 1832°F, reported that “[v]ery small enhancements [of reaction rates] occurred at about [eight percent] strain at [1832°F].”³⁰³ [footnote 303 text: Id., p. 30.] In fact, NUREG/CR-4412 states that only one pair of investigators (Bradhurst and Heuer) conducted tests that encompassed the temperature range—1652°F to 2192°F—in which zirconium-steam reaction rates were under-predicted for CORA-16. Bradhurst and Heuer reported that “[m]aximum enhancements occurred at slower strain rates. ... However, the overall weight gain or average oxide thickness in [the Zircaloy-2 specimens] was only minimally increased because of the localization effects of cracks in the oxide layer.”³⁰⁴ [footnote 304 text: Id.] A second report states that “Bradhurst and Heuer...found no direct influence [from cladding strain] on Zircaloy-2 oxidation outside of oxide cracks.”³⁰⁵ [footnote 305 text: F. J. Erbacher, S. Leistikow, “A Review of Zircaloy Fuel Cladding Behavior in a Loss-of-Coolant Accident,” Kernforschungszentrum Karlsruhe, KfK 3973, September 1985, p. 6.] (In CORA-16, in the temperature range from 1652°F to 2192°F, cladding strain would have occurred over a very brief period of time, because cladding temperatures were increasing rapidly.) (0463-3-24 [Leyse, Mark])

Comment: Clearly, it is unsubstantiated that the estimated cladding strain accurately accounts for why reaction rates for CORA-16 were under-predicted in the temperature range from 1652°F to 2192°F. First, there is a relatively sparse database on how cladding strain enhances reaction rates. Second, the little data that is available indicates that cladding strain *may* only *slightly* enhance reaction rates at cladding temperatures of 1832°F and greater.³⁰⁶ [footnote 306 text: R. E. Williford, “An Assessment of Safety Margins in Zircaloy Oxidation and Embrittlement Criteria for ECCS Acceptance,” p. 30.] Furthermore, ORNL papers on the BWR CORA experiments do not report that any experiments were conducted in order to confirm if in fact cladding strain actually increased zirconium-steam reaction rates and accounted for why reaction rates were under-predicted in the 1652°F to 2192°F temperature range for CORA-16. (0463-3-25 [Leyse, Mark])

Comment: There is also one phenomenon NRC did not consider in its 2011 analysis of CORA-16: “[t]he swelling of the [fuel] cladding...alters [the] pellet-to-cladding gap in a manner that provides less efficient energy transport from the fuel to the cladding,”³⁰⁷ [footnote 307 text: Winston & Strawn LLP, “Duke Energy Corporation, Catawba Nuclear Station Units 1 and 2,” Enclosure, Testimony of Robert C. Harvey and Bert M. Dunn on Behalf of Duke Energy Corporation, “MOX Fuel Lead Assembly Program, MOX Fuel Characteristics and Behavior, and Design Basis Accident (LOCA) Analysis,” July 1, 2004, ((ADAMS Accession No: ML041950059), p. 43.] which would cause the local cladding temperature heatup rate to decrease as the cladding ballooned, moving away from the internal heat source of the fuel. The CORA experiments were internally electrically heated (with annular uranium dioxide pellets to replicate uranium dioxide fuel pellets), so in CORA-16, the ballooning of the cladding would have had a mitigating factor on the local cladding temperature heatup rate, which, in turn, would have had a mitigating factor on zirconium-steam reaction rates. CORA-16 is an example of an experiment that had zirconium-steam reaction rates that were under-predicted in the “low temperature” range from 1652°F to 2192°F by computer safety models. The CORA-16 results

indicate that the currently used zirconium-steam reaction correlations, such as the Cathcart-Pawel and Urbanic-Heidrick correlations, are inadequate for use in computer safety models like MELCOR. (0463-3-26 [Leyse, Mark])

Comment: The Boron Carbide Contained in the Spent Fuel Racks: The boron carbide (“B4C”) contained in the Boral and Boraflex neutron-absorber materials that are placed in spent fuel racks would melt before it could oxidize in the racks. EPRI SFP accident guidance states that it should be assumed that Boral and Boraflex materials would melt and relocate downward to the bottom of the SFP.²⁴¹ [footnote 241 text: EPRI, “Severe Accident Management Guidance Technical Basis Report,” Volume 2: “The Physics of Accident Progression,” 1025295, Appendix EE, p. EE-9.] However, if some of the boron carbide were to oxidize (in dry air) later in the accident, the heat released—50,155 kJ/kg per kg of B4C reacted—would be approximately 7.7 times greater (per gram) than the heat released by the oxidation of zirconium in steam—approximately 6500 kJ per kg of Zr reacted.²⁴² [footnote 242 text: L. Belovsky, “Heat Release from B4C Oxidation in Steam and Air,” paper from “Behaviour of LWR core materials under accident conditions,” IAEA-TECDOC-921, Proceedings of a Technical Committee meeting held in Dimitrovgrad, Russian Federation, 9-13 October 1995, p. 57.] (0463-3-3 [Leyse, Mark])

Comment: Chemical Interactions between Zirconium and Inconel at “Low Temperatures;” Data from experiments studying severe reactor accidents can pertain to SFP accidents— as the NRC report NUREG-1738 concludes²⁴³ [footnote 243 text: NRC, “Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants,” NUREG-1738, February 2001 (ADAMS Accession No. ML010430066), Appendix 1 B, p. AI B-2.]—including information about the eutectic chemical interactions between materials that would occur in both types of accidents. Such experiments have demonstrated that eutectic chemical interactions between Inconel and Zircaloy occur at temperatures as “low” as 1832°F; hence, analysts have concluded that “[g]rid spacers can have a significant impact on the progression of damage in a reactor core during a severe accident. ...in a reactor core with Inconel grid spacers the meltdown of the core may begin at the location of the grid spacers.”²⁴⁴ [footnote 244 text: L.J. Siefken, M.V. Olsen, “A Model for the Effect of Inconel Grid Spacers on Progression of Damage in Reactor Core,” Nuclear Engineering and Design 146, 1994, p. 427.] It is pertinent that in the CORA severe reactor accident experiments, simulating meltdowns, “[i]n all cases, the damage of the bundle was initiated due to Zircaloy/stainless steel and Zircaloy/Inconel interactions. Localized liquefaction of these components started around 1200°C.”²⁴⁵ [footnote 245 text: P. Hofmann, “Current Knowledge on Core Degradation Phenomena, a Review,” Journal of Nuclear Materials, 270, 1999, p. 202.] In the CORA-2 and -3 experiments, “the meltdown of the Inconel spacer [took] less than one minute...[and] an enhanced melting in the midsection...shift[ed] the axial hot spot to the bottom of the bundle.”²⁴⁶ [footnote 246 text: S. Hagen, P. Hofmann, G. Schanz, L. Sepold, “Interactions in Zircaloy/UO2 Fuel Rod Bundles with Inconel Spacers at Temperatures above 1200°C (Posttest Results of Severe Fuel Damage Experiments CORA-2 and CORA-3),” Forschungszentrum Karlsruhe, KfK 4378, September 1990, p. 6.]; (Inconel is an alloy that has a higher percentage of nickel (Ni) than stainless steel; for example, Inconel 600 is composed of 76.0 percent nickel by weight, 15.0 percent chromium by weight, 8.0 percent iron (Fe) by weight, and small percentages of other elements. Stainless steel is a metal alloy with contents of chromium and iron greater than 11.5 percent by weight and 50 percent by weight, respectively; stainless steel also contains nickel, manganese, and small percentages of other elements.); The ballooning of zirconium fuel cladding would augment its contact with the Inconel grid spacers. If local temperatures were to increase to approximately 1200°C, the cladding-to-grid contact would initiate the eutectic chemical reaction between zirconium and Inconel. Hence, one could reasonably speculate that in a SFP boil-off accident,

if a fuel assembly had Inconel grid spacers, the first location it liquefied would be in the vicinity of an upper Inconel grid spacer. (0463-3-4 [Leyse, Mark])

Comment: Chemical Interactions Between Zircaloy and Stainless Steel at “Low Temperatures;” Discussing chemical interactions between Zircaloy and stainless steel (and comparing them to those between Zircaloy and Inconel), “Current Knowledge on Core Degradation Phenomena, a Review” states: In a first approach, the reaction behavior of Zircaloy with Inconel 718 is comparable to that with Type 316 stainless steel.²⁴⁷ [footnote 247 text: P. Hofmann, M. Markiewicz, “Chemical Interactions between As-Received and Pre-Oxidized Zircaloy and Inconel 718 at High Temperatures,” Kernforschungszentrum Karlsruhe, KfK 4729, 1994.] At temperatures <1100°C, Inconel attacks the Zircaloy faster than stainless steel; above 1100°C, the situation is the reverse. In both cases, the melting of a relatively large quantity of Zircaloy with limited melting of the adjacent stainless steel or Inconel takes place. During heat-up of the stainless steel/Zircaloy...reaction [system], a sudden and complete liquefaction of the specimens occurs at temperatures slightly above 1250°C. This may be the reason [one of the locations] that melt progression in a fuel rod bundle initiates [is] at absorber rod cladding (stainless steel)/Zircaloy guide tube contact areas.²⁴⁸ [footnote 248 text: P. Hofmann, “Current Knowledge on Core Degradation Phenomena, a Review,” p. 202.]; And discussing the affects of zirconium oxide (ZrO₂) layers on the chemical interaction between Zircaloy and stainless steel, “Current Knowledge on Core Degradation Phenomena, a Review” states: Oxide layers on the Zircaloy cladding outside diameter delay the chemical interactions between Zircaloy and steel, but they cannot prevent them. The influence of oxide layers becomes less important at temperatures >1100°C, since the dissolution of the protecting ZrO₂ layers occurs rather fast and the stainless steel is then in contact with metallic Zircaloy or oxygen-stabilized α -Zr(O).²⁴⁹ [footnote 249 text: Id.] (0463-3-5 [Leyse, Mark])

Comment: Molten Core Concrete Interaction in Spent Fuel Pool Accidents: For the SFP, the term “molten-core-concrete interaction” (“MCCI”) is a misnomer; MCCI refers to molten fuel assemblies chemically interacting with the SFP’s concrete content, after being relocated to the bottom of the SFP. MCCI would commence after the SFP’s stainless steel liner melted; then the molten fuel assemblies would chemically interact with concrete, generating hydrogen and carbon monoxide gases.²⁵⁰ [footnote 250 text: M. Kowalik et al., “Severe Accident Analyses for Shutdown Modes and Spent Fuel Pools to Support PSA level 2 Activities,” Eurosafe 2013 Seminar 1, p. 5.]; Regarding the MCCI that could occur in a SFP accident, a June 2013 NRC report on how earthquakes could affect BWR Mark I SFPs states: MCCI may occur in selected scenarios in which the fuel relocated to the bottom of the pool following the failure of the rack baseplate and its temperature exceeded the concrete ablation temperature [approximately 1227°C (2240°F)]. These cases involve large-scale debris relocation and large releases of volatile fission products. Even without MCCI, the fuel in debris form continues to release fission products resulting in very large releases of volatiles.²⁵¹ [footnote 251 text: NRC, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report,” June 2013, (ADAMS Accession No. ML13133A132), p 26.] (0463-3-6 [Leyse, Mark])

Comment: MELCOR Does Not Model the Exothermic Zirconium-Nitrogen Reaction: The NRC has recently performed a number of post-Fukushima computer simulations of SFP accidents with the Sandia National Laboratories (“SNL”) MELCOR computer safety model. However, MELCOR *does not simulate* the generation of heat from the chemical reaction of zirconium and nitrogen; neglecting to model a heat source that would affect the progression and severity of SFP accidents is a serious flaw. (0463-3-7 [Leyse, Mark])

Comment: Regarding limitations of the NRC's MELCOR computer safety model, in 2006, a SNL report observed that *MELCOR does not model the nitriding of zirconium alloy fuel cladding*, stating that fuel cladding would "combine with nitrogen if no oxygen or steam are available" and that the nitriding process is exothermic (heat-generating).²⁵³ [footnote 253 text: K. C. Wagner, R. O. Gauntt, Sandia National Laboratories, Analysis and Modeling Division, "Mitigation of Spent Fuel Pool Loss-of-Coolant Inventory Accidents and Extension of Reference Plant Analyses to Other Spent Fuel Pools," SANDIA Letter Report, Revision 2, p. 12.] And in August 2012 a different SNL report, "Fukushima Daiichi Accident Study" stated: "If inadequate cooling is provided, then the cladding will heat up and will rapidly oxidize (i.e., burn) and to a lesser extent, nitride (i.e., combine with nitrogen if no oxygen or steam are available). *Since the oxidation and nitride processes are exothermic*, the fuel rods could heat to melting conditions and structurally degrade"²⁵⁴ [footnote 254 text: Randall Gauntt et al., Sandia National Laboratories "Fukushima Daiichi Accident Study: Status as of April 2012," SAND2012-6173, August 2012, p. 183.] [emphasis added]. (0463-3-8 [Leyse, Mark])

Comment: In an April 2000 letter from Dana A. Powers, Chairman of the Advisory Committee on Reactor Safeguards ("ACRS"), to Richard A. Meserve, Chairman of the NRC, the ACRS advised the NRC Staff that an NRC report on SFP accident risk "relied on relatively geriatric work" for its *analysis of the interaction of air with zirconium fuel cladding*, stating that "[m]uch more is known now about air interactions with cladding," including knowledge gained "from studies being performed as part of a cooperative international program (PHEBUS FP)²⁵⁵ [footnote 255 text: PHEBUS FP is an experimental program that researched severe-accident reactor core damage.]) in which NRC is a partner." The ACRS told the NRC Staff that "[a]mong the findings of this work is *that nitrogen from air depleted of oxygen will interact exothermically with zircaloy cladding*. The reaction of zirconium with nitrogen is exothermic by about 86,000 calories per mole of zirconium reacted. Because the heat required to raise zirconium from room temperature to melting is only about 18,000 calories per mole, the reaction enthalpy with nitrogen is ample"²⁵⁶ [footnote 256 text: Dana A. Powers, Chairman of ACRS, Letter to Richard A. Meserve, Chairman of NRC, Regarding ACRS Recommendations for Improvements to the NRC Staff's "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," April 13, 2000, (ADAMS Accession No. ML003704532), pp. 3-4.] [emphasis added]. As early as 1987, a report that was prepared for the NRC, "Severe Accidents in Spent Fuel Pools in Support of Generic Safety Issue 82," stated that zirconium nitriding in air is an exothermic reaction, "releasing approximately 82 kcal/mole"—approximately 3.76 megajoules per kg of Zr reacted,²⁵⁷ [footnote 257 text: V. L. Sailor et al., Brookhaven National Laboratory, "Severe Accidents in Spent Fuel Pools in Support of Generic Safety Issue 82," NUREG/CR-4982, July 1987, p. 109.] which is approximately 30 percent of the quantity of energy (per kg of Zr reacted) produced by the zirconium-oxygen reaction in air. Unfortunately, more than 25 years later, the NRC's Post-Fukushima MELCOR simulations still do not model how the nitrogen content of air would affect the progression of a SFP accident. (0463-3-9 [Leyse, Mark])

Comment: Finally, the NRC is looking at expedited transfer of spent fuel to dry casks. Instead of properly examining expedited transfer of spent fuel to dry casks as an alternative in the DGEIS, the NRC examined expedited fuel transfer to dry casks using other documents such as the Spent Fuel Pool Study, which was finalized after the draft DGEIS was released, is not cited or explicitly referenced in the DGEIS, but somehow already incorporated into the DGEIS and apparently the NRC seeks to reference it in the DGEIS at a later date. See, e.g, NRC, Two Separate NRC Efforts Address Spent Fuel Safety, <http://public-blog.nrc.gov/2013/06/24/two-separate-nrc-efforts-address-spent-fuel-safety/> (June 24, 2013)("The draft GEIS does not explicitly reference the pool study, though the waste confidence staff worked closely with the staff preparing the pool study while developing relevant chapters of

the draft GEIS. If a final version of the study is published before the final waste confidence GEIS, the staff will incorporate a reference to it in the final GEIS." In response to comments New York submitted on the Spent Fuel Pool Study, the NRC was clear that "[t]his research study does not authorize any licensee action or set regulatory requirements. This study also does not establish any Commission policy." Spent Fuel Pool Consequence Study, Response to Comment #72. Yet, Staff has indicated that the DGEIS will incorporate the results of this study. Failure to explicitly reference documents upon which the DGEIS relies violates NEPA and the APA. (0473-11-13 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: NRC's Analysis of Spent Fuel Pool Fires Relies Heavily Upon NUREG-1738 Without Considering NUREG-1738's Limitations. The DGEIS Appendix F explains: "A significant portion of the NRC's analysis for spent fuel pool fires during the short-term storage timeframe is derived from NUREG-1738, "Technical Study of Spent Nuclear Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants (NRC 2001)." DGEIS at F-2. NRC states that this twelve year old, pre-Fukushima study "represents the NRC's current judgment as to the expected impacts from a spent fuel pool fire during the short- term storage timeframe." Id. As explained in the International Safety, Inc. ("ISR") report submitted under separate cover by the New York State Office of the Attorney General ("ISR Report"), NRC's use of NUREG-1738 is flawed for several reasons. First, ISR points out that the DGEIS fails to acknowledge NUREG-1738's assumptions and the stated limitations of a generic approach to spent fuel pool fires. ISR Report at 6-8. Because NUREG-1738 was a study performed in connection with a decommissioning rulemaking, it relied on a series of Industry Decommissioning Commitments and Staff Decommissioning Assumptions, which, if not carried out, could invalidate the analysis. Id. at 7-8. As described in more detail in the ISR Report, these decommissioning assumptions include assumptions regarding the age of the fuel beyond which a spent fuel pool fire can be ruled out (p. 2-1, NUREG-1738); the pool fire frequencies for all initiators (p. 3-7, NUREG-1738); the possibility for air cooling following damage caused by severe weather (p. 3-10, NUREG-1738); the low initiating event frequency for the loss of pool inventory (p. 3- 12, NUREG-1738); the probability of loss of cooling, loss of inventory, and loss of off- site power (p. 3-12, NUREG-1738); and the assumption that leaks are self-limiting. ISR explains how the DGEIS used vague language and largely ignored these specifics in NUREG-1738. With respect to frequency, NUREG-1738 uses the average frequencies for the seismic events (p. 3-9) and acknowledges that site-specific values could be ten times higher or lower (p. 3-7). ISR Report at 15. The DGEIS does not even mention examples of sites with lower or higher seismic frequencies. Again, it fails to use a conservative bounding analysis. A recent statement from Chairman Allison M. Macfarlane supports site-specific review: There's one additional item I'd like to raise with respect to our ongoing post-Fukushima work that may be of particular interest to you. We're reviewing the updated information from our licensees concerning external flooding and seismic events. Logic dictates that with such diverse topography and climate in this country, we must apply different assumptions when considering hazards for plants in California than those we apply for plants in Pennsylvania. Prepared Remarks of NRC Chairman Allison M. Macfarlane, State Liaison Officers Conference, Tuesday, November 5, 2013, Rockville, Maryland. This is another flaw that should be dealt with in a site-specific manner. The DGEIS also uses these average probabilities in Table F-1 (DGEIS at F-4). The total probability of pool drainage from NUREG-1353 (2×10^{-6} events per year) is based on best estimates of the frequency of various event sequences and is dominated by the seismic risk of structural failure (p. 4-36, NUREG-1353). (0473-13-4 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: As the ISR Report explains, the consequence assessment presented in the DGEIS is based on CRAC2 calculations, MACCS calculations, and MACCS2 calculations. The most detailed set of data comes from NUREG-1738 and is based on MACCS2 calculations. The central purpose of the Spent Fuel Pool Consequence Study is to determine if it is cost-beneficial to expedite the transfer of spent fuel from high-density spent fuel pools (reference) to dry storage casks (alternative) by analyzing the probabilities and consequences of severe accidents originating from a spent fuel pool. It likewise relied on MACCS2 calculations to determine the collective dose and various economic costs (i.e., costs associated with decontamination, interdiction and property condemnation). None of these consequence analyses constitutes a conservative bounding analysis. Indeed, they fail to account for the consequences at sites other than the reference site. (0473-13-8 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: In addition, the analysis in COMSECY-13-0300 and its primary technical document, the Consequence Study, suffer from substantial limitations. First the basis for the study of the consequences of a spent fuel accident was a reactor whose characteristics and surrounding demographics are considerably less likely to produce large accident consequences than many other reactors. For example, Indian Point, located only 35 miles north of New York City has an average population density within 50 miles of over 2,000 persons per square mile (Generic Environmental Impact Statement for License Renewal of Nuclear Plants Supplement 38 Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3, NUREG-1437 (December 2010) at 2-124), while the Consequence Study assumed a population density out to 50 miles of only 722 people per square mile (Consequence Study at D-31) and COMSECY-13-0300 at 99-100, Tables 53 and 55 assumed an average population of only 300 persons per square mile, creating that average by using reactor sites with a maximum population density of 722 and ignoring any mention of the Indian Point site. (0473-8-3 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Second, both studies assumed that the event that would initiate the release was an earthquake or other site-specific event like a cask drop where the configuration of the spent fuel pool could affect the consequences of the cask drop. Consequence Study at 9 and COMSECY-13-0300, Cover Memorandum at 7. But not included was the risk of a malevolent act, the probability of which cannot be calculated. (0473-8-4 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Third, both studies ignored the many unique, site-specific and as-yet-unevaluated problems created by the use of high burnup fuel in reactors. The use of high burnup fuel causes special problems, including a greater chance of accidents and an increased chance of structural failure of the fuel rods such that transfer to dry casks is more difficult, more dangerous, and more expensive. See e.g. NUREG-1738 at ix, 3-1. (0473-8-5 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The NRC continues to downplay the risk of storage ponds. If fuel rods are exposed, they can overheat, catch fire, and release massive quantities of radioactive material. The NRC continues to consider the environmental impact of these pools "low", even over the course of "indefinite" time periods, over which an accident is all but inevitable. (0531-2-19 [Morgan, Sally])

Comment: Pools are not protected by redundant emergency makeup and cooling systems[.] (0531-2-21 [Morgan, Sally])

Comment: The risk and consequences of a collapse of a spent fuel pool was explicitly ignored in the GEIS. No attempt was made to incorporate this type of possible accident into the risk assessment for spent fuel pool fires. The current, ongoing situation at Fukushima Dai-ichi unit #4 tells us that this particular hypothetical scenario is a very real possibility. (0552-2-17 [Macks, Vic])

Comment: The 2013 GEIS references a seriously out-dated spent fuel pool study: "Regulatory Analysis for the Resolution of Generic Issue 82, 'Beyond Design Basis Accidents in Spent Fuel Pools'" (NRC 1989). The information in this report is at least 24 years old. A new regulatory analysis should be done, with the inclusion of the experience from Fukushima, and should include a risk analysis of spent fuel pools containing irradiated MOX (mixed oxide) fuel rods. (0552-2-18 [Macks, Vic])

Comment: As of 2012, spent fuel pools are overcrowded, packed beyond their originally engineered capacity by as much as 9 times. (Union of Concerned Scientists), (Lochbaum). Lochbaum, David, Director, Nuclear Safety Project, testimony Before the Senate Committee on Energy and Natural Resources, July 20, 2013.
http://www.energy.senate.gov/public/index.cfm/files/serve?File_id=89dbc888-171c-4f77-8ecf-83a0055fcfb9 (0552-2-2 [Macks, Vic])

Comment: The Draft Consequence Study lacks scientific integrity because it examines only complete drainage of a pool and ignores the more severe case of partial drainage. Based on the canard that complete drainage is the worst case, the NRC ignored spent fuel pool accident risks for decades. Then in 2001, in NUREG-1738, the NRC admitted that the most severe accident risk is posed by prolonged disruption of air or water circulation over the spent fuel assemblies. The point was confirmed by a panel of the National Academy of Science in 2004. By reverting to the discredited assumption that complete pool drainage is the worst case, the NRC fatally undermines the integrity and credibility of the Study. (Curran), (NAS). Curran, Diane. "Mothers for Peace Attorney Diane Curran urges public participation in Sept. 18 NRC meeting", San Luis Obispo Mothers for Peace, <http://mothersforpeace.org/data/mothers-for-peace-attorney-diane-curran-urges-public-participation-in-sept.-18-nrc-meeting>. National Academy of Sciences (NAS), "Safety and Security of Commercial Spent Nuclear Fuel Storage: Public Report" (2006). http://www.nap.edu/download.php?record_id=11263. (0552-2-20 [Macks, Vic])

Comment: The Study is too narrow because it significantly underestimates risk by considering only one type of initiating event--an earthquake--and ignoring other credible initiating events that are at least as probable. For instance, the Study ignores the impacts of aging and the potential for an attack on a pool and/or adjacent reactor to initiate a pool fire. Vulnerability of spent fuel storage pools to terrorist attack is perhaps the greatest risk of all. Further, the Study does not analyze the potential for a core melt accident to cause or contribute to a pool fire. For instance, radiation released during a core melt accident could preclude access to the pool to supply emergency cooling. (Curran). Curran, Diane. "Mothers for Peace Attorney Diane Curran urges public participation in Sept. 18 NRC meeting", San Luis Obispo Mothers for Peace, <http://mothersforpeace.org/data/mothers-for-peace-attorney-diane-curran-urges-public-participation-in-sept.-18-nrc-meeting> (0552-2-21 [Macks, Vic])

Comment: The Study is misleading and biased because it only pretends to consider the relative merits of low-density storage. The Study purports to evaluate whether low-density pool storage of irradiated fuel would be cost-effective and safer than high-density storage. But NRC misleadingly uses the phrase "low-density" to refer to closed high-density racks that contain fewer fuel assemblies, not true low-density fuel storage in open-frame racks. The NRC decided

not to consider true open-rack low-density storage because it was assumed to be too expensive (see page 23). The Draft Consequence Study shows an appalling lack of scientific integrity by including the result of the study as an assumption: the question of whether a return to open-frame low-density storage is justified is the very question the NRC set out to answer in the Study. (Curran).Curran, Diane." Mothers for Peace Attorney Diane Curran urges public participation in Sept. 18 NRC meeting", San Luis Obispo Mothers for Peace, <http://mothersforpeace.org/data/mothers-for-peace-attorney-diane-curran-urges-public-participation-in-sept.-18-nrc-meeting>. (0552-2-22 [Macks, Vic])

Comment: Ignoring real world multiple risk factors. The draft NRC study has been done in a vacuum that excludes the hazards of a concurrent reactor accident that are known to impact the safety of spent fuel pool systems. Dr. Thompson correctly points out, "the physical proximity of spent-fuel pools to operating reactors, and their sharing of safety systems, means that the use of high-density racks creates strong linkages between reactor risk and pool risk." This fact is underscored in a 1990 NRC-sponsored study that points out that a long-term station blackout at the Peach Bottom nuclear station would cause "deflagrations to occur in the reactor building and refueling bay.." This is exactly what occurred at the Fukushima reactors, which caused significant damage to the spent fuel pools. (Thompson, 2013). Thompson, Gordon. Comments on the US Nuclear Regulatory Commission's Draft Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a US Mark I Boiling Water Reactor, August 2013. (0552-2-23 [Macks, Vic])

Comment: Aging and deterioration of Spent Fuel Pool Systems. The NRC staff dismisses this problem by ignoring a 2011 NRC-sponsored study that concludes, "as nuclear plants age, degradations of spent fuel pools (SFPs), reactor refueling cavities...are occurring at an increasing rate, primarily due to environment-related factors. During the last decade, a number of NPPs (nuclear power plants) have experienced water leakage from the SFPs [spent fuel pools] and reactor refueling cavities." Instead the NRC staff points to a study done 25 years ago, before aging effects were being observed. (NRC, 2011). U.S. Nuclear regulatory Commission (NRC), A summary of Aging Effects and Their Management in Reactor Spent Fuel Pools, Refueling Cavities, TORI and Safety-Related Concrete Structures, NUREG/CR-7111 (2011). P. vxiii.<http://pbadupws.nrc.gov/docs/ML1204/ML12047A184.pdf>. (0552-2-24 [Macks, Vic])

Comment: Failure to meet the NRC's Technical Safety Information Standard for Final Safety Analysis Reports (10 CFR 52.157). The draft study does not comport with the NRC's own technical information safety analysis standard for reactor operators. According to this regulation, safety analyses must incorporate all key reactor station components including the reactor operations and spent fuel handling and storage functions. (0552-2-25 [Macks, Vic])

Comment: Failure to compare the risks of high density versus open rack configurations: The draft study examines a reduction of spent fuel assemblies while allowing racking configurations that allow for high density storage to remain. Specifically, the study does not address the removal of neutron-absorbing panels that allow for closer spacing. It's been noted in a previous study that these panels can interfere with air convection during a pool drainage event and thus can enhance the heat-up of the nuclear fuel. In effect, they could become de facto "thermos bottles." Open rack storage would allow for free convection cooling and thus reduce the risk of ignition. (Alvarez). Robert Alvarez, Jan Beyea, Klaus Janberg, Jungmin Kang, Ed Lyman, Allison Macfarlane, Gordon Thompson, and Frank N. von Hippel, Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States, Science and Global Security, 11:1-51, 2003. (0552-2-26 [Macks, Vic])

Comment: Water loss in the spent fuel pool could lead to a catastrophic spent fuel pool fire. "Water could be lost from a spent-fuel pool through leakage, boiling, siphoning, pumping, displacement by objects falling into the pool, or overturning of the pool. These modes of water loss could arise from events, alone or in combination, that include: (i) acts of malice by persons within or outside the plant boundary; (ii) an accidental aircraft impact; (iii) an earthquake; (iv) dropping of a fuel cask; (v) accidental fires or explosions; and (vi) a severe accident at an adjacent reactor that, through the spread of radioactive material and other influences, precludes the ongoing provision of cooling and/or water makeup to the pool."(Thompson). Thompson, Gordon. Comments on the US Nuclear Regulatory Commission's Draft Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a US Mark I Boiling Water Reactor, August 2013. (0552-2-3 [Macks, Vic])

Comment: NRC also downplays the risks of pool fires by assuming that a pool drain down accident (or attack) involves the complete drain down of the pool. As Dr. Gordon Thompson of the Institute for Resource and Security Studies (IRSS) has pointed out, any technically competent person paying attention to the issue should have known since 1979 that a partial drain down of the pool is actually a worse-case scenario, for the leftover water in the bottom of the pool would block convection current air flow which would help cool the irradiated nuclear fuel, leading to faster heat up to the ignition point. (0552-2-30 [Macks, Vic])

Comment: The evaluation of the spent fuel pool fire risk in the GEIS relies on the spent fuel pools having only 3.5 spent fuel cores. Currently, spent fuel pools contain as many as 9 cores. (Lochbaum). The NRC estimates the spent fuel pool capacity for some reactors to be as high as 16.7 cores. (DGEIS G4). The ACTUAL over-loading of the fuel pools renders the probabilistic risk assessment invalid. Lochbaum, David, Director, Nuclear Safety Project, testimony Before the Senate Committee on Energy and Natural Resources, July 20, 2013.http://www.energy.senate.gov/public/index.cfm/files/serve?File_id=89dbc888-171c-4f77-8ecf-83a0055fcfb9 (0552-2-31 [Macks, Vic])

Comment: NRC downplays the risks of pool fires by assuming that surrounding populations will be successfully evacuated. But nuclear utilities are allowed to store high level radioactive withdrawn fuel rods in pools for decades after reactors permanently shutdown, in order to defer the costs of dry cask storage as far off into the future as possible, despite the inherent risks. At the same time, NRC allows utilities, via exemptions from regulations, to do away with 10-mile radius emergency planning zones (EPZs) as soon as 12-18 months post-reactor shutdown despite the lingering risk of storing high level nuclear waste in pools at such shutdown reactor sites. How can populations be evacuated if EPZs have been dismantled?! (0552-2-4 [Macks, Vic])

Comment: Spent fuel is highly flammable as well as radioactive, yet is primarily stored in densely packed pools of water that contain several times more fuel than the nuclear reactor itself. If a fuel pool is damaged or loses its cooling system, fuel rods could be exposed, overheat, and catch fire, releasing massive quantities of radioactive material. NRC refuses to address the incredible risks these facilities pose, pretending the low likelihood of an accident makes the extreme consequences irrelevant. (0552-2-6 [Macks, Vic])

Comment: 75% of the total (72,000 metric tons, plus 2,000 tons more per year) of spent fuel is in fuel pools and allowed to remain there for as much as 60 years beyond licensed life of reactor operations. The GEIS underestimates the risk of fuel pool fires and ignores the safer alternative of hardened on site storage at the nuclear plant sites. (0552-2-8 [Macks, Vic])

Comment: Also, the NRC has "classified" studies that are not available to the GAO, the National Academy of Sciences or the public!!! Why?? What is it that the NRC knows that they refuse to tell us?? How can the NRC move forward with this GEIS without resolving those issues? Why is it that the NRC does not have access to its own data base of past studies? How is it that the NRC could not/did not make available to the GAO that data base of past studies? How can the NRC function in the public interest without access to its own archive of studies? (0552-3-5 [Macks, Vic])

Comment: Environmental consequences vary considerably depending on the reactors proximity to high- population centers. Pilgrim and Indian Point are classic examples, with huge consequences of a spent fuel pool fire. The Massachusetts Attorney General in 2006 found Pilgrim's densely packed pool vulnerable and estimated that a spent fuel pool fire at Pilgrim would cost up to \$488 billion dollars, result in 24,000 latent cancers, and could contaminate hundreds of miles downwind⁴. [footnote 4 text: The Massachusetts Attorney General's Request for a Hearing and Petition for Leave to Intervene With respect to Entergy Nuclear Operations Inc.'s Application for Renewal of the Pilgrim Nuclear Power Plants Operating License and Petition for Backfit Order Requiring New Design features to Protect Against Spent Fuel Pool Accidents, Docket No. 50-293, May 26, 2006 includes a Report to The Massachusetts Attorney General On The Potential Consequences Of A Spent Fuel Pool Fire At The Pilgrim Or Vermont Yankee Nuclear Plant, Jan Beyea, PhD., May 25, 2006] Boston, Providence, smaller cities, and densely populated suburbs are within 50 miles. (0556-1-23 [Lampert, Mary])

Comment: Further, in estimating environmental impact, it cannot be limited to 50 miles as the DGIS did in its analysis.⁵ [footnote 5 text: National Academy of Sciences Safety and Security of Commercial Spent Nuclear Fuel Storage Public Report, National Academy of Sciences, April 2005, <http://www.nap.edu/books/0309096472/html/> said, Such (zirconium cladding) fires would create thermal plumes that could potentially transport radioactive aerosols hundreds of miles downwind under appropriate atmospheric conditions." (NAS, p. 50)] This points out yet another serious methodological weakness of the DGEIS and -- by extension -- the proposed rule. (0556-1-24 [Lampert, Mary])

Comment: NRC's analysis referenced and relied upon previous studies/reports that were outdated. They did not incorporate lessons learned from Fukushima and used outdated consequence codes to estimate environmental impacts of severe accidents. (0556-2-15 [Lampert, Mary])

Comment: NRC and the industry assume that the only radioactive release that needs to be considered is an atmospheric (forget about aqueous) release from the core (forget about the spent fuel pool), and even then only noble gasses and a small fraction of the Cs-137 in a core need be taken into consideration. (0556-2-18 [Lampert, Mary])

Comment: Similarly, there is no rational basis for the NRC DGEIS and referenced studies to assume that a radioactive release will only affect a very limited geographic area defined by an outdated straight-line Gaussian plume; and only out to 50 miles. (0556-2-19 [Lampert, Mary])

Comment: Clean-up and Decontamination is an enormously expensive job, extending over decades. Hosing down buildings and plowing fields under does not clean up or decontaminate. The NRC cannot rely on reports that continue to ignore: that there is no clean-up standard; that clean-up can take more than one year; that it has given no consideration to what can and must be done to the tons of contaminated soils and other wastes; that clean-up after a nuclear explosion is not comparable to clean-up after a nuclear reactor accident; and that forests, wetlands and water simply cannot be cleaned and will re-contaminate areas. (0556-2-20 [Lampert, Mary])

Comment: Also NRC adapted the MELCOR code, version 1.8.6, to examine the physical and chemical phenomena directly associated with a pool fire. (Section 6 NRC's Draft Consequence Study) Dr. Thompson²³ [footnote 23 text: Comments of the US NRC's Draft Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a US Mark I Boiling Water Reactor, by Dr. Gordon Thompson, submitted to the NRC's Cindy Bladey, Chief of Rules, Announcements, and Directives Branch, Office of Administration August 1, 2013, by Diane Curran (of Harmon, Curran, Spielberg & Eisenberg LLP).] at 20 explains that, "1. MELCOR has no capability to model the deformation of fuel cladding as temperature rises. Yet, NUREG-1738 predicted that cladding would balloon and burst in a temperature range of 700-850°C. That outcome could reduce heat transfer and promote ignition of cladding. NRC says that these effects would not be significant, but rests that claim on secret, unpublished studies.⁴⁵ [quoted footnote not included in comment] 2. Radioactive heat transfer is an important consideration in pool-fire modeling. Yet MELCOR employs a simplified approach to modeling this mode of heat transfer." In this context, NRC says:⁴⁶ [quoted footnote not included in comment] "It should be noted that there is a temperature gradient within each ring, and MELCOR attempts to model a multidimensional geometry with a simplified two-surface radiation model." Dr. Thompson also questions NRC's input assumptions. (Thompson, pp. 20-23) For example, how closely does the pool layout assumed by NRC correspond with actual practice in the nuclear industry? (0556-2-23 [Lampert, Mary])

Comment: The second document supporting the DGEIS and the Proposed Waste Confidence Rule is the US Nuclear Regulatory Commission's *Draft Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a US Mark I Boiling Water Reactor* (herein after "Earthquake Study"). Although the Proposed Rule explains that the Earthquake Study is not referenced in the DGEIS, it is for all practical purposes basic to the rule. In fact it was developed side-by-side to justify the DGEIS' and Proposed Rule's conclusions. The proposed Rule admits that "the staff is aware of the conclusions in the draft Study and worked closely with the authors who developed the draft Study to prepare the relevant sections of the draft GEIS": The DGEIS does not specifically reference the draft "Consequence Study Of A Beyond Design-Basis Earthquake Affecting The Spent Fuel Pool For A U.S. Mark Boiling Water Reacto"...If the NRC publishes a final study before the final GEIS is published, it will be added to the final GEIS. Although it did not specifically reference the draft Study in the DGEIS, the staff is aware of the conclusions in the draft Study and worked closely with the authors who developed the draft Study to prepare the relevant sections of the draft GEIS. The conclusions of the draft Study do not contradict the conclusions in the DGEIS and are consistent with the consequences reported in previous studies on spent fuel pool accidents. (Draft Rule, p. 56783, emphasis added). Therefore it is important to understand that the draft Earthquake Study is not a credible scientific document to provide any basis for the DGEIS's and Proposed Rule's conclusions. While the study purports to be a broad scientific inquiry into pool fire phenomena, instead it is a very narrow study that ignores basic pool fire phenomena, important pool fire accident contributors, and avoids evaluation of all mitigation strategies. Statements in the so-called Earthquake Study are unsupported by analysis. It says that a severe earthquake causing complete draining of a fuel pool is the primary source of risk to a spent fuel pool, assumes that the risk of pool fire is low and assumes that open-rack low-density pool storage is not any safer without even studying it. (0556-4-1 [Lampert, Mary])

Comment: The cost benefit analysis in the earthquake study was done prematurely because: (a) The analysis was done using pre-Fukushima MELCOR code prior to updating it based on Fukushima; (b) The National Academy has been called in by the U.S. Congress to determine the adequacy of NRC's safety regulation in light of the ongoing Fukushima nuclear disaster, with a specific emphasis on the advisability of current spent nuclear fuel pool practices at U.S. power

reactors. It seems to me that members of Congress should halt the NRC's fast moving train, relative to its continuing approval of high-density SNF pool storage, until the Academy finishes its quality assurance review. (0556-4-10 [Lampert, Mary])

Comment: NRC REFERENCED STUDIES: NRC referenced studies for spent fuel pool fires (Appendix F) in the DGEIS fail to include readily available assessments by independent experts, including studies authored by the Chairman of the NRC Allison Macfarlane; but instead NRC relied on outdated and inadequate studies performed by the NRC or its government contractor Brookhaven. The faults and defects of the selected documents relied upon by NRC are analyzed in full by Dr. Gordon R. Thompson in *Environmental Impacts of Storing Spent Nuclear Fuel And High-Level Waste From Commercial Nuclear Reactors: A Critique of NRC's Waste Confidence Decision And Environmental Impact Determination*, February 6, 2009 (pages 19-21 and 22-26); and in his *Comments on the US Nuclear Regulatory Commission's Draft Consequence Study of a BeyondDesign- Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I BWR*, August 1, 2013 (Section 3, A Brief History of Pool Fire Analysis). Perhaps, NRC also relied on other studies of spent fuel fire risk not referenced. It is possible that NRC managed to find secret studies of spent fuel fire risk that they could not find for GAO when asked to produce them. The August 2012 GAO Report said, "NRC could not easily identify, locate or access...because it does not have an agency-wide mechanism to ensure that it can identify and locate such classified studies³²." [footnote 32 text: GAO-12-797, Spent Nuclear Fuel; Accumulating Quantities at Commercial Reactors Present Storage and Challenges, August 2012, highlights] (0556-4-11 [Lampert, Mary])

Comment: Highlights -- What's Wrong with the Earthquake Study? 1. Pretence of considering low-density storage: The Study does not consider the risk implications of reverting to low-density, open-frame racks. Its authors did not model scenarios that compared the current high-density closed frame design to the safer low-density, open frame design. They compared only a full pool to one with total water loss. They studied only water loss, not geometry--closed or open frame. The reason, NRC explains, is that replacing storage racks would be expensive. NRC's mandated role is to protect public health and safety, not industry's finances. 2. Limited consideration of water-loss scenarios: The Study focuses its analysis only on water-loss scenarios that involve total drainage. By so doing, the Study ignores a substantial part of the pool-fire risk. For example, the Study makes no effort to determine how the presence of residual water could affect fuel ignition, despite the fact that NUREG 1738 (October 2000) reversed NRC's position that total drainage was most severe. Consideration of partial water loss would substantially increase the estimated risk. There have been several accidents due to other causes where spent fuel pools experienced a partial drain-down. In 1984, a ruptured refueling cavity seal drained 200,000 gallons at the Connecticut Yankee nuclear plant. In 1986 an inflatable seal at the Hatch plant in Georgia failed, causing 140,000 gallons to drain from its spent fuel pool. BWR pools typically hold about 400,000 gallons of water. 3. Limited consideration of initiating events: The Study considers only one type of initiating event--an earthquake. That narrow focus reflects a pre-determined conclusion that earthquake is the dominant contributor to the risk of a pool fire. (0556-4-2 [Lampert, Mary])

Comment: No analysis of risk linkages among pools and reactors: The Study identifies the potential for risk linkages, but does not properly analyze them. For example, the Study does not analyze a situation in which onsite radioactive contamination and other impacts of a reactor core melt would preclude mitigating actions that might prevent a pool fire. Yet, the probability of a core melt at an adjacent reactor is at least equal to the probability of the severe earthquake that the Study does consider. Thus, the Study significantly under-estimates pool-fire risks. (0556-4-4 [Lampert, Mary])

Comment: No Analysis of Cask Drops: Goutam Bagchi, NRR, in a February 12, 2001 08:25 AM email to Diane Jackson and George Hubbard, NRR, regarding the SFP Study: Structural and Seismic questions said: [TEXT BOX HERE ON CASK DROP EFFECT and CASK DROPS INSIDE THE POOL] [Text Box Image Submitted with Correspondence ML13354A021] (0556-4-5 [Lampert, Mary])

Comment: Misleading statements regarding mitigating actions: The feasibility and effectiveness of mitigation, such as the ability to provide make-up water to the pool. But the Study only considers "human reliability" and equates human error problems to mitigation failure. The Study acknowledges its limitation for considering only one variable. It ignores, for example, analyzing the effectiveness of spray systems and answering whether in fact they are installed and have been tested in all reactor pool and ignores the possibility that radiation fields and other onsite impacts of a reactor core melt could preclude mitigation for an extended period. Despite limiting mitigation to human reliability, the Study makes unsupported unequivocal statements about the feasibility of mitigation that reflects pre-determined conclusions. 8. Duration: NRC claims that the probability of a spent fuel pool problem causing water loss that could go longer than 7 days is negligible, indicating that lessons were not learned from Fukushima. There, radiation levels precluded personnel from full access to the site for a long period of time, and the full consequences remain un-mitigated. (0556-4-6 [Lampert, Mary])

Comment: NRC uses the MELCOR code to model phenomena related to a pool fire - including heat transfer, cladding ignition, and fire dynamics. Yet, the validity of MELCOR for this type of analysis, and the appropriateness of NRC's input assumptions, has not been tested. For example, independent analysts point to MELCOR's simplified treatment of radioactive heat transfer. (0556-4-7 [Lampert, Mary])

Comment: NRC incorrectly finds the probability of a pool fire to be so low that it concludes such an event is "inconsequential." However, because the consequences are so huge, irrespective of the odds of a fire any risk is unacceptable. (0556-5-12 [Lampert, Mary])

Comment: NRC ignored or down-played water loss that can result from acts of malice, an accidental plane crash, an earthquake, a cask drop, accidental fires or explosions, or a severe accident in an adjacent reactor, and ignored the collapse of a spent fuel pool whereas Fukushima Unit 4 shows that it is a real possibility. (0556-5-13 [Lampert, Mary])

Comment: NRC incorrectly assumes that water loss is complete and ignores the greater risk of a partial drain-down, worse because the leftover water in the bottom of the pool, blocking air convection flow to help cool the assemblies, will lead to a faster build up of heat. Back in October 2000, NUREG-1738 reversed NRC's longstanding false position that total instantaneous drainage of a pool is the most severe case of drainage; nevertheless the staff of NRC continues to forget what they once knew. (0556-5-14 [Lampert, Mary])

Comment: NRC incorrectly downplays the risks of pool fires assuming that the surrounding populations will be successfully evacuated. (0556-5-15 [Lampert, Mary])

Comment: But NRC provides exemptions to licensees to do away with emergency planning as soon as 12 to 18 months post reactor shutdown. (0556-5-16 [Lampert, Mary])

Comment: The GEIS focus on probability analysis of Spent Fuel Fires cannot be sustained as complying with NEPA, since Indian Point and many other plants in the nation have not applied for an amendment to become 805 plants and therefore probabilistic fire protection analysis is

not permitted without public hearing and amendment process. This basic assumption of the GEIS cannot be used to evaluate the environmental risks of spent fuel fires when the other requirements of 805 license amendment have not been met. (0611-39 [Shapiro, Susan])

Comment: In addition the environmental impacts and costs of High Burn Up Fuel on Spent Fuel Fires has not been considered. NRC Chair Allison MacFarlane co-authored a study with Von Hippel and others, regarding significantly increased fire risk from densely packed spent fuel pools (see: Robert Alvarez, Jan Beyea, Klaus Janberg, Jungmin Jang, Ed Lyman, Allison Macfarlane Gordon Thompson, Frank N. von Hippel, Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States, Science and Global Security 11:1-51, 2003 Taylor and Francis DOI:10.1080/08929880390214124) (0611-41 [Shapiro, Susan])

Comment: The GEIS does not address the significantly increased risk of spent fuel fire due at Indian Point due to: Overly packed of Spent Fuel Pools; Location on Two intersecting fault lines; Inclusion of High-Burn up fuel in the spent fuels; Known un-located and repaired cracks in spent fuel pools; Defective fire insulation at Indian Point which only works for 24 minutes instead of the required 1-3 hours; Dilution of Boron in spent fuel pools to density; Close proximity to two natural gas pipelines without on-site shutoff; High Burn Up Fuels impact on densely pack spent fuel pools. (0611-43 [Shapiro, Susan])

Comment: Most importantly the GEIS does not address the lack of plan or knowledge by the nuclear industry as to how to control a spent fuel fire. Spent fuel fires at Fukushima and Chernobyl could no be controlled, yet Mr. Steets of Entergy continues to claim that in the event of a spent fuel fire Entergy plans to use fire hoses to put out a radioactive spent fuel fire. This didn't work at Fukushima and won't work here. The public is aware this is PR nonsense and the Waste Confidence Board cannot base storage of nuclear waste on this kind of fantasy. (0611-44 [Shapiro, Susan])

Comment: The GEIS states that there is a low probability of spent fuel pool fires, and therefore a low risk of causing harm. However, as we draft these comments, we are concurrently witnessing the incapacity of TEPCO in Fukushima to effectively handle damaged fuel pools and core reactor melt downs-let alone to properly assess the impacts of escaped radiation on workers, local communities, the Pacific ocean, and natural resources. (0622-4-11 [Vale, Karen])

Comment: Fukushima showed us that storing hot spent fuel in a fuel pool is inherently dangerous. If a pool drains, recently used fuel catches fire. Storing such fuel inside a nuclear plant makes any disaster more difficult to manage, as a reactor disaster may make it impossible for quite some time to continue to maintain a fuel pool, and vice versa. (0634-1 [Cato, Michael])

Comment: The consequences of a fuel pool fire in the event that a disaster drains a pool are just as serious as a meltdown. Once fuel catches fire the radiation release has the potential to make getting near enough to the fire to control it extremely hazardous, and with fuel pools typically stored near reactors, such an event obviously runs the risk of triggering other disasters, such as loss of cooling and control of a nuclear reactor. (0634-6 [Cato, Michael])

Comment: The consequences at worst of a fuel pool fire would be similar to those seen at Chernobyl, Fukushima and Three Mile Island, with large areas of productive land ruined, and the health of those affected by resulting fallout from a fire destroyed. Note that Lithuania detected plutonium from Fukushima, the fallout from a serious disaster with a burning spent fuel pool would undoubtedly affect a huge area. (0634-9 [Cato, Michael])

Comment: The NRC continues to minimize the threats posed to nearby populations from radiation release caused by events such as pool fires. At present nuclear utilities are authorized to store high-level waste in pools for decades after a reactor permanently shuts down. This is potentially very dangerous, but by doing this utilities can pad their present-day bottom lines by delaying the costly move from pools to dry cask storage. (0648-10 [Price, Scott])

Comment: TVA agrees with the conclusions in the DGEIS and is in compliance or currently addressing the NRC's various orders and requests, including those related to the Fukushima event. For these reasons, the conclusions in Appendix F regarding SFP fires are fully applicable to TVA's plants and demonstrate that environmental impacts of SFP fires during the short-term storage timeframe are small. (0694-3-16 [Shea, Joseph])

Comment: TVA also agrees with NEI's comment¹⁴³ [footnote 143 text: NEI comments.] that the NRC should update DGEIS Appendix F to reference the NRC's recent SFP "Consequence Study."¹⁴⁴ [footnote 144 text: Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a US Mark I Boiling Water Reactor (June 2013), available at ADAMS Accession No. ML 13256A342.] Based on this study and previous studies, the NRC continues to believe "that spent fuel pools protect public health and safety." ¹⁴⁵ [footnote 145 text: *Id.* at xii.] (0694-3-17 [Shea, Joseph])

Comment: Although the DGEIS already discusses the conservative nature of the SFP fires analysis, TVA requests that the NRC further highlight the significant conservatisms in that analysis that are discussed above to further support the small impacts from SFP fires. (0694-3-18 [Shea, Joseph])

Comment: Entergy agrees with the conclusions in the DGEIS and is in compliance or currently addressing the NRC's various orders and requests, including those related to the Fukushima event. For these reasons, and for the additional reasons stated in Section IV.C, below, the conclusions in Appendix F regarding SFP fires are fully applicable to Entergy's plants, and demonstrate that environmental impacts of SFP fires during the short-term storage timeframe are SMALL. ¹⁴⁷ [footnote 147 text: Entergy also agrees with NEI's comment that the NRC should update DGEIS Appendix F to reference the NRC's recent SFP "Consequence Study." Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a US Mark I Boiling Water Reactor (June 2013), available at ADAMS Accession No. ML13256A342. As concluded in that study, "spent fuel is only susceptible to a radiological release within a few months after the fuel is moved from the reactor into the spent fuel pool." *Id.* at vii.] (0697-3-4 [Bessette, Paul] [Kuyler, Raphael])

Comment: Although the DGEIS already discusses the conservative nature of the SFP fires analysis, Entergy requests that the NRC further highlight the significant conservatisms in that analysis that are discussed above to further support the SMALL impacts from SFP fires. (0697-3-5 [Bessette, Paul] [Kuyler, Raphael])

Comment: NRC downplays the risks of pool fires by assuming that surrounding populations will be successfully evacuated. But nuclear utilities are allowed to store high level radioactive waste in pools for many decades after reactors permanently shutdown, in order to defer the costs of dry cask storage as far off into the future as possible, despite the inherent risks. At the same time, NRC allows utilities, via exemptions from regulations, to do away with 10-mile radius emergency planning zones as soon as 12-18 months post-reactor shutdown despite the lingering risk of storing HLRW in pools at such shutdown reactor sites. How can populations be evacuated if EPZs have been dismantled? (0700-5 [Women's Action for New Direction, Georgia])

Comment: Further, with respect to a potential fire in a spent fuel pool containing high burnup fuel, please see NRDC's Appendix C, authored by Mr. Mark Leyse on high burnup fuel cladding, fuel cladding deformation, such as ballooning, fuel fragmentation, relocation, and dispersal, and hydrogen explosions which could occur in the event of a spent fuel pool ("SFP") accident (and possible concurrent reactor core accident). The NRC's "Waste Confidence Generic Environmental Impact Statement: Draft Report for Comment," NUREG-2157, Appendix F, "Spent Fuel Pool Fires," does not consider a number of phenomena that would increase the probability of a SFP fire in the event of either: 1) a complete SFP loss-of-coolant accident ("LOCA"), 2) a partial SFP LOCA, or 3) a SFP boil-off accident. (0706-3-20 [Fettus, Geoffrey])

Comment: Page F-1-F-16. Appendix F, *Spent Fuel Pool Fires*. NRDC Comments[:] We append the comments of Mr. Mark Leyse. Mr. Leyse states Appendix F "does not consider a number of phenomena that would increase the probability of a spent fuel pool (SFP) fire in the event of either: 1) a complete SFP loss-of-coolant accident ("LOCA"), 2) a partial SFP LOCA, or 3) a SFP boil-off accident. (0706-4-14 [Fettus, Geoffrey])

Comment: It is doubtful that the NRC's computer safety model MELCOR simulates how local heavy oxide and/or crud layers would partly impede the local steam or air "coolant" flow through the spent fuel assemblies in a SFP boil-off accident or complete SFP LOCA, respectively. (0706-5-15 [Fettus, Geoffrey])

Comment: 4. The NRC's "Waste Confidence Generic Environmental Impact Statement: Draft Report for Comment," NUREG-2157, Appendix F, "Spent Fuel Pool Fires," does not consider a number of phenomena that would increase the probability of a SFP fire in the event of either: 1) a complete SFP loss-of-coolant accident ("LOCA"), 2) a partial SFP LOCA, or 3) a SFP boil-off accident. (0706-5-7 [Fettus, Geoffrey])

Comment: Heat produced by the radioactive decay heating of the fuel rods would cause the SFP's water to boil away; the fuel rods would become uncovered by water and heat up, increasing their local temperatures. When local fuel-cladding temperatures reached approximately 677°C (1250°F) the fuel rods would start to balloon and burst,²⁸ [footnote 28 text: The fuel rods would balloon and burst between approximately 677°C (1250°F) and 877°C (1610°F). See S. Guntay, J. Birchley, "MELCOR Further Development in the Area of Air Ingress and Participation in OECDNEA SFP Project to Be Performed in the Time Frame 2009-2012," April 2009, p. 14.] "releasing noble gases, such as xenon and krypton," into the environment.²⁹ [footnote 29 text: Zachary I. Franiewski *et al.*, Pennsylvania State University, "Spent Fuel Pool Analysis of a BWR-4 Fuel Bundle Under Loss of Coolant Conditions Using TRACE," NucE431W S2013, May 2013, p. 2.] This would occur because the fuel rods that are used in reactor cores are pre-pressurized: at higher temperatures, the internal gas pressure increases to points at which the fuel cladding balloons and bursts. (0706-6-1 [Fettus, Geoffrey])

Comment: Interestingly, the 2004 OECD Nuclear Energy Agency report states that, *in a reactor LOCA*, "[t]here is a more uniform cladding temperature at high burn-up, which can lead to much larger cladding deformations and thus more pronounced flow blockage."⁴⁸ [footnote 48 text: *Id.*, p.5.] It is plausible that these same phenomena would occur in a SFP boil-off accident, because the fuel rods in the SFP would not have the pronounced *chopped-cosine axial heat flux distribution*⁴⁹ [footnote 49 text: The locations of the active length of the fuel rods are much hotter at the mid-elevation than at the upper and lower ends. The active length of a fuel rod is the length of the cladding containing the fuel pellets; it is approximately 12-feet long.] that the fuel rods have in operating reactor cores; the axial heat flux, albeit far less, would be far more evenly distributed in the fuel rods stored in the SFP. (0706-6-10 [Fettus, Geoffrey])

Comment: The coplanar blockage of sausage-like fuel-cladding balloons (sections with a substantial axial extension), and any points of local rod-to-rod contact, would impede the local cooling of the fuel assemblies; and local blockage-section surface temperatures could increase up the point at which the zirconium fuel-cladding began to rapidly chemically react with steam or air at approximately 1000°C (1832°F) or 900°C (1652°F),⁵⁰ [footnote 50 text: Allan S. Benjamin *et al.*, Sandia Laboratories, "Spent Fuel Heatup Following Loss of Water During Storage," NUREG/CR-0649, March 1979, p. 47.] respectively. (0706-6-11 [Fettus, Geoffrey])

Comment: Ballooning and bursting would also cause the fuel-cladding to lose the protection of preexisting oxide layers, as clean surface locations opened up, facilitating exothermic (heat-generating) oxidation and hydriding of zirconium (both of these reactions are discussed below). (0706-6-12 [Fettus, Geoffrey])

Comment: Additionally, local ballooning and bursting of zirconium fuel cladding at grid spacers will augment the cladding-to-grid contact. The NRC report, NUREG-2121, states that "[g]rid spacers may 'pin' rod ballooning... In bundle geometries, ballooning tends to occur such that all the balloons are coplanar, but ballooning is largely suppressed in the sections of fuel rods that cross a grid spacer."⁵¹ [footnote 51 text: Patrick A.C. Raynaud, "Fuel Fragmentation, Relocation, and Dispersal During the Loss-of-Coolant Accident," NUREG-2121, March 2012, (ADAMS Accession No. ML12090A018), p. 75.] (0706-6-13 [Fettus, Geoffrey])

Comment: Regarding how fuel rod ballooning could *decrease* the time to the ignition of zirconium *in air* in a SFP accident, a 2009 paper about an OECD Nuclear Energy Agency SFP safety analysis project states: Fuel rod ballooning is an important phenomena expected to occur prior to ignition [of the zirconium fuel cladding in a SFP accident]. Rod ballooning has been shown to occur in the temperature range of 950 K to 1150 K [1250°F to 1610°F]. In the BWR 1x4 ignition test a peak clad temperature of 1050K [1430°F] was reached at 2.75 hrs and the rapid escalation to ignition began at 4.75 hrs at a peak clad temperature of 1200 K [1700°F]. Thus fuel rod ballooning is expected to occur during the crucial period prior to ignition *and could be expected to decrease the time to ignition by an hour or more*⁵² [footnote 52 text: S. Guntay, J. Birchley, "MELCOR Further Development in the Area of Air Ingress and Participation in OECD NEA SFP Project to Be Performed in the Time Frame 2009-2012," April 2009, p. 14.] [emphasis added]. (0706-6-14 [Fettus, Geoffrey])

Comment: It can be extrapolated that because fuel rod ballooning could decrease the time to the ignition of zirconium *in air* in a SFP accident, ballooning could also decrease the time to the ignition of zirconium *in steam* in a SFP accident. (0706-6-15 [Fettus, Geoffrey])

Comment: It is noteworthy that the NRC claims that "rod ballooning has a low impact on the timing to breakaway oxidation and the impact on the peak cladding temperature response was relatively insignificant."⁵³ [footnote 53 text: NRC, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report," June 2013, (ADAMS Accession No. ML13133A132), p. 26.] (0706-6-16 [Fettus, Geoffrey])

Comment: Creep failure of the fuel cladding could occur from incurring stress for approximately 10 hours at cladding temperatures between approximately 565°C (1049°F) and 600°C (1112°F) or greater.³⁰ [footnote 30 text: NRC, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," NUREG-1738, February 2001 (ADAMS Accession No. ML010430066), Appendix 1B, p. A1B-5.] The NRC's NUREG-1738 states that "[w]hile failure of the cladding at these lower temperatures will lead to fission product release, such release is considerably smaller than that assumed for the cases where the

temperature criterion is exceeded and significant fuel heatup and damage occurs."³¹ [footnote 31 text: NRC, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," NUREG-1738, February 2001 (ADAMS Accession No. ML010430066), Appendix 1B, p. A1B-5.] (0706-6-2 [Fettus, Geoffrey])

Comment: It is noteworthy that the NRC computer safety model "MELCOR does not have a fuel cladding deformation and strain model. It uses a value of 900°C for widespread cladding failure."³² [footnote 32 text: NRC, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report," June 2013, (ADAMS Accession No. ML13133A132), p. 26.] (0706-6-3 [Fettus, Geoffrey])

Comment: In a SFP boil-off accident, ballooning of the fuel cladding would most likely be in the form of sausage-type balloons, as occurred in the fuel-cleaning-tank accident at the Paks Nuclear Power Plant Unit 2 ("Paks-2"), in Hungary, in 2003.³³ [footnote 33 text: In 2003, at the Paks Unit 2 plant in Hungary, there was a fuel cleaning tank accident in which 30 fuel assemblies incurred severe damage. In the Paks-2 accident, the fuel rods ballooned—"long sausage balloon's with "very long ballooned areas." See Advisory Committee on Reactor Safeguards Reactor Fuels Subcommittee, September 29, 2003, located at: <http://www.nrc.gov/reading-rm/doc-collections/acrs/tr/subcommittee/2003/rf092903.pdf>, pp. 212-225.; see also IAEA, "OECD-IAEA Paks Fuel Project: Final Report," 2009, p. 12.] In the Paks-2 accident, 30 fuel assemblies were severely damaged and their fuel rods ballooned—"long sausage balloons"³⁴ [footnote 34 text: Advisory Committee on Reactor Safeguards Reactor Fuels Subcommittee, September 29, 2003, located at: <http://www.nrc.gov/reading-rm/doc-collections/acrs/tr/subcommittee/2003/rf092903.pdf>, pp. 212- 225.] with "very long ballooned areas."³⁵ [footnote 35 text: IAEA, "OECD-IAEA Paks Fuel Project: Final Report," 2009, p. 12.] At a 2003 Advisory Committee on Reactor Safeguards ("ACRS") Reactor Fuels Subcommittee meeting, at least one participant thought that such long balloons would occur in reactor large-break loss-of-coolant accidents ("LOCA"). (*This is pertinent to the characteristics of the fuel-cladding ballooning that would occur in SFP accidents*, because, in both types of accidents, fuel rods would heat up to the point at which their internal-pressure increases caused them to balloon; in both types of accidents, the external pressure would be far less than the internal pressure of the fuel rods.) (0706-6-4 [Fettus, Geoffrey])

Comment: In the ACRS meeting, Dr. Dana Powers (the lead author of "Cladding Swelling and Rupture Models for LOCA Analysis"³⁶ [footnote 36 text: D.A. Powers, R.O. Meyer, "Cladding Swelling and Rupture Models for LOCA Analysis," NUREG-0630, April 1980, (ADAMS Accession No. ML053490337).]) stated: "If you're trying to persuade me that we'll never see long sausage balloons in reactor accidents, give up now while you're ahead;" and "where I run into trouble is saying x or y can never happen. Simply because you've never seen it in an experiment you've done with one foot sections [of fuel cladding]; that's where I have real trouble."³⁷ [footnote 37 text: Advisory Committee on Reactor Safeguards Reactor Fuels Subcommittee, September 29, 2003, located at: <http://www.nrc.gov/reading-rm/doc-collections/acrs/tr/subcommittee/2003/rf092903.pdf>, pp. 217-218.] (0706-6-5 [Fettus, Geoffrey])

Comment: Experiments at Argonne Laboratories with segments of high burnup fuel rods—discussed in the same 2003 ACRS Subcommittee meeting—were conducted with 12 and 15 inch segments of fuel rods, with a "relatively uniform heating zone" *that was approximately five inches long*; hence, the ballooned locations of the fuel rods were not longer than five inches.³⁸ [footnote 38 text: Advisory Committee on Reactor Safeguards Reactor Fuels Subcommittee, September 29, 2003, located at: <http://www.nrc.gov/reading-rm/doc-collections/acrs/tr/subcommittee/2003/rf092903.pdf>, pp. 113, 181, and 195.] (0706-6-6 [Fettus, Geoffrey])

Comment: In a SFP boil-off accident, it is highly probable that the ballooned sections of the fuel rods would be coplanar (at the same elevation); with coplanarity, there would also likely be some degree of local rod-to-rod contact. When local cladding temperatures reached the point at which the fuel rods ballooned, such temperatures would tend to be at approximately the same elevation. Additionally, in SFP boil-off accident, the fuel assemblies that were most recently loaded into the SFP (the hottest assemblies) would be first ones to incur fuel-cladding ballooning. (0706-6-7 [Fettus, Geoffrey])

Comment: In addition to the Paks fuel cleaning tank accident there is further evidence that there could be long sausage-like ballooned areas of the fuel cladding in a boil-off SFP accident. (The experiments discussed in this paragraph are not SFP accident experiments; however, they apply to SFP accidents, because they are experiments in which fuel rod simulators were heated up to the point at which their internal pressure increases caused them to balloon.) For example: 1) the JAERI loss-of-accident tests had "axially extended contacts between rods (over more than cm [7.9 in]) in [49-rod³⁹ [footnote 39 text: European Commission: Nuclear Safety and the Environment, "Fuel Cladding Failure Criteria," September 1999, p. 88.]] bundle configurations;"⁴⁰ [footnote 40 text: Claude Grandjean, Institut de Radioprotection et de Sûreté Nucléaire (IRSN), "Coolability of Blocked Regions in a Rod Bundle after Ballooning under LOCA Conditions: Main Findings from a Review of Past Experimental Programmes," 2007.] 2) in the Materials Test 3 (MT-3), which had 12 full-length pre-pressurized fuel rods, "[t]he active strain [ballooned] region was spread over [a] ~2-[meter] (80-[in]) length" of the fuel rods⁴¹ [footnote 41 text: C. L. Wilson, G. M. Hesson, J. P. Pilger, L. L. King, F. E. Panisko, Pacific Northwest Laboratory, "Large-Break LOCA, In-Reactor Fuel Bundle Materials Test MT-6A," 1993, p. x.] (this does not mean that there was a continuous ballooned length of about 80.0-in; however, it indicates that there was excessive ballooning); 3) an Oak Ridge National Laboratory (ORNL) report states that for the CORA-16 experiment that there was *estimated* cladding strain (ballooning) on one of the fuel rods at the 550, 750, and 950 mm elevations, which indicates that the rod was estimated to have a ballooned length of at least 400 mm (15.75 in)⁴² [footnote 42 text: L. J. Ott, W. I. van Rij, "In-Vessel Phenomena—CORA: BWR Core Melt Progression Phenomena Program, Oak Ridge National Laboratory," CONF-9105173-3-Extd.Abst., Presented at Cooperative Severe Accident Research Program, Semiannual Review Meeting, Bethesda, Maryland, May 6-10, 1991.] (the CORA experiments, which simulated meltdown accidents, were conducted with zirconium alloy multi-rod bundles that were two meters long);⁴³ [footnote 43 text: P. Hofmann, S. Hagen, G. Schanz, G. Schumacher, L. Sepold, Idaho National Engineering Laboratory, EG&G Idaho, Inc., "CORA Experiments on the Materials Behavior of LWR Fuel Rod Bundles at High Temperatures," in NRC "Proceedings of the Nineteenth Water Reactor Safety Information Meeting," NUREG/CP-0119, Vol. 2, 1991, (ADAMS Accession No. ML042230460), p. 77.] 4) a second ORNL report states that for the CORA-33 experiment "the computed cladding strain [ballooning] was significant over 400 mm [15.75 in] of the rod length;"⁴⁴ [footnote 44 text: L. J. Ott, Siegfried Hagen, "Interpretation of the Results of the CORA-33 Dry Core Test," 1993.] and 5) the cladding balloons that occurred in the middle sections of the bundles from PWR FLECHT runs 2443 and 2544, which had unintended internal gas pressure increases,⁴⁵ [footnote 45 text: F. F. Cadek, D. P. Dominicis, R. H. Leyse, Westinghouse Electric Corporation, WCAP-7665, "PWR FLECHT (Full Length Emergency Cooling Heat Transfer) Final Report," April 1971, (ADAMS Accession No. ML070780083), p. 3-95.] were substantially longer than a few inches. (0706-6-8 [Fettus, Geoffrey])

Comment: Regarding assembly blockage in reactor LOCAs, resulting from newer zirconium fuel-cladding alloys like ZIRLO and M5, a 2004 OECD Nuclear Energy Agency report states that "[n]ew alloys have the tendency of being more ductile, which can increase ballooning size and thus increase blockage."⁴⁶ [footnote 46 text: OECD Nuclear Energy Agency, "Summary Record

of the Experts meeting on the proposed OECD-IRSN STLOC Project," NEA/CSNI/R(2004)1, January 13, 2004, p. 5.] Furthermore, the same report states that "it can be anticipated, due to this better ductility that, for modern alloys, *the rod balloons will be bigger and the resulting flow blockage geometry at burst higher with more radial and axial extension* than for Zy4 [an older zirconium fuel-cladding alloy] rods when experiencing the same conditions at burst"⁴⁷ [footnote 47 text: *Id.*, p. 17.] [emphasis added]. (As stated above, reactor LOCA fuel-cladding ballooning phenomena are pertinent to SFP accidents, because, in both types of accidents, fuel rods would heat up to the point at which their internal-pressure increases caused them to balloon; in both types of accidents, the external pressure would be far less than the internal pressure of the fuel rods.) (0706-6-9 [Fettus, Geoffrey])

Comment: A March 2012 NRC report, NUREG-2121, states that "[f]uel fragmentation refers to any separation of the fuel pellet into more than one piece, regardless of when or why it occurred." In the reactor core, during typical operation, the uranium dioxide (UO₂) "fuel pellets develop many cracks because of thermal stresses."⁵⁴ [footnote 54 text: Patrick A.C. Raynaud, "Fuel Fragmentation, Relocation, and Dispersal During the Loss-of-Coolant Accident," NUREG-2121, March 2012, (ADAMS Accession No. ML12090A018), p. 3.] A 2011 IAEA report explains that "[d]ue to thermal gradients, fuel pellets tend to fragment early in life,"⁵⁵ [footnote 55 text: IAEA, "Impact of High Burnup Uranium Oxide and Mixed Uranium-Plutonium Oxide Water Reactor Fuel on Spent Fuel Management," No. NF-T-3.8, 2011, p. 37.] which can occur at fuel burnups "as low as a few megawatt days per metric ton uranium (MWd/MTU)."⁵⁶ [footnote 56 text: Patrick A.C. Raynaud, "Fuel Fragmentation, Relocation, and Dispersal During the Loss-of-Coolant Accident," NUREG-2121, March 2012, (ADAMS Accession No. ML12090A018), p. 75. degree of additional fuel fragmentation would occur in a reactor LOCA; a SFP accident would perhaps incur a lesser degree of additional fuel fragmentation than a reactor LOCA.] It is likely that some degree of additional fuel fragmentation would occur in a reactor LOCA; a SFP accident would perhaps incur a lesser degree of additional fuel fragmentation than a reactor LOCA. (0706-7-1 [Fettus, Geoffrey])

Comment: Defining fuel dispersal, NUREG-2121 states that "[f]uel dispersal is the ejection of fuel fragments or particles through a rupture or opening in the cladding."⁶⁷ [footnote 67 text: Patrick A.C. Raynaud, "Fuel Fragmentation, Relocation, and Dispersal During the Loss-of-Coolant Accident," NUREG-2121, March 2012, (ADAMS Accession No. ML12090A018), p. 3.] Rapid reactor LOCA transient phenomena, such as rapid external depressurization, could enhance the dispersal fuel fragments from ruptured locations of the fuel cladding; external depressurization would not occur in SFP accidents. (0706-7-10 [Fettus, Geoffrey])

Comment: Fuel dispersal during a reactor LOCA could occur with fuel that had a burnup lower than 62 GWd/MTU; previously it was believed that *significant* fuel dispersal during a reactor LOCA would not occur if the fuel had burnups lower than 62 GWd/MTU (average for the peak rod).⁶⁸ [footnote 68 text: Patrick A.C. Raynaud, "Fuel Fragmentation, Relocation, and Dispersal During the Loss-of-Coolant Accident," NUREG-2121, March 2012, (ADAMS Accession No. ML12090A018), p. 1.] It seems probable that some degree of fuel dispersal would also occur in a SFP accident if the burnup were lower (or greater) than 62 GWd/MTU.) NUREG-2121 states that "[s]ome fuel dispersal has been observed in every case in which (1) rod rupture occurs, and (2) the fuel fragments are small enough to get through the rupture opening." And states that "[t]he amount of fuel that is dispersed can vary widely, from a puff of dust to large amounts of fragmented and pulverized fuel. Although evidence points to likely fuel dispersal in many tests, this phenomenon was not systematically investigated nor documented in the majority of test programs."⁶⁹ [footnote 69 text: Patrick A.C. Raynaud, "Fuel Fragmentation, Relocation, and

Dispersal During the Loss-of-Coolant Accident," NUREG-2121, March 2012, (ADAMS Accession No. ML12090A018), p. 75.] (0706-7-11 [Fettus, Geoffrey])

Comment: Radiological releases resulting from core damage would contaminate the nuclear power plant ("NPP") site and impede efforts to mitigate the accident, especially if radioactive debris were propelled throughout the site by hydrogen explosions, as occurred in the Fukushima Dai-ichi accident.⁷⁰ [footnote 70 text: Institute of Nuclear Power Operations ("INPO"), "Special Report on the Nuclear Accident at the Fukushima Dai-ichi Nuclear Power Station," INPO 11-005, November 2011, pp. 9, 12, 21, 24, 25, 32, 37, 79, 85, 86, 96.] After the Fukushima Dai-ichi site was contaminated, workers had to wear additional protective clothing and limit the time they spent, working to mitigate the accident.⁷¹ [footnote 71 text: Institute of Nuclear Power Operations ("INPO"), "Special Report on the Nuclear Accident at the Fukushima Dai-ichi Nuclear Power Station," INPO 11-005, November 2011, p. 9.] Efforts to mitigate a SFP accident would also be impeded (or possibly entirely prevented for significant time periods) by the radiologically-contaminated environment. (0706-7-12 [Fettus, Geoffrey])

Comment: In BWR Mark I and Mark II designs, SFPs are typically located at the level of the operating floor, approximately 100 to 150 feet above ground level,⁷² [footnote 72 text: NRC, "Regulatory Analysis for the Resolution of Generic Issue 82, 'Beyond Design Basis Accidents in Spent Fuel Pools'," NUREG-1353, April 1989, (ADAMS Accession No. ML082330232), p. 4.6.] in the reactor building (secondary containment). If either a BWR Mark I or Mark II reactor core melted down and the total amount of the zirconium in the core—approximately 76,000 kg—were to chemically react with steam, approximately 3360 kg of hydrogen would be generated.⁷³ [footnote 73 text: IAEA, "Mitigation of Hydrogen Hazards in Severe Accidents in Nuclear Power Plants," IAEA-TECDOC-1661, July 2011," p. 10 (hereinafter "Mitigation of Hydrogen Hazards in SA").] In the event of a severe accident at either a BWR Mark I or BWR Mark II, the Fukushima Dai-ichi accident scenario of hydrogen leaking from over-pressurized primary containments and/or hardened vent systems should be considered as likely to occur again. In the Fukushima Dai-ichi accident, BWR Mark I reactor buildings—essentially industrial buildings with design pressures of approximately 3.0 psig⁷⁴ [footnote 74 text: Sherrell R. Greene, Oak Ridge National Laboratory, "The Role of BWR Mark I Secondary Containments in Severe Accident Mitigation," Proceedings of the 14th Water Reactor Safety Information Meeting at the National Bureau of Standards, Gaithersburg, Maryland, October 27-31, 1986, Exhibit 6.]—were compromised by hydrogen explosions. BWR Mark II reactor buildings also have low design pressures. (0706-7-13 [Fettus, Geoffrey])

Comment: Hence, BWR Mark I and Mark II SFPs are vulnerable to the hydrogen explosions that can occur in reactor buildings. A June 2013 NRC report on how earthquakes could affect BWR Mark I SFPs states that "[t]he occurrence of a hydrogen combustion event from a concurrent reactor accident has the potential to generate debris which could impair SFP natural circulation air or steam cooling (should the fuel in the SFP become uncovered) for conditions in which the fuel might otherwise be cooled by means of these passive cooling modes."⁷⁵ [footnote 75 text: NRC, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report," June 2013, (ADAMS Accession No. ML13133A132), p.25.] Furthermore, if either a BWR Mark I or Mark II SFP were compromised by a hydrogen explosion, it could cause large radiological releases. (0706-7-14 [Fettus, Geoffrey])

Comment: If a BWR Mark I or Mark II reactor building were breached by a hydrogen explosion there would be more available oxygen to facilitate oxidation of the zirconium cladding of the fuel assemblies. A June 2013 NRC report on how earthquakes could affect BWR Mark I SFPs states

that if there were a hydrogen explosion in the reactor building, "damage could breach structures that would retain radioactive material, along with allowing more oxygen into the building, potentially increasing the severity of the spent fuel fire."⁷⁶ [footnote 76 text: NRC, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report," June 2013, (ADAMS Accession No. ML13133A132), p. ix.] The accelerated zirconium oxidation would contribute additional heat, causing a quicker fuel-cladding temperature escalation, releasing yet more heat, causing a more rapid axial and radial propagation of the SFP fire. This would cause increased radiological releases from the SFP. (0706-7-15 [Fettus, Geoffrey])

Comment: If the fuel assemblies were uncovered in either a SBO boil-off accident or a partial SFP LOCA, explosive hydrogen gas would be generated by the reaction of steam with the zirconium cladding of fuel rods. If enough hydrogen were generated, it could detonate.⁷⁷ [footnote 77 text: Juan J. Carbajo, Oak Ridge National Laboratory, "MELCOR Model of the Spent Fuel Pool of Fukushima Dai-ichi Unit 4," 2012, p. 1.] Computer analyses conducted at ORNL with the MELCOR computer safety model found that in a *hypothetical* scenario if Fukushima Dai-ichi Unit 4's SFP had boiled dry, a total of 1800 to 2050 kilograms ('kg') of hydrogen could have been generated. A 2012 ORNL paper states that "[i]n theory, it [would be] possible to generate up to 3.4 kg of hydrogen per assembly (from oxidation of [zirconium] in the fuel cladding and box), or a *total of 4,525 kg* from the hot 1331 assemblies stored in [Unit 4's SFP]. The hydrogen generated from oxidation of steel and B4C [boron carbide] in the racks [would] be additional"⁷⁸ [footnote 78 text: Juan J. Carbajo, Oak Ridge National Laboratory, "MELCOR Model of the Spent Fuel Pool of Fukushima Dai-ichi Unit 4," 2012, pp. 1-2.] [emphasis added]. (0706-7-16 [Fettus, Geoffrey])

Comment: It is noteworthy that in MELCOR BWR Mark I "SFP calculation[s], [hydrogen] ignition is assumed to occur in the reactor building when the hydrogen concentration exceeds 10 percent by volume. In addition, MELCOR checks to determine whether there is sufficient oxygen. The minimum oxygen mole fraction for ignition is 5 percent."⁷⁹ [footnote 79 text: NRC, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor: Draft Report," June 2013, (ADAMS Accession No. ML13133A132), p.103.] (0706-7-17 [Fettus, Geoffrey])

Comment: MELCOR SFP calculations of hydrogen combustion do not consider that significant deflagrations⁸⁰ [footnote 80 text: A deflagration is a combustion wave traveling at a subsonic speed (less than the speed of sound) relative to the unburned gas.] of hydrogen can occur when local hydrogen concentrations are lower than 10 percent by volume. For example, in the Three Mile Island Unit 2 ("TMI-2") accident, a hydrogen deflagration occurred when the hydrogen concentration was 8.1 volume percent;⁸¹ [footnote 81 text: Kahtan N. Jabbour, NRC, letter regarding Turkey Point Units 3 and 4, Exemption from Hydrogen Control Requirements, December 12, 2001, Attachment 2, "Safety Evaluation by the Office of Nuclear Reactor Regulation, Turkey Point Units 3 and 4," available at: www.nrc.gov, NRC Library, ADAMS Documents, Accession Number: ML013390647, p. 4.] the deflagration caused a rapid pressure increase of approximately 28 pounds per square inch ("psi") in the containment.⁸² [footnote 82 text: W. E. Lowry *et al.*, Lawrence Livermore National Laboratory, "Final Results of the Hydrogen Igniter Experimental Program," NUREG/CR-2486, February 1982, p. 4.] Of course, the volume of a PWR large day containment, such as TMI-2 had, is different than that of a BWR Mark I reactor building; however, it is clear that a significant hydrogen deflagration would compromise a BWR Mark I reactor building, which has a relatively low design pressure. (0706-7-18 [Fettus, Geoffrey])

Comment: PWR and BWR Mark III SFPs are typically located at ground level.⁸³ [footnote 83 text: NRC, "Regulatory Analysis for the Resolution of Generic Issue 82, 'Beyond Design Basis Accidents in Spent Fuel Pools'," NUREG-1353, April 1989, (ADAMS Accession No. ML082330232), p. 4.6.] In the event of a severe *reactor* accident, PWR and BWR Mark III SFPs would not be as vulnerable to the potential consequences of explosive hydrogen gas—generated from oxidized zirconium and other core materials—as BWR Mark I and Mark II SFPs. However, if the fuel assemblies were uncovered in either a SBO boil-off accident or a partial SFP LOCA, PWR and BWR Mark III SFPs, would be vulnerable to the explosive hydrogen gas that would be generated by the reaction of steam with zirconium and other materials in the SFP. (0706-7-19 [Fettus, Geoffrey])

Comment: NUREG-2121 states that "[a]t higher values of burnup, fission gas production and migration is postulated to generate a 'rim' region in fuel pellets that is highly porous;" and that "[t]he size of fuel fragments is not uniform but tends to become smaller with increasing burnup."⁵⁷ [footnote 57 text: Patrick A.C. Raynaud, "Fuel Fragmentation, Relocation, and Dispersal During the Loss-of-Coolant Accident," NUREG-2121, March 2012, (ADAMS Accession No. ML12090A018), pp. 3, 75.] (0706-7-2 [Fettus, Geoffrey])

Comment: For example, Indian Point Energy Center is located less than 25 miles north of New York City; more than 17 million people live within a 50-mile radius of Indian Point.⁸⁴ [footnote 84 text: Edwin S. Lyman, Union of Concerned Scientists, "Chernobyl on the Hudson?: The Health and Economic Impacts of a Terrorist Attack at the Indian Point Nuclear Plant," September 2004, p. 23.] On August 26, 2013, Indian Point Unit 2's SFP, which has a storage capacity of 1374 fuel assemblies, contained 1104 fuel assemblies (80 percent of capacity); and Indian Point Unit 3's SFP, which has a storage capacity of 1345 fuel assemblies, contained 1199 fuel assemblies (89 percent of capacity).⁸⁵ [footnote 85 text: NRC, "Summary of August 26, 2013, Meeting with Entergy Nuclear Operations, Inc. and Netco on Indian Point Unit 2 Spent Fuel Pool Management," September 24, 2013, (ADAMS Accession No. ML13256A086), p. 1.] (The fuel assemblies in a typical PWR core have approximately 26,000 kg of zirconium that, if completely oxidized, would generate a total of approximately 1150 kg of hydrogen.⁸⁶ [footnote 86 text: IAEA, "Mitigation of Hydrogen Hazards in Severe Accidents in Nuclear Power Plants," IAEA-TECDOC-1661, July 2011," p. 10 (hereinafter "Mitigation of Hydrogen Hazards in SA").] The cores of pressurized-water reactors, like Indian Point's, typically contain between 150 and 200 fuel assemblies.⁸⁷ [footnote 87 text: NRC, "Pressurized Water Reactors," (available at: <http://www.nrc.gov/reactors/pwrs.html> : last visited on 10/15/13).]) (0706-7-20 [Fettus, Geoffrey])

Comment: Indian Point's owner, Entergy, touts the safety of Indian Point Unit 2 and 3's SFPs, explaining that "[t]hey are constructed with concrete walls 4 to 6 feet wide and with a half-inch stainless steel inner liner" and that "the fuel pool for Indian Point 2 is completely underground and Indian Point 3[s] is nearly 100% underground, so they are protected on all sides by rock and gravel."⁸⁸ [footnote 88 text: Entergy, "Safe, Secure, Vital: Indian Point Energy Center," website, "Spent Fuel," (located at <http://www.safesecurevital.com/safe-secure-vital/spent-fuel.html>: last visited on October 12, 2013).] However, if there were a SFP fire at either unit (or at both), *thousands of kilograms of explosive hydrogen gas* could be generated by the oxidation (burning) of the tens of thousands kilograms of zirconium—the cladding material of the fuel rods—in storage. It is almost inevitable that hydrogen gas would detonate, breaching the barriers that are supposed to protect the public; releases of radiation could far exceed the quantity released by the Chernobyl Unit 4 accident. More land could be contaminated than the area encompassing the Chernobyl Exclusion Zone, with higher concentrations of radioactive cesium-137. The number of premature deaths from cancer and economic damages would perhaps be incalculable. (0706-7-21 [Fettus, Geoffrey])

Comment: An October 2011 Natural Resources Defense Council ("NRDC") report, "Nuclear Accident at Indian Point: Consequences and Costs," with analyses of the potential radiological consequences of *one full reactor core melt* at Indian Point, would perhaps help provide insight regarding the magnitude of the damages and suffering that would ensue from a SFP fire at Indian Point. The NRDC report states: An accident at Indian Point Unit 3 involving a full reactor core melt approaching the scale of Chernobyl could put people in New York City at risk for receiving a whole-body radiation dose greater than 25 rem, resulting in a 7 percent increase in risk of premature death from cancer for an average individual. An accident of this scale would require the administration of stable iodine throughout the New York City metropolitan area, and put thousands at risk for radiation sickness in and near the Hudson Valley....A release of radiation on the scale of Chernobyl's would make Manhattan too radioactively contaminated to live in if the city fell within the plume.⁸⁹ [footnote 89 text: Matthew McKinzie, NRDC, "Nuclear Accident at Indian Point: Consequences and Costs," October 17, 2011, Cover Sheet, p. 1.] (0706-7-22 [Fettus, Geoffrey])

Comment: It is noteworthy that a 2012 paper, "Oxidation Studies on Irradiated UO₂ Fuels," states that "[f]uel fragmentation would result in larger surface areas available for corrosion processes and radionuclide release."⁵⁸ [footnote 58 text: D. Papaioannou *et al.*, "Oxidation Studies on Irradiated UO₂ Fuels" Top Fuel 2012 Transactions, European Nuclear Society, September 2-6, 2012, p. 5.] (0706-7-3 [Fettus, Geoffrey])

Comment: Defining fuel relocation, NUREG-2121 states that "fuel relocation can be described as any physical movement of fuel pellets or fuel fragments within the cladding. ... *Radial* fuel relocation is the movement of the fuel outward toward the fuel cladding. ... *Axial* fuel relocation is the vertical movement of fuel fragments or particles within the cladding"⁵⁹ [footnote 59 text: Patrick A.C. Raynaud, "Fuel Fragmentation, Relocation, and Dispersal During the Loss-of-Coolant Accident," NUREG-2121, March 2012, (ADAMS Accession No. ML12090A018), p. 3.] [emphasis not added]. (0706-7-4 [Fettus, Geoffrey])

Comment: Regarding *radial* fuel relocation, NUREG-2121 states that "fuel pellet cracking promotes an outward relocation of the pellet fragments that causes additional gap closure. This process is widely recognized in fuel performance analysis. It starts at beginning of life and quickly reaches equilibrium—by 5 GWd/MTU."⁶⁰ [footnote 60 text: Patrick A.C. Raynaud, "Fuel Fragmentation, Relocation, and Dispersal During the Loss-of-Coolant Accident," NUREG-2121, March 2012, (ADAMS Accession No. ML12090A018), p. 3.] And regarding *axial* fuel relocation, NUREG-2121 states that "[u]nder normal operation, this process is usually limited by the fuel pellet immediately above or below the pellet in question." In experiments simulating reactor LOCAs, "voided regions of the cladding rod" and "additional fuel material [with]in the enlarged volume of the balloon region, or both" have been observed.⁶¹ [footnote 61 text: Patrick A.C. Raynaud, "Fuel Fragmentation, Relocation, and Dispersal During the Loss-of-Coolant Accident," NUREG-2121, March 2012, (ADAMS Accession No. ML12090A018), p. 3.] (0706-7-5 [Fettus, Geoffrey])

Comment: Additionally, regarding the potential for the accumulation of relocated fuel fragments at the elevations of the spacer grids, NUREG-2121 states: Grid spacers may 'pin' rod ballooning, potentially acting as choke points for fuel relocation. In bundle geometries, ballooning tends to occur such that all the balloons are coplanar, but ballooning is largely suppressed in the sections of fuel rods that cross a grid spacer.⁶² [footnote 62 text: Patrick A.C. Raynaud, "Fuel Fragmentation, Relocation, and Dispersal During the Loss-of-Coolant Accident," NUREG-2121, March 2012, (ADAMS Accession No. ML12090A018), p. 75.] (0706-7-6 [Fettus, Geoffrey])

Comment: Regarding the fuel relocation which could occur in high burn-up fuel, in a reactor LOCA, a 2004 OECD Nuclear Energy Agency report states that "ANL [Argonne National Laboratory] tests have shown [the] potential for greater relocation at high burn-up due to increased fuel fragmentation. It is unknown if fuel-cladding bonding⁶³ [footnote 63 text: Regarding fuel-cladding bonding an October 2003 paper states: "Inner surface cladding oxidation and subsequent mechanical bonding between the fuel pellet and the cladding are well-known phenomena of high burnup and high duty fuels." See Sven Van den Berghe *et al.*, "Observation of a Pellet-Cladding Bonding Layer in High Power Fuel," presented at "Advanced Fuel Pellet Materials and Designs for Water Cooled Reactors: Technical Committee Meeting," 20-24 October 2003, p. 307.] delays relocation."⁶⁴ [footnote 64 text: OECD Nuclear Energy Agency, "Summary Record of the Experts meeting on the proposed OECD-IRSN STLOC Project," NEA/CSNI/R(2004)1, January 13, 2004, p. 5.] (This information is pertinent to the characteristics of the fuel-cladding ballooning and fuel relocation that could occur in SFP accidents, because, such phenomena could occur in both types of accidents.) The same report observes that larger fuel-cladding balloons—caused by "[n]ew alloys [that] have the tendency of being more ductile, which can increase ballooning size"—would be likely to facilitate a greater extent of fuel relocation and "the associated power generation increase."⁶⁵ [footnote 65 text: OECD Nuclear Energy Agency, "Summary Record of the Experts meeting on the proposed OECD-IRSN STLOC Project," NEA/CSNI/R(2004)1, January 13, 2004, p. 5.] (In a SFP accident any power generation increases caused by fuel relocation within fuel-cladding balloons would not be significant because the heat flux (rate of heat transfer from the fuel rods) would be relatively low.) (0706-7-7 [Fettus, Geoffrey])

Comment: As stated above, the 2004 OECD Nuclear Energy Agency report states that "it can be anticipated, due to this better ductility that, for modern alloys, the rod balloons will be bigger and the resulting flow blockage geometry at burst higher with more radial and axial extension than for Zy4 [an older zirconium fuel-cladding alloy] rods when experiencing the same conditions at burst."⁶⁶ [footnote 66 text: OECD Nuclear Energy Agency, "Summary Record of the Experts meeting on the proposed OECD-IRSN STLOC Project," NEA/CSNI/R(2004)1, January 13, 2004, p. 17.] (0706-7-8 [Fettus, Geoffrey])

Comment: The coplanar blockage of sausage-like fuel-cladding balloons (sections with a substantial axial extension) that had relocated fuel fragments, would impede the local cooling of the fuel assemblies; and local blockage-section surface temperatures could increase up the point at which the zirconium fuel-cladding began to rapidly chemically react with either steam or air at approximately 1000°C (1832°F) or 900°C (1652°F), respectively. (0706-7-9 [Fettus, Geoffrey])

Comment: B. NRC's Assessment of the Impacts of Nuclear Waste Storage in the DGEIS Fails to Account for These Critical Site-Specific Concerns[.] 1. Indian Point Site-Specific Factors are Highly Relevant to Assessing Spent Fuel Pool Accident and Fire Risks and Consequences[.] The NRC's analysis of spent fuel pool fires in Appendix F of the DGEIS employs a generic approach that improperly fails to consider or "bound" the impacts that could occur in light of the site-specific factors discussed above. In particular, in light of the site-specific factors explained above, a spent fuel pool-related accident and/or fire at Indian Point may result in more broad-ranging, intense, and severe impacts than have been "studied" or accounted for in the DGEIS. It is well-established that the environmental impacts of catastrophic spent fuel pool fires, resulting from any of a variety of unforeseen circumstances, can be quite severe and encompass enormous geographic areas, and last for decades.⁴⁰ [footnote 40 text: See Dr. Jan Beyea, *Report to the Massachusetts Attorney General on the Potential Consequences of a Spent-Fuel Pool Fire at the Pilgrim or Vermont Yankee Nuclear Plant* (May 25, 2006), available

at, <http://pbadupws.nrc.gov/docs/ML1209/ML12094A181.pdf>; NRDC, Nuclear Accident at Indian Point: Consequences and Costs, *available at*, http://www.nrdc.org/nuclear/indianpoint/files/NRDC-1336_Indian_Point_FSr8medium.pdf; Thompson, Risk-Related Impacts; see also German Reactor Safety Org., *Protection of German Nuclear Power Plants Against the Background of the Terrorist Attacks in the U.S. on Sept. 11, 2001* (Nov. 27, 2002) (finding that large jetliners crashing into nuclear facilities under different scenarios could cause uncontrollable situations and the release of radiation); Lyman, Chernobyl on the Hudson, *supra* Note 30.] Thus, if a spent fuel pool accident and/or fire occurred at Indian Point, given the unique circumstances surrounding the plant, the impacts would be considerable. For example: the high population density surrounding Indian Point, coupled with the complete inadequacy of emergency evacuation procedures, means that the public health impacts of a severe, beyond design basis radiological release would be severe and potentially catastrophic. Moreover, because Indian Point is located near NYC, i.e., an area encompassing high value real estate, a spent fuel pool-related accident would result in severe economic impacts to the New York City metropolitan area and quite possibly the nation as a whole. Dr. Edwin Lyman has explained that the “radiological exposure of the population and corresponding long-term health consequences” from a catastrophic release of radioactive material “could be extremely severe, even for individuals well outside of the 10-mile emergency planning zone”; Dr. Lyman calculated “that over 500,000 latent cancer fatalities could occur under certain meteorological conditions” and that “even in the case of 100% evacuation within the 10-mile EPZ and 100% sheltering between 10 and 25 miles, the consequences could be catastrophic for residents of New York City and the entire metropolitan area” and that “[t]he economic impact and disruption for New York City residents . . . could be immense, involving damages from hundreds of billions to *trillions* of dollars, and the *permanent displacement of millions of individuals*.”⁴¹ [footnote 41 text: Lyman, Chernobyl on the Hudson, *supra* Note 30, at 23, 54 (emphasis added).] A 2011 analysis by the Natural Resources Defense Council conducted after the Fukushima Daichi disaster explains that “[a]n accident at one of Indian Point’s reactors on the scale of the recent catastrophe in Japan [which involved spent fuel pool failures] could cause a swath of land down to the George Washington Bridge to be uninhabitable for generations due to radiation contamination.”⁴² [footnote 42 text: NRDC, Nuclear Accident at Indian Point: Consequences and Costs, *available at*, http://www.nrdc.org/nuclear/indianpoint/files/NRDC-1336_Indian_Point_FSr8medium.pdf.] The economic and social significance of rendering the NYC metro area *uninhabitable*, as well as drinking water supplies unusable, cannot be overstated. Moreover, a SFP accident could also devastate the unique critical and significant surrounding ecosystems of the historic Hudson River. (0710-14 [Brancato, Deborah] [Musegaas, Philip])

Comment: B. NRC’s Assessment of the Impacts of Nuclear Waste Storage in the DGEIS Fails to Account for These Critical Site-Specific Concerns[.] Despite the inherent uniqueness of the risks at Indian Point, the DGEIS bases its generic spent fuel pool fire analysis on a single pool fire at the Surry Nuclear Plant in Virginia.⁴³ [footnote 43 text: See DGEIS, Appendix F (citing Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants (NUREG-1738), *available at*, <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1738/>).] The differences between the Indian Point and Surry reactor sites could not be more stark. For example, the Environmental Report for Surry’s license renewal review states that less than 400,000 people live within 20 miles of the reactor, equating to 294 persons per square mile.⁴⁴ [footnote 44 text: Applicant’s Environmental Report – Operating License Renewal Stage Surry Power Station Units 1 and 2 Virginia Electric & Power Company License Nos. DPR-32 and DPR-37, *available at*, http://www.nrc.gov/reactors/operating/licensing/renewal/applications/northanna-surry/surry_env.pdf (last accessed Dec. 19, 2013).] Surry has less than two million people living

within a 50 mile radius.⁴⁵ [footnote 45 text: *Id.*] In contrast, the EIS for Indian Point's license renewal states that, over one million people live within 20 miles, and approximately 17 million people live within a fifty mile radius.⁴⁶ [footnote 46 text: Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3 (NUREG-1437, Supplement 38), *available at*, <http://pbadupws.nrc.gov/docs/ML1033/ML103350405.pdf>, at p.2-124; see also Bill Dedman, *Nuclear Neighbors: Population Rises Near US Reactors*, NBC New.com, http://www.nbcnews.com/id/42555888/ns/us_news-life/t/nuclear-neighbors-population-rises-near-us-reactors/#.UrNSx8Kx7IU last accessed Dec. 19, 2013).] Within Indian Point's twenty mile radius, the population density is 886 persons per square mile, nearly three times as many as live near Surry. The NRC ignores this enormous population difference entirely in the DGEIS, and inexplicably relies on the Surry Plant as a generic baseline site for its spent fuel pool fire risk and consequence analysis. Clearly, the consequences of a spent fuel pool fire would be much more severe at Indian Point than they would at Surry, given the potential numbers of people living in proximity to Indian Point. In addition, the Surry base case utilized by NRC assumes a single pool fire, despite the fact that Indian Point and many other reactor sites have multiple reactors operating in close proximity.⁴⁷ [footnote 47 text: In New York, for example, the Nine Mile Point and Fitzpatrick nuclear power plants are located on adjacent sites.] Yet the NRC utterly fails to provide any rationale for its reliance on a single unit pool fire at a reactor with relatively low population density in surrounding communities.⁴⁸ [footnote 48 text: In fact, the NRC appears to be relying on Surry simply because the pool fire consequence analysis in the DGEIS is largely drawn from NUREG-1738, a spent fuel pool severe accident study. However, that study is particularly unhelpful since it was completed prior to the 9/11 attacks, and thus does not consider a scenario in which a spent fuel pool loses cooling water or is otherwise damaged due to terrorist attack.] (0710-15 [Brancato, Deborah] [Musegaas, Philip])

Comment: Thus, NRC's spent fuel pool fire impact analysis is factually and legally deficient for failing to encompass within its analysis, or otherwise consider, the reasonably foreseeable impacts that could occur as a result of a spent fuel pool accident and/or fire at Indian Point. NRC's generic approach to considering the consequences of spent fuel pool accidents is insufficient, and site-specific assessment is necessary and warranted. In addition, NRC should have also considered the unique, site-specific safety and security issues facing Indian Point, as well as seismic risks, in relation to assessing the *risk* of future spent fuel pool-related fires. That is, the circumstances present at Indian Point increase the risks of such accidents, yet such factors were not "bounded" or considered by NRC. Instead, the NRC continues to rely on a generic probability risk analysis that is largely inapplicable to Indian Point, particularly when it comes to the risk of a pool fire resulting from a terrorist attack. This also renders NRC's assessment in the DGEIS inadequate. (0710-16 [Brancato, Deborah] [Musegaas, Philip])

Comment: Tons of highly radioactive "spent" fuel are building up at every nuclear reactor site in the country, stored at high density in water-filled pools in buildings that could not withstand a hostile action and also offer no containment of radioactivity in the event of a procedural accident or natural disaster. If pools are even partially drained they pose a risk of catastrophic fire. (0711-14 [Olson, Mary])

Comment: NRC staff have not addressed the realities implied in the short statement above. By choosing to take a "reference" reactor approach, by failing to apply the full extent to which multiple factors may influence outcomes, and also failing to re-contextualize the calculations to include the over 100 existing sites and how this changes probability, we reject the work offered in NUREG 2157 on fuel pool fires completely. We offer questions on this in the QUESTIONS

attachment. NRC appears to have avoided the court's order to assess the consequences of fuel pool fires; we do not accept the idea that low probability is the same as no consequence. (0711-15 [Olson, Mary])

Comment: How long do pyrophotic properties persist? Are pyrophoric properties a function of time? Are pyrophoric properties a function of burn-up? (0711-32 [Olson, Mary])

Comment: What is the (total) probability in any given year of a fuel pool fire in the USA with 100 operable reactors? In the world? (0711-33 [Olson, Mary])

Comment: If you apply reactor-years to the probability assessment for fuel pool fire, what is the projected probability of a fuel pool fire SOMEWHERE in the USA during the period of existing nuclear licenses? (0711-41 [Olson, Mary])

Comment: The dangers of major radioactive releases from spent fuel pools have been underestimated for decades. The precarious state of the spent fuel pool in Unit 4 at the Fukushima Dai-ichi nuclear station has focused the world's attention on the issues at stake. Calculations have shown that the inventory of radioactive cesium in that spent fuel pool alone is more than 80 times the total amount of radioactive cesium released during the Chernobyl disaster in 1986. Massive radioactive releases from the irradiated fuel in a spent fuel pool could result from a prolonged loss of cooling, an accidental criticality accident [nuclear fission] brought about by a shift in the geometry of the spent fuel assemblies in the pool, or in the case of an extreme situation of overheating, a spent fuel fire igniting the zirconium cladding in adjacent irradiated fuel assemblies. (0714-2-1 [Edwards, Gordon])

Comment: In 2001, NRC issued a technical study called NUREG-1738 that examined the risk of spent fuel pool fire.³⁰ [footnote 30 text: Nuclear Regulatory Commission, NUREG-1738, *Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants*, ("NUREG-1738") ML010430066 (Feb. 2001).] That study found that, if a pool lost enough water to uncover the spent fuel assemblies, the spent fuel could heat to the point where the fuel's zirconium cladding might catch fire.³¹ [footnote 31 text: *Id.* at 2-1 to 2-3, A1A-1 to A1A-6. For an illustrated explanation of how a zirconium fire could occur, see The New York Times, Hazards of Storing Spent Fuel, (Mar. 18, 2011), *available at*: <http://www.nytimes.com/interactive/2011/03/12/world/asia/the-explosion-at-the-japanese-reactor.html?ref=asia>.] A zirconium fire could generate a radioactive plume causing thousands of deaths from cancer.³² [footnote 32 text: *Id.* at Appendix 4A, Attachment 1; *NAS Report* at 49-50.] Other studies submitted to NRC reached the same conclusion about the adverse consequences of a zirconium fire.³³ [footnote 33 text: Robert Alvarez, et al., *Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States*. Science and Global Security, Vol. 11:1-51, at 7-11 ("*Reducing the Hazards*") (Jan. 22, 2003); Beyea, Lyman, von Hippel, *Damages from a Major Release of 137Cs into the Atmosphere of the United States*, Science and Global Security, Vol. 12:125-136 ("*Damages from a Major Release*") (Jan. 21, 2004).] The graph below, taken from NUREG-1738, shows that for decay times of less than about 2 years for pressurized water reactors ("PWRs") and 1.5 years for boiling water reactors ("BWRs"), "it would take less than 10 hours for a zirconium fire to start or for significant fission product releases to begin once the fuel was fully uncovered and the fuel was cooled by an air flow of about two building volumes per hour. The figure also shows that after 4 years, PWR fuel could reach the point of fission product release in about 24 hours."³⁴ [footnote 34 text: NUREG-1738 at A1A-4.] [Figure inserted] NUREG-1738 also found that "[h]eat removal is very sensitive to" plant- specific factors, including "fuel assembly geometry" and "rack configuration," and is "subject to unpredictable changes after an earthquake or cask drop that drains the pool."³⁵

[footnote 35 text: *NUREG-1738* at x.] Following the release of *NUREG-1738*, NRC's Director of Operations issued a memorandum acknowledging that "a zirconium fire event can have public health and safety consequences similar to a severe core damage accident with a large offsite release" and "that the possibility of a zirconium fire cannot be dismissed even many years after final reactor shutdown."³⁶ [footnote 36 text: Nuclear Regulatory Commission, SECY-01-0100, NRC Policy Issue (Notation Vote) Memorandum from William D. Travers, Executive Director for Operations to NRC Commissioners, *Policy Issue Related to Safeguards, Insurance, and Emergency Preparedness Regulations at Decommissioning Nuclear Power Plants Storing Fuel in Spent Fuel Pools* (WITS 200000126), at 5, 2 (June 4, 2001).] (0718-1-14 [Sipos, John])

Comment: Similarly, in the relicensing proceeding for the Pilgrim nuclear power plant in Massachusetts, Dr. Gordon R. Thompson of the Institute for Resource and Security Studies submitted a report in June 2011 discussing the significant new information coming from Fukushima.⁹⁸ [footnote 98 text: *See Thompson 2011 Report.*] Thompson explained that the "Fukushima experience shows clearly that the operators' capability to mitigate an accident . . . can be severely degraded in the accident environment."⁹⁹ [footnote 99 text: *Id.* at 20.] One example of this was the operators' inability to add water to Unit 4's spent fuel pool for several days following the hydrogen explosion. (0718-2-6 [Sipos, John])

Comment: The authors of *NUREG-1738* were very careful to spell out the limitations of their generic approach for decommissioning plants. Subsequent documents like DGEIS and the Denial of Rulemaking Petitions in 73 Fed. Reg. 46,204 do not repeat these warnings. The following are examples of limitations that are identified in *NUREG-1738*. Regarding the age of the fuel beyond which a spent fuel pool fire can be ruled out (USNRC 2001, p. 2-1): "*...the revised analyses show that it is not feasible, without numerous constraints, to define a generic decay heat level (and therefore decay time) beyond which a zirconium fire is not physically possible. Heat removal is very sensitive to these constraints, and two of these constraints, fuel assembly geometry and spent fuel pool rack configuration, are plant specific.*" See also SECY-01-0100. Regarding the pool fire frequencies for all initiators (US-NRC 2001, p. 3.7): "*Plant-specific frequency estimates in some cases could be as much as an order of magnitude higher or lower because of the seismic hazard at the plant site.*" Regarding the possibility for air cooling following damage caused by severe weather (US-NRC 2001, p. 3-10): "*For loss of offsite power events caused by severe weather, the staff assumed a 90 percent partition for the high airflow case. This is based on a staff assumption that openings in the SFP building (e.g., doors and roof hatches) are large enough that, if forced circulation is lost, natural circulation cooling will provide at least two building volume of air per hour to the SFP. This assumption may need to be confirmed on a plant-specific basis.*" Regarding the low initiating event frequency⁵ [footnote 5: Throughout this report, the terms probability and frequency are used. Frequency is simply probability, expressed on a per-year basis. Thus, the event frequency is the probability that an event will occur within one year.] for the loss of pool inventory (US-NRC 2001, p. 3-12): "*These assumptions may be non-conservative on a plant-specific basis depending on SFP configuration and commitments for configuration control.*" Regarding the likelihood of loss of cooling, loss of inventory, and loss of off-site power (US-NRC 2001, p. 3-12): "*Initiating event frequencies for loss of cooling, loss of inventory, and loss of offsite power are based on generic data. In addition, the probability of power recovery is also based on generic information. Site-specific differences will proportionately affect the risk from these initiating events.*" Regarding the assumption that leaks are self-limiting (US-NRC 2001, p. A2A-67): "*For the loss of inventory event tree, the assumption that the leak is self-limiting after a drop in level of 15 feet, may be a more significant assumption that, on a site specific basis may be non-conservative, and requires validation.*" (0718-3-11 [Sipos, John])

Comment: In addition, NUREG-1738 relies on a series of Industry Decommissioning Commitments (IDC) and Staff Decommissioning Assumptions (SDA) that are spelled out and are assumed to apply generically to all plants (US-NRC 2001, p. 4-11 and 4-12). NUREG-1738 bases its analysis on the assumption that these commitments and assumptions are met. If they are not, the analysis carried out in NUREG-1738 may not be valid at a specific site. By contrast, the authors of the DGEIS use less definite language (US-NRC 2013, p. F8): *"In general, health impacts could be higher than the values reported in these studies if the amount of spent fuel involved in a fire (and, thus, the amount of radioactive material that could be released) was higher than assumed in these studies or the total population and population density were higher."* Later, in the DGEIS (US-NRC 2013, p. F-7): *"As with health impacts, the economic impacts would vary for different facilities. For example, higher total population or population density could result in higher relocation costs, and land use (e.g., whether land is used as farmland or not) could also impact decontamination and condemnation costs."* (0718-3-12 [Sipos, John])

Comment: In summary, it seems that the US-NRC's critique in the Denial of the Petition for Rulemaking of petitioners' assertion that fuel will burn regardless of age, quoted below (US-NRC 2008), is equally applicable to the conclusions of the DGEIS: *"This conclusion, however, was in no sense a statement of certainty and was made in order to reach a conclusion on a generic basis, without relying on any plant-specific analyses."* Likewise, US-NRC's assessment of spent fuel pool fire risk in the DGEIS Appendix F and determination that such risk is "small" is in no sense a statement of certainty regarding the risk at any given plant. (0718-3-13 [Sipos, John])

Comment: With respect to site specific characteristics, it should be noted that as of 1990, the Indian Point site had 15.1 million people living within 50 miles of the site – more than twice the number that lived within 50 miles of the Zion site. (US-NRC 1996, p. 2-2 to 2-8 stating that Indian Point had "almost 2000 persons per square mile"). These population totals have increased since 1990. US-NRC reports that as of 2000, 16.8 million people lived within 50 miles of Indian Point (US-NRC 2013, p. 3-8), and that as of 2010 approximately 17 million people lived within 50 miles of Indian Point.⁶ [footnote 6 text: The population within 50 miles of Indian Point is based on 2010 census data obtained from reference (US-NRC 2012b).] To ISR's knowledge, US-NRC has not disclosed or released the results of any site-specific MACCS2 analysis of a severe accident at the Indian Point spent fuel pools. Thus, it is not possible to compare the results of the Zion assessment to an Indian Point-specific assessment, and determine whether the differences are significant. (0718-3-15 [Sipos, John])

Comment: Section E.3 of the DGEIS discusses historical data on spent fuel pool leaks. It discusses the 13 sites where occurrences of spent fuel leaks that have been documented. However, the DGEIS does not include an exhaustive look at event reports and accidents precursors that should inform the assessment of environmental risks from the spent fuel pools. Since the publication of NUREG-1275 in 1997, there have been many event reports that could inform the DGEIS, and that should be described in the DGEIS. As an example, one of the assumptions included in the DGEIS is that pool drainage is not credible, based on the configuration of spent fuel pools. NUREG-1738, p. 3-5 (and again on p. 3-11, p. 3-15): *"Plants do not have drain paths in their SFPs that could lower the pool level (by draining, suction, or pumping) more than 15 feet below the normal pool operating level, and licensees must initiate recovery using offsite sources."* NUREG-1738, p. 3-6: *"IDC #6 Spent fuel pool seals that could cause leakage leading to fuel uncover in the event of seal failure shall be self-limiting to leakage or otherwise engineered so that drainage cannot occur."* These assumptions may not

be compatible with the configuration of some of the spent fuel pools, as the event report shown in Figure 1 shows. (0718-3-18 [Sipos, John])

Comment: While NUREG-1738 is clear that plants that do not pass the seismic checklist would not qualify for the exemptions on emergency preparedness (EP), indemnification or security, the DGEIS is far from clear on what would happen in a specific plant could not meet some of the conditions listed in NUREG-1738. Neither the DGEIS, nor NUREG-1738, lists exactly which plants meet the NUREG-1738 conditions and which plants do not. (0718-3-19 [Sipos, John])

Comment: NUREG-1738 was published before both the September 11 terrorist attacks and the severe accident at the Fukushima Dai-ichi nuclear power plants. Since the DGEIS relies on NUREG-1738 for the assessment of the consequences of a spent fuel pool fire, the quantitative analysis of consequences in the DGEIS does not include lessons learned from these two later events. (0718-3-8 [Sipos, John])

Comment: The DGEIS Appendix F qualitatively discusses NRC's orders following the September 11 terrorist attacks and the "lessons learned" NRC is developing and implementing in response to accident at Fukushima Dai-ichi. NRC's consideration of these safety enhancements is solely in the context of the probability that a spent fuel pool fire would occur. See DGEIS at F-12 ("These measures further reduce the probability of a spent fuel pool fire, and thus further increase the conservatism of NUREG-1738."). The DGEIS, however, does not quantify the reduction in probability or clearly explain which post-September 11 or post-Fukushima measures generically reduce the probability. (0718-3-9 [Sipos, John])

Comment: Two different seismic hazard estimates have been developed for U.S. reactor sites, one developed by Lawrence Livermore National Laboratories (LLNL) and one by the Electric Power Research Institute (EPRI). Using the site-specific LLNL seismic hazard estimates, the mean spent fuel pool failure probability for the sites analyzed by LLNL is about 2×10^{-6} per year and covers a range 6×10^{-7} per year to 1.5×10^{-5} per year (US-NRC 2001, p. 3-22). For the EPRI hazard estimates, the mean value of the pool failure frequency is about 2×10^{-7} per year and it covers the range 3×10^{-9} per year to 2×10^{-6} per year (US-NRC 2001, p. 3-21). The plants that have the lowest and highest seismic risks are not identified in the analysis. (0718-4-1 [Sipos, John])

Comment: As detailed in Section C.2.12 of COMSECY-13-0030, which adopts the Consequence Study, a sensitivity analysis was carried out as part of the Consequence Study to analyze the effect of population density on the offsite consequences. A summary of this analysis is shown in Table 2 below. The COMSECY contains the following warning regarding the Consequence Study's results: "*...the results are not representative of any specific site because site specific meteorology for these sites is not used.*" (US-NRC 2013a, p. 99) Despite this disclaimer, the conclusion of the COMSECY's sensitivity analysis is that population density is not a key parameter, i.e., US-NRC has decided that population density is not a variable that can significantly affect consequence calculation results (USNRC 2013a, p. 21). (0718-4-11 [Sipos, John])

Comment: Because many plants are located in low population areas, Peach Bottom's population may be representative of some plants. Given the combination of Indian Point's population and predominate wind direction, the results of US-NRC's Peach Bottom analysis are not applicable to Indian Point. As shown in Figure 3 below, the population density within 50 miles of the Indian Point site is far greater than even those considered in the Consequence Study's sensitivity analysis.⁷ [footnote 7 text: The population density within 50 miles of the Indian

Point site is derived from the 2010 census data presented in reference (US-NRC 2012b).] With the combination of higher population and a dominant wind direction toward the most populated areas, it is reasonable to expect that the consequences to the public surrounding Indian Point may be over 100% greater than the base case used in the Consequence Study. This increase is equally applicable for the calculation of economic costs, which does not appear to be included in the sensitivity analysis for population density. (0718-4-12 [Sipos, John])

Comment: There are several factors that must be considered alongside a significantly larger population, such as those who reside within 50 miles of the Indian Point reactor; building density is one such factor. With a larger building density than that of the reference site used in the Consequence Study, there are many more surfaces in urban environments that effectively deplete the amount of contamination in an airborne plume. This results in higher levels of contamination and thus greater radiological and economic costs (e.g., the cost of decontamination). Annex B provides a discussion of surface roughness as it relates to deposition velocity of radioactive particulate in urban environments. (0718-4-13 [Sipos, John])

Comment: The Consequence Study's value of nonfarm wealth (VALWNF) includes all public and private property not associated with farming that would be unusable if the region was rendered either temporarily or permanently uninhabitable. This value includes the cost of land, buildings, infrastructure, and the cost of any non-recoverable equipment or machinery (MACCS2 manual). The value chosen for the Consequence Study, which uses the Peach Bottom site as the reference case, is \$210,000/person (2012 USD). By its definition, this value is site-specific. As a comparison, in its submission for a licence renewal for Indian Point Units 2 and 3, the operator of the Indian Point reactors, Entergy, calculated VALWNF to be \$209,000/person (2004 USD) for the site. Entergy's value is approximately \$250,000/person in 2012 USD, which is 20% higher than the value used in the Consequence Study. As a further comparison, the corresponding value for VALWNF deemed appropriate in ISR Report 13014-01-01 is approximately \$284,000/person (2004 USD).⁸ [footnote 8 text: Appropriate value for Indian Point derived from ISR Report 13014-01-01: Review of Indian Point Severe Accident Off Site Consequence Analysis (Dec. 21, 2011) (ML12334A761) as modified in Revisions to Tables in ISR Report 13014-01-01 (Jun. 28, 2012) (ML12340A648).] In 2012 USD, this equates to \$345,000/person, which is 64% higher than the value used in the Consequence Study. (0718-4-14 [Sipos, John])

Comment: The Consequence Study's per capita cost of long-term relocation (POPCST) takes into account both personal and corporate income losses, as well as moving expenses, for a transitional period. The value chosen for the Consequence Study is \$12,000/person (2012 USD). This value is site-specific. For example, in the state of New York, the average per capita income is approximately \$32,000 (2011 USD). Using an interdiction period of 140 days as recommended in NUREG/CR-4551, the total amount of lost wages is \$12,500/person (2012 USD). With the addition of corporate income losses and moving expenses, this amount for Indian Point is expected to be higher than the value used in the Consequence Study. (0718-4-15 [Sipos, John])

Comment: In the Consequence Study, the decontamination time for both decontamination levels is entered as one year. The selection of one year differs from the decontamination times used in NUREG-1150 of 60 and 120 days for light and heavy decontamination, respectively. The Consequence Study does not explain why one year was selected instead of 60 and 120 days. In any event, decontamination time is also site-specific and the decontamination efforts required particularly for urban areas could increase the decontamination time beyond one year. Furthermore, the Consequence Study should have discussed and considered the unfolding

experience of decontamination following the 2011 Fukushima accident. As of the date of this report (December 2013), the Fukushima decontamination has not been completed even though two and a half years have passed since the accident occurred. Indeed, it is expected to take several more years. Thus, it is questionable to use one year for the TIMDEC input for both light and heavy decontamination in the Spent Fuel Consequence Study MACCS2 analysis; the decision to use one year should be explained and substantiated. (0718-4-16 [Sipos, John])

Comment: The DGEIS uses the risk assessment from NUREG-1738, which relies on a series of Industry Decommissioning Commitments (IDC) and Staff Decommissioning Assumptions (SDA) that are spelled out and are assumed to apply generically to all plants (US-NRC 2001, p. 4-11 and 4-12). Since Indian Point Unit 2 and 3 have not been decommissioned, it is not known which of these assumptions are actually met in the operating plants. The consequences of not meeting these assumptions should be spelled out in the DGEIS. (0718-4-18 [Sipos, John])

Comment: The DGEIS uses an average site seismicity corresponding to a frequency of exceeding 1.2 g of 2×10^{-7} per year to 2×10^{-6} per year. The actual frequency of exceeding 1.2 g at the Indian Point site is not quoted in the DGEIS or NUREG-1738; although the data shown in Figure 10 of COMSECY-2013-0030 (p.81) suggests that this frequency is greater than 2×10^{-6} per year. The recent US-NRC GI-199 report (US-NRC 2010, p. B-7) reports the safe shutdown earthquake, SSEPGA = 0.15 g for the Indian Point site, and the high confidence of a low probability of failure, HCLPFGA = 0.3 g for IP-2 and 0.15 g for IP-3. The safe shutdown earthquake is the largest earthquake that must be considered in the design. The high confidence of a low probability of failure earthquake takes into account the fragility of the plant. Chapter 9 of the IP2 and IP3 Final Safety Analysis Reports (FSARs) indicates that the SFP structures are classified as Seismic Category I. The IP2 FSAR is specific regarding the design criteria, and indicates that the IP2 SFP was designed in accordance with the provisions of American Concrete Institute (ACI)-318, "Building Code Requirements for Reinforced Concrete" (see Section 9.5.2.1.4 of the IP2 FSAR). The 1989 license amendment issued for IP3 SFP re-rack indicates that the design criteria used to evaluate the SFP structure are based on the provisions in ACI 349-80, "Code Requirements for Nuclear Safety-Related Concrete Structures." Based the classification of these structures indicated above, they are required to be designed against bounding loading combinations which include loads due to a safe shutdown earthquake. As such, the structural analyses are performed to ensure that the SFPs will remain functional during and after a safe shutdown earthquake (Boska 2011). (0718-4-19 [Sipos, John])

Comment: Based on the frequencies listed in Table 3.7-3 (US-NRC 2001, p. 3-35) the frequency of boil down events does not seem to consider loss of offsite power, and internal fire triggered by seismic events. NUREG-1738 considers the risk contribution of earthquakes that damages pool support systems in the seismic risk of pool fire (US-NRC 2001, p. 3-9, A2B-3). The return frequency of the earthquakes is assumed to be 1 : 4000 years and a failure to obtain off- site resources in a timely manner is assumed to be 1×10^{-4} . If loss of offsite power and internal fires triggered by seismic events were considered at the same earthquake return frequency as for the damage to pool support systems, the probability of these initiating events could increase. (0718-4-2 [Sipos, John])

Comment: Section 3.4.3 of this report discusses the importance of various MACCS2 input parameters in determining the offsite population dose cost and offsite economic cost following a severe accident at a spent fuel pool. The following table summarizes those input parameters and values used in the Consequence Study that are site-specific to the Peach Bottom reference plant and compares them to appropriate values for Indian Point. Table 3: Summary of site-specific MACCS2 input parameters relevant to Indian Point [table inserted] *The ISR Report and

updated tables submitted in the context of the Indian Point relicensing proceeding provided a suggested range of appropriate values for each of these parameters. For the sake of simplicity, and for illustrative purposes in this DGEIS proceeding, only the minimum value is represented here in Table 3. Values were CPI-adjusted to 2012 USD. The reader is directed to ISR Report 13014-01-01: Review of Indian Point Severe Accident Off Site Consequence Analysis (Dec. 21, 2011) (ML12334A761) as modified in Revisions to Tables in ISR Report 13014-01-01 (Jun. 28, 2012) (ML12340A648) for a complete discussion of site-specific input parameters for Indian Point, which also include higher input values. Furthermore, the DGEIS uses the population density around the Zion plant, 860 people per square mile, while the population density surrounding Indian Point is over 2100 people per square mile. (0718-4-20 [Sipos, John])

Comment: The total probability of pool drainage from NUREG-1353 (2×10^{-6} events per year) is based on best estimates of the frequency of various event sequences, and is dominated by the seismic risk of structural failure (US-NRC 1989, p. 4-36). It should be noted that NUREG-1738 uses the average probabilities for the seismic events (p. 3-9) and acknowledges that site-specific values could be ten times higher or lower (p. 3-7). The DGEIS relies upon these average probabilities from NUREG-1738, reporting them in Table F-1 (US-NRC 2013, p. F-4). The DGEIS, however, does not include the caveat from NUREG-1738 that site-specific probabilities could vary by a factor of ten. Nor does the DGEIS provide examples of sites that would have higher or lower probabilities, or explain how or if the probabilities reported in NUREG-1738 conservatively bound the range of accident probabilities. (0718-4-3 [Sipos, John])

Comment: For the cask drop event, NUREG-1738 bases the calculation of the probability of pool failure on Navy data and NUREG-0612 heavy loads evaluation (US-NRC 1980). For single failure-proof system, the frequency of catastrophic pool failure is 2×10^{-7} events per year. The frequency of catastrophic pool failure for non-single failure-proof system is 2.1×10^{-5} events per year, which exceeds the proposed pool performance guideline of 1×10^{-5} events per year. US-NRC believes that the frequency of pool failure can be reduced by performing a comprehensive and rigorous load drop analysis. For this reason, NUREG-1738 (Table 3.1, p. 3-9) and DGEIS quote the probability of cask drop as 2×10^{-7} events per year and ignores the calculation of the probability of cask drop for non-single failure-proof system. The US-NRC needs to show how the load drop analysis will change the human error rate calculation and reduce the frequency of cask drop events. In addition, the calculation presented on page 3-17 of NUREG-1738 is unclear. (0718-4-4 [Sipos, John])

Comment: For the single-failure-proof handling system, the load drop frequency is 9.6×10^{-6} y⁻¹ and the catastrophic failure is 2×10^{-7} y⁻¹, for a ratio of $2.08 \times 10^{-2} = 0.13 \times 0.16$. This matches the description given in the text. For non-single-failure-proof handling system the frequency of load drop is 3.4×10^{-4} y⁻¹ and the mean value for the catastrophic failure rate is 2.1×10^{-5} y⁻¹. The ratio is 6.2×10^{-2} catastrophic failure per transfer. How US-NRC arrived at this value is not clear. (0718-4-5 [Sipos, John])

Comment: The calculation of the societal risk quantities, including collective dose, collective early fatality, and latent fatality, as well as total economic costs is heavily dependent on the population density surrounding a particular site. The values in Table 1 were all calculated for the Zion site, using a population density of 860 people per square mile surrounding the site, as reported in US-NRC's 1996 GEIS for License Renewal. Zion's population density is not representative of some sites such as Indian Point, which had a population density of "almost 2000 persons per square mile," as reported in US-NRC's 1996 GEIS for License Renewal (US-NRC 1996, p. 2-2 to 2-8). Because Indian Point is surrounded by more than double the population density of Zion, the accident consequences would most certainly be significantly

higher for Indian Point than the consequences reported for Zion in Table 1. The DGEIS does not discuss differences in population density among sites, or calculate the effect those differences would have on the consequence calculations. (0718-4-6 [Sipos, John])

Comment: Table F-2 (p. F-8) of the DGEIS presents a comparison of frequency-weighted consequences from severe reactor accidents and spent fuel pool fires. For spent fuel pool fires, Table F-2 multiplies the consequences presented in Table 1 by the average frequency for accident presented in Table 1, to produce frequency-weighted consequences. Multiplying the average values for the frequency and the consequences is acceptable if the probability distributions are un-correlated (see elaboration provided in Annex A). If the same plants that have a higher frequency of severe earthquakes also have the highest density of population around the site, the values calculated in Table F-2 of the DGEIS may under-represent the average risk. (0718-4-7 [Sipos, John])

Comment: US-NRC should calculate the correlation coefficient between the frequency of seismic events for the Zion site and the density of the population around the Zion site and use this correlation coefficient to correct the frequency-weighted probabilities presented in Table F-2 of the DGEIS. Alternatively, the US-NRC should calculate the collective dose- risk and the economic cost-risk for each site and re-calculate the average. (0718-4-8 [Sipos, John])

Comment: Ensure that the conclusions of the DGEIS are based on actual practices and conditions at spent fuel pools at various sites around the U.S. Explicitly list and describe those sites that have spent fuel pools that do not meet an assumption or condition included in the DGEIS or documents relied upon by the DGEIS. (0718-5-1 [Sipos, John])

Comment: The DGEIS should either employ conservative bounding or direct site-specific review for certain plants like Indian Point. (0718-5-2 [Sipos, John])

Comment: Document explicitly how the assessment of event frequencies includes the contribution of seismic events to loss of offsite power and internal fire. (0718-5-5 [Sipos, John])

Comment: Show how the load drop analysis required for non-single failure proof cranes changes the human error rate calculation from 2.1×10^{-5} per year to 2×10^{-7} per year for cask drop events. (0718-5-6 [Sipos, John])

Comment: Revise the calculation of the societal risk-dose and the economic risk-cost to account for the possible correlation between the seismic risk and the population density. (0718-5-7 [Sipos, John])

Comment: Include an analysis of the impact of new monitoring, and post-accident response measures put in place for intentional, malevolent actions since 9/11 and the Fukushima event, listing which plants have implemented which measures and quantify how those measures affect risk. (0718-5-8 [Sipos, John])

Comment: Why not pay heed to what the Court ordered? The Court said, "Even though the Commission engaged in a more substantial analysis of fires than it did of leaks, that analysis is plagued by a failure to examine the consequences of pool fires in addition to the probabilities. Petitioners, citing *Limerick Ecology Action, Inc. v. Nuclear Regulatory Commission*, 869 F.2d 719, 739 (3d Cir. 1989), argue that the Commission could only avoid conducting an EIS if it found the risk of fires to be "remote and speculative." The Commission, citing *Carolina Environmental Study Group v. United States*, 510 F.2d at 799, argues that it did not need to

examine the consequences of fires because it found the risk of fires to be very low. We disagree with both parties. As should be clear by this point in our opinion, an agency conducting an EA generally must examine both the probability of a given harm occurring and the consequences of that harm if it does occur. Only if the harm in question is so "remote and speculative" as to reduce the effective probability of its occurrence to zero may the agency dispense with the consequences portion of the analysis. See *Limerick Ecology Action, Inc.*, 869 F.2d at 739. But, contra petitioners, the finding that the probability of a given harm is non-zero does not, by itself, mandate an EIS: after the agency examines the consequences of the harm in proportion to the likelihood of its occurrence, the overall expected harm could still be insignificant and thus could support a FONSI. See *Carolina Env'tl. Study Grp.*, 510 F.2d at 799 ("Recognition of the minimal probability of such an event is not equatable with non-recognition of its consequences."). Here, however, the Commission did not undertake to examine the consequences of pool fires at all. Depending on the weighing of the probability and the consequences, an EIS may or may not be required, and such a determination would merit considerable deference. *C.f.*, *City of New York*, 715 F.2d at 751-52 (deferring to an agency's weighing of a "catastrophic" harm against an "infinitesimal probability"). But unless the risk is "remote and speculative," the Commission must put the weights on both sides of the scale before it can make a determination. (0723-7 [Shadis, Raymond])

Comment: The pools are filled and most now contain decades of accumulated waste, multiple atomic reactor cores-worth of ultra-hazardous irradiated nuclear fuel. Instead of emptying most of the irradiated fuel to dry casks to restore the pools to their original designed low-density configuration, most nuclear plants have kept pools as full as possible regardless of the potential high risk of a pool fire. (0757-2 [Lynch, Laura])

Comment: NextEra agrees with the NRC's ultimate conclusion that the environmental impacts of spent fuel pool leaks and the probability-weighted consequence of spent fuel pool fires would be small. (0808-4 [Petro, James])

Comment: According to a 2011 Time magazine story, in-ground pools are located in buildings next to operating reactors at 73 U.S. sites; attic pools, like the ones at Fukushima, are used at 31 plants. Each pool is a massive radiological dirty bomb waiting to ignite. A 1997 Brookhaven National Laboratory study said such a disaster at one irradiated fuel pool could result in 138,000 deaths and contaminate 2,000 square miles. The NRC dismisses this sort of catastrophe by claiming it has calculated the possibility of such an event to be vanishingly small, because of multiple redundant safeguards. Such calculations were also used to prove the possibility of meltdowns at Fukushima was vanishingly small. These calculations of risk are reminiscent of the flawed fault-tree analysis calculations of the discredited MIT Rasmussen Reactor Safety Report of the 1970's. (0815-2 [Gunter, Keith] [Izant, Carol])

Comment: The NRC continues to downplay and inadequately address the vulnerability of spent fuel pools to accidents, attacks, and fires despite the fact that every reactor continues "re-racking" spent fuel in high density configurations. The NRC justifies its position, in part, by assuming that populations in the 10 mile Emergency Planning Zones (EPZs) will be successfully evacuated in the event of a fire. This ignores the fact that spent fuel can and will remain in pools long after reactor closure because this option is less expensive than dry casks. At the same time, the NRC can exempt utilities from maintaining EPZs within a mere 12-18 months after reactor shutdown. How can populations be evacuated if EPZs have been eliminated? (0819-10 [Kline, Connie])

Comment: Furthermore, spent fuel pools are not under the robust/redundant containment of the reactor, itself, making accidents or attacks more likely to release radiation. The NRC has admitted that even irradiated fuel that has been cooled for decades in pools could spontaneously combust if overheated due to loss of coolant, partial drainage, or contact with air resulting from loss of power, pump circulation failure, pool puncture from loading dry casks (see below) or a terrorist attack. These scenarios would result in disastrous releases of radioactivity into the environment. (0819-11 [Kline, Connie])

Comment: This is especially true when Section F.2.2 entitled probability-weighted consequences of a Spent Fuel Pool Fire is considered where the NRC states that the probability-weighted consequence of a severe nuclear reactor accident is equated to the probability-weighted consequence of a spent fuel pool accident. Under NUREG 2157 the surrounding community could have to live with the possibility of an accident equal in consequence to a severe nuclear reactor accident for up to 60 years after the plant is shut down. While the plant owner/operator decommissions the plant with the spent fuel in the pools rather than in dry casks. (0826-16 [Morgal, Rick])

Comment: Confidence is fostered through knowledge and preparation. To date the NRC has been less than forth coming to the public about known possible consequences associated with a spent fuel fire and its potential impacts on the surrounding community. A prime example of the NRC knowingly covering up the potentially catastrophic outcome of a spent fuel pool fire is found in Draft NUREG-2157's Table F-1 where it is estimated that there would be 191 Collective Early Fatalities from a spent fuel fire. My sense of confidence in the NRC's risk evaluation process is lost with such unreasonably low predictions. (0826-23 [Morgal, Rick])

Comment: In Appendix F of the draft GEIS, the NRC has continued to follow this approach appropriately in assessing the environmental impacts of spent fuel pool fires. Fully addressing the Court's remand, the discussion in Appendix F confirms the extremely remote probability at any site, but potentially severe consequences, of a spent fuel pool fire. The NRC's assessment is based on a substantial technical record that has been developed on this issue over many years by the NRC and its contractors. The NRC has presented data on both short-term and long-term health effects, as well as economic consequences (including evacuation and relocation costs, property damages, and cleanup and decontamination costs). The draft GEIS assessment supports a conclusion of low overall risk and therefore no significant environmental impact. NEI agrees that the environmental impacts associated with a spent fuel pool fire would be small based on the probability-weighted consequences of such an event at all existing reactor sites. In particular, NUREG-1738, "Technical Study of Spent Nuclear Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants" (2001) finds that the probability of a spent fuel pool fire is very low. Regulatory requirements imposed since the study was conducted make a spent fuel pool fire even less likely.⁷⁴ [footnote 74 text: See Draft GEIS at F-11 - F-12.] (0827-2-13 [Ginsberg, Ellen])

Comment: NEI also agrees with the NRC's conclusion that the probability-weighted population doses and economic consequences would be comparable to the values calculated for a reactor accident, as estimated in the 1996 and 2013 License Renewal GEIS. Furthermore, mitigation measures implemented by reactor licensees (including measures adopted or being adopted after the Fukushima event of March 2011) further reduce these consequences, supporting the conclusion that environmental impacts of storage would be small. In total, the analysis of spent fuel pool fires in the draft GEIS is exactly as the Court required - it assesses the consequences of this very low probability of this type of event and the overall impact based on a risk assessment. (0827-2-14 [Ginsberg, Ellen])

Comment: Lastly, NEI strongly encourages the NRC to update Appendix F to reference the NRC's recent spent fuel pool "Consequence Study."⁷⁵ [footnote 75 text: *Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a US Mark I Boiling Water Reactor*, June 2013.] The study represents a significant addition to the body of work currently cited and further confirms NRC's conclusion that the impacts of spent fuel pool fires would be small. The most notable conclusion of this more recent study is that, for the scenario examined, "spent fuel is only susceptible to a radiological release within a few months after the fuel is moved from the reactor into the spent fuel pool."⁷⁶ [footnote 76 text: *Id.* at vii.] (0827-2-15 [Ginsberg, Ellen])

Comment: The risks and perils of storing nuclear waste at reactor sites continue to be ignored. This creates false confidence. Spent fuel is highly flammable and radioactive, yet is primarily stored in densely packed pools of water that contain several times more radioactive fuel than in the nuclear reactor itself. If the cooling system of a fuel pool fails, fuel rods could be exposed and catch fire, resulting in the release of massive quantities of radioactive material. (0840-10 [Taylor, Tom])

Comment: The economic cost estimates of a spent fuel pool accident in the draft generic EIS appear to be very low, perhaps because it is assumed that spent fuel pool accidents will not occur along with reactor accidents or other events. (0851-5 [Thatcher, Tami])

Comment: The NRC considers the risk of spent-fuel pool fires "inconsequential"-but for residents nearby, they would be disastrous. (0864-4 [Gellert, Sally Jane])

Comment: Each nuclear power plant in the United States has different design characteristics since the United States did not pursue a common design approach to NPP. This variability includes the spent fuel pools (SFP). Of concern is what may occur in the event the SFP loses coolant or the consequences of a fire in the pool in which the zirconium casing of the spent fuel catches fire. Significant releases of radiation can result, only if the heat from spent fuel exceeds the capacity to remove heat from the pool. The NRC has examined the frequency of events leading to water loss from the SPF. Despite real world variability inherent in U.S. NPP, the NRC staff has concluded that a generic analysis of SPF is appropriate. Still the NRC itself has questioned such assumptions. Its own documents suggest this when stating: "In its thermal-hydraulic analysis, documented in Appendix 1A, the staff concluded that it was not feasible, without numerous constraints, to establish a generic decay heat level (and therefore a decay time) beyond which a zirconium fire is physically impossible. Heat removal is very sensitive to these additional constraints, which involve factors such as fuel assembly geometry and SFP rack configuration. However, fuel assembly geometry and rack configuration are plant specific, and both are subject to unpredictable changes after an earthquake or cask drop that drains the pool. Therefore, since a non-negligible decay heat source lasts many years and since configurations ensuring sufficient air flow for cooling cannot be assured, the possibility of reaching the zirconium ignition temperature cannot be precluded on a generic basis" (NUREG 1738). This passage suggests that some portions of the NRC staff do not believe that it is possible to generically assess the risks to spent fuel pools. (0867-3-17 [Griffin, William])

Comment: In fact, the DGEIS flouts both NEPA and the Court's application of NEPA in *New York*, 681 F.3d 481 (D.C. Cir. 2012) in multiple ways: The DGEIS asserts that the environmental impact of pool fires is "SMALL," i.e., insignificant. In reaching this conclusion, the NRC uses a flawed concept of risk that is inappropriate to the consideration of potentially catastrophic environmental impacts. The DGEIS also ignores a range of pool fire causes, including the potential for an attack, the substantial cumulative frequency of fires, and the

possibility that the risk environment will become more adverse in the future. If these factors are considered, the environmental impact of accident-induced pool fires is not SMALL, but LARGE. (0897-1-11 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Another significant deficiency in the DGEIS' risk analysis is its failure to consider the relationship between pool fires and operating reactors. Pool storage of spent fuel, as considered in the DGEIS, could occur, and probably will occur, at locations near operational reactors. Risk linkages among spent-fuel pools and operational reactors at a site could be manifested in a cascading sequence of incidents that preclude mitigating actions needed to maintain pools in a safe state. Mitigating actions could be precluded by, for example, a radiation field arising from the release of radioactive material. NRC has never, to Dr. Thompson's knowledge, published a credible technical analysis of a cascading sequence of incidents of this type, or publicly stated that it has performed such analysis in secret. The present state of knowledge suggests that risk linkage among pools and operational reactors leads to an under-estimate of risk by at least one order of magnitude (i.e., factor of 10). Accordingly, the DGEIS should have carefully considered the potential linkage of radiological risk among pools and operational reactors at each site. The DGEIS has not considered this matter. Thompson Declaration, Section X. (0897-6-18 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Importantly, the draft GEIS substantially underestimates the consequences of a pool fire. Those consequences could include the long-term displacement of millions of people, economic damage measured in trillions of dollars, and adverse social and political outcomes. A pool fire yielding these consequences would be a national disaster of historic dimensions. Thompson Declaration, Section X. And as discussed above, very large consequences are qualitatively different than smaller ones. As Dr. Thompson's declaration shows, the nature of pool fire risks is such that a meaningful environmental impact estimate cannot be yielded by simply multiplying probability times consequences. First, some of the key factors are not easily quantifiable; for instance, it is difficult to quantify the probability of an attack, which is easily the greatest threat to a spent fuel pool. As Dr. Thompson suggests, the element of prudence should pay a significant role where a facility is as attractive a target as a fully laden fuel pool. Second, the NRC does not have a full picture of all the factors that could cause a pool fire. For instance, in footnote 5 on page F-9 of the DGEIS, the NRC admits that the seismic risk analysis on which it based its consequence analysis did not include reactors in the western United States, presumably because of the fact that they have been studied less than eastern earthquakes. Third, the NRC has not aggressively pursued research or open public debate about the behavior of spent fuel in pools. As a result, there is not a significant body of rigorous scientific research that can be relied upon, as is more the case with reactor studies. And finally, the consequences of an accident or successful attack on a fuel pool could be catastrophic on a massive scale. Measuring potential damages in billions of dollars is not sufficient to account for the social, economic and political upheaval that such an event may cause. Thus, the NRC's estimate that spent fuel pool fires have insignificant impact is not defensible. In fact, a reasonable assessment of pool fire impacts would conclude they are significant. (0897-6-19 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Health and property damage impacts provide another example. The Draft GEIS acknowledges that population densities are highly variable and that the environs of the Indian Point nuclear plant has the highest density of all. Yet, the consequences of a spent fuel pool fire are considered for the Surry plant, where the density is much lower. Moreover, the analyses cited are all more than a decade old and cannot therefore reflect the impact of growing amount of high burnup fuel in spent fuel pools.¹³⁸ [footnote 138 text: NRC 2013a, Appendix F, Table F-2 (p. F-8). The most recent document cited in the notes to this table dates from 2002.] It is

possible to bound impacts of such accidents by focusing on high density population sites with high property value concentrations. But the Draft GEIS has not done this. (0898-5-10 [Curran, Diane] [Makhijani, Arjun])

Comment: (VIII-20) Morris et al describe the use of the VISAC code to analyze the impact of a large aircraft on the containment of a reactor.⁷⁹ [footnote 79 text: Morris et al, 2006.] They note that the hard parts of the aircraft - notably, the jet engine rotors - might not fully penetrate the containment. They consider, however, the entry of a small fraction (apparently, 1 percent) of the aircraft's jet fuel into the annular space between the inner and outer walls of the containment. Perusal of Figure VIII-2 shows analogous spaces in that reactor design. Vaporization and ignition of the jet fuel in this confined space would, with high conditional probability, lead to a violent fuel-air explosion. Morris et al describe VISAC analyses that show, in all cases, significant damage to the containment from this explosion, with holes in both the inner and outer walls. They go on to say:⁸⁰ [footnote 80 text: Morris et al, 2006, page 206.] "While the damage is significant, subsequent events are most likely responsible for most of the radioactive release predicted. It is unlikely that the staff inside the control room adjacent to the containment building will survive the smoke and toxic fumes resulting from the fire, even if they managed to survive the direct consequences of the crash of the airplane. In view of the fire engulfing the containment building and adjacent structures, it seems unlikely that the separately located auxiliary control room could be reached by the staff members originally located in the main control room. Therefore, even if those in the control room should be unaffected by the air fuel explosion, the additional fire hazard outdoors will prohibit the surviving operators from shutting down the plant in a controlled manner from the auxiliary control room." (VIII-21) The potential events that Morris et al describe can be viewed as stages in a cascading sequence of incidents. First, the aircraft strikes the containment. Second, some jet fuel enters a confined space. Third, a fuel-air explosion breaches the containment and causes other damage. At some point during stages 1-3, or subsequently, the control room, the auxiliary control room, and their personnel are rendered nonfunctional. Fourth, radioactive material is released from the reactor to the interior of the containment, or directly to the external environment. Fifth, radioactive material passes from the interior of the containment to the external environment. Sixth, the cascade could proceed to one or more pool fires, as discussed in the following paragraph. (0916-1-21 [Curran, Diane] [Thompson, Gordon R.]

Comment: (VIII-22) The spent-fuel pool that serves the afflicted reactor, and the cooling and water makeup systems that serve that pool, could be damaged by the aircraft impact or by the fuel-air explosion. That damage could be sufficient to initiate a zircaloy fire in the pool. A nearby spent-fuel pool, built to serve another reactor, could suffer similar damage, resulting in a zircaloy fire in that pool. Deposition of radioactive material released from the afflicted reactor would create an intense radiation field around the reactor. The radiation field could extend in all directions, because the fire accompanying this disaster would create intense turbulence in the local atmosphere. The radiation field could preclude personnel access for days or weeks, thereby precluding mitigating actions that might prevent the initiation of zircaloy fires in the affected pools. In that situation, a nearby pool that was not affected directly by the aircraft impact could boil dry, leading to a fire in that pool. (VIII-23) NRC has never, to my knowledge, published a credible technical analysis of a cascading sequence of incidents of this type. Nor, to my knowledge, has NRC ever publicly stated that it has performed such analysis in secret. Until such analysis is done, and done properly, NRC will not be able to complete an adequate GEIS on the environmental impacts of storing spent fuel. (0916-1-22 [Curran, Diane] [Thompson, Gordon R.]

Comment: (X-17) Now, in its Tier 3 analysis, the NRC staff seeks to close off any further inquiry into the risk of a pool fire. The staff recommends:¹⁰⁰ [footnote 100 text: Satorius, 2013b, page 10.] "The staff's assessment concludes that the expedited transfer of spent fuel to dry cask storage would provide only a minor or limited safety benefit, and that its expected implementation costs would not be warranted. Therefore, the staff recommends that no further generic assessments be pursued related to possible regulatory actions to require the expedited transfer of spent fuel to dry cask storage and that this Tier 3 Japan lessons-learned activity be closed." (0916-2-11 [Curran, Diane] [Thompson, Gordon R.]

Comment: (X-18) The Tier 3 analysis relies heavily upon NRC's consequence study.¹⁰¹ [footnote 101 text: Barto et al, 2013b.] I provided a critical review of that study in the Thompson draft consequence declaration.¹⁰² [footnote 102 text: Thompson, 2013a.] I concluded that NRC's consequence study is fundamentally and irredeemably flawed, and recommended:¹⁰³ [footnote 103 text: Thompson, 2013a, Section VIII.] "(VIII-7) NRC's Draft Consequence Study should be scrapped. (VIII-8) In addressing the pool-fire issue, NRC should focus its initial attention exclusively on establishing a solid technical understanding of phenomena directly related to a potential pool fire. To do this, NRC would start with a clean slate and use the best available modeling capability backed up by experiment. This modeling and experimental work would be done according to scientific principles. Further recommendations regarding such work are provided in Section IV, above. (0916-2-12 [Curran, Diane] [Thompson, Gordon R.]

Comment: (X-19) I recommend additional investigation of pool-fire phenomena because, more than three decades after the potential for a pool fire was recognized, NRC has not yet established a solid technical understanding of relevant phenomena. Thus, the NRC staff's recommendation to cease investigation of pool-fire issues is imprudent. Apparently, the NRC staff believes that acquisition of a solid understanding of pool-fire phenomena is unnecessary. The staff has not articulated a clear position on this matter. Such a position has, however, been articulated by Dr. Dana Powers, a member of NRC's Advisory Committee on Reactor Safeguards (ACRS), in a written commentary on the Thompson draft consequence declaration.¹⁰⁴ [footnote 104 text: Armijo, 2013, Enclosure 3.] That commentary, with associated documents, accompanies this declaration as Exhibit #40. Dr. Powers' commentary includes the statement:¹⁰⁵ [footnote 105 text: Armijo, 2013, Enclosure 3, page 4 (emphasis added).] "Much of Section IV of Dr. Thompson's report is devoted to outlining an extensive study of accident phenomenology for spent fuel events. The intent seems to be to establish a very comprehensive understanding to a scientific certainty in this phenomenology. Dr. Thompson does not make it clear why this should be done if, in fact, it can be shown that partial drain events are easily remediated with high confidence and that complete drain events are highly improbable. Nor does he provide a ranking of the use of resources for the purposes of studying spent fuel pools in preference to other safety issues. On the basis of results presented to ACRS thus far, it would appear that a systems engineering evaluation would suggest the best use of available resources would be to assure that mitigation of partial drain events was assured and that complete drain events were highly improbable. This would obviate the need for a detailed understanding of accident phenomenology. Should a decision be made to conduct confirmatory research, examination of the Dr. Thompson's list of topics might be useful starting point in the identification of possible avenues of investigation." (X-20) Dr. Powers' statement is instructive. He and I view the pool-fire problem from opposite perspectives. His confidence regarding the efficacy of mitigating measures, and the validity of probability estimates, is such that he sees no need for a thorough understanding of relevant phenomena. In my judgment, however, there is compelling evidence that: (i) mitigation of loss of water from a pool could not be assured in many potential situations; and (ii) complete or partial loss of water from a pool has a significant probability. Moreover, the consequences of a pool fire could be severe. Accordingly, given

present knowledge of pool-fire phenomena, prudence dictates a high-priority action - the rapid elimination of high-density racks from all pools. A thorough investigation of pool-fire phenomena, conducted in parallel with that action, might yield knowledge that somewhat reduces the urgency and scope of the action, thus reducing its cost. I recommend such an investigation. (0916-2-13 [Curran, Diane] [Thompson, Gordon R.]

Comment: (X-22) In April 2000, the Chairman of ACRS wrote a letter to the Chairman of NRC, discussing some pool-fire phenomena.¹⁰⁶ [footnote 106 text: Powers, 2000.] That letter accompanies this declaration as Exhibit #41. The letter discussed a number of phenomenological issues that had not been properly considered by NRC. I focus here on one of those issues. That issue is the influence of zirconium hydrides on the ignition of exposed spent fuel. As part of its discussion of that issue, the ACRS letter said:¹⁰⁷ [footnote 107 text: Powers, 2000, page 3 (emphasis added).] "We also have difficulties with the analysis performed to determine the time at which the risk of zirconium fires becomes negligible. In previous interactions with the staff on this study, we indicated that there were issues associated with the formation of zirconium-hydride precipitates in the cladding of fuel especially when that fuel has been taken to high burnups. Many metal hydrides are spontaneously combustible in air. Spontaneous combustion of zirconium hydrides would render moot the issue of "ignition" temperature that is the focus of the staff analysis of air interactions with exposed cladding. The staff has neglected the issue of hydrides and suggested that uncertainties in the critical decay heat times and the critical temperatures can be found by sensitivity analyses. Sensitivity analyses with models lacking essential physics and chemistry would be of little use in determining the real uncertainties." (X-23) Given the trend of driving nuclear fuel to ever-higher burnups, one could reasonably expect that NRC would seriously address the concern expressed by ACRS. The ACRS letter did stimulate the preparation of an NRC internal memorandum.¹⁰⁸ [footnote 108 text: Eltawila, 2001.] That memorandum, with its attached draft report, accompanies this declaration as Exhibit #42. The memorandum and its attached draft report discussed factors that could influence the ignition of zircaloy when exposed to air or steam. Those factors included the presence of hydrides. They also included the ballooning and burst of fuel cladding, a matter I return to below. The draft report attached to the memorandum contained the statement:¹⁰⁹ [footnote 109 text: Eltawila, 2001, attached draft report by Chung and Basu, page 9 (emphasis added).] "It would be necessary to conduct actual ignition tests on either spent fuel or pre-oxidized and hydrided cladding to generate experimental data to understand these various effects and to determine unambiguously the potential for autoignition. For lack of such experimental data, the potential for autoignition after ballooning and burst cannot be ruled out at this time." (0916-2-14 [Curran, Diane] [Thompson, Gordon R.]

Comment: (X-24) Ignition tests on actual spent fuel would be problematic because the fuel's large inventory of radioactive material would have to be shielded and contained. NRC did sponsor ignition tests on pre-oxidized cladding, as described in the report NUREG/CR6846, published in 2004.¹¹⁰ [footnote 110 text: Natesan and Soppet, 2004.] That report accompanies this declaration as Exhibit #43. At the time of publication of NUREG/CR-6846, NRC had not sponsored tests on hydrided cladding. Those tests were promised at some future time, as follows:¹¹¹ [footnote 111 text: Natesan and Soppet, 2004, Foreword (by Farouk Eltawila), page xvii.] "The effect of pre-existing hydrides, formed on the cladding surface during in-reactor operation and relevant, in particular, for high burnup operation, is being investigated under a follow-on program at the Argonne National Laboratory. This latter study will be reported separately." (X-25) NRC's consequence study was published in 2013. In that study, the theoretical model used to represent zircaloy ignition and combustion is drawn directly from NUREG/CR-6846. The model reflects the ignition tests on pre-oxidized cladding that are mentioned in the preceding paragraph. The study notes that this model shows accelerated

combustion compared with previous models, and that this effect is confirmed by experiment.¹¹² [footnote 112 text: Barto et al, 2013b, pages 93 and 94.] Thus, the tests on pre-oxidized cladding that are described in NUREG/CR-6846 were a useful step toward simulating the ignition and combustion of actual spent fuel. Moreover, this step revealed that combustion would be more vigorous than previously expected. Yet, NRC's consequence study does not mention the effects of hydrides on cladding ignition and combustion, despite ACRS's highlighting of this issue in 2000 and NRC's promise in 2004 to sponsor appropriate tests. Thus, it seems that a key aspect of the ignition and combustion behavior of actual spent fuel, arising from the presence of hydrides, has been ignored by NRC. Moreover, accumulation of hydrides increases with burnup, and there is a trend of driving nuclear fuel to ever-higher burnups. (0916-2-15 [Curran, Diane] [Thompson, Gordon R.]

Comment: (X-26) As discussed in paragraph X-23, above, factors that could influence the ignition of zircaloy include the ballooning and burst of fuel cladding. It is well known that cladding can balloon (i.e., swell) and ultimately burst at temperatures substantially above the normal operating temperature. During the ballooning phase, the cross-sectional area for axial fluid flow through a fuel assembly could be reduced, thereby reducing heat transfer from the fuel. At the time of burst, unoxidized cladding would be exposed to air or steam, which could promote zircaloy ignition. The MELCOR code used in NRC's consequence study lacks a capability to model the ballooning and burst of fuel cladding.¹¹³ [footnote 113 text: Barto et al, 2013b, Table 3, page 26.] MELCOR has been "benchmarked" against tests involving the ignition of electrically heated structures simulating fuel assemblies, as described in the report NUREG/CR-7143.¹¹⁴ [footnote 114 text: Lindgren and Durbin, 2013.] That report accompanies this declaration as Exhibit #44. Apparently, the tests did not involve ballooning and burst of cladding, perhaps because the simulated fuel rods were not sealed. Thus, neither MELCOR nor these tests provides any information about the implications of cladding ballooning and burst for zircaloy ignition. NRC's consequence study alludes to secret studies that address this matter, but provides no citation.¹¹⁵ [footnote 115 text: Barto et al, 2013b, Table 3 (page 26).] (X-27) An April 2003 accident at the Paks-2 nuclear power plant in Hungary shows how overheated nuclear fuel will balloon and then burst. The accident and a subsequent simulation are described in a 2007 conference paper that accompanies this declaration as Exhibit #45.¹¹⁶ The accident occurred while fuel was undergoing chemical cleaning inside a tank submerged in the plant's spent-fuel pool. Cooling water was supplied to the tank by a pump submerged in the pool. On this occasion, the water flow was inadequate, reportedly due to design defects and operating deficiencies. As a result, a steam bubble formed in the tank and fuel temperature began to rise. The zircaloy fuel cladding experienced extensive ballooning, followed by cladding burst and zirconium-steam combustion. This accident did not lead to a substantial release of radioactive material to the atmosphere, because it occurred inside a closed tank submerged in a pool. Nevertheless, this accident provides real-world evidence of the significance of phenomena such as cladding ballooning and burst. Regrettably, NRC's consequence study has not accounted for all relevant phenomena.¹¹⁶ [footnote 116 text: Windberg and Hozer, 2007.] (0916-2-16 [Curran, Diane] [Thompson, Gordon R.]

Comment: (X-32) The discussion in Section V, above, regarding the limitations of PRA, suggests that the actual frequency of a pool fire may be substantially higher than is asserted in the draft GEIS. Here, I focus on an issue that reinforces that suggestion. That issue is the linkage of pool risk and reactor risk. As discussed in Section VIII, above, NRC has never done a credible analysis of this linkage. Moreover, there is persuasive evidence, including the Fukushima accident, that a reactor accident could be part of a cascading sequence of incidents that preclude mitigating actions needed to maintain nearby pools in a safe state. Finally, as discussed in Section VIII, pool storage of spent fuel, as considered in the draft GEIS, will

probably occur at locations near operational reactors. (X-33) As discussed in paragraph V-21, above, direct experience of reactor accidents suggests that the frequency of accident-induced severe core damage may be in the vicinity of 3.2×10^{-4} per reactor-year. Let us now consider the conditional probability of a pool fire, given severe core damage at a nearby reactor. Experience suggests that this conditional probability is less than 1, because there have been 5 core melts and 0 pool fires at commercial facilities. Given the present state of knowledge, selecting a value of 0.1 for this conditional probability is prudent. Thus, a reasonable estimate for the frequency of an accident-induced pool fire, associated with an accident at a nearby reactor, is $0.1 \times 3.2 \times 10^{-4} = 3.2 \times 10^{-5}$ per pool-year.¹¹⁹ That value is 13 times higher than the pool-fire frequency (i.e., 2.4×10^{-6} per pool-year) at the upper end of the range asserted by the draft GEIS, and 55 times higher than the frequency (i.e., 5.8×10^{-7} per pool-year) at the lower end of the range. ¹¹⁹ Here, I make the simplifying assumption that each reactor has a risk linkage with one nearby pool other than its own pool, and vice versa. (X-34) The discussion in the three preceding paragraphs can be structured in terms of the equation that is set forth in paragraph V-31, above. In that context, “PRA finding” is the pool-fire frequency asserted by the draft GEIS. The present state of knowledge suggests that “Reality factor #1” has a value of about one order of magnitude (i.e., factor of 10) at the upper end of the draft GEIS’s frequency range. That value reflects the fact that the PRA-type analyses cited in the draft GEIS did not account for linkage of pool risk and reactor risk. (0916-2-17 [Curran, Diane] [Thompson, Gordon R.]

Comment: (X-42) NRC’s consequence study, which is not cited in the draft GEIS, provides some quantitative estimates of pool-fire consequences.¹²² [footnote 122 text: The pool fire considered in NRC’s consequence study would begin in recently-discharged fuel. In this declaration, I consider older spent fuel that falls under the ambit of the draft GEIS. However, the consequences that I discuss would be determined primarily by the magnitude of release of comparatively long-lived radio-isotopes, principally Cs-137. Thus, the consequences predicted by NRC’s consequence study are applicable to the situation that I consider.] These estimates do not appear in the draft GEIS. I discuss these estimates because they help to show that the draft GEIS substantially under-estimates the potential consequences of a pool fire. These estimates are specific to a potential fire at the Peach Bottom site in Pennsylvania. The particular estimates shown below are for an atmospheric release containing 330 PBq (i.e., 8.8 MCi) of the radioactive isotope Cs-137. That is a minor fraction of the inventory available for release. There are two operational reactors at the Peach Bottom site. Each reactor has its own spent-fuel pool, and each pool now contains about 2,180 PBq (i.e., 59 MCi) of Cs-137.¹²³ [footnote 123 text: Satorius, 2013b, Enclosure 1, Table 72 (page 133).] The quantity (i.e., mass) of fuel in each pool is equivalent to 5 reactor cores. For a postulated release of 330 PBq of Cs-137, NRC’s consequence study predicts the following average outcomes of a pool fire, on a per-event basis:¹²⁴ [footnote 124 text: Barto et al, 2013b, Table 33 (page 162).] [1]] Collective radiation dose of 350,000 person-Sv across a population living within an unspecified distance. [2]] Land area interdicted (i.e., rendered unfit for habitation) of 24,300 square km (i.e., 9,400 square miles).¹²⁵ [footnote 125 text: The relationship between the estimated average area of interdicted land and distance is as follows: 1,200 square miles within a 50-mile distance; 3,100 square miles within a 100-mile distance; and 9,400 square miles within a 500-mile distance. (See: Barto et al, 2013b, Table 35.)] [3]] Long-term displacement of 4.1 million people.¹²⁶ [footnote 126 text: The relationship between the estimated average number of displaced people and distance is as follows: 780,000 people within a 50-mile distance; 2.0 million people within a 100-mile distance; and 4.1 million people within a 500-mile distance. (See: Barto et al, 2013b, Table 36.)] (X-43) The numbers shown in paragraphs X-41 and X-42 begin to show the scale of the national disaster that could arise from a pool fire. Long-term displacement of 4.1 million people, which is an average case and not a worst case, would be a disaster of historic magnitude.¹²⁷ [footnote 127 text: For a given atmospheric release, the

estimated number of displaced people varies with wind direction, atmospheric stability, precipitation, and other factors. NRC's consequence study presents an average case.] As discussed in paragraph IV-16, above, this event would cause substantial political stress and other adverse consequences. The social, political, and economic consequences would be diverse and difficult to predict, but would undoubtedly be severe. Moreover, the estimates described in paragraph X-42 assume a release of only 7% of the inventory of Cs-137 in the two pools at the Peach Bottom site. A larger release could occur. (0916-2-20 [Curran, Diane] [Thompson, Gordon R.]

Comment: (X-45) Beyea et al considered two potential, atmospheric releases. One release would consist of 130 PBq (i.e., 3.5 MCi) of Cs-137, and the other release would consist of 1,300 PBq (i.e., 35 MCi) of Cs-137. These releases represent two possible outcomes of a pool fire. The larger release would represent 60% of the Cs-137 inventory now in each of the two pools at the Peach Bottom site. Beyea et al estimated offsite economic damage for the two releases, at each of five nuclear-power-plant sites. For the 130 PBq release, the estimated offsite economic damage, averaged across the five sites, was \$91 billion. For the 1,300 PBq release, the estimated offsite economic damage, averaged across the five sites, was \$385 billion.¹³⁰ [footnote 130 text: Beyea et al, 2004, Table 3 (page 131).] Both values are substantially higher than the economic- damage estimate of \$56 billion to \$58 billion, covering both onsite and offsite damage, that is set forth in the draft GEIS. Yet, Beyea et al did not consider a full range of contributors to offsite economic damage. Nor did they consider onsite economic damage. (X-46) A more comprehensive set of contributors to economic damage was considered by IRSN. Their findings are set forth in Table X-1, drawing from IRSN's 2007 report. That report was secret when first prepared, but was leaked to the press in early 2013 and, soon thereafter, was published by IRSN. The report considered an atmospheric release from a reactor at the Dampierre site in France. Economic damage was attributed primarily to the presence of 100 PBq of Cs-137 in the release. Thus, IRSN's findings are applicable to a pool fire. This pool fire would not be a worst-case event. A release of 100 PBq of Cs-137 would represent only 5% of the Cs-137 inventory now in each of the two pools at the Peach Bottom site. (X-47) The cost (i.e., economic damage) estimates shown in Table X-1 are in Euro. Here, I use a currency conversion of US\$1.40 per Euro. With that conversion, Table X-1 shows that IRSN's base-case estimate of economic damage from a release of 100 PBq of Cs-137 in France is \$1,060 billion (760 billion Euro). The low-case estimate is \$410 billion (290 billion Euro), and the high-case estimate is \$8,060 billion (5,760 billion Euro). For comparison, the GDP of the United States in 2012 was \$15,700 billion.¹³¹ [footnote 131 text: World Bank website, "GDP (current US\$)", accessed on 13 December 2013 at: <http://data.worldbank.org/indicator/NY.GDP.MKTP.CD>] (X-48) A cost study of the type done by IRSN would yield different results if done for a US nuclear site. There is no reason to expect, however, that the estimated economic damage would be substantially lower in the US case. The damage could be higher. Thus, IRSN's 2007 analysis provides, until a better estimate becomes available, a reasonable default estimate of economic damage from a pool fire in the United States that would release 100 PBq (2.7 MCi) of Cs-137. I am not aware of any other analysis that considers all of the cost contributors that are considered in the IRSN analysis. The draft GEIS's estimation of economic damage, as shown in paragraph X-41, is derived from analysis that is substantially inferior to the IRSN analysis. (0916-2-21 [Curran, Diane] [Thompson, Gordon R.]

Comment: (X-49) The economic damage estimated by IRSN would be only part of the consequences of a pool fire. The accompanying social and political consequences would be diverse and difficult to predict, but would undoubtedly be severe. Thus, a pool fire could be a national disaster of historic dimensions. That is why IRSN analysts, whose work is described in paragraphs IV-11 through IV-13, above, said in their 2012 paper that a massive release of

radioactive material would be “an unmanageable European catastrophe”.¹³² [footnote 132 text: Pascucci-Cahen and Patrick, 2012.] In their 2012 paper, these analysts did not disclose the magnitude of a “massive” release. I assume that this release would contain no more than 100 PBq of Cs-137, the amount considered in IRSN’s 2007 report. That report was secret when the IRSN analysts presented their 2012 paper. (0916-2-22 [Curran, Diane] [Thompson, Gordon R.]

Comment: (X-50) Japan’s experience with fallout from the 2011 Fukushima accident is instructive. The pattern of radioactive fallout across Japan is complex, as shown in Figure V-4. That fallout contained about 6 PBq of Cs-137, as shown in Table V-1. This amount of Cs-137 is comparatively small in the context of a potential release from a pool fire. Yet, the impacts of the Fukushima fallout on Japan are diverse and significant. For example, it is reported that 160,000 people were displaced from land contaminated by the Fukushima accident, and about one-third of this population remains in temporary housing. There is considerable uncertainty about the number of people who may be able to return to their homes.¹³³ [footnote 133 text: Knight and Slodkowski, 2013. Determination of radiological risk and environmental impact] Also, all of Japan’s nuclear power plants remain shut down, due to public concern about their operation. (0916-2-23 [Curran, Diane] [Thompson, Gordon R.]

Comment: (X-4) In paragraph VIII-13, above, and elsewhere in this declaration, I discuss NRC’s consequence study.⁸⁵ [footnote 85 text: Barto et al, 2013b.] That study, published in draft form in June 2013 and final form in October 2013, is NRC’s most recent technical analysis of pool fires. Yet, that study is not cited in Sections 4.18 and 4.19 and Appendix F of the draft GEIS, which was published in September 2013. That omission is significant from several perspectives. For example, as discussed in paragraphs VIII-14 through VIII-16, above, NRC’s consequence study identified an important issue that has not been considered in the draft GEIS. That issue is the linkage of pool risk and reactor risk. (0916-2-5 [Curran, Diane] [Thompson, Gordon R.]

Comment: (X-5) The NRC staff incorporated the findings of NRC’s consequence study into a staff recommendation regarding the expedited transfer of spent fuel from pools to dry storage. The staff recommended against expedited transfer in a November 2013 document that I refer to hereafter, following NRC practice, as the “Tier 3 analysis”.⁸⁶ [footnote 86 text: Satorius, 2013b.] That document accompanies this declaration as Exhibit #36. The Tier 3 analysis describes its connection to the draft GEIS as follows:⁸⁷ [footnote 87 text: Satorius, 2013b, page 9.] “Within this Tier 3 analysis, the staff has considered the agency’s activities on the waste confidence generic environmental impact statement (GEIS) and rulemaking, and it has ensured that the availability of these documents and interactions with stakeholders are coordinated to facilitate the public’s involvement in these activities. Although this Tier 3 analysis was not specifically referenced in the draft GEIS, those who prepared the draft GEIS were aware of the conclusions in this Tier 3 analysis, and the staff has coordinated this activity with the relevant sections of the draft GEIS. To facilitate the public’s ability to provide input, a draft of the October 2013 SFP study was released for public review and comment on July 1, 2013. Additionally, the draft evaluation of this Tier 3 issue was released to the public on September 26, 2013, well before the draft GEIS public comment period ends on December 20, 2013.” (X-6) Omission of the Tier 3 analysis from the citations in the draft GEIS is significant because the Tier 3 analysis sets forth an NRC staff position on the radiological risk of pool fires. The draft GEIS does not address that position. Yet, according to the statement quoted in the preceding paragraph, the preparers of the draft GEIS were aware of the conclusions in the Tier 3 analysis, and the two documents were “coordinated” in some manner. Thus, the Tier 3 analysis had a substantial but undocumented influence on the draft GEIS.⁸⁸ [footnote 88 text: One illustration of a likely influence is the draft GEIS’s assertion that air cooling of spent fuel would prevent a pool fire at a

point much earlier following fuel offload from a reactor than was considered in the study NUREG-1738. (See: NRC, 2013b, Appendix F, page F-11.) The Tier 3 analysis and NRC's consequence study represent NRC's most recent analysis of pool-fire issues such as the role of air cooling, but are not cited in the draft GEIS.] The lack of documentation of this influence handicaps those who seek to comment on the draft GEIS. (0916-2-6 [Curran, Diane] [Thompson, Gordon R.])

Comment: (X-9) If water were lost from a pool equipped with high-density racks, the racks would inhibit heat transfer from the exposed fuel. Thus, spent fuel in the pool would increase in temperature, potentially leading to ignition and sustained combustion of zircaloy cladding in air or steam. To a technically trained observer, it should be obvious that ignition could be more likely if residual water were present in the pool, other factors being equal. Residual water would block the flow of air from below, thus reducing heat transfer from the exposed portion of the fuel. Figure X-2 illustrates this phenomenon. As a result, spent fuel with a comparatively high age after discharge from a reactor could burn if residual water were present. The initial phase of "burning" would, in this case, be a steam-zircaloy reaction. (0916-2-7 [Curran, Diane] [Thompson, Gordon R.])

Comment: (X-10) As discussed in paragraph VI-4, above, NUREG-0575 dismissed the potential for a pool fire, arguing that spent fuel aged more than one year would not burn if water were lost from a pool.⁸⁹ [footnote 89 text: NRC, 1979, page 4-21.] NUREG-0575 was by NRC in 1979. NRC held a similar position in 1989, when it published the pool-fire study NUREG-1353.⁹⁰ [footnote 90 text: Throm, 1989.] That study accompanies this declaration as Exhibit #37. NUREG-1353 stated:⁹¹ [footnote 91 text: Throm, 1989, page 1-1 (emphasis added).] "A typical spent fuel storage pool with high density storage racks can hold roughly five times the fuel in the core. However, since reloads typically discharge one third of the core, much of the spent fuel stored in the pool will have had considerable decay time. This reduces the radioactive inventory somewhat. More importantly, after roughly three years of storage, spent fuel can be aircooled. The spent fuel need not be submerged to prevent melting, although submersion is still desirable for shielding and to reduce airborne activity." (X-11) Thus, from 1979 to 1989, NRC failed to understand the significance of residual water for zircaloy ignition. NRC's belief that comparatively old fuel would not ignite derived from NRC's mistaken assumption that the worst case of water loss from a pool would be total, instantaneous drainage. This erroneous belief continued into 1999 and 2000, while NRC was preparing a pool-fire study that was eventually published, in February 2001, as NUREG-1738.⁹² [footnote 92 text: Collins and Hubbard, 2001.] That study accompanies this declaration as Exhibit #38. Preliminary versions of NUREG-1738 were published by NRC in June 1999 and February 2000. (0916-2-8 [Curran, Diane] [Thompson, Gordon R.])

Comment: Before publishing NUREG-1738 in February 2001, NRC had published several studies related to pool fires. These studies, like NUREG-1353, contained erroneous statements about the potential for ignition of comparatively old fuel. They also contained other substantial deficiencies.⁹⁶ [footnote 96 text: Thompson, 2009, Section 5.] For example, NUREG-1353 did not consider storage of BWR spent fuel in high-density racks, even though such storage has been common practice for many years.⁹⁷ [footnote 97 text: Throm, 1989, pages 4-9 and 4-10.] Yet, NRC has neither retracted nor repudiated NUREG-1353, despite its clear obsolescence. Indeed, the draft GEIS cites NUREG-1353 as a major source of information on the probability and consequences of a pool fire.⁹⁸ [footnote 98 text: NRC, 2013b, Table F-1 (page F-4).] (0916-2-9 [Curran, Diane] [Thompson, Gordon R.])

Comment: The draft GEIS significantly under-estimates the probability of an accident-induced pool fire, in part because it does not consider the linkage of pool risk and reactor risk. The present state of knowledge suggests that the under-estimate is by at least one order of magnitude (i.e., factor of 10). (0916-3-20 [Curran, Diane] [Thompson, Gordon R.])

Comment: The draft GEIS substantially under-estimates the consequences of a pool fire. Those consequences could include the long-term displacement of millions of people, economic damage measured in trillions of dollars, and adverse social and political outcomes. A pool fire yielding these consequences would be a national disaster of historic dimensions. (0916-3-22 [Curran, Diane] [Thompson, Gordon R.])

Comment: Moreover, if such an event occurred, citizens would experience significant consequences even if they did not suffer from substantial, immediate injury such as displacement from their homes. The economic, social, and political consequences of this event would be felt by everyone residing in the United States, and by many people outside its borders. This pool fire would be a national disaster with international implications. (0916-3-3 [Curran, Diane] [Thompson, Gordon R.])

Comment: (X-60) The draft GEIS asserts that the environmental impact of accident-induced pool fires is SMALL.¹³⁷ [footnote 137 text: NRC, 2013b, Table 4-2 (page 4-91).] However, as shown above, the draft GEIS indicates that the cumulative frequency of such fires could be 0.024 events per century. Also, NRC's consequence study shows that the consequences of a pool fire could be severe, with outcomes such as the long-term displacement of 4.1 million people. IRSN's analysis shows that outcomes could include economic damage measured in trillions of dollars. Therefore, the environmental impact of accident-induced pool fires is not SMALL. Instead, it is LARGE. This finding does not account for linkage of pool risk and reactor risk. If that linkage is accounted for, as is appropriate, the cumulative frequency of accident-induced pool fires could be 0.32 events per century. In that case, it is even more evident that the environmental impact of accident-induced pool fires is not SMALL. Instead, it is LARGE. Thus, the draft GEIS substantially under-estimates the environmental impact of accident-induced pool fires. Also, the draft GEIS ignores the possibility that the risk environment will become more adverse in the future. In addition, the draft GEIS uses a flawed definition of risk – the arithmetic definition. (0916-3-5 [Curran, Diane] [Thompson, Gordon R.])

Comment: For its analysis of spent fuel pool fires, Exelon recommends that the NRC use existing information to the extent possible. The NRC has previously compiled numerous technical studies regarding the risks and environmental impacts of onsite spent fuel storage that it can rely upon in assessing both the probabilities and consequences of spent fuel pool fires. Exelon agrees that the environmental impacts associated with a spent fuel pool fire would be small based on the probability-weighted consequences of such an event at all existing reactor sites. (0942-12 [Helker, David P.])

Comment: It is noted in the reference information that the likelihood of spent fuel pool fires is very low and diminishes to zero as fuel cools. The data indicates that only freshly discharged (less than four months) fuel has the ability to create a spent fuel pool fire. This effectively eliminates most of the spent fuel being considered, and certainly all of the fuel for plants who have terminated their license. The NRC should carefully weigh this important fact during its consideration of the risk of spent fuel pool fires. (0942-13 [Helker, David P.])

40. Comments Concerning Spent Fuel Pool Leaks

Comment: Regarding pool leaks, there is a long list of pool leaks that have already occurred -- at Dresden Unit 1, due to a broken pipe; at Hatch in Georgia; at BWX Technologies in Lynchburg, Virginia; at Indian Point 1 and 2 on the banks of the Hudson River upstream of New York City; at Salem Unit 1 in New Jersey; at Connecticut Yankee. All NRC licensees. There has also been a pool leak at a Department of Energy pool, the high flux beam reactor at Brookhaven National Lab on Long Island. (0030-2-6 [Kamps, Kevin])

Comment: He mentioned a number of reactors where there were spent fuel pool leaks, all of them considered in this EIS, all of the impacts meeting the definition of small because the right steps were taken. (0030-6-7 [McCullum, Rod])

Comment: A growing list of radioactive leaks from HLRW storage pools have already occurred in the U.S. This has taken place at the following NRC-licensed facilities: Dresden, IL; Hatch, GA; BWX Technologies, VA; Indian Point 1 & 2, NY; Salem 1, NJ; Connecticut Yankee; and Davis-Besse, OH. A pool leak has also occurred at a U.S. Department of Energy licensed facility, the High Flux Beam Reactor at Brookhaven National Lab on Long Island, NY. (0034-6 [Wagner, Jim and Virginia])

Comment: I can only imagine how the next generation and the generations after that are going to feel when the amount of nuclear waste has grown even larger and they are dealing with the inevitable problems of dangerous leaking old fuel pools (0163-34-4 [Azulay, Jessica])

Comment: We heard from nuclear storage engineer earlier tonight. Do you think there's a conflict of interest there. He testified unequivocally that storage systems for spent nuclear fuel work, that they are tight, and that there is no possible way for these systems to leak. Well, I have news for all the other engineers who have worked on these systems. They are leaking. Vermont Yankee closed in part because it was leaking and it was too expensive to dig up all the miles of pipes to figure out where the leak was. Indian Point is leaking. There are plants across the country leaking as we speak. This is what scares me the most. Engineers make questionable assumptions to support their designs. Designs that may be built under conflict of interest, that is to support the nuclear industry. (0163-48-5 [Meyer, Bill])

Comment: The other main issues regarding Indian Point that are false and misleading is that all the spent fuels currently -- that we have leak-detection systems or administrative controls to monitor the spent fuel pools. We know that in 2005 that the leaks at Indian Point were only found by accident. They were only found because an independent contractor saw wet on the ground. There is no actual monitoring of the spent fuel pools. In fact, there is no actual monitoring of the releases of radiation and I am now carrying a Geiger counter (indicating), and I would hope that the NRC provides all of us with Geiger counts so that we can actually create a monitoring program. The reality is the spent fuel pool two, which is known to be leaking, only 40 percent of it has been inspected. 60 percent of it, which we know is leaking, they don't know where the leak is. It has not been inspected. That's a false assumption of this GEIS. The other basic false assumption is that the leaks are emptied into a drain that can be monitored and then they'll be treated and cleaned up. When in fact, the leak -- the NRC stopped cleanup of the Indian Point site. They said "You know what, we're just going to let it seep into the ground, into the effluent and into the ground." (0163-7-7 [Shapiro, Susan])

Comment: According to an article in Science Journal, "fuel in U.S. spent fuel pools is packed four times as densely as it was 25 years ago". Obviously, this could pose serious health risks if

there was any leakage or terroristic attacks (Kintisch, 2011). Highlighted by the recent disaster in Fukushima, Japan, nuclear waste leakage can present a variety of problems. Nuclear waste that leaks from storage pools or casks can contaminate the surrounding earth and groundwater . In addition to potential physiological issues such as cancer, the threat of potential contamination can severely tax people's psychological health (Revkin, 2012). Because nuclear energy is still misunderstood by many people, the fear of the unknown often dictates their mindsets. Even if any potential contamination in the ground is so minimal that it becomes negligible, the public does not know or necessarily understand that. As history has shown, it is easy to scare the public with threat of potential nuclear waste leakage. Obviously, keeping the public comfortable and happy is important; living in constant fear that on-site storage containers, like the concrete pools and casks, could be leaking will not help achieve this goal at all. (0205-19 [Lyons, Laura])

Comment: Additionally, concrete-lined pools are not 100% percent foolproof. They can leak wastes into the ground which can contaminate ground water (Harnett, 2013). (0205-7 [Lyons, Laura])

Comment: One other fact check, and then I will wrap up, Miriam. It is -- it wasn't mentioned that the HFBR reactor experience wasn't considered in here. And I've heard that before and that really gets to me because I have personal experience on that one. First of all, it's a bit out the scope because, you know, it was a DOE, not a commercial reactor, it was an unlined spent fuel pool, which is not typical in our industry. But, yes, it was a spent fuel pool leak. The leakage was detected very early by onsite wells, not offsite wells. The Department of Energy, and I was involved in this, went through some very proactive efforts to make sure that nobody's drinking water supply was harmed. And in fact this is consistent with the facts that I reviewed for the other spent fuel pool leaks that are considered in this EIS. We have in place groundwater-detection and mitigation strategies, that if there is a small leak in a pool, we take care of it. We are in our safety culture and we know what to do. So, again, that HFBR example is entirely consistent with the facts that are cited in the GEIS. (0244-11-13 [McCullum, Rod])

Comment: I note that Appendix E of the draft GEIS provides a detailed discussion of the environmental impacts of spent fuel pool leaks during short-term storage time frame. The draft GEIS describes the current regulatory regime to avoid and respond to spent fuel pool leaks, including the NRC's requirements and industry initiatives for groundwater monitoring and remediation of contaminated groundwater. Importantly, the NRC does not simply rely on its regulatory oversight to conclude that the environmental impacts of spent fuel pool leaks during the short-term time frame will be small. The draft GEIS, in fact, discusses spent fuel pool design and maintenance, operational practices, site hydrogeological characteristics, and radionuclide transport properties to establish the Agency's basis for concluding that there is a very low likelihood that an undetected leak from a spent fuel pool will migrate offsite. These considerations are all generic and they obviate the need for site-specific assessment. Furthermore, in the unlikely event that a spent fuel pool leak were to migrate offsite, the draft GEIS assesses the potential for impacts on groundwater, surface water, soils, and public health using a bounding approach. Therefore, contrary to some of the views presented at this meeting and others, we believe there is ample support for the draft GEIS conclusions that the potential impacts involving spent fuel pool leaks will be small. (0246-14-3 [Ginsberg, Ellen])

Comment: [N]or does it discount the very real and present threat of all the leaks that are currently occurring in radioactive waste dumps. (0250-39-4 [Richards, Kitty Katherine])

Comment: So this idea that we should ignore the issue of this high-density wet storage that exists and what it's going to take to reduce the dangers from that alone, let alone deal with the permanent and ongoing problems of the continued generation of additional waste. There's a severe problem with the way the analysis so far has been done on aboveground leak detection, as there are a number of recorded incidences in which existing wet pool leakages have not been detected for many years and whether significant volumes of radioactive waste have been released. (0329-12-7 [Paddock, Brian])

Comment: Fuel tank radiation leaks can occur, sometimes unnoticed, through corrosion of the stainless steel liner caused by pool chemistry and emissions from the fuel elements, as well as micro-cracks in the concrete support structure. On-site discoveries of boric acid penetration as well as large tritium contamination outside the pool structures have been reported, which prove silent pool leakage. The problem with tritium is that it migrates relatively easily off-site with the liquid drainage from pool leaks or by evaporation as water vapor. (0410-13 [Nelson, Dennis])

Comment: The NRC's flawed environmental study is based on a number of unrealistic assumptions that must be reconsidered. In NRC's view, because past spent fuel pool leaks have allegedly caused only minor impacts, NRC assumes that future leaks will "also" be "insignificant." As a result, NRC's has provided a grossly inadequate and incomplete impact assessment related to pool leaks. (0465-5 [Commenters, Multiple])

Comment: In addition, the NRC relies heavily on a purely voluntary industry initiative to justify its finding that future spent fuel pool leaks will be "handled" and "addressed" sufficiently. (0465-6 [Commenters, Multiple])

Comment: As discussed above, the DGEIS "assumes that spent nuclear fuel . . . is removed from the pool within 60 years of the end of the reactor's licensed life for operation." DGEIS at E-1. Therefore, the DGEIS looks only at spent fuel pool leaks that occur within sixty years from the end of plant operation, which is referred to as the "short-term" timeframe. As discussed above, there is no basis for NRC's assumption that all waste will be moved from pools to dry cask by sixty years after licensed life. The D.C. Circuit found that "a proper analysis of the risks [of leaks] would necessarily look forward to examine the effects of the additional time in storage." New York, 681 F.3d at 481. It gave the NRC one option only for concluding that no analysis of spent fuel pool leaks is necessary: "Only if the harm in question is so 'remote and speculative' as to reduce the effective probability of its occurrence to zero may the agency dispense with the consequences portion of the analysis." Id. at 482. Since NRC cannot predict with certainty that all spent fuel will be removed from pools within sixty years, it must look at the consequences of leaving fuel in pools beyond that timeframe. For example, NRC must examine the effects of aging on spent fuel pool structural integrity and how this will affect leaks throughout the entire period covered by the EIS, including the short-term, long-term, and indefinite timeframes. As shown by the data provided in Appendix E, spent fuel pool leaks have occurred at numerous plants during the reactors' initial licensing terms. DGEIS at E-19 to E-21. In addition, a study cited in the DGEIS concluded: "As nuclear plants age, occurrences of degradation of spent fuel pools (SFPs), reactor refueling cavities, and the torus structure of light-water reactor nuclear power plants (NPPs) are occurring at an increasing rate, primarily due to environment-related factors." Copinger et al., Summary of Aging Effects and Their Management in Reactor Spent Fuel Pools, Refueling Cavities, Tori, and Safety-Related Concrete Structures, NUREG/CR-7111 (2012) (ML12047A184). This raises concerns that the structural integrity of the spent fuel pools may diminish significantly during the long-term and indefinite timeframes, increasing the likelihood and severity of leaks. Moreover, the aging management programs relied on by NRC Staff (DGEIS at E-4 to E-5) to monitor spent fuel pool structural integrity were designed to cover

only the twenty-year period of extended operations, not the sixty-year period after operations have ceased. These programs may therefore be inadequate to provide a long term assurance of pool structural integrity. (0473-15-1 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: In fact, short-term, high-volume spent fuel pool leaks have occurred at U.S. reactors. For example, in 1986, the spent fuel pool at Edwin I. Hatch Unit 1 released an estimated 141,500 gallons of contaminated water, 124,000 gallons of which was released into a swamp that drains into the Altamaha River. NRC, Liquid Radioactive Release Lessons Learned Task Force Final Report, at 5, (Sept. 1, 2006) (ML062650312). Moreover, while NRC states that licensees will mitigate the impacts of high-volume leaks before noticeable off-site environmental impacts will occur, it does not set forth a mitigation plan for such leaks or present evidence that past mitigation measures have proven successful. This may be because NRC regulations do not require the immediate mitigation of spent fuel pool leaks and often, NRC allows licensees to simply monitor leaks rather than remediate them. See *id.* at 3-10. An agency may forego an analysis based on "specific mitigation measures which completely compensate for any possible adverse environmental impacts," *Cabinet Mountains Wilderness/ Scotchman's Peak Grizzly Bears v. Peterson*, 685 F.2d 678, 682 (D.C. Cir. 1982), but those measures must be supported by "substantial evidence" showing their adequacy, *Nat'l Audubon Soc'y v. Hoffman*, 132 F.3d 7, 17 (2d Cir. 1997). NRC must either explain how mitigation measures can prevent environmental impacts from short-term, high-volume leaks or look at the probability and consequences of such leaks. This includes examining how human error, severe accidents, natural disasters, climate change, and sabotage or terrorism may increase the likelihood of short-term, high-volume spent fuel pool leaks in the future. (0473-15-10 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Furthermore, as fuel remains in spent fuel pools during the long-term and indefinite timeframes, the outer cladding material encasing the fuel may degrade, thereby allowing fission products to be released from the fuel into the pool water.³⁸ [footnote 38 text: 38 See NRC, Liquid Radioactive Release Lessons Learned Task Force Final Report at i (2006) (ML062650312); Robert Alvarez, Spent Nuclear Fuel Pools in the U.S.: Reducing the Deadly Risks of Storage, at 2 and 16 (May 2011); National Academy of Sciences, Safety and Security of Commercial Spent Nuclear Fuel Storage: Public Report, The National Academies Press, at 19, FN 10 (2006).] This may cause the radioactivity of the spent fuel pool water to increase over time, further contributing to the severity of leaks in the long-term and indefinite timeframes. Since NRC cannot predict with certainty that all spent fuel will be removed from pools within sixty years, it must examine the probability and environmental consequences of leaks after that time, as well as techniques for managing the aging of spent fuel pools in order to prevent such leaks. (0473-15-2 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The D.C. Circuit directed NRC to examine past leaks in a manner "that would allow the Commission to rule out the possibility that those leaks were only harmless because of site-specific factors or even sheer luck." *New York*, 681 F.3d at 481. Despite this command, the NRC failed to undertake a detailed examination of past leaks. Similar to the 2010 Waste Confidence Update which "has no analysis of those possibilities other than to say that past leaks had 'negligible' near-term health effects,"³⁹ [footnote 39 text: 39 *New York*, 681 F.3d at 481.] the DGEIS simply lists the occurrence of past leaks, the dose from past leaks, and the Groundwater Task Force finding that no past leaks have affected the health of the public. See DGEIS at E-20 to E-22. The DGEIS fails to examine why these leaks did not affect public health or whether they were "harmless" because of site-specific factors. Moreover, despite

acknowledging that at least seven leaks have resulted in inadvertent liquid radioactive releases to the environment, the DGEIS does not examine whether those leaks caused any type of environmental impact other than a public health impact. Nor does the DGEIS explain how the impacts of past leaks give any indication of the potential for future leaks. Such an analysis would be a standard procedure in the kind of "root cause analysis" that NRC requires its licensees to undertake whenever there is radiation release. See e.g. Standard Review Plan for the Review of a License Application for the Tank Waste Remediation System Privatization (TWRS-P) Project Final Report, NUREG-1702 (Mar. 2000) at Section 11.8. Such an analysis requires ascertaining the underlying cause of the problem and taking measures to fix the cause so it will not recur. The DGEIS includes no such root cause analysis of the many spent fuel pool leaks and thus provides no reasoned basis to conclude that such leaks will not continue or that they will not be more severe in the future. For example, if the root cause of the leaks is the aging of the spent fuel pools, which were never meant to be long-term storage solutions, then the prospect for even greater and more damaging leaks in the future is far more serious than the DGEIS's optimistic assumption. The D.C. Circuit specifically noted: "Even setting aside the fact that near-term health effects are not the only type of environmental impacts, the harm from past leaks--without more--tells us very little about the potential for future leaks or the harm such leaks might portend." New York, 681 F.3d at 481. The DGEIS should take a more detailed examination of the causes of past leaks and explain whether or not aging will increase such causes. Without providing more detailed analysis of past leaks, the DGEIS cannot predict the impacts of future leaks. (0473-15-3 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: NRC further limits its evaluation of spent fuel pool leaks to "long-term, low-volume undetected" leaks, based on its assumption that this is "the most probable scenario where spent fuel pool leakage would lead to an offsite environmental impact." DGEIS at E-10. NRC states that it does not need to examine the environmental consequences of short-term, high-volume leaks in the DGEIS because "licensees would likely identify and mitigate, if necessary, the impacts from any significant short-term water loss before noticeable offsite environmental impacts would occur." DGEIS at E-9 to E-10. However, NRC does not find that short-term, high-volume leaks could not occur in the future, nor does it cite any studies or reports to support the assumption such leaks will not cause offsite environmental impacts. Effectively, NRC asserts that short-term, high-volume leaks will not affect the environment because NRC and licensees are "on duty." But, as the D.C. Circuit found, "merely pointing to the compliance program is in no way sufficient to support a scientific finding that spent-fuel pools will not cause a significant environment impact during the extended storage period." New York, 681 F.3d at 481. Also, NRC's compliance program is voluntary--there is no NRC requirement that licensees conduct onsite groundwater monitoring. Instead, NRC allows licensees to rely on a voluntary groundwater monitoring initiative set forth by industry. DGEIS at E5-E6. (0473-15-9 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: It does not take into account the likelihood of past and future leaks, nor fully consider the consequences of the leaks. (0531-1-4 [Morgan, Sally])

Comment: The NRC continues to maintain that the risk to groundwater and drinking water is low, despite previous studies by the NRC itself that previous leaks "did, or potentially could, impact groundwater resources relative to established EPA drinking water standards" (0531-1-7 [Morgan, Sally])

Comment: It does not take into account the likelihood of past and future leaks, nor fully consider the consequences of the leaks. (0531-2-4 [Morgan, Sally])

Comment: The NRC continues to maintain that the risk to groundwater and drinking water is low, despite previous studies by the NRC itself that previous leaks "did, or potentially could, impact groundwater resources relative to established EPA drinking water standards" (NRC, Liquid Radioactive Release Lessons Learned Task Force Final Report¹³ (2006); as cited in the courts decision of New York vs. NRC) (0531-2-7 [Morgan, Sally])

Comment: The same comments made under the heading of Surface-Water Quality and Use apply here. There are so many "likely", "unlikely" and "likelihood" modifiers used that a high degree of uncertainty attaches to the assurances that nothing bad will happen if the pools leak. The statement that the small number of leak releases of contaminants to the environment, "based on the available data, have not affected the health of the public" is less than reassuring, especially if only impacts on humans is looked for. (0553-10 [Wilshire, Howard])

Comment: Water Quality. The Draft GEIS does not address impacts to drinking water quality. Instead, it discounts them. For instance, while NRC notes that onsite contamination in excess of drinking water standards exists, it minimizes the significance of these instances because the contamination has not migrated offsite. Given that (a) the NRC's goal is to release all decommissioned sites for unrestricted use, and (b) 10 C.F.R. § 20.1402 requires reduction of radiological emissions from decommissioned sites to 25 mrem from all sources including drinking water, the impact of contamination caused by spent fuel pool leakage to drinking water must be addressed. (0556-3-2 [Lampert, Mary])

Comment: Past Leaks. The GEIS underestimates the likely frequency of past leaks and does not fully consider the consequences of such leaks. NRC failed to adequately assess the likelihood of future leaks because it did not consider at least two important past leaks. A Yankee Rowe leak released approximately 2 million gallons of contaminated water. Some of this leakage made its way into the Deerfield River.²⁴ [footnote 24 text: See Yankee Atomic Electric Company (YAEC). 2006. *Groundwater Protection – Data Collection Questionnaire*. Rowe, MA. July 19. Online at <http://pbadupws.nrc.gov/docs/ML0620/ML062080156.pdf>.] In 1997, ground water samples taken by Brookhaven National Labs (BNL) revealed concentrations of tritium at twice the allowable federal drinking water limits. Some samples taken later were 32 times the standard. The tritium was found to be leaking from the High Flux Beam Reactor's spent fuel pool into the aquifer that provides drinking water for nearby Suffolk County residents.²⁵ [footnote 25 text: See General Accounting Office (now called the Government Accountability Office) (GAO), Department of Energy: *Information on the Tritium Leak and Contractor Dismissal at the Brookhaven National Laboratory*. GAO/RCED-98-26 (1997). Online at <http://pbadupws.nrc.gov/docs/ML1209/ML120960692.pdf>.] DOE's and BNL's investigation of this incident concluded that the tritium had been leaking for as long as 12 years without their knowledge.²⁶ [footnote 26 text: *Ibid.*] (0556-3-3 [Lampert, Mary])

Comment: Leak Detection. NRC's leak detection analysis fails to consider difficulties associated with leak detection, especially with long-term, low-volume leaks. Several spent fuel pool leaks have gone undetected for prolonged periods of time despite NRC's assurance that measures are in place to ensure timely detection. This undercuts NRC's conclusion that it is unlikely for leaks to occur and go undetected long enough to result in significant impacts to the environment. The Yankee Rowe and BNL leaks went undetected for longer than one year and perhaps as long as twelve years. At Salem, a leak thought to be only a few gallons per day turned out to be about 100 gallons per day. The volume and significance of this leak were NOT detected by the spent fuel pool water level instrumentation or the installed leak detection system because of a clogged drain in the monitoring system.²⁷ [footnote 27 text: See NRC, Spent Fuel

Pool Leakage to Onsite Groundwater, Information Notice 2004-05 (March 3, 2004). Online at <http://www.nrc.gov/reading-rm/doc-collections/gen-comm/info-notices/2004/in200405.pdf>] (0556-3-4 [Lampert, Mary])

Comment: No Quantitative Assessment. NRC's analysis of pool leak impacts is devoid of any quantitative assessment. The Draft GEIS does not consider the numerical limits of impactful spent fuel pool leaks in terms of volume and duration. A quantitative analysis of spent fuel pool leak detection is necessary for a forward- looking spent fuel pool leak analysis, as required by the Court in *New York v. NRC*. (0556-3-5 [Lampert, Mary])

Comment: Inapplicable Regulations and Guidelines. The Draft GEIS inappropriately relies on inapplicable regulations and guidelines. NRC incorrectly relied on spent fuel pool monitoring requirements that are only applicable during the movement of spent fuel from one storage facility to another. NRC also incorrectly relied on groundwater monitoring and inspection programs that are not mandatory or not applicable. (0556-3-6 [Lampert, Mary])

Comment: Inadequate Regulatory Program. NRC failed to consider the inadequacy of its regulatory program to detect future leaks. NRC failed to consider the significant reduction in regulatory oversight and regulation of spent fuel storage that occurs after reactors shut down. NRC also failed to consider the future implications of the probability and consequences of past leaks, leak detection difficulties, and difficulties that arise with monitoring and inspections. Therefore, NRC failed to properly determine the significant impacts of spent fuel pool leaks because it did not conduct a forward-looking analysis. (0556-3-7 [Lampert, Mary])

Comment: In characterizing the impacts of short and long-term storage on groundwater quality and use as SMALL, the GEIS admits that "continued storage of spent fuel could result in nonradiological and radiological impacts to groundwater quality, including tritium contamination." (ES. 13.1.8, p. xxxvii) It assumes, however, that monitoring programs would "ensure that impacts from spent fuel pool leaks would be unlikely." In practice, however, there has been little, if any, monitoring, and even if there has been monitoring, nothing has been done to fix the leaks in the spent fuel pools at Indian Point. As discussed abCove, tritium and strontium 90 have shown up in water intended for drinking water drawn 3.5 miles downstream from the leaks, as well as in Hudson River fish. These clearly seem to be impacts of "sufficient quantity and duration to affect offsite locations." (0604-5 [Pisha, Gayla])

Comment: The Second inaccurate and misleading fundamental assumption is about leaks detection and monitoring since the GEIS states that that: "All spent fuel is currently in operation "have either leak detection system or administrative controls to monitor the spent fuel pools liner." This assumption is in direct contradiction to the situation that currently exists at Indian Point. Spent fuel pool #2 has been known to be leaking since at least 2005, yet to date only 40% of the spent fuel pool have been inspected. Instead of requiring a design basis inspection of a known leaking spent fuel pool the NRC granted Entergy exemptions from inspection because it was too difficult to inspect due to construction limitations. Exacerbating this failure the leaks from Spent Fuel Pool #2 were not detected by "leak detection" or, by "administrative controls", but by accident when an independent contractor happened to notice a wet spot on the ground outside the spent fuel pool #2 walls. It remains undetermined how long the leak existed or how much radioactive effluent has been discharged into the ground and groundwater before its accidental discovery. (0611-34 [Shapiro, Susan])

Comment: Another basic false fundamental assumption of the GEIS is that: "Leakage empties into drains that be can be monitored", and "directed into a sump, liquid radioactive waste

treatment system or other cleanup or collection system." At Indian Point leakage the leaks have not been monitored and there is no collection and treatment system. Instead at Indian Point the NRC made a determination to halt clean up of the large underground lake of radioactive effluent under Indian Point, laced with radioactive cesium, strontium, tritium and cobalt. Shockingly the NRC decided to leave the radioactive effluent in the fractured bedrock under Indian Point and allow the radioactive effluent to leach into the historic Hudson River. This decision was made in 2007 when after accidentally discovery of the leaking spent fuel pools an attempt to clean up the site was made, but soon discontinued. The GEIS does not address this ongoing failure to contain and clean up radioactive active waste. In addition Indian Point #1, which was shuttered for many years, is proof that SAFSTOR isn't safe. Indian Point 1 was known to be leaking radioactive effluent for years without remediation. (0611-35 [Shapiro, Susan])

Comment: Section 4.8 of the DGEIS states that storage of spent fuel in spent fuel pools could result in radiological impacts on groundwater quality, but it is "very unlikely" that a leak from a spent fuel pool would go undetected and reach the offsite environment. However, undetected leakage from spent fuel pools and other reactor components has plagued reactor licensees and communities for decades. As mentioned above (see our "Surface-Water Quality and Use" comments), there have been several cases where fuel pool leakage and other leaks of radioactive material have occurred undetected for extended periods of time. For instance, Pilgrim has been leaking tritium into the ground at least since the 1990s, when the Massachusetts Department of Public Health first started using groundwater testing wells on the site. The tritium leaks at Pilgrim have been ongoing, and are still of unknown source(s).¹⁶ [footnote 16 text: MA Department of Public Health. June 13, 2012. PNPS: Tritium in Groundwater Monitoring Wells.

<http://www.mass.gov/eohhs/docs/dph/environmental/radiationcontrol/tritium/2012-updates/pnps-update-6-13-12.pdf>] Additionally, Yankee Rowe Nuclear Station in Massachusetts leaked about 2 million gallons of contaminated water from a spent fuel pool in the mid-1960s, which contaminated the Deerfield River.¹⁷ [footnote 17 text: Yankee Atomic Electric Company. July 19, 2006. Groundwater Protection Data Collection Questionnaire <http://pbadupws.nrc.gov/docs/ML0620/ML062080156.pdf>] (0622-2-11 [Vale, Karen])

Comment: In Appendix E of the DGEIS, the NRC describes the general method used to remediate tritium leaks as "monitored natural attenuation." However, at no point does the DGEIS address the conditions at Pilgrim where tritium is regularly entering the groundwater and being allowed to discharge into Cape Cod Bay for "natural attenuation" without environmental monitoring (in addition to above-normal concentrations of cobalt-60 and cesium-137 that have been found in soil samples by the Massachusetts Environmental Radiation Laboratory, which can spread easily in the environment due to high water solubility).¹⁹ [footnote 19 text: Pilgrim Nuclear Power Station (PNPS): Tritium in Groundwater Monitoring Wells. MA Dept of Public Health. Oct 18, 2013.] It is a failure of regulatory oversight that allows this unabated contamination of the environment at Pilgrim. Release and presence of tritium in the groundwater and soil must be addressed more robustly by the NRC. Given that there is a general lack of knowledge on the impacts of tritium on aquatic organisms, and there has been little effort to test or monitor the release at Pilgrim, we cannot evaluate the harm that is being done. (0622-2-16 [Vale, Karen])

Comment: Section 4.6 of the DGEIS also states most soil contamination from spent fuel pool leaks would remain onsite and, therefore, offsite soil contamination is unlikely to occur. However, this depends on many factors, including soil type, groundwater flow, and the size of the leak. For example, at Entergy's Pilgrim plant in Plymouth, Massachusetts, it has been assessed that the groundwater flows toward Cape Cod Bay.⁸ [footnote 8 text: Entergy Nuclear

Generation Company. 2006. Appendix E. Pilgrim Nuclear Power Station, Applicant's Environmental Report, Operating License Renewal Stage. 261 pp.] Additionally, Pilgrim is located on the Plymouth-Carver Sole Source Aquifer,⁹ [footnote 9 text: U.S. EPA. Plymouth-Carver Sole Source Aquifer Map.] which is characterized by highly permeable soils.¹⁰ [footnote 10 text: Executive Office of Energy and Environmental Affairs. 2007. Plymouth Carver Sole Source Aquifer Action Plan Final Report. Prepared for the EOEEA by Fuss & O'Neill, Lakeville, MA. See Section 2.2.2 - Soil Types.] Considering these factors, contaminants that enter the soil would likely migrate to the Aquifer and/or Cape Cod Bay. According to the 2007 Plymouth-Carver Sole Source Aquifer Action Plan Final Report, the "course-grained soil, the sand and gravel glacial outwash deposits that comprise the PCA are more susceptible to the infiltration and migration of contaminants than less permeable soils typical of non-potentially productive aquifers."¹¹ [footnote 11 text: Executive Office of Energy and Environmental Affairs. 2007. Plymouth Carver Sole Source Aquifer Action Plan Final Report. Prepared for the EOEEA by Fuss & O'Neill, Lakeville, MA. See Section 2.2.5 - Aquifer Susceptibility.] The report also states that contaminants entering into the soil and groundwater would not be impeded from migration into the Plymouth-Carver Aquifer without human intervention. (0622-2-4 [Vale, Karen])

Comment: The DGEIS also states that it is unlikely that a spent fuel pool would leak continuously (24 hours per day, 365 days per year) undetected and unimpeded to local surface waters, and that the quantities of radioactive material discharged to nearby surface waters would be comparable to values associated with permitted, treated effluent discharges from operating nuclear power plants; therefore the NRC concludes that the impact of spent fuel pool leaks on surface water would be "SMALL". However, there have been several cases where fuel pool leakage and other leaks of radioactive material have occurred continuously undetected and unimpeded. For instance, Pilgrim has been leaking tritium into the ground at least since the 1990s, when the Massachusetts Department of Public Health first started testing the groundwater. The leaks have been ongoing, and are still of unknown source(s).¹³ [footnote 13 text: MA Department of Public Health. June 13, 2012. PNPS: Tritium in Groundwater Monitoring Wells. <http://www.mass.gov/eohhs/docs/dph/environmental/radiationcontrol/tritium/2012-updates/pnps-update-6-13-12.pdf>] Another example is Yankee Rowe Nuclear Station, also in Massachusetts, which leaked about 2 million gallons of contaminated water from a pool between 1963 and 1965, some of which made it to the Deerfield River.¹⁴ [footnote 14 text: Yankee Atomic Electric Company. July 19, 2006. Groundwater Protection Data Collection Questionnaire] Also, Brookhaven National Labs located in Long Island, New York, leaked tritium into the drinking water aquifer from its fuel pool.¹⁵ [footnote 15 text: U.S. General Accounting Office. 1997. Information on the Tritium Leak and Contractor Dismissal at the Brookhaven National Laboratory] These cases certainly did not cause "SMALL" impacts. The NRC should accurately assess the impacts of pool leaks and other leaks of radioactive material being discharged into surrounding ground and surface waters. (0622-2-9 [Vale, Karen])

Comment: In addition, the draft GEIS claims the impacts of spent fuel pool leaks to be insignificant, but fails to take into account the significance of past leaks, which have plagued communities for decades. (0646-21 [Hanson, Courtney])

Comment: Appendix E to Draft NUREG-2157, "Waste Confidence Generic Environmental Impact Statement" (DGEIS), describes the environmental impacts of spent fuel pool leaks that may occur during the short-term storage timeframe. Section E.3 reviews the history of spent fuel pool leaks at commercial nuclear power plants. Table E-4, "Occurrence of Spent Fuel Pool Leakage at U.S. Nuclear Power Plants." lists sites at which spent fuel pool leakage has occurred based on data and information available to the NRC. Salem Unit 2 is incorrectly listed as having released radioactive liquid to the environment from spent fuel pool leakage. As noted

in NUREG/CR-7111, "A Summary of Aging Effects and Their Management in Reactor Spent Fuel Pools, Refueling Cavities, Tori, and Safety-Related Concrete Structures," in 2-10, evidence of a small leak was noted to be present in the Unit 2 telltale drain system. The Unit 2 spent fuel pool leakage is properly characterized as contained within spent fuel pool leakage-collection system. DGEIS Table E-4 should be revised accordingly. (0647-1 [Duke, Paul])

Comment: Surface Water, Groundwater, Aquatic Species --In general the GEIS assumes that radioactive leaks are small, monitored and controlled under regulatory control. No major ongoing leaks are analyzed. Nor are situations in which there is a major loss of spent fuel pool water from a leak analyzed, or in which water use has to be dramatically increased in order to prevent a spent fuel fire by providing makeup water. (0693-4-1 [Warren, Barbara])

Comment: DGEIS Table E-5 states that the maximum tritium contamination detected within the site boundary for the WBN SFP leak was 30,000 pCi/L.¹²⁷ [footnote 127 text: *Id.* at E-21.] This value appears to be inconsistent with the WBN-2 FES, which states: "The highest concentration of tritium detected in 2005 was approximately 20,400 Bq/L (550,000 pCi/L)."¹²⁸ [footnote 128 text: WBN-2 FES at 2-13. See also TVA June 2007 FSEIS at 53 ("The highest amount of tritium detected was approximately 550,000 pCi/L.")]. TVA requests that the NRC review its source of the WBN information in DGEIS Table E-5 and correct it if necessary to be consistent with the WBN-2 FES. Changing this value has no impact on the SMALL impact conclusion, particularly because there are no further indications of leakage from the WBN SFP and the value is bounded by other values in DGEIS Table E-5.¹²⁹ [footnote 129 text: DGEIS at E-21.] (0694-3-15 [Shea, Joseph])

Comment: •As noted in DGEIS Sections 4.6, 4.7, and 4.8, SFP leaks could result in radiological contamination of soils, groundwater, and surface water.⁹⁶ [footnote 96 text: *See Id.* at 4-20 to 4-28.] TVA agrees that the environmental impacts of continued spent fuel storage at its nuclear plants, including WBN-2, on these environmental areas would be SMALL. (0694-3-4 [Shea, Joseph])

Comment: •As noted in DGEIS Sections 4.6, 4.7, and 4.8, SFP leaks could result in radiological contamination of soils, groundwater and surface water. Entergy agrees that the environmental impacts of continued spent fuel storage at its nuclear plants, including IPEC, on these environmental areas would be SMALL. (0697-2-13 [Bessette, Paul] [Kuyler, Raphael])

Comment: Next, Mr. Lochbaum notes the Draft GEIS relies on the availability of spent fuel pool leakage detection system and a regulatory system for groundwater monitoring measures, but the Draft GEIS omits any meaningful discussion that spent fuel pool water level instrumentation is not required to be functioning except when irradiated fuel is being moved within the pool and that groundwater monitoring measures are entirely voluntary. (0706-4-10 [Fettus, Geoffrey])

Comment: In direct contradiction of the direction from the DC Circuit, NRC fails to identify how the spent fuel pool leaks listed in Table E-4 were detected. By not identifying the means of detecting these past leaks, the WC DGEIS fails support its assumption that leaks will be readily detectable. Instead, the WC DGEIS leaves open the possibility that the leaks were only detected through sheer luck. The WC DGEIS must explicitly identify the means by which past leaks were detected and ensure that regulatory requirements will retain these means throughout the 60-year short-term storage period. Otherwise, the NRC has no basis for a finding of reasonable assurance that the methods on which it relies will detect future leaks. (0706-4-11 [Fettus, Geoffrey])

Comment: Most important, Mr. Lochbaum observes NRC fails to recognize that both regulatory requirements and its oversight regime are significantly scaled back when nuclear power reactors cease operation. For example, the aging management measures supporting renewal of reactor operating licenses only apply during the period of extended reactor operation—not the six decades of spent fuel pool storage that follow. And Mr. Lochbaum submits significant evidence that NRC's inspection effort in the shut-down period is drastically reduced. (0706-4-12 [Fettus, Geoffrey])

Comment: In short, NRC has serious gaps in its analysis and has failed to present evidence supporting its conclusion spent fuel pool leaks will be detected or have little impact on the environment. (0706-4-13 [Fettus, Geoffrey])

Comment: Pages E-1 to E-26. Appendix E Analysis of Spent Fuel Pool Leaks[.] NRDC Comments[:] NRDC's concern with spent fuel pool leaks are not whether spent nuclear fuel "can" be stored safely for some period of time appropriately cooling in a pool. The issue is whether spent fuel "will" be stored safely for extended periods of time and whether applicable regulatory controls are adequate. There is little in Appendix E to allay our substantive concerns and even less here to satisfy the directions of the D.C. Circuit. See, *New York et al.* at 481. For a thorough treatment of the concerns of NRDC and many others in the environmental and safety community, we recommend and concur with the concerns and observations expressed by Mr. David Lochbaum of the Union of Concerned Scientists with respect to NRC's analysis of spent fuel pool leaks in this Draft GEIS.⁴⁵ [footnote 45 text: See *Critique of the Analysis of Safety and Environmental Risks Posed by Spent Fuel Pool Leaks in the NRC's Draft Waste Confidence Generic Environmental Impact Statement*, December 13, 2013, Declaration of David Lochbaum, Director, Nuclear Safety Project, Union of Concerned Scientists.] The task the DC Circuit set for NRC with respect to the analysis of spent fuel pool leaks was straightforward. In discussing what the agency had before it with the last iteration of the Waste Confidence Decision, the Court wrote: The WCD Update seeks to extend the period of time for which pools are considered safe for storage; therefore, a proper analysis of the risks would necessarily look forward to examine the effects of the additional time in storage, as well as examining past leaks in a manner that would allow the Commission to rule out the possibility that those leaks were only harmless because of site-specific factors or even sheer luck. The WCD Update has no analysis of those possibilities other than to say that past leaks had "negligible" near-term health effects. *Id.* A study of the impact of thirty additional years of SNF storage must actually concern itself with the extra years of storage. (0706-4-8 [Fettus, Geoffrey])

Comment: *Id.* Specifically, the Court was concerned with a "*proper analysis of the risks would necessarily look forward to examine the effects of the additional time in storage, as well as examining past leaks in a manner that would allow the Commission to rule out the possibility that those leaks were only harmless because of site-specific factors or even sheer luck.*" As Mr. Lochbaum makes clear, while the Draft GEIS concedes long-term, low-volume spent fuel pool leaks could exceed public health regulatory limits and impact groundwater resources, it fails to provide meaningful support such leaks are unlikely to happen.⁴⁶ [footnote 46 text: See Sections IV and VIII of Mr. Lochbaum's Declaration.] Indeed, to the contrary, Mr. Lochbaum presents numerous examples NRC has failed to include in its analysis.⁴⁷ [footnote 47 text: See discussion in Lochbaum Declaration from 10-18 and "NRC did not consider the leaks that occurred from the spent fuel pools at the Brookhaven National Laboratory and the Yankee Rowe nuclear plant. The BNL spent fuel pool leaked radioactively contaminated water into the ground for up to 12 years. Four tests for leakage from the spent fuel pool over a seven year period failed to detect the leak. And numerous monitoring wells already existing or added to the site failed to detect the leaked water for many years or attributed leak indications other sources. But this event was not

included among the past events NRC considered for the WC DGEIS. Likewise, the NRC failed to consider in the WC DGEIS the two million gallons that leaked from the Yankee Rowe nuclear plant.” Lochbaum Declaration at 46.] (0706-4-9 [Fettus, Geoffrey])

Comment: Leaks from the Unit 1 spent fuel pools were also first discovered in the 1990s.³⁶ [footnote 36 text: For a discussion of Indian Point Unit 1 spent fuel pool leaks, see generally Riverkeeper Post-Hearing Brief on Radiological Materials at 30-33.] The previous owner of Unit 1 attempted to manage the leakage with a collection system. However, in 2006, Entergy discovered that this system had been failing and allowing highly toxic radioactive contaminants, including Strontium-90, Cesium-137, Nickel-63, and Cobalt-60, to be released to the environment at a rate of about 70 gallons/day. This rampant leakage only ceased at the end of 2008 when Entergy completed moving the fuel out of, and draining, the leaking Unit 1 pool. Entergy’s hydrogeologic investigation, spurred by the discovery of Unit 2 spent fuel pool leakage, uncovered that the leaks from the Unit 1 pools that began in the 1990s and continued until the end of 2008 had resulted in an extensive additional plume of contamination in the groundwater at Indian Point containing the aforementioned radionuclides. This plume commingles with the tritium plume generated by the Unit 2 spent fuel pool leaks. Moreover, despite the fact that no *new* radionuclides are being introduced from the Unit 1 pool, the previous contamination is retained in the subsurface, and will continue to be released into the groundwater, and subsequently into the Hudson River, indefinitely. (0710-10 [Brancato, Deborah] [Musegaas, Philip])

Comment: In addition, over the course of Indian Point’s over 40 years of operation, numerous radiological leaks and spills have occurred and resulted in releases of radioactivity. This includes, but is not limited to the following:³⁷ [footnote 37 text: See Riverkeeper Post-Hearing Brief on Radiological Materials at 33-38.] •In 1988, 8,400 gallons of radioactively contaminated water was released to the Hudson River as the result of a crack in the condenser blowdown line Unit 2; •In 2009, a Unit 1 distillation tank valve leaked enough radioactivity to cause noticeable increases in a groundwater monitoring well; •In 2009, a refueling water storage tank spilled radioactive water, causing greatly elevated levels of radioactivity in the groundwater wells for several months; •In 2009, a plant worker “discovered” that a pipe buried eight feet underground had sprung a leak when he found himself standing in a puddle of water; the leak resulted in an estimated 100,000 gallons of radioactive water to be released to the environment; •In 2009, Entergy discovered radioactive “washout” occurring at Indian Point, i.e., airborne tritium releases caused by radioactive leaks that evaporate, release via vents, and then condense and deposit in the environment; and •In 2011, Entergy identified elevated levels of radioactivity in the groundwater; it took Entergy months to discern that the cause was a leak in a recirculation pump. Inadvertent radiological leaks at Indian Point have resulted in two large commingled groundwater contamination plumes containing a number of different dangerously toxic radionuclides. Notably, Strontium-90 is a radionuclide that is absorbed by and concentrates in bone, while Cesium-137 is absorbed by muscle; tritium behaves like, and cannot be filtered out of, water, and can be ingested, inhaled, or absorbed through skin. (0710-11 [Brancato, Deborah] [Musegaas, Philip])

Comment: The levels of contamination in the groundwater at Indian Point persist at high levels.³⁸ [footnote 38 text: For a general discussion of the persistent nature of contamination plumes at Indian Point, see Riverkeeper Post-Hearing Brief on Radiological Materials at 38-56.] For example, since groundwater monitoring started at Indian Point, Entergy has regularly detected levels of radionuclides in the groundwater beneath Indian Point in excess of maximum contaminant levels (“MCLs”) established by the U.S. Environmental Protection Agency (“EPA”) for radionuclides in drinking water. This is a trend that is likely to continue. Indeed, the levels of

contamination in the groundwater will periodically increase even in the absence of new radioactive leakage due to episodic releases of radionuclides that are stored in the subsurface. Moreover, any new radioactive leaks that may occur in the future will indisputably add to the existing groundwater contamination, prevent the groundwater plumes from decreasing over time, and/or increase the overall levels of the plumes. To be sure, future radiological leaks from varying plant components are highly likely at Indian Point due to combination of factors, including the following: (1) Entergy has a completely inadequate program for managing and preventing leaks from buried components, which the U.S. government has explained are increasingly aging and likely to corrode and leak in the future; (2) Entergy employs a completely reactive approach to the management of radiological leaks at Indian Point, relying on groundwater monitoring to detect leaks *well after* they occur, which essentially ensure that leaks enter the environment, and/or waiting until critical circumstances arise to address operational leakage related events; and (3) Entergy has deficient, inadequately funded maintenance programs which result in insufficient leak management. Thus, the continued operation of Indian Point will foreseeably lead to additional radioactive leaks from plant systems, structures and components, and, as a result thereof, persistent and ever-accumulating contamination in the groundwater beneath the site. (0710-12 [Brancato, Deborah] [Musegaas, Philip])

Comment: Notably, it is undisputed that the groundwater contamination at Indian Point already migrates and releases to the Hudson River, regularly contributing to the levels of radioactivity present in the river.³⁹ [footnote 39 text: For a general discussion of the movement of the radiological contamination at Indian Point, see Riverkeeper Post-Hearing Brief on Radiological Materials at 56-60.] In fact, Entergy relies on monitored natural attenuation (“MNA”) to “manage” the radiological contamination at Indian Point, and will continue to do so *at least* throughout Entergy’s proposed license renewal periods for Indian Point. This means that the existing, as well as any future, new groundwater contamination will remain in the groundwater until it flushes out into to the Hudson River or decays. Entergy’s approach ensures that radioactive groundwater contamination will release to the Hudson River for upwards of centuries. Notably, Entergy has refused to extract the contamination so as to better minimize the impact of the groundwater contamination on the environment, despite the fact that such a remediation approach is technically feasible and advisable. (0710-13 [Brancato, Deborah] [Musegaas, Philip])

Comment: 2. Indian Point Site-Specific Factors are Highly Relevant to Assessing Spent Fuel Pool Leak Risks and Consequences[.] As an initial matter, the analysis in Appendix E of the DGEIS is deficient and fails to comply with NEPA or the Court Ruling because it inexplicably limits the analysis to offsite impacts only⁴⁹ [footnote 49 text: See DGEIS, Appendix E at pgs. E-1, E-8.] and relies on “institutional controls” to purportedly ensure the safe management of spent fuel onsite for an indefinite period of time in the future, without conducting an actual assessment of the efficacy of the regulatory controls being relied upon to prevent or mitigate the effects of long term storage. In Appendix E, the NRC assumes that existing decommissioning regulations will ensure that all onsite contamination will be remediated during the sixty year timeframe, thereby obviating the need for any assessment of onsite impacts from future spent fuel pool leaks. This is in direct contravention of the Court Ruling, which explicitly warned the NRC against continuing to rely on existing regulations as a basis for determining future impacts. The Court Ruling states: With full credit to the Commission’s considerable enforcement and inspection efforts, *merely pointing to the compliance program is in no way sufficient to support a scientific finding that spent-fuel pools will not cause a significant environment impact during the extended storage period.* This is particularly true when the period of time covered by the Commission’s predictions may extend to nearly a century for some facilities.⁵⁰ [footnote 50 text: *New York v. NRC*, 681 F.3d at 481 (emphasis added).] (0710-17 [Brancato, Deborah] [Musegaas, Philip])

Comment: In any event, as with spent fuel pool accidents, the NRC's analysis of spent fuel pool leaks in the DGEIS also employs a generic approach that improperly fails to consider or "bound" the impacts that could occur in light of the site-specific factors discussed above. The NRC's generic approach to future pool leaks makes no sense when viewed in light of the completely opposite conclusion regarding the need for site specific impact assessment reached in the NRC Staff's recent revision to the Generic Environmental Impact Statement pertaining to nuclear power plant license renewal ("License Renewal GEIS"). In the License Renewal GEIS, the NRC included a new "Category 2" issue, i.e., an issue for which it is necessary for the agency to conduct a site-specific assessment, related to "radionuclides in groundwater."⁵¹ [footnote 51 text: Generic Environmental Impact Statement for License Renewal of Nuclear Plants, NUREG-1436, Volume 1, Revision 1 (May 2013), *available at*, <http://pbadupws.nrc.gov/docs/ML1310/ML13106A241.pdf>, at pp.S-7, 1-24 ("Category 2 issues are those that do not meet one or more of the criteria of Category 1, and therefore, require additional plant-specific review").] In this context, NRC explained as follows: This new Category 2 issue evaluates the potential contamination and degradation of groundwater resources resulting from inadvertent discharges of radionuclides into groundwater from nuclear power plants. Within the past several years, there have been numerous events at power reactor sites which involved unknown, uncontrolled, and unmonitored releases of radionuclides into the groundwater. The number of these events and the high level of public controversy have made this issue one that the NRC believes needs a "hard look" as required by NEPA. (0710-18 [Brancato, Deborah] [Musegaas, Philip])

Comment: As a voluntary action, NEI 07-07 [*Industry Ground Water Protection Initiative-Final Guidance Document*; NEI 2007] cannot be enforced by the NRC. As such, no violations can be issued against a licensee who fails to comply with the guidance in NEI 07-07. Furthermore, the NRC cannot rely on a voluntary initiative as a basis to ensure that the nuclear power industry will have adequate information available for the NRC to determine whether a documented leak or spill does or does not have an adverse impact on groundwater resources. Regarding the magnitude of impact, the NRC bases its determination of SMALL to MODERATE impact on a review of existing plants have had inadvertent releases of radioactive liquids. Even though the NRC expects impacts for all plants to be within this range, a conclusion of LARGE impact would not be precluded for a future license renewal review based on new and significant information if the data support such a conclusion. As reflected in the final GEIS and rule, "Radionuclides released to groundwater" remains a Category 2 issue.⁵² [footnote 52 text: *Id.* at p.1-24.] (0710-19 [Brancato, Deborah] [Musegaas, Philip])

Comment: Further proof of the NRC Staff's arbitrary approach in the DGEIS can be found in testimony that was provided to the NRC Commissioners prior to the finalization of the License Renewal GEIS. In this testimony, a staff member of the NRC, Andy Imboden (who is notably also involved in the waste confidence DGEIS), explained that "[i]n a NEPA context, radionuclides in groundwater as projected over the period of extended operation and their impact to the groundwater resource, makes radionuclides and groundwater an issue that is appropriately discussed in an Environmental Impact Statement," and that "given the various sources of radionuclides, such as from the spent fuel pool, buried pipe, et cetera, unique hydrological feature for each plant, the staff concluded that a *site-specific review is required*."⁵³ [footnote 53 text: Transcript, Briefing on Proposed Rule to Revise the Environmental Review for Renewal of Nuclear Power Plant Operating Licenses, January 11, 2012 (ML120180209) at 63-64 (emphasis added).] Yet, here in the context of the DGEIS related to "waste confidence," NRC is content to rely upon the same exact referenced industry guidance and generically dispose of spent fuel pool leakage concerns. There is no basis whatsoever for NRC's conflicting positions. Notably, the License Renewal GEIS was directly concerned about spent fuel pool leaks, and

several of the reactor site leaks discussed in the License Renewal GEIS involved spent fuel pool leaks, such as Indian Point.⁵⁴ [footnote 54 text: See, e.g. Generic Environmental Impact Statement for License Renewal of Nuclear Plants, NUREG-1436, Volume 1, Revision 1 (May 2013), *available at*, <http://pbadupws.nrc.gov/docs/ML1310/ML13106A241.pdf>, at 4-52 (“The majority of the inadvertent liquid release events involved tritium, which is a radioactive isotope of hydrogen. However, other radioactive isotopes, such as cesium and strontium, have also been inadvertently released into the groundwater. The types of events include leakage from spent fuel pools, buried piping, and failed pressure relief valves on an effluent discharge line.” (emphasis added)).] It is inconsistent, arbitrary, and illogical for the NRC to require site specific assessment of radionuclide releases to groundwater during license renewal timeframes, and conversely find that future spent fuel pool leaks will be insignificant, and not require site specific assessment for spent fuel pool leaks during the 60-year post-operating license timeframe. For the same reasons stated in relation to the License Renewal GEIS, radionuclide leaks from the spent fuel pools and related components should also be examined in a site-specific manner during the post-operating timeframes contemplated in the DGEIS. Not doing so would violate NEPA and the Administrative Procedure Act, and serves to create regulatory confusion regarding the need to assess the impacts of spent fuel storage in the future. Importantly, site-specific consideration is critical in light of the unique impacts posed by spent fuel pool leaks at Indian Point. That is, NRC limited analysis in the DGEIS did not consider or otherwise somehow bound or encompass the unique and potentially considerable impacts that can occur at Indian Point from spent fuel pool leaks due to site-specific factors discussed above. (0710-20 [Brancato, Deborah] [Musegaas, Philip])

Comment: Moreover, NRC should have also considered the unique, site-specific issues facing Indian Point, in relation to assessing the *risk* of ongoing and/or additional spent fuel pool leaks occurring in the future during the post-operating license timeframe. For example: newly assessed and heretofore unaccounted for increased risks of earthquakes in the area may affect the structural integrity of the Indian Point spent fuel pools, which could exacerbate existing, or cause new leaks. Likewise, ongoing and future inadequate plant maintenance and management, especially in relation to spent fuel pool leaks and leakage detection (as is already highly evident at Indian Point as discussed above), may result in inadvertent, undetected ongoing or new leakage and unacceptable releases to the environment. Notably, NRC’s dependence on purported institutional controls, voluntary programs, and current alleged regulatory “requirements,” is completely misguided in light of the fact that the plant operators at Indian Point do not even detect and/or manage spent fuel pool leaks properly now, while the plant operates.⁵⁷ [footnote 57 text: See *generally* Comments by Environmental Organizations on Draft Waste Confidence Generic Environmental Impact Statement and Proposed Waste Confidence Rule And Petition to Revise and Integrate All Regulations Related to Back End of the Uranium Fuel Cycle (December 20, 2013) and Declaration of David Lochbaum, Critique of the Analysis of Safety and Environmental Risks Posed by Spent Fuel Pool Leaks in the NRC’s Draft Waste Confidence Generic Environmental Impact Statement, attached thereto.] In sum, the site-specific circumstances facing Indian Point increases the risks of such spent fuel pool leaks and consequences thereof, yet such factors were not “bounded” or considered by NRC. This renders NRC’s assessment in the DGEIS inadequate. (0710-23 [Brancato, Deborah] [Musegaas, Philip])

Comment: Accidental radiological leaks and spills have been a rampant and pervasive problem at Indian Point for decades, and will likely continue as long as the reactors operate and spent fuel is stored in the facility’s aging pools.³⁴ [footnote 34 text: A thorough factual record relating to the long and persistent history of inadvertent radiological releases at Indian Point is discussed in a post-hearing brief submitted by Riverkeeper in a proceeding pending before the

New York State Department of Environmental Conservation concerning the request by the owner of Indian Point, Entergy, for a Water Quality Certification pursuant to Section 401 of the Federal Clean Water Act; in that proceeding, an issue related to whether radiological releases from Indian Point are consistent with State water quality standards was raised. See Post-Hearing Closing Brief of Intervenors Riverkeeper, Natural Resources Defense Council, and Scenic Hudson Regarding Issue for Adjudication No. 3 – Radiological Materials (April 27, 2012), *available at*, <http://www.riverkeeper.org/wp-content/uploads/2012/12/2012.04.27.Indian-Point-401-SPDES-Proceedings-Riverkeeper-Closing-Brief-Radiological.pdf> (hereinafter cited as “Riverkeeper Post-Hearing Brief on Radiological Materials”). This brief supports the factual statements herein related to radiological leakage issues at Indian Point, and is hereby incorporated by reference in its entirety into the record of this NEPA review.] Leaks from Indian Point’s Unit 2 spent fuel pool started occurring in the 1990s.³⁵ [footnote 35 text: For a discussion of Indian Point Unit 2 spent fuel pool leaks, see generally Riverkeeper Post-Hearing Brief on Radiological Materials at 24-29.] In 2005, Entergy “discovered” that the Unit 2 pool was cracked and actively leaking. A follow-up hydrogeologic investigation, during which additional leakage sources from the Unit 2 pool were found, uncovered an extensive groundwater plume of tritium, from which it could be gleaned that the Unit 2 pool had been leaking radioactivity to the groundwater for years. Despite Entergy’s representations that it “fixed” the Unit 2 spent fuel pool leaks, in 2010 yet another, *new*, active leak source from the pool was discovered. Moreover, Entergy has never been able to inspect about 40% of the liner of the Unit 2 pool due to the density of the fuel, and Entergy concedes that other active leaks are likely ongoing. It is highly likely that the Unit 2 spent fuel pool will continue to leak radioactivity into the environment as Indian Point continues to operate: Entergy has no intention of ever conducting any full inspections of the Unit 2 spent fuel pool liner, or even any additional partial inspections that could detect potential leak sources; the pool has no “tell-tale” drain collection system which allows any leaks to be collected and monitored; the Unit 2 pool will continue to age and degrade since it is subject to the bathtub curve effect; and the owner of Indian Point, Entergy, employs a purely reactive approach that will discover leaks from the pool only *after* they occur. (0710-9 [Brancato, Deborah] [Musegaas, Philip])

Comment: The GEIS discloses that tritium moves quickly, and other radionuclides more slowly, where is the analysis of the existing soil contamination over time? Where is the projection for additional soil contamination? Even if all reactors close, decommissioning has the possibility of creating more soil contamination. If reactor operations continue, likely the activities that created existing contamination will also continue. Where is that analysis? (0711-36 [Olson, Mary])

Comment: Although NRC has described spent fuel pools as “leak tight,” the experience has shown that description to be inaccurate. In 2005, Indian Point identified leakage of radionuclide-contaminated water from cracks in two different spent fuel pools and subsequently discovered tritium, strontium, and other radionuclides in groundwater underneath the site.⁴⁹ [footnote 49 text: Nuclear Regulatory Commission, NRC Talking Points Slide Entitled, “Tritium at Nuclear Power Plants in the United States, Slide 3: Background,” ML063260464 (Nov. 7, 2006); Nuclear Regulatory Commission Office of Nuclear Reactor Regulation, *Ground-Water Contamination Due to Undetected Leakage of Radioactive Water*, NRC Information Notice 2006-13, at 3-4 (“Ground-Water Contamination”) ML060540038 (July 10, 2006).] Strontium and tritium from Indian Point’s spent fuel pools have reached the Hudson River.⁵⁰ [footnote 50 text: *Ground-Water Contamination* at 3-4; Entergy, Indian Point License Renewal Application, Environmental Report at 5-4, ML071210530 (Apr. 23, 2007).] Existing radioactive leaks at Indian Point have already far exceeded national drinking water standards.⁵¹ [footnote 51 text: See GZA GeoEnvironmental, Inc., *Hydrogeologic Site Investigation Report, Indian Point Energy Center*, at

90, 126, ML080320540 ("GZA Report") (Jan. 7, 2008); see also 40 C.F.R. § 141.66 (establishing drinking water standard for tritium at 20,000 pCi per liter and strontium at 8 pCi per liter).] All fresh groundwater in New York State is Class GA, the best use of which is as a source of potable water supply.⁵² [footnote 52 text: 6 N.Y.C.R.R. § 701.15.] Indian Point groundwater concentrations have exceeded national drinking water standards for tritium in six locations, sometimes by more than four times the tritium concentrations considered harmful to human health, and exceed national drinking water standards for Strontium-90 in ten locations, by almost five times in some locations.⁵³ [footnote 53 text: *GZA Report* at 125-26.] While NRC has recently acknowledged tritium leaks, it has been reluctant to acknowledge leaks of strontium and other radionuclides. In November 2010, the State of New York sought to draw the Commission's attention to the fact that radionuclides in addition to tritium have leaked from reactors.⁵⁴ [footnote 54 text: State of New York Comment Letter on Groundwater Task Force Report, Docket ID NRC-2010-0302, 75 Fed. Reg. 57987 (Nov. 1, 2010) ML103080060.] Moreover, the subsurface radiation plumes have exceeded EPA drinking water standards.⁵⁵ [footnote 55 text: *Id.*] The concerns outlined in the State's 2010 letter further support treating groundwater contamination as a site-specific environmental impact. (0718-1-17 [Sipos, John])

Comment: In 2002, water from a spent fuel pool at Salem Nuclear Power Plant in New Jersey was discovered to have leaked into a narrow seismic gap between two buildings, and further investigation revealed tritium in the groundwater near one of the buildings.⁵⁶ [footnote 56 text: Nuclear Regulatory Commission Office of Nuclear Reactor Regulation, *Spent Fuel Pool Leakage to Onsite Groundwater*, NRC Information Notice 2004-05 (Salem, New Jersey, Nuclear Generating Station), ML040580454 (Mar. 3, 2004).] These leaks occurred during the reactors' initial licensing term, calling into question the structural integrity of spent fuel pools as many reactors approach the end of their initial terms and seek license renewals. Radioactive water has also leaked from spent fuel pools at the Seabrook Nuclear Power Station in Seabrook, New Hampshire in 1999, at the Tennessee Valley Authority's Watts Bar Nuclear Generating Station in Spring City, Tennessee in 2002, and at Palo Verde Nuclear Generating Station, Unit 1 in Wintersburg, Arizona in 2005.⁵⁷ [footnote 57 text: Nuclear Regulatory Commission, *Liquid Radioactive Release Lessons Learned Task Force Final Report*, at 9, 24, and 35, ("Radioactive Release Lessons Learned") ML062650312 (Sept. 1, 2006).] In 1997, groundwater samples taken by Brookhaven National Laboratories in Long Island, New York revealed concentrations of tritium at twice the allowable federal drinking-water standards.⁵⁸ [footnote 58 text: General Accounting Office, Report to Congressional Requesters, Department of Energy, *Information on the Tritium Leak and Contractor Dismissal at the Brookhaven National Laboratory* (GAO/RCED-98-26), at 1-9 ("Tritium Leak and Contractor Dismissal") (Nov. 1997).] Subsequent samples were found to contain thirty-two times the standard.⁵⁹ [footnote 59 text: *Id.* at 4.] The tritium was leaking from the spent fuel pool serving the laboratory's nuclear reactor into the aquifer that provides the sole source of drinking water for nearby Suffolk County residents.⁶⁰ [footnote 60 text: *Id.* at 7-9; 43 Fed. Reg. 26,611, 26,612 (June 21, 1978) (EPA designation of sole source aquifer).] The Department of Energy's and laboratory's investigations concluded that the tritium had been leaking for as long as twelve years without the Department's or laboratory's knowledge.⁶¹ [footnote 61 text: *Tritium Leak and Contractor Dismissal* at 9.] A subsequent federal investigation concluded that Brookhaven employees did not aggressively monitor its spent fuel pool for leaks—even postponing an agreed-upon monitoring-well system—so that years passed before tritium contamination was discovered in the aquifer near the spent fuel pool.⁶² [footnote 62 text: *Id.* at 9-12.] (0718-1-18 [Sipos, John])

Comment: In 1986, in an "acute unmonitored release of large volumes of contaminated liquids to onsite ground surfaces and surface waters," 124,000 gallons of water containing 0.20 curies of tritium and 0.373 curies of mixed fission products leaked from the spent fuel pool at the Edwin

I. Hatch nuclear power plant in Baxley, Georgia to a nearby swamp and into the Altamaha River.⁶³ [footnote 63 text: *Radioactive Release Lessons Learned* at 5, 14; 55 Fed. Reg. 38474 (page 54) (Sept. 18, 1990).] The plant's owner did not calculate the maximum possible offsite doses, because no regulation required it to do so, but NRC found that the accident "demonstrated a lack of insistence on procedural adherence and attention to detail." and levied a civil monetary penalty.⁶⁴ [footnote 64 text: *Radioactive Release Lessons Learned* at 34.] NRC acknowledged this Hatch leak in its 1990 waste confidence findings and also that on August 16, 1988 a seal on a fuel pool pump failed at the Turkey Point nuclear plant near Miami, Florida causing approximately 3,000 gallons of radioactive water to leak into a nearby storm sewer, contaminating the shoes and clothing of approximately 15 workers.⁶⁵ [footnote 65 text: 55 Fed. Reg. 38474, (p. 54) (Sept. 18, 1990).] (0718-1-19 [Sipos, John])

Comment: NRC recently acknowledged that "leaks can develop in [spent fuel pools] and go undetected for long periods of time absent appropriate monitoring, resulting in the contamination of onsite groundwater and the potential for undetected, unevaluated releases of radioactivity to an unrestricted area."⁶⁶ [footnote 66 text: *Ground-Water Contamination* at 5.] The NRC has also acknowledged that its current regulations do not require groundwater monitoring and that licensees typically initiate groundwater monitoring only in response to known leaks.⁶⁷ [footnote 67 text: *Id.* at 5-6.] But NRC has not required plants to monitor for, assess, or remediate leaks, instead relying on voluntary initiatives undertaken by industry.⁶⁸ [footnote 68 text: Nuclear Regulatory Commission, *Senior Management Review of Overall Regulatory Approach to Ground Water Protection*, SECY-11-0019 (Feb. 9, 2011); *Ground-Water Contamination* at 5-7.] (0718-1-20 [Sipos, John])

Comment: In regard to "waste management," a leak in one of the spent fuel pools was accidentally discovered by a workman on the site. Since this discovery, the source of the leak has not yet been found; and water from this crowded spent fuel rod pool continues to leak into the surrounding area - ground, groundwater and river. (0762-5 [Skopic, Catherine])

Comment: Appendix E provides an analysis of spent fuel pool leaks. However, it does not contain any analysis of mitigation including a description of the emergency preparedness or what will be required in the event of a pool leak. In short, the Appendix does not provide the necessary support for an appropriate NEAP analysis on mitigation. (0783-3-23 [Harlan, Thomas])

Comment: p. 4-25 to 4-27, Groundwater Quality and Use "...The impacts 1 of a spent fuel pool leak on offsite groundwater depend on many factors, including the volume and rate of water released from the spent fuel pool, the radionuclide content and concentration and water chemistry of the spent fuel pool water, the direction of groundwater flow, the distance to an offsite groundwater receptor, the velocity or transport rates of radionuclides through the subsurface, and radioactive decay rates. A recent revision to the NRC's regulations that explicitly requires monitoring of subsurface areas will further ensure leaks are detected. Besides these measures, the hydrologic characteristics associated with typical nuclear power plant settings (see Section E.2.1.3)--such as their location near large waterbodies (due to cooling requirements), shallow water table flow direction toward these waterbodies, flat hydraulic gradients in the shallow water tables, large distance to local groundwater users, and the likelihood that local groundwater usage is in deeper confined aquifers--will act to impede the offsite migration of future spent fuel pool leakage. Finally, current and future spent fuel pool sites are required to have routine environmental monitoring programs in place that should take samples at offsite groundwater sources (e.g., potable or irrigation) in areas where the hydraulic gradient or recharge properties are suitable for contamination (NRC 1991c,d). Further, any detection of onsite contamination would likely result in additional monitoring, including additional

sampling of any nearby private wells, as part of an expanded environmental monitoring program. With these measures and characteristics in place, it is unlikely that offsite migration of spent fuel pool leaks will occur or go undetected. Based on resulting from a spent fuel pool leak during the short-term timeframe would be SMALL." Comment: The same comments made under the heading of Surface-Water Quality and Use apply here. There are so many "likely", "unlikely" and "likelihood" modifiers used that a high degree of uncertainty attaches to the assurances that nothing bad will happen if the pools leak. The statement that the small number of leak releases of contaminants to the environment, "based on the available data, have not affected the health of the public" is less than reassuring, especially if only impacts on humans is looked for. (0805-10 [Wilshire, Howard])

Comment: Too many proposed low impact leaks and transport difficulties classified as SMALL importance. (0817-1 [Munson, Marcia])

Comment: Through incompetence, negligence, non-disclosure, and falsification, the nuclear industry ignored or hid spent fuel pool leaks (especially tritium) into soil and groundwater from virtually every reactor unit in the U.S. The NRC acknowledges these leaks and admits that onsite contamination exceeds drinking water standards, but minimizes the danger and health risk of radioactive effluent from these aging, deteriorating, buried, inaccessible pipes as insignificant and unlikely to migrate offsite, while indiscriminately issuing reactor license extensions and allowing tons more spent fuel to be produced. (0819-8 [Kline, Connie])

Comment: The DGEIS reference to radioactive spill and leak detection is completely unsatisfactory. It ignores NRC's own records of undetected leaks and the understatement and underestimates of the volume of leaks which have been found. (0821-10 [Paddock, Brian])

Comment: Safety of future drinking water from each leak of radioactive contamination depends upon seriously addressing all leaks and stopping their migration immediately-not sitting back doing nothing and waiting for the leak to get worse and to spread offsite. It is unacceptable to not require each leak to be stopped as soon as it is discovered, including if it requires plant shut-down and eliminates profit margins. The environmental and public safety requires the highest value on the decision tree in all NRC decisions and rules, including over that of investor profits and the financial and timing preferences of reactor owners. Unanticipated leaks have become commonplace at every nuclear reactor. The NRC is too often not enforcing and mandating leaks to be completely stopped and cleaned up. This shows that environmental and public safety are inaccurately not being given the highest values in the complete oversight decision tree. (0823-42 [Michetti, Susan])

Comment: The Draft Generic EIS unacceptably uses a flawed approach to assess and analyze leaks, particularly in terms of actual specific past leaks at each and every nuclear power plant, as well as fails to consider the full impacts of these leaks. (0823-43 [Michetti, Susan])

Comment: Massachusetts' Yankee Rowe leaked 2 million gallons radioactive water that unacceptably contaminated the Deerfield River[.] For example, Yankee Rowe leaked and released about 2 million gallons of radioactive water that flowed into the Deerfield River, as identified in Yankee *Atomic Electric Company's Groundwater Protection- Data Collection Questionnaire*, July 19, 2006, Rowe, MA. Brookhaven National Labs' spent fuel pool leaked tritium into Suffolk County drinking water aquifer[.] In another example, Brookhaven National Labs measured ground water samples in 1997 and later that violated the allowable federal drinking water limits for tritium ranging from 2 to 32 times the standard. This leak originated from the High Flux Beam Reactor's spent fuel pool and unacceptably migrated into the drinking water

aquifer for nearby Suffolk County residents, as identified in US GAO, *Department of Energy: Information on the Tritium Leak and Contractor Dismissal at the Brookhaven National Laboratory*, GAO/RCED-98-26 (1977). Leaks beyond one year duration show unacceptable complacency and inadequate safety enforcement[.] The DOE and Brookhaven National Labs found evidence that more than a decade had passed without their knowledge of this unacceptable leak (GAO/RCED-98-26 (1977), *DOE: Information on the Tritium Leak and Contractor Dismissal at the BNL*). The finding that the timeframe for which this leak was unknown demonstrates that scientific assessment, methods, and practices are being too speedily conducted and without the thoroughness and rigor required. Such failure to meet scientific thinking at the oversight level requires immediate correction. In view of the NRC's claims that safety measures are in place for timely leak detection, it becomes more troubling that at least two spent fuel pool leaks were undetected for prolonged time periods in excess of one year. It is disturbing that such safety claims contradict actual reality more than once. Such inaccurate safety assurances by the NRC result in the NRC decision-making process displaying unreliability, undependability, and untrustworthiness. Such contradictions between promised assurances and facts are unacceptable. The NRC assures inaccurately that it is unlikely for leaks to go undetected for time periods that enable pollution of the outside environment significantly; such leaks have already occurred at Yankee Rowe nuclear plant and at BNL for longer than one year and perhaps longer than a decade, for examples. A leak reported as only a few gallons a day at spent fuel pool at Salem consisted of 100 gallons a day. Quicker observation, more thorough initial investigation, and accuracy of reporting in a timely way are required and need improvement. (0823-44 [Michetti, Susan])

Comment: It is disturbing that the volume and significance of this leak were not detected by instrumentation as well as not detected by the leak detection system. It is disturbing that a clogged drain in the monitoring system could cause failures, upon which safety depends. Failure in the maintenance of a clogged drain is an indicator that the NRC's safety assurances are flawed at the level of sufficient maintenance necessary to provide complete safety to the public and the environment. (0823-45 [Michetti, Susan])

Comment: It is unacceptable for the NRC's "scientific" analysis, by definition, of spent fuel pool leak impacts to fail to contain required quantitative assessment. The Draft Generic EIS fails to provide measurements, particularly of volume, speed, and duration, that define the mathematical measurable limits of significant spent fuel pool leaks. In all leaks, the identification of each radioactive elemental isotope should be provided as well as the concentration of quantity in the leaked water. Impacts should be determined through assessments of the factors of volume of leak, duration of leak, speed of leak, and isotope identification and concentration, as the minimum information upon which to base significant impacts. This is not a complete listing. (0823-46 [Michetti, Susan])

Comment: What is the measurable amount of leakage that defines NRC's significant contamination criteria? All leaks require sufficient enforcement action. Leaks not stopped within a reasonable time at the maintenance level with sufficient repairs and remodeling require stricter enforcement and fines. When enforcement action and fines do not successfully stop the leaks within less than a year, it is prudent to require shutdown of all operations for safety. The causal complacency needs to be tightened to an extremely rare exception when leaks are fully contained internally and do not escape into the environment outside of the building. (0823-47 [Michetti, Susan])

Comment: It is unacceptable for the Draft Generic EIS to depend upon groundwater monitoring and inspection programs to monitor leaks, particularly when those programs are not mandatory.

Such information should be considered auxiliary or supplemental ways to support more primary data. More primary measurements should be required to increase earlier leak detection as well as source location of a leak. (0823-50 [Michetti, Susan])

Comment: Appendix E of the draft GEIS sets forth a detailed discussion of the environmental impacts of spent fuel pool leaks during the short-term storage timeframe. NEI believes that the NRC adequately addressed the leaks issue and correctly concluded that the GEIS satisfies the Court's remand, as well as the NEPA "hard look" standard. Leaks are not an issue in the long-term storage scenario because the NRC has reasonably assumed that spent fuel will be moved to dry storage during the short-term timeframe. The draft GEIS appropriately describes the current regulatory regime for spent fuel pool leaks, including the NRC's requirements and industry initiatives for groundwater monitoring and remediation of contaminated groundwater. NRC, in Section E.3, has done a thorough job of compiling and examining industry's historical experience with spent fuel pool leakage and has, importantly, noted that none of these events are known to have resulted in contamination of drinking water.⁶⁵ [footnote 65 text: Draft GEIS at E-21] In accordance with NRC requirements, industry will maintain the capability to detect and mitigate any spent fuel pool leakage - as was done in the cases examined - as long as the pools are operational. However, the NRC does not simply rely on its ongoing regulatory oversight to conclude that the environmental impacts of spent fuel pool leaks during the short-term storage timeframe will be small. The draft GEIS discusses the minimum requirements for spent fuel pool design and maintenance, operational practices, site hydrogeological characteristics, and radionuclide-transport properties that apply at all sites and that provide reasonable assurance that there is a very low likelihood that an undetected leak from a spent fuel pool will migrate offsite.⁶⁶ [footnote 66 text: See, e.g., 10 C.F.R. § 50.65 (maintenance rule) and 10 C.F.R. § 100.20(c) (siting criteria).] These considerations are all generic, and obviate further site-specific assessments. Furthermore, in the unlikely event that a spent fuel pool leak migrates offsite, the draft GEIS assesses the potential for impacts on groundwater, surface water, soils, and public health using a bounding approach. The draft GEIS concludes that the environmental impacts of a spent fuel pool leak during continued storage would be small.⁶⁷ [footnote 67 text: Draft GEIS at Iviii - lix.] (0827-2-10 [Ginsberg, Ellen])

Comment: Based on operating experience, NEI agrees that impacts to groundwater would be small because it is highly unlikely that a leak of sufficient quantity and duration could occur without detection, or that migration of such a spent fuel pool leak would proceed at a rate that could not be mitigated before there would be any contamination of drinking water. Similarly, the impacts of spent fuel pool leaks on surface water would be small because, even in the highly unlikely event that undetected spent fuel pool leakage flowed continuously and unimpeded to local surface waters, the quantities of radioactive material discharged to nearby surface waters would be comparable to values associated with permitted, treated effluent discharges from operating nuclear power plants. This is assured by programs put in place to meet the requirements of a 2007 industry groundwater protection initiative that addresses "inadvertent releases" that "are well below the NRC's limits that ensure protection of the public health and safety."⁶⁸ [footnote 68 text: NEI 07-07 "Industry Ground Water Protection Initiative - Final Guidance Document," Aug. 2007.] With respect to the impacts on soil, the NRC correctly concludes that the leakage would be detected or absorbed onsite before migrating offsite, assuring that environmental impacts would be confined and small.⁶⁹ [footnote 69 text: Draft GEIS at E-18.] Lastly, as a result of the low probability of a leak affecting offsite groundwater sources, the impacts to public health resulting from a spent fuel pool leak during the short-term timeframe also would be small. In sum, the NRC has collected substantial data on the effects of spent fuel pool leaks. The draft GEIS extensively discusses factors that affect the likelihood that spent fuel pool leaks will migrate offsite and impact offsite resources. Although past experience

does not guarantee future results, operating experience is important. Experience is the basis for many of the upgrades and initiatives that have been put in place across all U.S. reactor sites. Moreover, experience is a useful predictor of future performance: it allows the industry and the NRC to project realistic risks as opposed to highly speculative, hypothetical risks. Coupled with continued regulatory oversight, there is ample support for the NRC's conclusions in the draft GEIS that the potential impacts involving spent fuel pool leaks would be small. (0827-2-11 [Ginsberg, Ellen])

Comment: In fact, the DGEIS flouts both NEPA and the Court's application of NEPA in *New York*, 681 F.3d 481 (D.C. Cir. 2012) in multiple ways: The DGEIS violates the Court's decision in *New York* by failing to analyze the significance of past spent fuel leaks for future risks, by making unsupported assumptions about its future ability to detect leaks, and by relying on inapplicable or nonexistent regulatory requirements for future prevention of leaks. (0897-1-10 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The Proposed Rule's Determination That Spent Fuel Can Be Safely Stored in Pools for an Indefinite Period is Not Based on an Adequate Environmental Analysis of Spent Fuel Pool Leaks[.] NRC's analysis of spent fuel pool ("SFP") leaks in the DGEIS violates NEPA. NEPA requires agencies to take a "hard look" at all reasonably foreseeable impacts of the proposed action. 42 U.S.C. 4332(2)(C); *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989) (quoting *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n. 21 (1976)); see also 40 C.F.R. §§ 1502.1, 1502.8 (agencies must include a "full and fair discussion" of direct, indirect, and cumulative environmental impacts). As the Court concluded in *New York v. NRC*, this means "[u]nder NEPA, an agency must look at both the probabilities of potentially harmful events and the consequences if those events come to pass." 681 F.3d at 478-79 (citing *Carolina Envtl. Study Grp. v. U.S.*, 510 F.2d 796, 799 (D.C. Cir. 1975)). Only if the probability of an environmental impact is so low as to be "remote and speculative," can an agency avoid analyzing the impacts of an action. *Id.* (citing *City of New York v. Dep't of Transp.*, 715 F.2d 732, 738 (2d Cir. 1983) ("The concept of overall risk incorporates the significance of possible adverse consequences discounted by the improbability of their occurrence.")). Thus, the Court held that the NRC must evaluate both the probability and the consequences of environmental impacts resulting from SFP leaks before finalizing the Waste Confidence Decision. In reaching this conclusion, the Court in *New York v. NRC* found NRC's previous analysis of SFP leaks underlying the 2010 waste confidence decision lacking. The Court faulted the NRC for failing to "look forward to examine the effects of the additional time [spent fuel will be held] in storage [pools]," and failing to "examin[e] past leaks in a manner that would allow the Commission to rule out the possibility that those leaks were only harmless because of site- specific factors or even sheer luck." 681 F.3d at 481. The Court went on to fault the NRC for relying on untested improvements to SFPs to conclude leak impacts would be insignificant and relying entirely on monitoring and compliance programs as a buffer against pool degradation. *Id.* The Court then reached the seemingly obvious conclusion, that "[a] study of the impact of thirty additional years of SNF storage must actually concern itself with the extra years of storage." *Id.* Regrettably, the NRC's new SFP leaks analysis in the DGEIS suffers from the same flaws as the vacated 2010 waste confidence decision. Seemingly without regard to NEPA or the *New York v. NRC* Court's decision, the NRC concludes SFP leaks will not have significant impacts without conducting the requisite analyses required by the remand and NEPA. (0897-4-19 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: First, the NRC again fails to evaluate the relevance of past leaks to future risks, other than to say past leaks were not large enough to adversely impact public health. This is exactly the kind of backward-looking thinking the Court disapproved in *New York v. NRC*. As

the Court unequivocally provided, “the harm of past leaks—without more—tells us very little about the potential for future leaks or the harm such leaks might portend.” (0897-4-20 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Second, the NRC again inappropriately relies almost exclusively on compliance programs to support its scientific finding that significant impacts will not occur. See DGEIS at E-9, 4-26 (The NRC states that “stainless-steel liners and leakage-collection systems . . . and . . . monitoring and surveillance of SFP water levels[,] make it unlikely that a leak will remain undetected long enough to exceed any regulatory requirement . . .” and further asserts that required groundwater monitoring provides an additional layer of protection.). As the Court warned the agency in *New York v. NRC*, “merely pointing to the compliance program is in no way sufficient to support a scientific finding that spent-fuel pools will not cause a significant environmental impact during the extended storage time.” See 681 F.3d at 481 (The NRC cannot merely assert that “leaks will not occur because the NRC is ‘on duty.’”). (0897-4-21 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The DGEIS also violates NEPA. It fails to consider many reasonably foreseeable impacts, including off-site impacts that do not exceed the NRC’s radiological exposure limits, on-site impacts, and certain social and economic factors including licensee longevity, property devaluations, and cleanup costs. It also fails to fully evaluate cumulative impacts. See *generally Robertson*, 490 U.S. at 350. (0897-4-23 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The NRC’s SFP leaks impact analysis violates NEPA and the Court’s decision in *New York v. NRC* because it does not evaluate the relevance of past leak events to the probability and consequences of future leaks[.] In its SFP leak impacts analysis, the NRC must “examin[e] past leaks in a manner that would allow the Commission to rule out the possibility that those leaks were only harmless because of site-specific factors or even sheer luck.” *New York v. NRC* 681 F.3d at 481. Without such an examination, the NRC cannot rely on “a finding that past leaks have been harmless [to reach] a conclusion that future leaks at all sites will be harmless as well.” *Id.* But this is exactly what the NRC attempts to do in its DGEIS – it provides a list of past leaks without meaningfully evaluating the circumstances surrounding leak detection or the leak impacts. And, the list is incomplete: the NRC fails to mention significant past SFP leaks at the Yankee Rowe nuclear plant and Brookhaven National Laboratories (“BNL”) that grossly exceeded the U.S. Environmental Protection Agency (“EPA”) drinking water standard of 20,000 picocuries per liter (pCi/l) for tritium. Lochbaum Declaration, pars. 4.3-4.6, 4.7-4.17. The occurrence of these leaks not only undermines the NRC’s conclusion that past SFP leaks were “harmless,” but the fact that such large leaks progressed undetected for years undermines the NRC’s assurances that all future SFP leaks will be detected before causing harm, based on the assumption that existing regulatory requirements are sufficient to meet this goal. NEPA requires a more complete evaluation of the relevance of past leak events to the probability and consequences of future leaks. (0897-5-1 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: [footnote] 12 Not only should the NRC have included a postulated leak analysis, it should have quantified that analysis. The NRC must conduct a quantitative analysis to the extent practicable. See 10 C.F.R. § 51.71(d). A discussion of how a quantitative analysis could have been conducted can be found in the Lochbaum Declaration, pars. 6.32 to 6.34.12 Not only should the NRC have included a postulated leak analysis, it should have quantified that analysis. The NRC must conduct a quantitative analysis to the extent practicable. See 10 C.F.R. § 51.71(d). A discussion of how a quantitative analysis could have been conducted can be found in the Lochbaum Declaration, pars. 6.32 to 6.34. (0897-5-10 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In conducting a sufficient NEPA analysis, the NRC should have analyzed examples of shut down reactors and the regulatory scheme that applies to them. For example, the Zion and Dresden Unit 1 nuclear plants are shut down and have greatly reduced regulatory programs. Lochbaum Declaration, pars. 7.22-7.36 (At the shutdown Zion nuclear plant, works or inspectors “seeking to ascertain whether ‘spent fuel in a safe condition’ is reasonably assured . . . need only evaluate whether protections against a fuel handling accident and a significant reduction in SFP water inventory are adequate.”) (At the shutdown Dresden reactor the licensee turned off the SFP cooling and cleanup system in 1983 and the owner had no leak detection program or water level inventory program.). The NRC’s claims that leaks will be detected before significant impacts are caused because it is “on duty” not only violate NEPA and the Court’s decision, but they are also untrue. The NRC should have conducted an analysis that discussed regulations and programs that are in place throughout the storage period. And, the NRC should have analyzed the impacts of SFP leaks should these limited regulations and programs not result in prompt leak detection. (0897-5-11 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: NRC’s SFP leaks impact analysis violates NEPA and the Court’s decision in *New York v. NRC* because it fails to meaningfully consider the impacts of additional storage time[.] “[A] proper analysis of the risks [of SFP leaks] would necessarily look forward to examine the effects of the additional time in storage . . .” because the “WCD . . . seeks to extend the period of time for which pools are considered safe for storage.” *New York v. NRC*, 681 F.3d at 481. In vacating the 2010 waste confidence decision, the court held that “[a] study of the impact of thirty additional years of SNF storage must actually concern itself with the extra years of storage.” *Id.* An analysis of the extra storage time is especially relevant, “when the period of time covered by the Commission’s predictions may extend to nearly a century for some facilities.” *Id.* In the proposed rule 10 C.F.R. § 51.23, there is no delineated time frame for storage (“it is feasible to safely store spent nuclear fuel following the licensed life for operation of a reactor”), and as such, it could be indefinite. Regardless of whether NRC claims fuel will only be in pools for 60 years or indefinitely, NRC has not considered the impacts of the additional time in pool storage. While implementation of aging management programs is required by the NRC during a facility’s operating life, and period of extended operation, there is no such requirement during the 60 year post –shutdown period, or beyond. Lochbaum Declaration, pars. 7.37-7.43. As a result, further aging degradation in the absence of such programs will eventually cause an increase in the failure rate of certain plant structures or systems, including SFPs, based on the use of the “bathtub curve.” See Lochbaum Declaration, pars. 7.37, 7.42. The NRC’s SFP leaks analysis fails to explain the increase in failure rate or provide support for its conclusion that extra time in storage will not cause significant impacts if and when future leaks occur. As such, it flies in the face of NEPA and the Court’s decision. (0897-5-12 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: NRC’s analysis violates NEPA because it fails to consider certain reasonably foreseeable significant impacts altogether[.] As discussed at the outset of this Section, the NRC must take a “hard look” at all reasonably foreseeable impacts of the proposed action. 42 U.S.C. 4332(2)(C); *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989) (quoting *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n. 21 (1976)). Further, as the *New York v. NRC* Court noted, this goes beyond merely looking at human health impacts. 681 F.3d at 481 (noting that “near-term health effects are not the only type of environmental impacts”). NRC’s analysis violates NEPA because it fails to evaluate certain significant impacts altogether and fails to fully consider cumulative impacts related to SFP leaks. As explained in greater detail in the Lochbaum Declaration, the NRC fails to evaluate offsite impacts from leaks when the contamination does not exceed federal radiological standards, onsite leak impacts, and social and economic impacts related to property devaluation and licensee longevity. See *generally* Lochbaum Declaration, Section VIII. For example, in the DGEIS, the NRC considers

radiological impacts “small” if releases do not exceed standards in NRC’s regulations. DGEIS at 4-64, E-18. However, significant environmental impacts can and do occur even with contamination below NRC’s radiological standards. See Lochbaum Declaration, pars. 8.2-8.7 (explaining that while the contamination from the Salem nuclear plant SFP leak has not violated federal standards for drinking water, it resulted in a sizable cleanup cost; and noting an effluent pipe leak at Braidwood nuclear plant in Illinois had significant consequences even though it did not exceed offsite radiological standards—e.g., bottled water was provided to about 420 homeowners and the licensee purchased contaminated property and reimbursed some 14 property owners for devaluations from the leak). The NRC also excludes any analysis of onsite impacts from SFP leaks. DGEIS at E-8 (asserting that onsite impacts are outside the scope of the DGEIS). But significant impacts, such as costly cleanups, could occur onsite for SFP leaks, and should be analyzed in the DGEIS. Lochbaum Declaration, pars. 8.2-8.7 (e.g., an underground pipe leak at New Jersey’s Oyster Creek nuclear plant cost millions of dollars to cleanup even though it remained onsite). (0897-5-13 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In addition, an assessment of the foreseeable impacts of SFP leaks on surface waters must also consider the potential for such leaks to interfere with recreational enjoyment of such waters (such as swimming, fishing, boating, etc.), with regard to the fact that such waters may be legally designated as suitable for such purposes by State agencies. (0897-5-16 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: NRC’s analysis of past leaks in Tables E-4 and E-5 is incomplete[.] As discussed above, the NRC must look at both the probability and consequences of SFP leaks. *New York v. NRC*, 681 F.3d at 478-79 (citing *Carolina Env’tl. Study Grp. v. U.S.*, 510 F.2d 796,799 (D.C. Cir. 1975)). To do this, the NRC claims to have looked at past leaks to “establish a baseline for the analysis of future impacts and provide context to those impacts.” DGEIS at E-19. Information about the occurrence of past leaks is contained entirely within Table E-4 in the DGEIS, which lists 16 past leaks at 13 reactors sites. DGEIS at E-20. However, this table is incomplete, and fails to discuss the BNL and Yankee Rowe nuclear plant SFP leaks. Without assessing these leaks, the DGEIS underestimates the prevalence of past leaks and thus the likelihood of future leaks. See Lochbaum Declaration, par. 4.2. These omitted leaks have important implications (discussed below) and must be considered. (0897-5-2 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: NRC’s analysis violates NEPA because it fails to consider relevant measures to mitigate adverse environmental consequences of SFP leaks[.] NEPA mandates that in undertaking environmental reviews, agencies must “discuss the extent to which adverse effects can be avoided” so that “the agency [and] other interested groups and individuals can properly evaluate the severity of the adverse effects.” *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351-52 (1989) (citations omitted).²¹ [footnote 21 text: See also *id.* (“One important ingredient of an EIS is the discussion of steps that can be taken to mitigate adverse environmental consequences. . . Implicit in NEPA’s demand that an agency prepare a detailed statement on ‘any adverse environmental effects which cannot be avoided should the proposal be implemented,’ is an understanding that the EIS will discuss the extent to which adverse effects can be avoided. More generally, omission of a reasonably complete discussion of possible mitigation measures would undermine the ‘action forcing’ function of NEPA. Without such a discussion, neither the agency nor other interested groups and individuals can properly evaluate the severity of the adverse effects. . . Recognizing the importance of such a discussion in guaranteeing that the agency has taken a ‘hard look’ at the environmental consequences of proposed federal action, CEQ regulations require that the agency discuss

possible mitigation measures in defining the scope of the EIS, in discussing alternatives to the proposed action, and consequences of that action, and in explaining its ultimate decision.”] Without such a discussion, it is patent that the agency has failed to take the requisite “hard look” at the environmental consequences of a proposed action. *See id.* Regulations implementing NEPA are likewise instructive. In particular, federal regulations require that reviewing agencies consider and assess mitigation measures in an EIS. 40 C.F.R. § 1508.25(b)(3); *see also* 10 CFR Part 51, Subpart A, App. A (“appropriate mitigating measures of the alternatives will be discussed”). These regulations define mitigation as: (a) Avoiding the impact altogether by not taking a certain action or parts of an action. (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation. (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment. (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action. (e) Compensating for the impact by replacing or providing substitute resources or environments. (0897-5-20 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Yet, the DGEIS fails to include an assessment of all relevant measures that may mitigate adverse environmental consequences of future SFP leaks and any contamination of the environment resulting therefrom. Various feasible measures are available that could avoid, minimize, rectify, reduce, or eliminate the environmental impacts of future radiological SFP leaks and contamination associated with such leaks. The EIS should include an assessment of the feasibility and efficacy of all reasonable measures to mitigate the impacts of future SFP leaks on the environment, including, but not limited to, the following: • Immediate clean-up activities associated with groundwater contamination resulting from SFP leakage. NRC must fully consider the degree and extent to which immediate clean-up activities may reduce environmental impacts of future SFP leakage. In particular, NRC must assess the feasibility and efficacy of extracting (via extraction wells) any contaminated groundwater, treating and/or excavating any contaminated soil, and any other remedial clean-up measures that could address contamination resulting from future SFP leaks. For example, NRC must analyze the degree to which groundwater extraction may prevent the migration of radiological contamination into adjacent surface waters and thereby avoid impacts to aquatic ecologies. Notably, NRC should not simply accept, or draw conclusions based upon, activities licensees may have (or have not) already taken in response to previous radiological leakage and groundwater contamination circumstances. Instead, NRC should evaluate the efficacy of groundwater extraction, soil remediation, and other clean-up measures on an independent basis. • Mandatory comprehensive groundwater monitoring. NRC must assess the efficacy of *mandatory* groundwater monitoring for minimizing the environmental harm of any future SFP leaks. NRC currently has no plans to impose any such mandatory requirements, but instead continues to rely on a purely voluntary industry program.²² [footnote 22 text: SECY-11-0019, Policy Issue, Senior Management Review of Overall Regulatory Approach to Groundwater Protection, (February 9, 2011), *available at*, <http://www.nrc.gov/reading-rm/doccollections/commission/secys/2011/2011-0019scy.pdf>, at 3-4.] The benefits of mandatory monitoring are patent. Mandatory, as opposed to voluntary, monitoring can potentially assist in minimizing the impacts of potential future SFP leaks, and, therefore, must be fully considered in the DGEIS.²² SECY-11-0019, Policy Issue, Senior Management Review of Overall Regulatory Approach to Groundwater Protection, (February 9, 2011), *available at*, <http://www.nrc.gov/reading-rm/doc-collections/commission/secys/2011/2011-0019scy.pdf>, at 3-4. (0897-5-21 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: • Preventative measures to proactively find SFP leaks before they occur and potentially cause measureable environmental impacts. The degree to which licensees are currently committed to, or will be required to, inspect SFPs is suspect. *See* Lochbaum

Declaration at Paragraphs 6.38-6.44, 7.13-7.25, 7.33-7.35, 9.6. NRC must assess the feasibility and efficacy of mandatory regular inspections of SFPs during the post- operation pool storage timeframes. NRC should consider the practicality and usefulness of physical/mechanical inspections of SFP liners, walls, floors, transfer canals, and other portions, at recurring frequencies. To the extent spent fuel is too densely packed to allow for full inspection, NRC must assess the feasibility and efficacy of reducing the density of pools to allow for such full inspections. • Measures to prevent initiation or exacerbation of future SFP leaks. NRC should analyze the feasibility and efficacy of measures that could be undertaken to enhance the integrity or robustness of SFP structures and prevent the initiation or exacerbation of SFP leaks. NRC should consider newer technologies, materials, or “upgrades” that may minimize the potential for SFP leaks and environmental contamination as a result thereof. For example, NRC should consider whether existing SFPs have “tell-tale” drain collection systems that prevent environmental harm, and, to the extent SFPs do not have such systems, the efficacy of retrofitting SFPs with such systems. NRC should also consider the impacts of new seismological information on the integrity of SFPs in the event of earthquakes in the future and available “upgrades” to account for such circumstances. • Preventative measures to proactively prevent future leaks from leaking non-SFP components. NRC must assess the steps that it could take to prevent or reduce future leaks from non-SFP components (e.g., other plant systems, structures, and components such as buried pipes), which, if not addressed are likely to result in cumulative environmental impacts in conjunction with future SFP leaks. NRC should also consider all reasonable measures that licensees could take to reduce or minimize the likelihood of future component leaks and impacts to groundwater, such as the feasibility and efficacy of moving buried pipes and structures above-ground so as to be able to better monitor such components, and substantially increasing the number of inspections of components that are known to be prone to leakage. (0897-5-22 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: • Measures to mitigate impacts to aquatic ecologies in adjacent affected waterways. NRC must give due consideration to the fact that aquatic ecosystems may be exposed to contamination from SFP leaks for centuries. Even low levels of any such contamination may result in impacts over time. Therefore, NRC must fully assess all measures that will minimize environmental harm to aquatic ecologies resulting from radiological SFP leaks. This includes, but is not limited to, an assessment of the feasibility and efficacy of enhanced/robust environmental monitoring of the impacts of future SFP leaks to these ecosystems. NRC cannot simply assume that existing NRC radiological effluent and environmental monitoring programs are adequate to capture all environmental impacts that may occur as a result of future SFP leaks. NRC should consider the degree to which enhanced programs will be able to more accurately detect any impacts, and, therefore assist in minimizing environmental harm. NRC should consider a wide portfolio of monitoring measures that licensees may not currently undertake, including, but certainly not limited to, the analysis of fish bone and shellfish shells in order to monitor for certain “bone seeking” radionuclides such as strontium-90, the sampling of benthic organisms, sampling at additional control locations, sampling of specific species as opposed to only opportunistic sampling, sampling more frequently, and sampling of additional analyses to ensure detection of particular radionuclides. • Measures to increase public access to information concerning future SFP leaks and groundwater contamination that occurs as a result. NRC must fully analyze the extent to which more openness and transparency regarding SFP leaks and groundwater contamination will reduce environmental impacts. That is, an assessment of the significance of an environmental impact includes the degree to which it is highly controversial. 40 C.F.R. § 1508.27(b). To the extent SFP leaks may be considered controversial,²³ [footnote 23 text: For example, since leaks at Indian Point were “discovered,” there has been a high level of public concern, which continues today. See Liquid Radioactive Release Lessons Learned Task Force Final Report,

September 1, 2006, at ii, *available at*, ADAMS Accession No. ML062650312.] they are “significant” as contemplated by NEPA. Thus, measures to alleviate public concern would assist in minimizing the overall impacts of any future SFP leaks. Accordingly, NRC should consider mitigation measures related to openness and transparency in relation to SFP leaks. For example, NRC should consider the feasibility and efficacy of full and regular public disclosure and publication of licensee radiological groundwater monitoring results to keep the public fully informed of existing circumstances. This is in relation to any results that are not already currently made publicly available via NRC’s ADAMS. NRC should contemplate the usefulness of such disclosures as results are generated, i.e., on a monthly or quarterly basis, depending on specific circumstances. In addition, measures to provide the public with easier access to site-specific annual radiological monitoring reports, which are available in NRC’s document system, ADAMS, should also be considered. NRC has the unequivocal obligation to *consider and discuss* relevant mitigation options that are available, and to weigh the costs and benefits of such options. *See Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351-52 (1989). Thus, pursuant to the basic tenets of NEPA, NRC must assess the foregoing measures, as well as any and all other relevant potential mitigation measures. (0897-5-23 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: NRC also fails to discuss the actual probability of past leaks in its analysis of future leaks. NRC asserts that SFP leaks “seldom occur due to stringent design features and operational controls.” DGEIS at E-9. This is blatantly false. SFP leaks occur often, as demonstrated by NRC’s own chart acknowledging that at least 16 leaks have occurred at 13 reactor sites (out of approximately 100), and also by the above discussion of several leaks that NRC failed to consider. *See* DGEIS at E-20. Basic math tells us that more than 10-15% of SFPs in the United States have already leaked. And those are just the leaks that have been detected. As discussed in the following subsection it is clear that many leaks go undetected for long periods of time and as such, it is reasonably likely that additional leaks are occurring or have occurred at operating reactors that are currently unknown to the NRC. (0897-5-3 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: NRC does not discuss the circumstances and implications of past leaks[.] Not only does the NRC fail to fully consider the probability of future SFP leaks as noted above, but the NRC also fails to properly assess the circumstances within which past leaks were detected, and the environmental and economic impacts of past SFP leaks (including those leaks listed in Table E-4, the BNL leak, and the Yankee Rowe leak). NEPA requires such consideration. *See New York v. NRC*, 681 F.3d at 478-79 (citing *Carolina Env’tl. Study Grp. v. U.S.*, 510 F.2d 796, 799 (D.C. Cir. 1975)). “Only if the harm in question is so ‘remote and speculative’ as to reduce the effective probability of its occurrence to zero may the agency dispense with the consequences portion of the analysis.” *New York v. NRC*, 681 F.3d at 482 (citing *Limerick Ecology Action, Inc. v. NRC*, 869 F.2d 719, 739 (3d Cir. 1989)). As is more fully set forth in the accompanying Lochbaum Declaration, many past leaks directly refute the NRC’s underlying conclusion in the DGEIS that leaks will be detected promptly and not cause significant harm. For example, the Yankee Rowe and Salem nuclear plant leaks demonstrate how a leak of over 100 gallons per day (gpd) can occur for long periods of time without detection. Lochbaum Declaration, pars. 4.3-4.7, 4.18-4.23. Each of these leaks caused harm. Lochbaum Declaration, pars. 4.3-4.7, 4.18-4.23 (at Yankee Rowe “approximately two million gallons of radioactively contaminated water leaked for perhaps as long as three years before [the leak] was detected,” with nearby surface water having tritium concentrations of over 1,000,000 pCi/L) (the Salem leak leached into surrounding soil and groundwater below the reactor site, causing the need for a massive cleanup in which, so far, “over 28 million gallons of groundwater have been recovered and processed”). Leaks at BNL and Indian Point demonstrate that smaller leaks

can likewise go undetected and contaminate the environment. Lochbaum Declaration, pars. 4.7-4.17, pars. 4.24-4.31 (the BNL leak went undetected for 12 years and contaminated groundwater, causing tritium levels between 2 and 32 times the federal drinking water standard) (at Indian Point, a leak went undetected, leaching into the soil and groundwater for about 2 years and resulting in exceedances of drinking water standards for tritium and strontium-90). The NRC failed to consider the consequences of these, or any other leaks listed in Table E-4, in its SFP leaks analysis. (0897-5-4 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Moreover, the NRC does not describe how the leakage was ultimately detected for any of the SFP leak events listed on Table E-4 in the DGEIS. Lochbaum Declaration, pars. 4.3-4.17. As noted in the Lochbaum Declaration, several of the SFP leaks (including Salem, BNL, and Indian Point) were detected by “sheer luck.” Lochbaum Declaration, pars. 4.7-4.17, 4.18-4.23, 4.24-4.31 (at Salem, because of a clog in the leak detection system, a 100 gpd leak went undetected until water from the leak seeped through concrete and formed a puddle on the floor of an adjacent building at the reactor site) (at BNL, despite discovering contamination in the groundwater in the 1980s, a SFP leak was not detected in four inspections or through water level monitoring for 12 years; eventually, during a fifth test in 1997, the leak was discovered) (at Indian Point, a SFP leak that started in the 1990s went undetected for years until it was discovered during the investigation of a subsequent leak in 2005; the 2005 leak was only discovered when workers noticed moisture forming on a concrete wall during construction related excavation). Before concluding that future leaks will not cause significant environmental impacts, the NRC was required to consider the impacts of past leaks and describe how past leaks were detected. It failed to do so. And, because of that failure it could not then assess whether past detection methods can ensure that future leaks will likewise be detected. In fact, as described above, many past leaks were discovered literally by accident, or due to random occurrences that were entirely unconnected to NRC regulatory requirements and controls in place at the time. Common sense dictates that the thorough, careful analysis of past leaks required by NEPA must necessarily examine how the past leaks were detected, in order to determine whether existing and future controls are sufficient. Because the NRC cannot reasonably rely on luck, NEPA requires it to analyze impacts of future leaks that go undetected. Without such an analysis, the DGEIS violates NEPA and the Court’s order in *New York v. NRC*. (0897-5-5 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The NRC’s SFP leak impacts analysis violates NEPA and the Court’s decision in *New York v. NRC* because it inappropriately relies almost entirely on compliance programs to support its scientific finding that significant impacts will not occur[.] In the DGEIS, the NRC concludes that leaks will be prevented and detected before causing significant impacts. DGEIS at xxxvii, 4-26, E-9–10, E-15–16. To reach this conclusion, (a) the NRC claims that all leaks of greater than 100 gallons per day will be promptly detected, and (b) the NRC relies on inapplicable leak detection regulations, voluntary programs, and programs that are substantially reduced in scope after reactors shut down. NRC cannot, without more, simply assert that “leaks will not occur because the NRC is ‘on duty.’” *New York v. NRC*, 681 F.3d at 481. Relying almost entirely on monitoring and regulatory compliance programs, many of which are inapplicable once a reactor shuts down, to conclude that future leaks will be detected before causing significant impacts is not sufficient. See *id.* (Despite NRC’s enforcement and inspection efforts, “merely pointing to the compliance program is in no way sufficient to support a scientific finding that SFPs will not cause a significant environment[al] impact during the extended storage period.” This is especially true when the NRC’s predictions span nearly a century at certain facilities.). NEPA requires the NRC to consider the reasonably foreseeable impacts that could result if these monitoring and regulatory compliance programs fail to detect a significant leak. (0897-5-6 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The NRC fails to explain the importance and usefulness of its 100 gallon per day leak detection threshold[.] In the DGEIS, the NRC claims that leaks equal to or greater than the average evaporation rate, 100 gallons per day (gpd), will be promptly detected—100 gpd is the average SFP evaporation rate. DGEIS at E-10 (According to the DGEIS, “[t]o go undetected, a leak would need to be less than the fluctuations in water level of a SFP lost to evaporation.”). This assumption, however, is simply not true. As noted above in Section VI.D.1.B, leaks great than 100 gpd have gone undetected by monitoring systems in the past for long periods of time (e.g., the Yankee Rowe leak, which went undetected for somewhere between 1 and 3 years, and released 2 million gallons of contaminated SFP water; the Salem leak which went undetected for a long period of time due to a clog in the telltale drain of the leak detection system). Lochbaum Declaration, pars. 4.4-4.5, 4.21. And, the NRC did not even evaluate leaks less than 100 gpd. As described above, past leaks of less than 100 gpd have also gone undetected for long periods of time (e.g., the Indian Point leaks went undetected for long periods of time, including one for over 2 years in the 1990s; the BNL leak went undetected for 12 years despite abnormally high tritium levels in the groundwater and repeated SFP tests). Lochbaum Declaration, pars. 4.17, 4.25. The NRC’s claim that it is on duty and that it will promptly detect leaks of over 100 gpd and that lesser leaks will not cause significant impacts is unsupported. Because past leaks have occurred both above and below the threshold, it is reasonably foreseeable that similar leaks could occur in the future. NEPA requires the NRC to analyze the impacts of such future leaks in its DGEIS. (0897-5-7 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The NRC improperly relies on inapplicable regulations, voluntary programs, and programs that are greatly reduced in scope after reactors shut down[.] In concluding that all leaks will be detected before causing significant impacts, the NRC repeatedly relies on inapplicable and voluntary compliance and monitoring programs. See Lochbaum Declaration at Sections VI and VII. For example, the NRC claims SFP water levels are being “constantly measured by instrumentation.” DGEIS at E-10. This is false. Water level instrumentation is not required to be in pools at all times; rather, it is required only during the short time when spent fuel is being moved. Lochbaum Declaration, par. 6.19. The NRC also claims that licensees are required to perform groundwater monitoring at reactor sites for support of its conclusion that leaks are unlikely to migrate off site. DGEIS at E-10. This is also false. The NRC has no general groundwater monitoring requirements, either for operating reactors or decommissioning reactors. Lochbaum Declaration, par. 6.40. To support its claim, the NRC relies on the Decommissioning Planning Rule (DGEIS at E-5, E-8); however, that rule allows licensees to choose whether or not to conduct groundwater monitoring. Lochbaum Declaration, Section VI.D, par. 6.41. And the NRC relies on the Groundwater Protection Initiative as support for its conclusions about SFP leaks. DGEIS at E-6. Unfortunately, the Groundwater Protection Initiative is voluntary and as such, cannot be relied upon to ensure future leaks will be promptly detected. Lochbaum Declaration, pars. 6.42-6.44 (noting further that this voluntary program has only been audited at operating reactors, never at shutdown reactors). Further, there is no requirement that licensees analyze a postulated leak of any magnitude of contaminated water from a SFP, even though that type of NRC requirement exists in other contexts (e.g., during the licensing process for the liquid waste management system).¹² [footnote 12 text: Not only should the NRC have included a postulated leak analysis, it should have quantified that analysis. The NRC must conduct a quantitative analysis to the extent practicable. See 10 C.F.R. § 51.71(d). A discussion of how a quantitative analysis could have been conducted can be found in the Lochbaum Declaration, pars. 6.32 to 6.34.] Lochbaum Declaration, pars. 6.25-6.30. Because these programs are voluntary or inapplicable, NRC has no basis for relying on them to conclude that leaks will be detected before causing significant impacts. (0897-5-8 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In support of its conclusion, NRC also assumes that current monitoring requirements, oversight procedures, and other programs will remain effective after reactors shut down. DGEIS at 1-15, 1-17, E-4. This assumption is unsound because the scope of many of these requirements, procedures, and programs will be greatly reduced. Lochbaum Declaration, par. 7.2. For example, shut down reactor licensees do not receive important safety communications and enforcement orders that are issued to operating reactor licensees. Lochbaum Declaration, Pars. 7.3-7.10 (e.g., after the March 2011 Fukushima disaster in Japan, an order requiring installation of monitoring equipment at SFPs was sent to reactor licensees, but no record of the order exists for the shutdown Zion nuclear power reactors). Similarly, NRC relies upon the Maintenance Rule to ensure leak detection. DGEIS at E-5. However, it is greatly reduced in scope after reactors shut down. Lochbaum Declaration, pars. 7.20-7.21 (Under the Maintenance Rule, “licensees can and do legally omit structures, systems, and components needed to detect and mitigate SFP leaks . . . from the scope of their maintenance programs.”). NRC also relies on its aging management program to ensure SFPs remain structurally sound during storage. DGEIS at E-5. However, that program, like so many others, is reduced in scope after reactors shut down. Lochbaum Declaration, pars. 7.37-7.43 (explaining that aging management is only required during the period of extended operation, not throughout the entire 60-year storage period). The NRC’s analysis fails to evaluate how this reduction in aging management protects against the bathtub curve effect—demonstrating an increase in failure rate over time. Lochbaum Declaration, par. 7.42. (0897-5-9 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: David Lochbaum’s declaration shows that NRC relies on nonexistent or inapplicable regulatory requirements to prevent or detect future leaks at decommissioned reactors. Given the large volume and radioactivity of some undiscovered pool leaks in the past, and given NRC’s failure to show that they will be detected and prevented in the future, environmental impacts of pool leaks are significant. (0897-7-4 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The conclusion in the WC DGEIS that spent fuel pool leak impacts are insignificant is based on three key assumptions. First, the WC DGEIS assumes that any leak rate greater than 100 gallons per day (gpd) will be readily detected. The NRC explains the basis for this assumption in the WC DGEIS as follows: *Based on operational experience, the model leak used for analysis here is assumed to correspond to a leak rate of approximately 380 L/day (100 gpd). . . . In analyzing the impacts of a spent fuel pool leak, the NRC assumed a leak rate similar to the rate of water lost due to evaporation, which would effectively double the makeup rate to the spent fuel pool. A leak of this magnitude would likely be identified in an expeditious manner because of licensee monitoring and surveillance.* (NRC 2013b, page E-10, lines 9-14) As discussed in Sections IV, V and VI below, this assumption is flawed because past spent fuel pool leaks suggest that leaks of up to and perhaps greater than 100 gallons per day may not be detected within weeks, months, or even years. Licensees are not even legally required to have functioning spent fuel pool water level instrumentation or groundwater monitoring systems during the 60-year short-term storage period, except during very limited and special situations. In addition, this assumption is not supported by any evaluation showing that leaks smaller than 100 gallons per day would be detected before causing significant impacts. (0899-1-1 [Curran, Diane] [Lochbaum, David])

Comment: 4.21 The leak was finally detected when water leaked through a concrete wall and puddled on the floor of an adjacent room. Thus, the leak of up to 100 gallons per day from the Salem spent fuel pool was *not* detected by the spent fuel pool water level instrumentation or the system installed specifically to detect such leakage. (Salem was an operating reactor at the time

with hundreds of workers present to limit the amount of time the puddle remained undetected. Had Salem instead been in the short-term storage period, it is less certain that the much smaller work force making far less frequent trips through the permanently closed plant would have found this leak as quickly. The WC DGEIS must explicitly identify the regulatory requirements that remain in place during the 60-year short-term storage period that provide reasonable assurance that future leaks similar to the Salem spent fuel pool leak--or worse---cannot result in significant impacts.) 4.22 Making matters worse, the leak detection system at Salem not only failed to promptly detect leakage from the spent fuel pool, it caused that leakage to reach the environment and contaminate surrounding soil. Had the leak detection system not become blocked, water leaking from the spent fuel pool would have flowed through the tell-tale drain lines to a collection tank. The leakage would have been monitored and stored in a tank specifically designed to hold radioactively contaminated water. Instead, the radioactively contaminated water leaked through concrete walls into the neighboring soil. 4.23 The State of New Jersey compelled Salem's owner to remediate the contaminated soil. On February 16, 2005, workers began pumping water out of extraction wells at the Salem site. The campaign was to process this groundwater to remove radioactivity from it, essentially recovering the radioactivity that had leaked from the spent fuel pool. As of September 2011, over 28 million gallons of groundwater had been recovered and processed (Arcadis, 2012). It represents 28 million reasons not to believe that spent fuel pool leaks will be detected before causing significant impact. (0899-1-10 [Curran, Diane] [Lochbaum, David])

Comment: D. Indian Point leaks[.] 4.24 Leaks from the spent fuel pools at two of the three reactors at the Indian Point nuclear plant in New York are listed in Table E-4 of the WC DGEIS, but their circumstances are not discussed in much detail. As with the other leaks discussed above, the Indian Point leaks contradict the WC DGEIS in important ways. 4.25 The owner of the Indian Point nuclear plant in New York informed the NRC about leakage from the Unit 2 spent fuel pool (SFP) in the 1990s: *It is believed that SFP water leaked out of the construction joint at a rate of about 50 gallons per day for about 2 years, leaking into the underlying ground water.* (Entergy 2008) 4.26 Workers inadvertently punctured the stainless steel liner inside the Indian Point Unit 2 spent fuel pool while modifying the storage racks for spent fuel inside the pool. The hole was repaired, but water collected in the space between the liner and the concrete walls and floor of the pool. The plant's owner estimated that approximately 36,500 gallons of radioactively contaminated water flowed from this location to a construction joint (seam) in the concrete. Water leaked past this joint into the soil and "underlying groundwater" (Entergy 2008, page 2). 4.27 This leak remained undetected until another leak from the same spent fuel pool was discovered in 2005. At that time, workers were excavating the ground outside the Unit 2 fuel handling building and noticed moisture forming on the exposed concrete wall. That discovery prompted an investigation that revealed this ongoing leak through the concrete wall and led to the discovery of the earlier leak through the construction joint (Entergy 2008). (0899-1-11 [Curran, Diane] [Lochbaum, David])

Comment: 4.28 The leak rate of water from the spent fuel pool through the construction joint was estimated to be 50 gallons per day. That leak remained undetected while it was occurring--the leak was only identified and quantified long after the fact. For the WC DGEIS, the NRC assumed that a leak rate of 100 gallons per day would be readily detected. But the NRC failed to evaluate a longstanding leak of less than 100 gallons per day. In other words, if this undetected leakage of 50 gallons per day had continued leaking throughout the 60-year short-term storage period instead of only two years, it might have resulted in significant impacts. 4.29 In addition, according to a recent evaluation by a consultant retained by Indian Point's owner, leakage from the Unit 2 spent fuel pool may be continuing at a rate of between 10 and 30 gallons per day (GZA 2012, footnote 6). If such leakage persists for 60 years, 219,000 to

657,000 gallons will leak. The inability to determine whether past leakage has been stopped also casts considerable doubt on the ability to definitively conclude whether future leakage has started. After all, contamination measured in a groundwater well can easily be attributed to the old source and not initiate an investigation for a new, and perhaps more significant, source. 4.30 Such masking factored heavily into the reactor vessel head degradation near-miss at the Davis-Besse nuclear plant when workers and the NRC misdiagnosed boric acid accumulation on the outer surface of the reactor vessel head as coming from control rod drive mechanism flange leakage, a recurring problem at this site across several years. When later leakage occurred through the control rod drive mechanism itself--a significantly larger potential hazard--the owner and the NRC missed opportunities to detect and correct it in a timely manner. Boric acid accumulation was falsely blamed on the old, recurring benign source instead of to the new, emerging malignant source (NRC 2002). 4.31 The WC DGEIS fails to conclusively show either that smaller leak rates (e.g., less than 100 gallons per day) can be detected in a timely manner or that smaller leaks cannot possibly result in significant impact. The WC DGEIS must explicitly identify the regulatory requirements that remain in place during the 60-year short-term storage period that provide reasonable assurance that future leaks similar to the Indian Point spent fuel pool leaks--or worse--cannot result in significant impacts. (0899-1-12 [Curran, Diane] [Lochbaum, David])

Comment: Pattern of Not Discussing Causes of Spent Fuel Pool Leaks in the WC DGEIS[.] 4.32 As discussed above for the Salem and Indian Point spent fuel pool leak events, the NRC does not describe in the WC DGEIS how the leakage was ultimately detected. This is also true for all the other spent fuel pool leak events listed on Table E-4 in the WC DGEIS. Obviously, it is also true for the Yankee Rowe and BNL spent fuel pool leak events since the NRC does not mention them at all in the WC DGEIS. 4.33 By failing to explicitly describe how these past spent fuel pool leaks were detected, the NRC also fails to demonstrate how future spent fuel pool leaks would be discovered. In the WC DGEIS, the NRC must explain how past leaks were detected and identify the regulatory requirements that remain in place during the 60-year short-term storage period that provide reasonable assurance that future leaks will be detected. (0899-1-13 [Curran, Diane] [Lochbaum, David])

Comment: V. THE WC DGEIS FAILS TO PROPERLY CONSIDER THE DIFFICULTIES INHERENT IN SPENT FUEL POOL LEAK DETECTION[.] 5.1 The NRC's analysis for the WC DGEIS of spent fuel pool leak detection is flawed because it fails to consider the inherent difficulties associated with leak detection and because its 100 gallon per day threshold for effective leak detection lacks solid foundation. The WC DGEIS simply fails to demonstrate that leaks with greater or less than 100 gallons per day will be detected before causing significant impacts. 5.2 The NRC assumes in the WC DGEIS that spent fuel pool leakage equal to the average evaporation rate of water from spent fuel pools would be promptly detected and therefore could be promptly stopped and remediated. The WC DGEIS explains the basis for this assumption as follows: *Based on operational experience, the model leak used for analysis here is assumed to correspond to a leak rate of approximately 380 L/day (100 gpd). ...In analyzing the impacts of a spent fuel pool leak, the NRC assumed a leak rate similar to the rate of water lost due to evaporation, which would effectively double the makeup rate to the spent fuel pool. A leak of this magnitude would likely be identified in an expeditious manner because of licensee monitoring and surveillance.* (NRC 2013b, page E-10, lines 9-14) 5.3 This assumption is flawed in the following respect. When a spent fuel pool leaks onto the floor or into a surrounding plant area, the puddle formed helps assure timely detection (see paragraph 4.21 of this declaration for such an example). But when a spent fuel pool leaks into the ground, detection becomes more complicated and timely detection less certain (see paragraphs 4.25 to 4.28 of this declaration for such an example). As the NRC noted in a separate study on leaks of

radioactively contaminated water into the groundwater: *SFP [spent fuel pool] leak detection may require special techniques since SFPs have an evaporation rate up to several hundred gallons per day. This evaporation rate may mask small leaks in the SFP liner and make small leakage rates difficult to detect by evaluation of make-up rates within a water balance calculation. (NRC 2006a, page 6) (0899-1-14 [Curran, Diane] [Lochbaum, David])*

Comment: 5.4 In the WC DGEIS, the NRC assumes that the spent fuel pool will leak at a rate equal to an evaporation rate of 100 gallons per day. As discussed in paragraph 4.5 of this declaration, the leak rate at the Yankee Rowe plant significantly exceeded 100 gallons per day and yet remained undetected until two million gallons had been released. But the NRC neither lists this reported leak in Table E-4 of the WC DGEIS nor discusses it anywhere within the report. The Yankee Rowe leak undermines-if not totally refutes-the validity of the NRC's assumption that spent fuel pool leaks of 100 gallon per day or greater would be discovered in a timely manner. 5.5 Likewise, potential leakage of 100 gallons per day from spent fuel pool at Salem might not have been detected in a timely manner (see paragraphs 4.19 to 4.21 of this declaration). 5.6 Thus, the WC DGEIS is flawed because the NRC wrongly assumes that spent fuel pool leaks of 100 gpd and larger would be detected and stopped in a timely manner and that the leaked water would pose no significant impacts. 5.7 The WC DGEIS is also flawed because it fails to show that spent fuel pool leak rates of less than 100 gpd will be detected before causing significant impacts. As previously described in paragraphs 4.7 to 4.17 of this declaration, workers eventually discovered that the spent fuel pool at BNL had been leaking at a rate of 6 to 9 gallons per day for over a decade. Four prior spent fuel pool leak tests at BNL failed to properly account for evaporation rates and missed opportunities to detect a leak. And as discussed in paragraph 4.29 above, the Unit 2 spent fuel pool at the Indian Point nuclear plant may still be leaking at 10 to 30 gallons per day. 5.7 The WC DGEIS cannot summarily dismiss that significant impacts might result from spent fuel pool leaks smaller than 100 gallons per day. Instead, the NRC must either (a) show that smaller leaks cannot result in significant impacts even when undetected throughout the 60-year short-term storage period, or (b) identify the regulatory requirements providing reliable assurance that a smaller leak would be detected before it has significant impact. The WC DGEIS cannot merely wish significant impacts away. 5.8 A showing that smaller leaks for prolonged periods cannot result in significant impacts could be made by evaluating potential consequences from the most vulnerable location (i.e., the site where leakage is most likely to have significant impacts due to factors such as the geology, hydrology, population demographics, etc.) against acceptance criteria coupled with confirmatory checks before reactors enter the 60-year short-term storage period that the sites are not more vulnerable. An alternative to this bounding evaluation would be a regulatory requirement that all licensees conduct site-specific evaluations prior to their reactors enter the 60-year short-term storage period. (0899-1-15 [Curran, Diane] [Lochbaum, David])

Comment: THE WC DGEIS RELIES ON INCORRECT ASSUMPTIONS ABOUT THE COVERAGE AND APPLICABILITY OF MONITORING REQUIREMENTS[.] 6.1 In concluding that spent fuel pool leaks will be detected in a timely manner, the WC DGEIS relies on the current existence and continuing applicability of a robust set of regulatory requirements for monitoring spent fuel pool water levels and monitoring the groundwater at the site for radioactive contamination, as well as maintenance of spent fuel pools. These assumptions are simply wrong. The requirements are neither robust nor continuing. Even during the more vigilant period of reactor operation, the key requirement on which NRC relies-monitoring of spent fuel pool water levels-applies only in very limited circumstances. And there is no requirement in NRC regulations at all for regular groundwater monitoring during reactor operation and after the reactor permanently shuts down. While the nuclear industry has developed a voluntary groundwater monitoring program, such voluntary measures could be terminated at any time, at

the discretion of the industry. And while NRC inspectors have audited the implementation of the voluntary measures at reactors that are presently operating, they did not audit the measures at the reactors that have already permanently shut down and have no stated plans to conduct further audits anywhere. Therefore, the NRC has no basis for relying on these voluntary measures during the 60-year short-term storage period. Thus, a close look shows that the assumption in the WC DGEIS about strong regulatory oversight—an essential underpinning of the NRC's risk and impact prediction for spent fuel pool leaks—is tenuous at best and an illusion at worst. (0899-1-16 [Curran, Diane] [Lochbaum, David])

Comment: Limited Spent Fuel Pool Water Level Monitoring Requirements[.] 6.2 According to the WC DGEIS, during the short-term storage period: *Significant short-term water loss from a spent fuel pool is likely to be identified due to licensee monitoring of spent fuel pool water levels.* (NRC 2013b, page E-9). But this conclusion is undermined by gaps in the NRC's regulatory requirements governing spent fuel pool water level monitoring. 6.3 When the NRC issues an operating license for a nuclear power reactor, an appendix to the license contains the technical specifications. The technical specifications establish the minimum complement of equipment needed for safety, the testing and inspections required to assure reliability of this equipment, and the remedial measures to be taken when necessary equipment is unavailable. 6.4 The NRC developed Standard Technical Specifications for reactors designed by the different vendors (e.g., Westinghouse, Combustion Engineering, Babcock & Wilcox, and General Electric). Many owners have formally obtained NRC permission to tailor the Standard Technical Specifications to their reactors. In any case, the custom technical specifications for the remaining reactors are comparable in technical content; the primary difference being in the organization and presentation of that technical content. 6.5 The minimum complement of equipment is defined by Limiting Conditions for Operation (LCOs) and applicability statements. For example, an LCO might require two safety pumps to be available when the reactor is operating but only one safety pump when the reactor is shut down. (0899-1-17 [Curran, Diane] [Lochbaum, David])

Comment: 6.6 LCO 3.7.8 of the NRC's Standard Technical Specifications covers the minimum water level necessary for safety in the boiling water reactors manufactured by General Electric: LCO 3.7.8 *The spent fuel pool water level shall be > [23]⁹* [footnote 9 text: The number in brackets is a convention used within the Standard Technical Specifications to denote a value determined by reactor-specific calculations. For the majority of reactors, the bracketed value will be retained—for some reactor, the site-specific value may be slightly higher or lower as dictated by individual designs.] ft over the top of irradiated fuel assemblies seated in the spent fuel storage pool racks. (NRC 2012b, page 3.7.8-1) 6.7 The associated applicability statement defines when the water level must satisfy this LCO: *APPLICABILITY: During movement of irradiated fuel assemblies in the spent fuel storage pool.* (NRC 2012b, page 3.7.8-1) 6.8 Thus, there is a regulatory requirement that the water level be above a certain level in the spent fuel pool only when irradiated fuel assemblies are being moved within the pool. 6.9 The reason for this minimum spent fuel pool level and when it is applicable is described in the Bases document developed by the NRC for the General Electric Standard Technical Specifications: *BACKGROUND The minimum water level in the spent fuel storage pool meets the assumptions of the iodine decontamination factors following a fuel handling accident.* (NRC 2012c, page B 3.7.8-1) *LCO: The specified water level preserves the assumptions of the fuel handling accident analysis. As such, it is the minimum required for fuel movement within the spent fuel storage pool.* (NRC 2012c, page B 3.7.8-1) *APPLICABILITY: This LCO applies during movement of irradiated fuel assemblies in the spent fuel storage pool since the potential for a release of fission products exists.* (NRC 2012c, page B 3.7.8-1) (0899-1-18 [Curran, Diane] [Lochbaum, David])

Comment: 6.10 The minimum spent fuel pool water level requirement protects against radiation released during a fuel handling accident such as when an irradiated fuel assembly drops onto other irradiated fuel assemblies damaging fuel rods and releasing radioactive gases and particles. This exclusive role for the required water level is reinforced by the measures mandated in the Standard Technical Specifications should the requirement not be met: ACTIONS A. *Spent fuel storage pool water level not within limit.* REQUIRED ACTION A.1 *Suspend movement of irradiated fuel assemblies in the spent fuel storage pool.* (NRC 2012c, page 3.7.8-1) 6.11 It is, therefore, not required that the water level in the spent fuel pool be restored to above the minimum level or even that a declining water level be halted--all that is required is that the movement of irradiated fuel assemblies within the spent fuel pool be halted. 6.12 For the minimum spent fuel pool water level requirement specified by LCO 3.7.8 to be satisfied, another provision in the Standard Technical Specifications requires that the instrumentation used to measure the level be functional. Specifically, the definition of OPERABLE¹⁰ [footnote 10 text: The capitalization of this word is a convention used within the Standard Technical Specifications for terms defined within Section 1.1. This convention alerts users to the fact that the terms have explicit meanings.] in Section 1.1, Definitions, of the Standard Technical Specifications states: *A system, subsystem, division, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, division, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).* (NRC 2012b, page 1.1-4) (0899-1-19 [Curran, Diane] [Lochbaum, David])

Comment: The conclusion in the WC DGEIS that spent fuel pool leak impacts are insignificant is based on three key assumptions.[...] Second, the WC DGEIS assumes that: *A strong regulatory framework that includes both regulatory oversight and licensee compliance is important to the continued safe storage of spent fuel.* (NRC 2013b, page B15, lines 27-28)****The analyses in this draft GEIS are based on current technology and regulations.* (NRC 2013b, page 1-17, line 21) As discussed in Section VII below, this assumption is flawed because it relies on regulatory requirements and measures in place for operating reactors without considering the significant reduction in regulatory requirements and oversight that occurs during storage after reactors cease operating. (0899-1-2 [Curran, Diane] [Lochbaum, David])

Comment: 6.13 This definition of OPERABLE applied to LCO 3.7.8 means that REQUIRED ACTION A.1 is invoked whenever the measured water level in the spent fuel pool drops within [23] feet of irradiated (spent) fuel assemblies in the pool's storage racks or whenever the water level instrumentation is unavailable to provide the measured level. 6.14 The relationship between the definition of OPERABLE and the APPLICABILITY statement in LCO 3.7.8 means that the instrumentation used to measure the water level in the spent fuel pool is only required to be available when irradiated (spent) fuel assemblies are being moved in the spent fuel pool. At all other times, the spent fuel pool water level instrumentation can be unavailable (i.e., non-functional) without invoking any out-of-service deadlines or required compensatory actions. 6.15 The NRC's regulatory requirements for water level inside spent fuel pools at pressurized water reactors are comparable: LCO 3.7.15 The fuel storage pool water level shall be > 23 ft over the top of irradiate fuel assemblies seated in the storage racks. (NRC 2012d, page 3.7.15-1) APPLICABILITY: *During movement of irradiated fuel assemblies in the fuel storage pool.* (NRC 2012d, page 3.7.15-1) ACTIONS A. *Fuel storage pool water level not within limit.* REQUIRED ACTION: *Suspend movement of irradiated fuel assemblies in the fuel storage pool.* (NRC 2012d, page 3.7.15-1) BACKGROUND *The minimum water level in the fuel storage pool meets the assumptions of iodine decontamination factors following a fuel handling accident. The*

specified water level shields and minimizes the general area does when the storage racks are filled to their maximum capacity. The water also provides shielding during the movement of spent fuel. (NRC 2012e, page B 3.7.15-1) LCO The fuel storage pool water level is required to be > 23 ft over the top of irradiated fuel assemblies seated in the storage racks. The specified water level preserves the assumptions of the fuel handling accident analysis. (NRC 2012e, page B 3.7.15-1) APPLICABILITY The LCO applies during movement of irradiated fuel assemblies in the fuel storage pool, since the potential for a release of fission products exists. (NRC 2012e, page B 3.7.15-2) (0899-1-20 [Curran, Diane] [Lochbaum, David])

Comment: 6.16 Limiting the applicability of the minimum water level in the spent fuel pool to only when irradiated fuel assemblies are being moved decreases the likelihood that spent fuel pool leakage will be detected. When these LCOs are not applicable (i.e., when irradiated fuel assemblies are not being moved), it is not required that the instrumentation used to monitor the spent fuel pool water level be in service. Consequently, if the spent fuel pool water level instrumentation broke, there would be no regulatory requirement to return it to service. As a practical matter, under current regulations, the water level instrumentation-and the associated audible, visual, and computer alarms that are generated when water level drops too low-could remain out of service until just before the next planned movement of irradiated fuel assemblies within the spent fuel pool. Because irradiated fuel assemblies are seldom moved within the spent fuel pools, especially within spent fuel pools at reactors that have been permanently shut down, the water level instrumentation could be legally out of service for the overwhelming majority of the time. This reality undermines reasonable assurance that a low-volume spent fuel pool leak would be readily detected. 6.17 In the procedure used when examining spent fuel pools at permanently shut down nuclear power reactors, the NRC inspectors are tasked to: *Review and evaluate whether the SFP instrumentation, alarms and leakage detection systems are adequate to assure the safe wet storage of spent fuel.* (NRC 1997, Section 02.02) 6.18 The NRC's Standard Technical Specifications and their Bases define "safe wet storage of spent fuel" as being when at least 23 feet of water exists above the top of the storage racks when irradiated fuel is being moved. When irradiated fuel is not being moved, no regulatory requirement governs the amount of water in the spent fuel pool or the availability of water level instrumentation. Consequently, if an NRC inspector finds the spent fuel pool water level instrumentation out of service or water level inside the pool far below normal, he or she lacks regulatory leverage to compel either condition to be remedied. 6.19 Thus, these LCOs, which are inapplicable during storage because they only apply when spent fuel is being moved, are not supportive of NRC's conclusion that spent fuel pools are being constantly monitored and maintained. The WC DGEIS cannot place much weight on equipment and conditions unless they are required to be in place. (0899-1-21 [Curran, Diane] [Lochbaum, David])

Comment: 4.7 NRC has failed to consider the longstanding leakage of radioactively contaminated water from the spent fuel pool at the Brookhaven National Laboratory (BNL) on Long Island, New York.⁶ [footnote 6 text: The BNL and its spent fuel pool are not licensed or regulated by the NRC. It is regulated by the U.S. Department of Energy (DOE). But this spent fuel pool leak should be known to the NRC, evidenced by the 1997 GAO report residing within the NRC's electronic library.] The BNL leak is important because a leak went undiscovered for over a decade, despite extensive, focused monitoring and inspection programs. The NRC did not consider the BNL spent fuel pool leak in the WC DGEIS and therefore failed to demonstrate how the factors that contributed to the BNL leak remaining undetected for such a prolonged period could not also allow a larger and/or longer leak from a spent fuel pool during the 60-year short-term period following permanent reactor shutdown. 4.8 According to a 1997 report by the U.S. General Accounting Office, now called the Government Accountability Office, (GAO) found within the NRC's Agencywide Documents Access and Management System (ADAMS): *In*

January 1997, ground water samples taken by BNL staff revealed concentrations of tritium that were twice the allowable federal drinking water standards--some samples taken later were 32 times the standard. The tritium was found to be leaking from the laboratory's High Flux Beam Reactor's spent fuel pool into the aquifer that provides drinking water for nearby Suffolk County residents. (GAO 1997, page 1) (0899-1-22 [Curran, Diane] [Lochbaum, David])

Comment: 4.9 The NRC relies on spent fuel pool water level monitoring and groundwater monitoring in concluding in the WC DGEIS that spent fuel pool leaks could not possibly remain undetected for a long period of time. But both these measures failed to prevent such an outcome at BNL: *DOE's and BNL's investigation of this incident concluded that the tritium had been leaking for as long as 12 years without DOE's or BNL's knowledge. (GAO 1997, page 1) Tests conducted after the tritium leak was discovered more accurately accounted for evaporation rates and concluded that the pool was leaking 6 to 9 gallons per day. (GAO 1997, page 10)* 4.10 That the BNL leak remained undiscovered for over a decade clearly illustrates that detection of radioactively contaminated water in monitoring wells or the surrounding soil does not necessarily lead to finding a leaking spent fuel pool. According to the GAO's report: *In January 1997, ground water samples taken by BNL staff revealed concentrations of tritium that were twice the allowable federal drinking water standards--some samples taken later were 32 times the standard. The tritium was found to be leaking from the laboratory's High Flux Beam Reactor's spent fuel pool into the aquifer that provides drinking water for nearby Suffolk County residents. (GAO 1997, page 1) (0899-1-23 [Curran, Diane] [Lochbaum, David])*

Comment: The conclusion in the WC DGEIS that spent fuel pool leak impacts are insignificant is based on three key assumptions.[...] Third and last, the WC DGEIS assumes that potential adverse consequences from spent fuel pool leaks will be minimal. As discussed in Section VIII below, this assumption is not valid because the NRC failed to properly consider consequences like property devaluations and remediation costs that could occur when spent fuel pools leak. (0899-1-3 [Curran, Diane] [Lochbaum, David])

Comment: THE WC DGEIS FAILS TO FULLY AND PROPERLY APPLY EXPERIENCE FROM PAST SPENT FUEL POOL LEAKS IN ASSESSING FUTURE SPENT FUEL POOL LEAK RISKS (0899-1-4 [Curran, Diane] [Lochbaum, David])

Comment: The WC DGEIS fails to include at least two important spent fuel pool leak events: the Yankee Rowe nuclear reactor leak and the Brookhaven National Laboratory leak. By omitting these leaks from the WC DGEIS, NRC has failed to consider all past spent fuel pool leaks and formed an inaccurate picture of the potential for future leaks. (0899-1-5 [Curran, Diane] [Lochbaum, David])

Comment: Yankee Rowe Leak[.] 4.3 The WC DGEIS fails to consider the spent fuel pool leak at the Yankee Rowe nuclear plant in Massachusetts. The Yankee Rowe leak is important because approximately two million gallons of radioactively contaminated water leaked for perhaps as long as three years before it was detected. Some of this radioactive contamination made its way into nearby springs that flow into the Deerfield River. 4.4 The plant's owner reported this leak to the NRC in July 2006 along with other leaks and spills of radioactively contaminated water at the site. The owner's submittal highlighted the spent fuel pool leak: *The most noteworthy release that is believed to be the predominant source of tritium in groundwater, occurred between 1963 and 1965 and involved a leak from the Spent Fuel Pool -- Ion Exchange Pit structural interface. This leak is estimated to have resulted in the release of over two million gallons of water to the soil. Tritium concentrations exceeding 1,000,000 pCi/L were measured in Sherman Spring at the time of the leak. The spring discharges on licensed property and flows*

into the Deerfield River. (YAEC 2006)³ [footnote 3 text: The owner--s report did not indicate whether the water leak from the spent fuel pool or the ion exchange pit or from both places. Regardless, this event demonstrates that radioactively contaminated water can leak at large rates for a long time without being detected--directly contradicting the assumption in the WC DGEIS being challenged in this declaration.] 4.5 This Yankee Rowe leak resulting in measured tritium concentrations exceeding one million picocuries per liter⁴ [footnote 4 text: For context, EPA's regulatory limit for tritium in drinking water is 20,000 picocuries per liter.] with flow into a nearby river should have been evaluated by the NRC in the WC DGEIS. The leak was reported to have occurred between 1963 and 1965--indicating a maximum duration of three years and perhaps lasting less than one year. Two million gallons leaking over a three-year period translates into an average leak rate of 1,826 gallons per day.⁵ [footnote 5 text: Calculated by dividing 2,000,000 gallons by 1,095 days.] If the duration was two years, the average leak rate was 2,740 gallons per day. If the duration was only one year, the average leak rate was over 5,479 gallons per day. (For this leak rate to have been "only" 100 gallons per day, the leak would have had to span 54 years, 9 months, and 16 days.) In the WC DGEIS, the NRC assumes that spent fuel pool leakage of 100 gallons per day and greater will be readily detected. The Yankee Rowe leak strongly suggests that leak rates far greater than 100 gallons per day can remain undetected for a long time. The WC DGEIS must explicitly identify the regulatory requirements that remain in place during the 60-year short-term storage period that provide reasonable assurance that future leaks similar to the Yankee Rowe leak--or worse--cannot result in significant impacts. 4.6 By failing to evaluate this Yankee Rowe leak, the NRC has also failed to establish how this leak was detected. If the leak was detected fortuitously rather than by a formal monitoring process, the WC DGEIS should have considered potential impacts had this leak remained undetected for a longer duration. (0899-1-6 [Curran, Diane] [Lochbaum, David])

Comment: 4.12 Radioactively contaminated water was detected in monitoring wells during the 1980s, but because the spent fuel pool is not the only potential source of such contamination, it was not considered to be the source: *Higher than expected levels of tritium were first discovered in a drinking water well about 500 feet from the reactor in 1986. BNL officials at the time reasoned that the tritium came from local sewer lines and did not suspect the reactor's spent-fuel pool as a source. Sewer lines were a known source of tritium. Tritium originated from condensation that forms inside the reactor building and eventually reached the laboratory's sewer system. No further samples were taken from this well, which was closed because of high levels of other nonradioactive contaminants.* (GAO 1997, pages 7-8)[.] 4.13 Workers tested the spent fuel pool for leaks in January 1989, July 1994, January 1995, and March 1996. Each test concluded was that the spent fuel pool was not leaking. In January 1997, workers conducted a fifth spent fuel pool leak test. This time leakage was detected. These tests were essentially self-fulfilling prophecies, showing no leakage when no leakage was believed to be occurring and finding leakage after monitoring well results suggested leakage was happening. *BNL officials acknowledge, in retrospect, that these tests were not carefully conducted because laboratory staff failed to accurately measure the spent-fuel pool's evaporation rate. Tests conducted after the tritium leak was discovered more accurately accounted for evaporation rates and concluded that the pool was leaking 6 to 9 gallons per day.* (GAO 1997, page 10)[.] Using BNL's data as support, a 1993 DOE report noted that the spent-fuel pool was not leaking. The report also noted, however, that there was no reliable means of determining if the spent-fuel pool was leaking. (GAO 1997, page 8)[.] 4.14 In the summer of 1989, workers installed two additional monitoring wells near the reactor and its spent fuel pool. Samples from these wells did not indicate a leak was in process; not because a leak was not occurring but because they were not in locations to detect an underground plume: *BNL officials also relied on well-sampling results to reinforce their position that the spent-fuel pool was not leaking, but these samples did not*

provide adequate coverage of the area surrounding the reactor where the spent-fuel pool was located. (GAO 1997, page 10) (0899-1-7 [Curran, Diane] [Lochbaum, David])

Comment: 4.15 Workers at BNL conducted leak tests of the spent fuel pool and installed monitoring wells to detect radioactively contaminated water leaking into the ground. But rather than causing timely detection of a leaking spent fuel pool, these measures instead gave BNL officials false confidence, and thereby enabled the leakage to continue unabated: *Reliance on incomplete tests of water level in the spent-fuel pool and on sample data from monitoring wells scattered around the site led Brookhaven and DOE officials to give low priority to a potential tritium leak. (GAO 1997, page 2)***To allay the [Suffolk] country's concerns, BNL said that the pool did not leak because it had successfully passed a leak test in 1989. BNL also said that two monitoring wells that were installed in 1989 near the reactor did not indicate any leaking from the reactor's spent-fuel pool. Although BNL officials later told us that the leak test was not accurate and that the two monitoring wells they installed earlier were in the wrong location to detect the tritium contamination, BNL officials relied on these data as the basis for their confidence that the spent-fuel pool did not leak. (GAO 1997, page 8)[.]* 4.16 It is important to recognize that at BNL, a long-term, low-volume leak from the spent fuel pool occurred due to unreliable water level instrumentation, misplaced monitoring wells, and misdiagnosed monitoring well results. This event and its contributing factors cast extreme doubt on the NRC's spent fuel pool leak evaluation in the WC DGEIS: *As a result, this evaluation considers a long-term, low-volume undetected leak from a spent fuel pool as the most probable scenario where spent fuel pool leakage would lead to an offsite environmental impact. To go undetected, a leak would need to be less than the fluctuations in water level of a spent fuel pool due to evaporation. This is so because the spent fuel pool water level is constantly measured by instrumentation and monitored routinely by the reactor operators. Also, licensees must perform routine inspections of leak-detection systems and physically inspect the spent fuel pool area for leakage. (NRC 2013b, page E-10, lines 1-8)[.]* 4.17 If the BNL spent fuel pool leaked at 6 to 9 gallons per day for 12 years, then 26,280 to 39,420 gallons of radioactively contaminated water reached the ground before being detected and terminated. This longstanding leak is an important example that NRC should have considered in the WC DGEIS. The WC DGEIS must explicitly identify the regulatory requirements that remain in place during the 60-year short-term storage period that provide reasonable assurance that future leaks similar to the BNL spent fuel pool leak--or worse--cannot result in significant impacts. (0899-1-8 [Curran, Diane] [Lochbaum, David])

Comment: C. Salem Leak[.] 4.18 An event at the Salem nuclear plant in New Jersey is a compelling example that an undetected spent fuel pool leak close to the maximum evaporation rate of about 100 gallons per day (gpd) might not be promptly detected. In other words, this event contradicts the conclusion stated in the WC DGEIS that leaks of this magnitude would be promptly detected. 4.19 Like the majority of U.S. nuclear power reactors, the spent fuel pools for Salem's two reactors have reinforced concrete walls and floors. To prevent outward leakage through the porous concrete, each spent fuel pool is equipped with a stainless steel liner. The small space between the liner and the concrete collects spent fuel pool water leaking through the liner. The tell-tale drain routes this water to collection tanks for treatment and then either re-use or release.⁷ [footnote 7 text: In the WC DGEIS (NRC 2013b, page E-19), this is labeled the leak chase system.] The tell-tale drain lines became nearly fully obstructed at Salem. Instead of leaking water flowing through the tell-tale drain lines to the collection tank, spent fuel pool water leaked into the space between the stainless steel liner and the concrete. Some of the spent fuel pool water then leaked outward through the concrete. When blockage of the tell-tale drain lines was finally noticed, workers were sent to clean out the lines. When the tell-tale drain line blockage was removed, the measured and indicated leak rate increased: *After the cleaning*

effort [for the tell-tale drains], the leak rate from the tell-tale drain increased from about 19 liters per day (5 gallons a day) to about 380 liters per day (100 gpd). (NRC 2004, page 2) 4.20 Some, or all, of this 100 gallon per day flow could have been radioactively contaminated water leaking from the spent fuel pool.⁸ [footnote 8 text: It was not reported how much of this flow was attributed to inward leakage of groundwater through the concrete and how much of it was spent fuel pool water outward through the stainless steel liner.] (0899-1-9 [Curran, Diane] [Lochbaum, David])

Comment: Limited Spent Fuel Pool Water Level Record-keeping Requirements[.] 6.20 The NRC presumes in the WC DGEIS that its inspectors will review records such as those prepared by plant workers for tasks like providing makeup water to the spent fuel pool to compensate for evaporation and periodically logging the spent fuel pool water level, and will detect any spent fuel pool leakage (if the workers own efforts have not already discovered leakage). An NRC inspection procedure for examining spent fuel pools at permanently shut down nuclear power reactors appears—at first blush—to support this assumption by stating: *The SFP water level instrumentation and alarms should ensure that any significant loss of inventory will be promptly detected by operations personnel. ... Operator rounds and control room logs should provide a data base sufficient to identify spent fuel pool leakage problems.* (NRC 1997, Section 03.02) 6.21 As discussed in paragraphs 6.6 to 6.16 of this declaration, however, there are no regulatory requirements in place during the short-term storage period that ensure spent fuel pool level instrumentation will routinely be available. Consequently, the NRC's assumption that routine spent fuel pool water level monitoring and record-keeping will detect spent fuel pool leakage is invalid. Again, the WC DGEIS cannot place much weight on equipment and conditions unless they are required to be in place throughout the 60-year short-term storage period. (0899-2-1 [Curran, Diane] [Lochbaum, David])

Comment: 7.4 Owners of reactors that have permanently shut down nuclear power reactors and who have certified to the NRC that all irradiated fuel has been removed from the reactor vessel did not formally receive the warning from the NRC about spent fuel pool leakage. If information is power, the NRC leaves these owners powerless to prevent similar leaks from their spent fuel pools. 7.5 The NRC's failure to send such warnings to owners of permanently shut down reactors has implications beyond merely keeping individual storage sites in the dark. Operating experience programs adopted throughout the nuclear power industry in the wake of the March 1979 accident at Three Mile Island are used to review incoming correspondence such as NRC's Information Notices and screen them for applicability to the site. Applicable documents are routed to appropriate departments for review and action. Applicable documents are thus formally incorporated into training programs and procedures. But the NRC's decision to exclude owners of permanently shut down nuclear power reactors about a spent fuel pool leakage problem robs them of the operating experience opportunity to capture this information in appropriate in-plant procedures and programs—the very procedures and programs the NRC improperly takes full credit for in the WC DGEIS. 7.6 The NRC also fails to require licensees of permanently shut down reactors to implement safety upgrades, even those upgrades directly related to spent fuel pool safety. For instance, on March 12, 2012, the NRC issued three orders requiring licensees to implement lessons it learned from the March 2011 accident at Fukushima in Japan. One of the orders issued that day required the installation of reliable instrumentation to monitor the water level inside spent fuel pools: *The lack of information on the condition of the spent fuel pools contributed to a poor understanding of possible radiation releases and adversely impacted effective prioritization of emergency response actions by decision makers.* (NRC 2012f, attachment 1, page 3) *** *During the events in Fukushima, responders were without reliable instrumentation to determine water level in the spent fuel pool.* (NRC 2012f, attachment 1, page 6) *** *...the Commission has determined that all power reactor licensees*

and CP [construction permit] holders must have a reliable means of remotely monitoring wide-range spent fuel pool levels to support effective prioritization of event mitigation and recovery actions in the event of a beyond-design-basis external event. (NRC 2012f, attachment 1, page 7) (0899-2-10 [Curran, Diane] [Lochbaum, David])

Comment: 7.7 This NRC order to install reliable spent fuel pool water level instrumentation was issued to: *All Power Reactor Licensees and Holders of Construction Permits in Active or Deferred Status* (NRC 2012f, page 1) 7.8 A search performed on August 27, 2013, of ADAMS, the NRC's online electronic library of publicly available agency records, failed to identify any such order issued by the NRC on or after March 12, 2012, for the permanently shut down Zion nuclear power reactors.

7.9 The NRC confirmed its intention not to impose these safety upgrades on permanently shut down reactors after the Crystal River Unit 3 reactor in Florida shut down in early 2013. Its owner had received the March 2012 order from the NRC to install reliable spent fuel pool water level instrumentation. The owner asked the NRC to rescind the order because the reactor would not resume operation (Duke 2013). The NRC granted the request and approved the removal of (or lack of installation of) reliable spent fuel pool instrumentation from this permanently shut down reactor (NRC 2013c). 7.10 After the Kewaunee reactor in Wisconsin shut down later in 2013, its owner also requested that the NRC rescind its order requiring reliable spent fuel pool water level instrumentation to be installed (Dominion 2013). (0899-2-11 [Curran, Diane] [Lochbaum, David])

Comment: 7.11 Another example of the regulatory requirement shrinkage involves groundwater monitoring. According to the WC DGEIS: *In April 2011, the NRC evaluated industry performance in "Summary of Results from Completion of NRC's Temporary Instruction on Groundwater Protection, TI-2515/173 Industry Groundwater Protection Initiative."* ... *This report was based on inspections conducted between August 2008 and August 2010 at all nuclear power plant sites.* (NRC 2013b, page E-7, lines 1-4) 7.12 The WC DGEIS is correct that TI-2515/173 was written to apply to all nuclear power reactors: *This Temporary Instruction (TI) applies to all holders of operating licenses for nuclear power reactors, including those plants which have permanently ceased operations.* (NRC 2008) 7.13 But the statement in the WC DGEIS that NRC's report was based on inspections of groundwater monitoring "at all nuclear power plant sites" is patently false. Instead, inspections were only performed at some nuclear plants sites; namely, the sites with operating nuclear power reactors. Sites with only permanently shut down nuclear power reactors were not inspected between August 2008 and August 2010 as is clearly evident from Tables 1, 2, 3, and 4 from NRC 2008 found in Appendix A. 7.14 These tables clearly show that, while the NRC inspected the voluntary programs implemented under the Groundwater Protection Initiative at operating nuclear power plants, it did not inspect the programs implemented at permanently shut down plants like Zion and Humboldt Bay.¹² [footnote 12 text: A search of the NRC's ADAMS library on August 29, 2013, failed to produce any publicly available records indicating that the NRC had, or plans to, conduct groundwater protection initiative inspections using the Groundwater Protection Initiative, TI-2515/173, at permanently shut down nuclear power reactors.] The WC DGEIS cannot place weight on voluntary measures that have never been inspected by the NRC. 7.15 Regarding its inspections at operating nuclear power plants that someday will permanently shut down, the NRC's position is that: *Licensees that have implemented a groundwater monitoring program consistent with the Nuclear Energy Institute Groundwater Protection Initiative are considered to have an adequate program for the purposes of the Decommissioning Planning Rule.* (NRC 2013b, page 3-10, line 37 to page 3-20, line 1) 7.16 Based on the successful results from the one-time Groundwater Protection Initiative inspection at operating nuclear power plants, the NRC apparently considers the voluntary groundwater monitoring program to be adequate over

the entire 60-year short-term storage period at shutdown plants in the WC DGEIS. This assumption is illogical and contrary to the NRC's experience periodically inspecting mandatory—not voluntary—regulatory requirements at operating nuclear power plants.

7.17 The industry's Groundwater Protection Initiative is a voluntary measure that is currently not being routinely inspected by the NRC at either operating or permanently shut down nuclear power plants. As such, the WC DGEIS cannot credit this non-mandatory, non-inspected program with detecting and correcting leaks during the 60-year short-term storage period. (0899-2-12 [Curran, Diane] [Lochbaum, David])

Comment: 7.18 Further evidence of lessened regulatory oversight after a reactor permanently shuts down is provided by the NRC's Reactor Oversight Process (ROP). Under the ROP, the NRC conducts routine and reactive inspections at operating nuclear power plants to verify compliance with regulatory requirements or identify non-compliances warranting correction. Appendix B lists the ROP's baseline inspection procedures and the associated frequencies with which they are conducted. The baseline inspections examine a wide range of areas, from fire protection to radiation protection to maintenance to security, over a three-year period. The NRC conducts some baseline inspections every quarter. The least frequent baseline inspection is conducted at least once every three years. 7.19 Recent ROP inspection results as posted on the NRC's website on August 28, 2013, are contained in Appendix C. The numerous green, white, yellow, red, and greater-than-green inspection findings clearly demonstrate that plant owners do not always comply with regulatory requirements, even in areas routinely examined by NRC inspectors. All results labeled with any colored box indicate noncompliance with regulatory requirements. The NRC cannot assume in the WC DGEIS that owners will conform to voluntary measures (such as the Groundwater Protection Initiative) when their track record demonstrates repetitive non-compliance with mandatory regulatory requirements. 7.20 Similarly, the scope of the Maintenance Rule—on which the NRC relies for its finding of no possibility of significant impact (see WC DGEIS, page E-5, lines 1-13)—shrinks after a nuclear reactor permanently shuts down. Decades ago, the NRC promulgated the Maintenance Rule to establish regulatory requirements for maintenance and testing of safety related components (NRC 1991). But the rule does not provide protection against spent fuel pool leaks: *Maintenance at Nuclear Power Plants, "requires monitoring the performance or condition of structures, systems, or components (SSCs). For licensees who have submitted the certifications for cessation of operation and for permanent fuel removal specified in 10 CFR 50.82(a)(1), this section applies only to the extent the licensee monitors the performance or condition of the SSCs associated with the storage, control, and maintenance of spent fuel in a safe condition and in a manner sufficient to provide reasonable assurance that such SSCs are capable of fulfilling their intended functions* (see 10 CFR 50.65(a)(1)). (NRC 2000, page 1.184-12)

7.21 As described in paragraphs 6.3 to 6.15 of this declaration, the safety analysis reports and technical specifications establish "spent fuel in a safe condition" as entailing protection against a fuel handling accident. The safety analysis reports and technical specifications do not impart protection against long-term, low-volume leaks from the spent fuel pool as part of "spent fuel in a safe condition." Thus, licensees can and do legally omit structures, systems, and components needed to detect and mitigate spent fuel pool leaks (e.g., water level instrumentation, water makeup pumps, leakage detection systems, etc.) from the scope of their maintenance rule programs. The WC DGEIS simply cannot take credit for measures its regulations allow licensees to remove. The WC DGEIS must only credit measures that regulations compel licensee to retain. (0899-2-13 [Curran, Diane] [Lochbaum, David])

Comment: Zion – A Case Study[.] 7.22 The permanently shut down nuclear power reactors at the Zion nuclear plant in Illinois illustrate regulatory requirement shrinkage: *In March 1998, Com*

*Ed certified per 10CFR50.82 that the company had permanently ceased power operation and that all fuel was in the Spent Fuel Pool. This is a permanent, non-revocable certification that changed the Zion Station licensing basis. (ComEd 1998, attachment B, page 1) *** The most significant effect of this licensing basis change was to eliminate nuclear safety functions for the majority of the structures, systems, and components (SSC's). Those SSC's, which had only performed a reactor safety function (i.e., SSC's that do not support spent fuel or radiation protection function), need no longer be maintained under nuclear grade controls. (ComEd 1998, attachment B, page 1) 7.23* The scope of maintaining "spent fuel in a safe condition" at Zion was also redefined to narrow its scope:

Radioactive Release from a Subsystem or Component: All accidents, with the exception of the Fuel Handling accident in the Fuel Building, were deleted. ... Added section with new accident analyses for Spent Fuel Pool Accident, loss of Spent Fuel Pool Cooling, and HIC Drop Accident. (ComEd 1998, attachment B, page 15) However, two aspects of the pool design would allow the inventory to be significantly reduced in the event of a failure. These are, 1.A seal failure of a fuel transfer canal removable weir gate, and 2.A rupture of the spent fuel cooling water pump return line. (ComEd 1998, page 5-4) 7.24 Any worker or NRC inspector seeking to ascertain whether "spent fuel in a safe condition" is reasonably assured at Zion need only evaluate whether protections against a fuel handling accident and a significant reduction in spent fuel pool water inventory are adequate. As described in VI of this declaration, protection against a fuel handling accident is defined to be maintaining the water level at least 23 feet above the spent fuel storage racks when irradiated fuel assemblies (or the HIC cask) are being moved; otherwise, any spent fuel pool water level is acceptable. As described in ComEd 1998, protection against a significant reduction in spent fuel pool water inventory involves the fuel transfer canal's weir gate seal and the spent fuel pool cooling water pump discharge piping. Protection against a long-term, low-volume spent fuel pool leak is neither directly nor indirectly associated with these regulatory requirements. 7.25 The WC DGEIS cannot credit regulatory requirements that are entirely silent on the matter to provide protection against long-term, low-volume spent fuel pool leaks during the 60-year short-term storage period. (0899-2-14 [Curran, Diane] [Lochbaum, David])

Comment: Dresden – A Case Study[.] 7.26 Dresden Unit 1 in Illinois provides another important example of the breakdown in monitoring programs and regulatory oversight after reactors permanently shut down. This example undermines the NRC's assumption stated in the WC DGEIS that: *Even though the reactor is no longer operating during the short-term storage timeframe, a licensee is still bound by the terms and conditions of its operating license until the license is terminated. As a result, the NRC assumes that spent fuel pool maintenance requirements that are in place during the operating period of the reactor will remain in place during the short-term timeframe and will stay in place even if the license is modified during the short-term timeframe.* (NRC 2013b, page E-4, lines 13-17) 7.27 The NRC is, or should be, aware of past events such as that at Dresden rendering this assumption tenuous at best, outright invalid at worst. On January 25, 1994, workers discovered about 55,000 gallons of water on the floor of the basement of the reactor building for the Unit 1 reactor at the Dresden nuclear plant in Illinois. Its owner had permanently shut down the reactor on October 31, 1978. The NRC dispatched a special inspection team to Dresden to investigate this event. The NRC's team discovered (NRC 1994a): • The owner stopped providing heating for the reactor building in 1989. The lack of heating led to cold temperatures inside the building that froze the water inside a pipe of the service water system causing it to burst. Leakage from this ruptured pipe was found on the basement floor. The lack of heating could also have frozen and ruptured the fuel transfer tube, allowing the spent fuel pool water to drain down and expose the top several feet of irradiated fuel in the storage racks. Had this occurred, the drained water would have reduced shielding and created high radiation levels onsite. • The owner had turned off the spent fuel pool

cooling and cleanup system in 1983. By 1987, the water quality inside the spent fuel pool degraded to the point where an influx of microorganisms had developed. Records showed that the conductivity of the spent fuel pool water was two times the limit in the operating license. • The poor quality of the spent fuel pool water could have adversely affected the seating surfaces and gaskets for the spent fuel pool gate. • The owner had no spent fuel pool leak detection program, nor did the owner have a water inventory program that might have detected leakage from the spent fuel pool via increased makeup additions to it. (0899-2-15 [Curran, Diane] [Lochbaum, David])

Comment: 7.28 According to the NRC: *The inspection team concluded that the layup of the plant and storage of spent fuel at Dresden 1 was not well managed or maintained for a period of years and that weaknesses existed in the site quality audit and inspection programs. Further, safety reviews of changes to Dresden 1 systems such as termination of heating and ventilation for the containment were apparently not performed or not adequately reviewed to determine the safety consequences of the changes. Interviews with personnel at the Dresden site (which includes two operating units in addition to Dresden 1) showed that, in part, the weaknesses identified above were based on an incorrect belief that Dresden 1 could not cause a serious safety problem because it was permanently shut down. This belief resulted in audits and safety evaluations that were not rigorously implemented or that did not include the Dresden 1 systems and programs.* (NRC 1994a, page 3) The NRC imposed a \$200,000 civil penalty on the plant's owner for this event (NRC 1994a). 7.29 This event exposes the reality that the NRC's WC DGEIS fails to address the significant reduction in regulatory requirements that occurs after a reactor permanently shuts down. The NRC assumes in the WC DGEIS that all spent fuel pool maintenance measures will apply and be met during the short-term storage period. Yet, the NRC fined the owner of Dresden Unit 1 for inappropriate actions like turning off the spent fuel pool cooling and cleanup system 12 years prior to this event and allowing the water quality inside the spent fuel pool to violate operating license requirements for many years. The WC DGEIS is deficient by assuming this event is isolated and never to be repeated and not identifying reliable means to prevent recurrence. 7.30 The Dresden event also reveals the significant reduction in regulatory oversight that occurs after a reactor permanently shuts down. At the time of this event, the Dresden nuclear plant had two operating reactors and one permanently shut down reactor. Because of the operating reactors, the NRC had inspectors assigned full-time to the plant site supplemented by inspectors from its regional and headquarters offices. Clearly, those inspectors devoted almost all of their time and attention to the operating reactors; otherwise, they might have noticed that the owner turned off the Unit 1 spent fuel pool cooling and cleanup system 12 years earlier or had discontinued heating the Unit 1 reactor building 5 years earlier. Had Dresden Unit 1 not been adjacent to two operating reactors, the NRC would not have full-time inspectors assigned to the plant site. (0899-2-16 [Curran, Diane] [Lochbaum, David])

Comment: 7.31 The NRC inspection effort at Dresden is not unique. Shown above are the NRC inspection hours applied to various reactors in 1992. The Three Mile Island nuclear plant had one operating reactor and one permanently shut down reactor. Its Unit 1 reactor received nearly 3,700 inspection-hours of NRC attention while the permanently shut down Unit 2 reactor received about one-tenth of that attention, a scant 300 inspection-hours or so. In 1992, the Unit 1 reactor at the Browns Ferry nuclear plant had been shut down since March 1985 – not permanently shut down, but not expected to restart anytime soon (it did not resume operating until early 2007). NRC inspectors devoted less than 750 hours of attention to it during 1992. The permanently shut down Unit 1 reactor at Dresden was not even on the NRC's charts: the Dresden Units 2 and 3 reactors received over 3,000 NRC inspection-hours. 7.32 NRC Inspection Manual Chapter 0305, "Operating Reactor Assessment Program," is the agency's

overall guidance document outlining the frequency and scope of the inspections it conducts at nuclear power reactors. On October 18, 2013, the NRC revised Manual Chapter 0305 to add this sentence: *A power reactor is no longer subject to this manual chapter after a licensee submits a written certification to cease operation in accordance with 10 CFR 50.82(a)(1)(ii).* (NRC 2013a) 7.33 NRC Inspection Manual Chapters 0350, “Oversight of Reactor Facilities in a Shutdown Condition Due to Significant Performance and/or Operational Concerns,” and 0351, “Implementation of The Reactor Oversight Process at Reactor Facilities in an Extended Shutdown Condition for Reasons Other Than Significant Performance Problems,” cover nuclear power reactors that have been shut down for lengthy periods, but which are expected to eventually resume operations. These manual chapters do not apply to permanently shut down reactors. A review of the Inspection Manual Chapters¹³ [footnote 13 text: See <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/manual-chapter/>] and associated NRC Inspection Procedures¹⁴ [footnote 14 text: See <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/>] identified only one procedure applicable to permanently shut down nuclear power reactors (NRC 1997a). It focused on spent fuel pools. This sole procedure was developed in response to the 1994 event at Dresden Unit 1. According to the NRC, it is “estimated to require 32 onsite inspection hours semi-annually” (NRC 1997a). (0899-2-17 [Curran, Diane] [Lochbaum, David])

Comment: 7.34 And it appears that the NRC’s “semi-annual” spent fuel pool inspection expectations are actually being halfway met. According to the NRC’s online electronic library, ADAMS, the NRC conducted this spent fuel pool inspection of the spent fuel pools at the permanently shut down Zion nuclear plant and documented its findings in reports dated May 13, 2011, August 18, 2011, and August 7, 2012 – three inspections over the past three years. And for the reasons described in Section VI of this declaration, even these infrequent NRC inspections provide little assurance that spent fuel pool leaks will be detected and corrected in a timely manner. 7.35 In summary, the NRC’s WC DGEIS does not consider the reality that permanently shut down reactors receive less management attention (as evidenced by the Dresden Unit 1 event) and significantly less NRC oversight (as evidenced by the Dresden Unit 1 event and the inspection hour tabulation). This reality invalidates the NRC’s assumptions that licensee programs and NRC’s oversight will continue at the same levels after reactors shut down as existed when the reactors operated. 7.36 To meaningfully assess the impacts of spent fuel pool leaks in the WC DGEIS, the NRC must rely on regulatory requirements that will remain in place over the entire 60-year short-term storage period and not on regulatory requirements that are inapplicable or significantly reduced in scope after reactors permanently shut down. Only if the WC DGEIS achieves this can it provide reasonable assurance that spent fuel pool leaks will be detected before the leaked materials exceed public health regulatory limits and cause noticeable impacts to groundwater resources. (0899-2-18 [Curran, Diane] [Lochbaum, David])

Comment: Reduction in Aging Management Protections[.] 7.37 The WC DGEIS also fails to properly consider the significant reduction in scope for aging management regulatory requirements and associated supporting analyses that happens when nuclear power plants permanently shut down. Spent fuel pools and the piping and components connected to them are subject to aging degradation. Aging degradation does not magically cease when reactor operation ceases but continues on throughout the 60-year short-term storage phase. As depicted below in what is commonly called the “bathtub curve” due to its shape, aging degradation can cause the failure rate to increase: 7.38 The NRC has approved renewed operating licenses for the majority of the nuclear power reactors operating today.¹⁵ [footnote 15 text: See “Completed Application” list at <http://www.nrc.gov/reactors/operating/licensing/renewal/applications.html>] The NRC’s license renewal rule (10 CFR. Part 54) enables the NRC to renew the original 40-year operating license

for up to 20 additional years. The NRC will renew an operating license only after determining that the aging management program for in- scope passive systems, structures, and components is adequate: *For each structure and component identified in paragraph (a)(1) of this section, demonstrate that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB [current licensing basis] for the period of extended operation.* (10 CFR. §54.21(a)(3)) As described in Section A2 of the NRC's Generic Aging Lessons Learned Report (NRC 2012a), the spent fuel pool and associated equipment are within the scope of the license renewal rule and therefore require adequate aging management programs during the period of extended operation. 7.39 But the period of extended operation only covers the duration of reactor operation, not to the end of the 60-year short-term storage period as clearly illustrated in Figure 2.4 of the WC DGEIS: (0899-2-19 [Curran, Diane] [Lochbaum, David])

Comment: Nonexistent Spent Fuel Pool Leak Analysis Requirements[.] 6.22 Returning to the procedure used by NRC inspectors when examining spent fuel pools at permanently shut down nuclear power reactors, the NRC states: *Within the scope of this inspection, the inspector should evaluate the tests or analytical calculations performed to determine SFP leakage and evaporation rates. The assumptions in these tests and calculations should be assessed and evaluated. For example, a licensee may bound their analyses by a worst-case situation and normalized environmental conditions.* (NRC 1997, Section 03.02) 6.23 But there is no regulatory requirement for licensees to ever calculate spent fuel pool evaporation rates or analyze reasonably foreseeable leakage scenarios. The WC DGEIS states:

The safety of spent fuel storage is established for each facility through a safety analysis report prepared by the licensee to support its application for an operating license and review by the NRC. Each safety analysis report includes a number of operational conditions and limitations important to safe spent fuel storage. These conditions and limitations are subject to regulations that restrict the changes that can be implemented without prior NRC approval. (NRC 2013b, page E-4, lines 18-22) 6.24 The NRC developed a Standard Review Plan (NUREG-0800) to guide its staff in reviewing safety analysis reports submitted by applicants for reactor operating licenses and determining whether all applicable regulatory requirements have been met. The Standard Review Plan also aides applicants in preparing their submittals to the NRC. 6.25 The spent fuel pool is not the only source of radioactively contaminated water at nuclear power plants. In fact, its water contains significantly lower concentrations of radioactivity than contained in other systems and components. For example, the liquid waste management system (LWMS) collects, stores, and processes highly radioactive liquids. Applicants for operating licenses evaluate the postulated failure of a large LWMS tank that results in most if not all its radioactive contents being released as described in Section 11.6 of the NRC's Standard Review Plan: *As a result, a gross failure of the LWMS is considered highly unlikely, e.g., such as a failure involving the near total loss of the system's inventory of radioactive materials. However, the malfunction of a tank and its components, a valve misalignment, tank overflow, or an operator error appear more likely and are assumed to be types of failures warranting an evaluation of their consequences. Although no specific types of system failures have been designated as being representative, it was considered that for the safety evaluation of the LWMS, the type of malfunction analyzed should be limited to the postulated failure of a tank or pipe rupture, located outside of containment. The evaluation considers the impact of the failure on the nearest potable water supply, and the use of water for direct human consumption or indirectly through animals (livestock watering), crops (agricultural irrigation), and food processing (water as an ingredient).* (NRC 2007, page BTP 11-6-2). (0899-2-2 [Curran, Diane] [Lochbaum, David])

Comment: 7.40 The applicant for a renewed operating license develops aging management programs for in-scope systems, structures, and components—including the spent fuel pool and associated equipment—that provide reasonable assurance that required margins will be maintained over the duration of extended reactor operation. Once the period of extended operation ends and the short-term storage period begins, no regulations require licensees to continue their aging management programs. 7.41 The short-term storage period of 60 years equals the operating lifetime of a nuclear power reactor obtaining only one renewal – the 40-year initial term plus the 20-year period of extended operation. The aging management programs prepared by the applicants and approved by the NRC only consider the 20-year period of extended operation. While the efficacy of these programs does not automatically expire along with the operating licenses, the fact remains that neither the plant owners nor the NRC have formally evaluated aging degradation mechanisms and reliable barriers against excessive degradation over the 60-year short-term storage period assumed in the WC DGEIS. 7.42 The bathtub curve shows that aging degradation will eventually cause the failure rate to increase. Regulatory requirements such as the maintenance rule and the aging management programs mandated by the license renewal rule guard against problems caused by structures, systems, and components being operated deep into the Increasing Failure Rate portion on the right end of the bathtub curve. In other words, these mandated measures require that equipment affected by aging degradation be repaired or replaced before safety margins are compromised. The lack of comparable regulatory requirements during the 60-year short-term storage period increases the likelihood that unchecked aging degradation causes problems. 7.43 In summary, the WC DGEIS must consider the significant reduction in the scope of regulatory requirements and oversight that occurs after reactors permanently shut down rather than the inflated levels that exist while the reactors operate. (0899-2-20 [Curran, Diane] [Lochbaum, David])

Comment: 6.26 Note that a LWMS tank failure and its potential consequences to the environment are required to be analyzed despite this scenario being “considered highly unlikely” by the NRC. 6.27 The Tennessee Valley Authority evaluated the postulated release of radioactively contaminated water from LWMS tanks at its Browns Ferry Nuclear Plant (BFNP) in Alabama. TVA reported: *In order to assess the impact of a liquid radwaste spill on the nearest potable water supply surrounding the BFNP site, a study was conducted to determine if the limits of 10CFR20, Appendix B, Table 2, Column 2 will be exceeded. The results of the study involving a postulated release of liquid radwaste from the worst offending tank indicates that the limits of 10CFR20 will not be exceeded. The worst offending tank identified is the waste collector tank with a maximum operating volume of 38,000 gallons and maximum activity of $1.4E+8$ microcuries.*¹¹ [footnote 11 text: $1.4E+8$ is scientific notation for 140,000,000.] (TVA 2003, page 9.2-7) 6.29 Studies of postulated releases from LWMS tanks serve two important purposes. First, the results demonstrate compliance with federal regulations on discharges of radioactivity to the environment. Second, they define the boundaries for future plant activities. 6.30 As discussed in paragraphs 3.2 to 3.4 above, postulated losses of water inventory from the reactor vessel must be postulated and evaluated, regardless of the low likelihood of occurrence. As discussed in paragraphs 6.25 to 6.28 above, postulated losses of water inventory from LWMS tanks must be postulated and evaluated, again regardless of their likelihood. These evaluations define the respective hazards that federal regulations require protection against. Their results essentially form the answer keys when determining whether a reactor’s design and procedures comply with federal regulations. Their results also establish boundaries for subsequent reactor operation. Before a license modifies the plant or revises its procedures, 10 CFR §50.59, Changes, tests and experiments, requires that the proposed activity be evaluated against the established boundaries. If an activity significantly increases the consequences or likelihood of a previously evaluated event, it cannot happen unless the NRC explicitly approves it. (0899-2-3 [Curran, Diane] [Lochbaum, David])

Comment: 6.31 Neither the NRC's Standard Review Plan nor any of the literally dozens of safety analysis reports submitted by plant owners analyze either a long-term, low-volume leak from a spent fuel pool or the rapid and complete loss of spent fuel pool water into the environment. The failure to analyze a spent fuel pool leak means that neither of the two purposes described in paragraphs 6.29 and 6.30 above is met. First, because the hazard is not defined, the adequacy of purported protective measures intended to manage the risk cannot be objectively assessed. Second, because a hazard evaluations results are not available to establish boundaries, there is no assurance that adequate protection will be sustained throughout the 60-year short-term storage period. 6.32 To illustrate the necessary role performed by hazard evaluations, consider a hypothetical case in which a spent fuel pool leak was postulated and evaluated. Suppose the results from that evaluation showed that a leak of up to X gallons per day could not cause significant impacts and that a leak of X gallons per day or greater could not cause significant impacts as long as it was detected within Y days. These results define how much water could be released via what specific pathways to facilitate objective determination whether NRC and EPA radiation protection standards will be met. 6.33 The results from the hypothetical hazard evaluation described in paragraph 6.32 above establish boundaries that provide assurance that risk continues to be properly managed into the future. For example, suppose the basis for concluding that leaks of up to X gallons per day not resulting in significant impacts relied on the combination of migration time required for leaked water to reach a source of drinking water and the filtering of radionuclides from the plume before it reached that source. The subsequent discovery that leaked water could enter an underground conduit and reach a drinking water source, effectively bypassing the delay and filtering functions of the geology/hydrology, would necessitate a re-evaluation to determine if the study's conclusion remained valid or required revision. As another example, suppose the means of detecting the X gallons per day or larger leak within Y days relies on weekly sampling from a close-in groundwater monitoring well. Before the frequency of sampling this well was relaxed to monthly or before this well was removed from service and replaced by a well three times more distant, an evaluation would need to conclude that a leak of X gallons per day or greater will still be detectable within Y days—otherwise, proper management of the risk of significant impacts is invalidated. (0899-2-4 [Curran, Diane] [Lochbaum, David])

Comment: 6.34 Absent the proper foundation afforded by a hazard evaluation, it is speculative to conclude that spent fuel pool leaks of 100 gallons per day will be detected before causing significant impacts. And even if such speculation was valid today, the conditions enabling that conclusion to remain valid throughout the short-term period are not explicitly defined. Consequently, owners could inadvertently undermine its validity by taking steps such as relaxing sampling frequencies, relocating wells, or removing water level instrumentation. 6.35 Risk management requires a hazard and its protections to both be defined as explicitly as possible. Doing so enables the risk to be properly managed now and into the future. By explicitly defining the hazard, one can determine when changing conditions increase the hazard, thus allowing protection levels to be increased accordingly. By explicitly defining protections credited against the hazard, one can make informed decisions whether proposed changes to the protections retain the necessary safety margins. 6.36 But there is simply no regulatory requirement that licensees analyze a postulated leak of any rate (small, medium, or large) of radioactive water from the spent fuel pool for any duration (short or long) for its postulated consequences to the environment. Neither the spent fuel pool leak hazard nor protections against it are explicitly defined. The conclusions expressed in the WC DGEIS that spent fuel pool leaks will be detected before causing significant impacts are therefore speculative and subjective. 6.37 In addition, the WC DGEIS provides no argument that a spent fuel pool leak is more "highly unlikely" than a LWMS tank failure. In fact, the WC DGEIS is silent regarding the relative likelihood of these two scenarios. Yet LWMS tank leaks must be analyzed for its

potential consequences to the environment while spent fuel pool leaks need not. This discrepancy is not justified. (0899-2-5 [Curran, Diane] [Lochbaum, David])

Comment: Nonexistent Groundwater Monitoring and Inspection Requirements.

6.38 The NRC in the WC DGEIS assumes that leaks of 100 gallons per day and greater from the spent fuel pool will be readily detected, corrected, and mitigated to prevent significant impacts. The NRC further assumes that groundwater monitoring will back up in-plant leakage detection processes so as to detect spent fuel pool leaks before significant impacts occur:

In addition to spent fuel pool design and operational controls, licensees are required, as described in Section E.1.2, to perform groundwater monitoring at nuclear power plant sites, which makes it unlikely that leakage from the spent fuel pool would remain undetected long enough for any contamination to migrate offsite. In addition, a groundwater-monitoring program based on a site characterization that conforms to standards (e.g., ANSI/ANS 2.17-2010) and a configuration of monitoring wells that takes into account the most likely leakage pathway (i.e., the spent fuel pool) would further reduce the likelihood that a leak would remain undetected long enough for contamination to migrate offsite. (NRC 2013b, page E-10, lines 15-22)

6.39 The foundation for this WC DGEIS assumption exists in the procedure used by NRC inspectors when examining spent fuel pools at permanently shut down nuclear power reactors:

The inspector should also review data from the licensee's environmental monitoring program, if applicable, to determine if there are indications of SFP leakage into the environment. (NRC 1997, Section 03.02)

6.40 But the environmental monitoring program is an illusion. There are no regulatory requirements for groundwater monitoring either at operating reactors or reactors during the 60-year short-term storage period:

Existing NRC regulations do not explicitly mandate routine onsite ground-water monitoring in the Restricted Area during facility operations. (NRC 2006a, page 5), (0899-2-6 [Curran, Diane] [Lochbaum, David])

Comment: 6.41 Although the WC DGEIS cites a recent Decommissioning Planning Rule that “requires all licensees to establish operational practices to minimize site contamination and perform reasonable subsurface radiological surveys” (NRC 2013b, page B-18, lines 17-18), in reality the rule allows licensees to choose whether or not to conduct groundwater monitoring their operations to minimize the introduction of residual radioactivity into the site, particularly in the subsurface soil and groundwater. There are a variety of monitoring methods to evaluate subsurface characteristics, and these are highly site specific with respect to their effectiveness. One or more licensees may find that compliance with the amendments will mean the installation of groundwater monitoring wells and surface monitoring devices at their sites. (Federal Register 2011, page 35561) (emphasis added) 6.42 Rather than enforceable, reliable, dependable regulatory requirements, the WC DGEIS instead relies on a voluntary industry program for groundwater monitoring: *For nuclear power plants licensed before August 20, 1997, which includes all currently operating reactors, NRC has found that, in general, groundwater monitoring conducted in accordance with the Groundwater Protection Initiative developed by the Nuclear Energy Institute, a nuclear industry consortium, is adequate to comply with these regulations. ... However, licensees may choose to develop groundwater-monitoring programs*

*with additional elements than those recommended by the Groundwater Protection Initiative. For nuclear power plants licensed after August 20, 1997, licensees are subject to the additional requirements of 10 CFR 20.1406(a)-(b), of which “monitoring and routine surveillance programs are an important part of minimizing potential contamination”. (NRC 2013b, page E-5, lines 38 to page E-6, line 9) *** The Nuclear Energy Institute developed its Groundwater Protection Initiative in 2006 in response to leaks containing radioactive material at several plants. The initiative is described in NEI 07-07, “Industry Ground Water Protection Initiative – Final Guidance Document”... All power reactor licensees have committed to follow the initiative, which identifies actions to improve licensee response to inadvertent releases, including releases from spent fuel pools that may result in low, but detectable, levels of plant-related radioactive materials in subsurface soils and water. (NRC 2013b, page E-6, lines 10-16) (0899-2-7 [Curran, Diane] [Lochbaum, David])*

Comment: 6.43 But the NRC’s reliance on such voluntary measures directly contradicts NRC’s conclusion that: *A strong regulatory framework that includes both regulatory oversight and licensee compliance is important to the continued safe storage of spent fuel.* (NRC 2013b, page B-15, lines 27-28) 6.44 The NRC’s insistence on a strong regulatory program as the basis for its environmental findings is reasonable. The industry’s Groundwater Protection Initiative is a voluntary measure that may be retracted or relaxed by the nuclear industry at any time without NRC review and approval. In addition, as discussed below in Section VII, it is currently not being routinely inspected by the NRC at either operating or permanently shut down nuclear power plants. As such, the WC DGEIS cannot credit this non-mandatory, non-inspected program with detecting and correcting leaks during the 60-year short-term storage period. (0899-2-8 [Curran, Diane] [Lochbaum, David])

Comment: VII. THE WC DGEIS FAILS TO ACCOUNT FOR THE SIGNIFICANT REDUCTION IN REGULATORY REQUIREMENTS AND OVERSIGHT THAT OCCURS AFTER A REACTOR CEASES OPERATION[.] 7.1 In reaching its conclusion that spent fuel leaks cannot have significant impacts, the WC DGEIS assumes the continued effectiveness of current monitoring requirements, oversight procedures, and other measures that are in place while the reactor is operating, rather than looking ahead to the fewer requirements, procedures, and other measures that will remain in place after reactors permanently shut down. As stated in the WC DGEIS: *For the purposes of the analyses in this draft GEIS, the NRC assumes that regulatory control of radiation safety will remain at the same level of regulatory control as currently exists today.* (NRC 2013b, page 1-15, lines 3-5) *** *The analyses in this draft GEIS are based on current technology and regulations.* (NRC 2013b, page 1-17, line 21) *** *Even though the reactor is no longer operating during the short-term storage timeframe, a licensee is still bound by the terms and conditions of its operating license until the license is terminated. As a result, the NRC assumes that spent fuel pool maintenance requirements that are in place during the operating period of the reactor will remain in place during the short-term timeframe and will stay in place even if the license is modified during the short-term timeframe.* (NRC 2013b, page E-4, lines 13-17) 7.2 This assumption is blatantly wrong. There is extensive evidence that the scope of regulatory requirements and associated regulatory oversight significantly shrinks after a nuclear power reactor permanently shuts down. This declaration presents some examples, although much more evidence exists. 7.3 For instance, standard NRC communications with licensees about safety problems and concerns are typically not sent to licensees of permanently shut down reactors, even when they contain relevant information. On March 3, 2004, the NRC issued Information Notice 2004-05 regarding the leak from the spent fuel pool at Salem that reached the soil. The NRC sent this warning notice to: *All holders of operating licenses for nuclear power reactors (except those who have permanently ceased operations and have*

certified that fuel has been permanently removed from the reactor vessel) (NRC 2004, page 1) (0899-2-9 [Curran, Diane] [Lochbaum, David])

Comment: VIII. THE WC DGEIS FAILS TO CONSIDER SOME SIGNIFICANT IMPACTS FROM A SPENT FUEL POOL LEAK[.] 8.1 The WC DGEIS is also inadequate because it fails altogether to consider a number of credible environmental impacts related to spent fuel pool leaks. (0899-3-1 [Curran, Diane] [Lochbaum, David])

Comment: 9.5 In the WC DGEIS, the NRC fails to identify how the spent fuel pool leaks listed in Table E4 were detected. By not identifying the means of detecting these past leaks, the WC DGEIS fails support its assumption that leaks will be readily detectable. Instead, the WC DGEIS leaves open the possibility that the leaks were only detected through sheer luck. The WC DGEIS must explicitly identify the means by which past leaks were detected and ensure that regulatory requirements will retain these means throughout the 60-year short-term storage period. Otherwise, the NRC has no basis for a finding of reasonable assurance that the methods on which it relies will detect future leaks. (0899-3-10 [Curran, Diane] [Lochbaum, David])

Comment: 9.6 In the WC DGEIS, the NRC fails to recognize that both regulatory requirements and its oversight regime are significantly scaled back when nuclear power reactors cease operation. For example, the aging management measures supporting renewal of reactor operating licenses only apply during the period of extended reactor operation-not the six decades of spent fuel pool storage that follow. And evidence shows that the NRC's inspection effort is drastically reduced, to almost drive-by inspection efforts, after a reactor permanently shuts down. (0899-3-11 [Curran, Diane] [Lochbaum, David])

Comment: 9.7 For the WC DGEIS, the NRC fails to properly consider impacts from leaks causing offsite contamination below federal health standards and onsite contamination. The Braidwood event, for example, reveals that leaks resulting in offsite contamination cause significant impacts while the Salem and Oyster Creek events reveal that leaks resulting in onsite contamination can also entail significant impacts. (0899-3-12 [Curran, Diane] [Lochbaum, David])

Comment: 9.8 The NRC lacks the regulatory backstop needed to validate assumptions made for the WC DGEIS about spent fuel pool leakage detection capabilities and leak impacts. Consequently, the conclusion in the WC DGEIS that spent fuel pool leaks cannot have significant impacts may not be relied upon. (0899-3-13 [Curran, Diane] [Lochbaum, David])

Comment: 9.9 The WC DGEIS must be revised to explicitly and properly:

- Identify the regulatory requirements in place throughout the short-term storage period that provide reasonable assurance that spent fuel pool leakage of X^{17} [footnote 17 text: In the WC DGEIS, the NRC assumed an X value of 100. Correcting the many deficiencies, errors, and shortcomings identified by this declaration may result in a final X value higher or lower than 100.] gallons per day or greater will be detected before causing significant impacts.
- Demonstrate by analysis applicable to all sites, or require site-specific analyses, showing that spent fuel pool leakage of less than X gallons per day of infinite duration cannot cause significant impacts. (0899-3-14 [Curran, Diane] [Lochbaum, David])

Comment: 9.10 Absent the failures and deficiencies identified in this declaration being adequately remedied, the WC DGEIS cannot support rulemaking and policies allowing irradiated fuel to be stored in spent fuel pools for up to 60 years following cessation of reactor operation. Past spent fuel pool leaks raise serious questions about safety and environmental risks from future leaks. Those questions must have sound and well-supported answers before

the NRC approves the storage of spent fuel in pools for 60 years following reactor operation. Otherwise, post-operational spent fuel storage is nothing more than a six-decade gamble. (0899-3-15 [Curran, Diane] [Lochbaum, David])

Comment: Offsite Contamination Below Standards and Onsite Contamination Excluded[.] 8.2 The WC DGEIS fails to consider environmental impacts other than contamination in excess of NRC and EPA standards. (NRC 2013b, page E-18, lines 31-32). It also excludes onsite contamination. As a result, the WC DGEIS fails to consider numerous instances in which onsite contamination resulted in costly cleanups, which were required regardless of whether the licensee had failed to comply with NRC standards. In other words, compliance with NRC standards was insufficient protection against significant impacts. 8.3 For instance, the leak from the Salem spent fuel pool is not significant under the WC DGEIS criterion even though millions of dollars have been spent remediating tritium contamination in the groundwater. As described in Section IV.C above, water leaked from the spent fuel pool at the Salem nuclear plant prompted the State of New Jersey to compel its owner to remediate the site to recover the radioactively contaminated water. Over 28 million gallons of water have been drawn from the soil around the plant, treated, and either re-used by the plant or legally discharged (Arcadis 2013). Salem's leaking spent fuel pool did not result in any measured level of radioactivity in drinking water that exceeded federal standards, but it resulted in a sizeable cleanup cost. Spent fuel pool leaks in the future could pose financial burdens on stockholders, ratepayers, or taxpayers—a factor that NRC seems to have overlooked in the WC DGEIS. 8.4 Similarly, an onsite leak at the Oyster Creek nuclear plant in New Jersey costs millions of dollars to remediate. In April 2009, radioactively contaminated water leaked from an underground pipe at the Oyster Creek nuclear plant in New Jersey. The State of New Jersey ordered the plant's owner to clean up the leak. New Jersey Department of Environmental Protection Deputy Commissioner Iren Kropp was quoted as saying "They don't get a court hearing. They have to act and do exactly what we say" under the state's Spill Act. A company manager estimated the costs to exceed \$13 million (Bates 2010). While this leak came from an underground pipe rather than the spent fuel pool, the contaminated water carried a hefty price tag even though it did not migrate offsite. The NRC fails to consider such onsite contamination consequences in the WC DGEIS. 8.5 And as discussed above in Section IV.D, Indian Point suffered a 50 gallon per day leak from the Unit 2 spent fuel pool that the owner believes to have lasted for over two years. This and other leaks discovered from the Unit 1 and Unit 2 spent fuel pools led to extensive and costly investigatory and assessment efforts at the site. Again, the WC DGEIS gives no indication that NRC considered such onsite contamination consequences. (0899-3-2 [Curran, Diane] [Lochbaum, David])

Comment: 8.6 While the source was an effluent pipe used to discharge radioactively contaminated water to the Kankakee River rather than the spent fuel pool, a leak discovered in 2005 at the Braidwood nuclear plant in Illinois had significant impact even though it did not result in any measured radionuclide concentrations in offsite groundwater used for drinking or in drinking wells in excess of EPA and NRC regulatory limits. Among the consequences from this leak: • Exelon Corporation, Braidwood's owner, agreed to purchase one property and reimburse 14 other property owners for devaluations stemming from the leak (Dow Jones, 2005). • The NRC's Chairman described the leak in his four-page transmittal letter for a monthly report to Congressional oversight committee Chairs and Ranking Members (NRC 2006c, page 2). Thus, leakage resulting in no offsite contamination above regulatory limits—considered insignificant in the WC DGEIS—was considered significant enough to promptly report it to the U.S. Congress. • The Illinois Attorney General and the Will County State's Attorney jointly filed a lawsuit against Exelon on eight counts related to the leaks (Illinois Attorney General, 2006). • Exelon agreed to provide bottled water to about 420 homeowners near the Braidwood nuclear plant (Associated

Press, 2006). • Exelon, the Illinois Attorney General, and the Will County State's Attorney settled the leak lawsuit on May 11, 2006. Per the agreement, Exelon agreed to reimburse the State of Illinois and Will County for all their costs related to the leak, to implement several remediation measures, and to take other measures intended to prevent future leaks (Twelfth Circuit Court, 2006). 8.7 In summary, the Salem, Oyster Creek and Indian Point cases clearly demonstrated that leaks contaminating the plant's property can have significant impacts. And the Braidwood case clearly demonstrates that leaks contaminated offsite properties below regulatory limits can also have significant impacts. The WC DGEIS cannot summarily dismiss this reality. (0899-3-3 [Curran, Diane] [Lochbaum, David])

Comment: B. Social and Economic Impacts[.] 8.8 The WC DGEIS does not properly consider the social and economic effects of contamination in nearby communities. These effects can be significant. 8.9 For example, during a workshop on groundwater protection conducted by the NRC on April 20, 2010, Bill Buscher of the State of Illinois Environmental Protection Agency pointed out that the millions of gallons of radioactively contaminated water that leaked from the Braidwood nuclear plant and migrated offsite and into people's drinking wells had serious implications even though the measured tritium concentrations were within the federal standards for drinking water. Buscher explained that several nearby residents were approaching retirement age and had planned to sell their properties and use the proceeds to relocate to live out their golden years. But the specter of radioactive contamination sent real estate prices spiraling downward. It is not clear from the WC DGEIS that the NRC considers potential property devaluations caused by spent fuel pool leaks. (0899-3-4 [Curran, Diane] [Lochbaum, David])

Comment: C. Licensee Longevity[.] 8.10 The WC DGEIS assumes that companies owning permanently shut down reactors are immortal. As of 2003, the companies comprising the Standard & Poor 500 stock index (S&P 500) had been publicly traded for an average of 25 years, with this average trending towards shorter values.¹⁶ [footnote 16 text: Per August 25, 2010, posting to <http://www.investopedia.com/stock-analysis/2010/the-average-lifespan-of-sp-500-companies-xom-aapl-pg-ibm-jnj0825.aspx>] The NRC assumes in the WC DGEIS that spent fuel pools could be around for up to 140 years (40 year original operating license period along with two 20-year license extensions followed by up to 60 years of short-term storage after reactor operation permanently ceases). The NRC thus assumes that the owner, or licensee, responsible for maintaining the spent fuel pool and monitoring against leaks will endure for 5.6 times longer than the average lifetime of the S&P 500 companies. The NRC apparently failed to consider, from a socioeconomic perspective, the fact that an owner no longer receiving revenue from a permanently retired generating plant may not survive for six decades. The WC DGEIS needs to either explain how bankruptcy, changes in ownership, takeover by the state, and other ownership issues cannot occur during the 60-year short-term storage period or explain how the spent fuel pool leak risk will be properly managed during and following such ownership issues. (0899-3-5 [Curran, Diane] [Lochbaum, David])

Comment: IX. Conclusions[.] 9.1 The WC DGEIS concedes that long-term, low-volume spent fuel pool leaks could exceed public health regulatory limits and impact groundwater resources. Although the WC DGEIS concludes that any such leaks are very unlikely to happen, it fails to provide solid, reliable support for this conclusion. (0899-3-6 [Curran, Diane] [Lochbaum, David])

Comment: 9.2 The WC DGEIS does not show that the NRC has considered all relevant spent fuel pool leaks. For instance, the NRC did not consider the leaks that occurred from the spent fuel pools at the Brookhaven National Laboratory and the Yankee Rowe nuclear plant. The BNL spent fuel pool leaked radioactively contaminated water into the ground for up to 12 years. Four

tests for leakage from the spent fuel pool over a seven year period failed to detect the leak. And numerous monitoring wells already existing or added to the site failed to detect the leaked water for many years or attributed leak indications other sources. But this event was not included among the past events NRC considered for the WC DGEIS. Likewise, the NRC failed to consider in the WC DGEIS the two million gallons that leaked from the Yankee Rowe nuclear plant. (0899-3-7 [Curran, Diane] [Lochbaum, David])

Comment: 9.3 In the WC DGEIS, NRC assumes that spent fuel pool leaks of 100 gallons per day or more would be readily detected before causing significant impacts. In making this assumption, the NRC relies on the availability of spent fuel pool leakage detection system and groundwater monitoring measures. But the WC DGEIS fails to properly consider that spent fuel pool water level instrumentation is not required to be functioning except during the very rare occasions when irradiated fuel is being moved within the pool and that groundwater monitoring measures are entirely voluntary. Thus, the NRC relies on measures that quite simply may be non-existent. In addition, the WC DGEIS fails to explain how leakage far in excess of 100 gallons remained undetected at Yankee Rowe until two million gallons of radioactively contaminated water had escaped into the soil. (0899-3-8 [Curran, Diane] [Lochbaum, David])

Comment: 9.4 In the WC DGEIS, the NRC fails to justify its conclusion that spent fuel pool leaks of less than 100 gallons per day either will be detected in a timely manner or will cause no significant impact if undetected for an extended period. The BNL and Indian Point leaks contradict the NRC's conclusion because each involved releases of tens of thousands of gallons, but at rates of less than 50 gallons per day. The WC DGEIS dismisses leaks smaller than 100 gallons per day, regardless of their duration, but without explicitly defining the hazard and protections credited against it (as discussed in paragraphs 6.31 to 6.37), this dismissal is speculative and subjective. (0899-3-9 [Curran, Diane] [Lochbaum, David])

Comment: Aquatic Resources -Groundwater and Surface Water[:] The description of potential impacts to groundwater does not consider potential leaks from spent fuel storage pools that could develop after reactors shutdown. *Recommendation:* Provide an analysis of potential leaks at spent fuel pools and potential impacts to ground and surface water sources. (0915-11 [Bromm, Susan E.])

Comment: On Page 2-11, NRC speaks confidently about high-level radioactive waste storage pools' robust design and structure, including "leak-detection systems." This begs the question, how then did so many pools, as are listed in Table E-4 on Page E-20, leak into the environment, sometimes for years, or even decades on end, without the nuclear utility nor even the NRC knowing about it? In short, NRC's confident claims about pools' robustness and leak-proof nature don't hold water. (0919-3-14 [Kamps, Kevin])

Comment: Re: footnote #1 on Page 4-7, where NRC states "Typically shutdown units that are co-located with operating units either have a small dedicated staff or have workers from the operating units assigned and dedicated to the shutdown unit (e.g., spent fuel pool maintenance and monitoring activities)."...It was fortuitous, as conveyed in David Lochbaum's expert witness commentary, that the worker at Dresden 1 in the mid-1990s happened to discover, by sheer luck while walking through the long shuttered Unit 1 building, a flood of leaking service water system water in the basement, due to a frozen pipe. Commonwealth Edison had decided to simply not heat the building, to save money. Had the irradiated nuclear fuel storage pool likewise sprung an unnoticed leak, a catastrophe could have unfolded! (0919-6-12 [Kamps, Kevin])

Comment: At Page 4-25, starting at line 29, NRC states "in the very unlikely event that a leak from a spent fuel pool goes undetected and the resulting groundwater plume reaches the offsite environment, it is possible that the leak could be of sufficient magnitude and duration to contaminate a groundwater source above a regulatory limit (i.e., a maximum contaminant level [MCL] for one or more radionuclides)." (highlight added)--VERY UNLIKELY EVENT?! What about all the leaks listed in this DGEIS's Table E-4 that NRC admits leaked radioactivity into the environment, sometimes for many years, without detection? What about the pool leaks at Brookhaven National Lab, as David Lochbaum asks, again a years-long, undetected leak? (0919-7-11 [Kamps, Kevin])

Comment: Re: Page 4-26, beginning at line 5, where NRC states "Further, as discussed in Appendix E, spent fuel pool design (e.g., stainless-steel liners and leakage-collection systems) and operational controls (e.g., monitoring and surveillance of spent fuel pool water levels) make it unlikely that a leak will remain undetected long enough to exceed any regulatory requirement (e.g., the NRC dose limit or EPA-mandated Maximum Contaminant Level) in the offsite environment. Although a small number of spent fuel pool leaks have caused radioactive liquid releases to the environment, based on the available data, none of these releases have affected the health of the public (NRC 2006a)."--Re: health impacts, what about the insights documented in Kelly McMasters' book *Welcome to Shirley: Memoir from an Atomic Town*?! Shirley, Long Island drank the groundwater contaminated with tritium and other radioactive poisons from the leaking pool at Brookhaven National Lab, which NRC didn't even bother to include in its Appendix E. As David Lochbaum comments, the Brookhaven National Lab pool leak must be added to this analysis, and its significant impacts on the health of downstream residents, especially children, taken seriously. (0919-7-12 [Kamps, Kevin])

Comment: NRC's answer to any ground water contamination at a nuclear power plant site is that the contaminated ground water will be detected by the monitoring wells, the contamination will only be in the water table aquifer and it will only flow to the surface water body at the plant. In New Jersey and many other areas the gradients and flow direction of ground water flow can be changed by pumping centers miles away from the rivers. (0920-10 [Foster, Ruth])

Comment: The report indicates for ground water quality and use the impacts would be SMALL since there is " ... a low probability of a leak of sufficient quantity and duration to affect offsite locations and (2) site hydrologic characteristics and monitoring programs ensure that impacts from spent pool leaks would be unlikely." When Table E-4, Occurrence of Spent Fuel Pool Leakage at U.S. Nuclear Power Plants, is compared to Table G-1, Capacity of Spent Fuel Pools for Operating Nuclear Power Reactors, it is clear that there is not a low probability of a spent pool leak since about 17% of the spent fuel pool has already had leaks, or 15 or 16 spent fuel pools (Table E-4) out of 104 reactors (Table G-1) with spent fuel pools. As indicated on Table E-4, eight of the leaks reached the environment (migrated out of the containment building). According to Table G-1 there are 94 spent fuel pools since some reactors share a spent fuel pool. (0920-16 [Foster, Ruth])

Comment: At one New Jersey facility two of the three nuclear power plants which had spent fuel pool leaks that reached the environment. It should be noted that none of the REMP ground water monitoring systems detected the tritium contamination in the ground water. The plumes of the tritium that contaminated ground water were initially delineated only after an extensive drilling program with monitoring wells placed at both plants. Only after extensive negotiations with the plant operator to drill deeper monitoring wells into the first confined aquifer below the plant, it has been confirmed that tritium contamination has migrated downward into the deeper aquifer. Since this deeper aquifer is confined the flow direction may not be in the same direction

as the water table aquifer. Studies are currently underway to determine the actual flow direction. At another New Jersey plant, a leak in a condenser pipe caused significant ground water contamination by tritium. In this case also, the REMP ground water monitoring wells never detected the tritium from the leak. After several years of negotiations, the company installed deeper monitor wells that indicated the tritium was moving downward into a deeper aquifer below a clay layer which the company's consultants indicated would protect the deeper aquifer. The part of the plume in the deeper aquifer has the potential to flow in the opposite direction as the water table aquifer. Without having additional wells drilled into the deeper zone, the true flow direction cannot be determined from the existing deep monitoring wells. At both Salem-Hope Creek and the Oyster Creek facilities, tritium contamination has migrated into aquifers below clay layers which both facilities indicated in their various reports would prevent any contamination from reaching the deeper aquifers at the plant sites. When they finally installed the deeper monitor wells the State requested, tritium was found in the deeper aquifer at both sites. Also at both of these sites there is a strong possibility that the flow will not be to the surface water body as NRC indicates always is the case. (0920-17 [Foster, Ruth])

Comment: [T]he NRC assumes the ground water system remains constant since the reactor was first designed. In New Jersey the ground water usage near the plants has increased by as much as a factor of ten. Modern regional ground water flow maps for many areas show that some rivers are now recharging the aquifers and not that the aquifers are always recharging the rivers as the NRC model indicates. (0920-18 [Foster, Ruth])

Comment: The first paragraph indicates that offsite impacts from a leak would be very low due leak monitoring, NRC oversight and groundwater monitoring. At the plants in New Jersey, for all of the known leaks (spent fuel pool and piping leaks) where the ground water was contaminated, none of the required routine monitoring (REMP) ground water monitoring wells at the facilities detected any of the leaks or the contamination of the ground water even though in the several of the plumes the tritium concentrations were < 1,000,000 pCi/liter. With routine ground water samples being taken yearly a leak or spill can be migrating in the subsurface for up to a year before sample was taken, and the sample would only show something if it was directly down gradient of the leak. A spent fuel leak detection system (under drain) showed up leakage at one plant, but that leak was likely undetected for several years before it was noticed since the tritium had migrated a significant distance from the believed site of the leak. (0920-20 [Foster, Ruth])

Comment: It is stated that the analyses in this draft GEIS are based on current technology and regulations. That may be true, but facility designs were based on the technology and science of 50 or more years ago. For example, as stated earlier, when the geology of many of these sites was assessed the theory of continental drift and plate tectonics was not accepted by the geologic community. The acceptance of this theory has allowed geologists to better understand fault origins, movements and even orientation. Current studies on faults and earthquakes such as Earth Scope are changing the earthquake hazard evaluation of many parts of the country. Studies into ground water movement and ground water contamination over the last 30 years have changed the way the resource is viewed and cleanups are conducted. For example, at both Oyster Creek and the Salem plants, underlying shallow clay units were identified in the original plant reports and it was indicated that these clays would prevent any contamination from moving below the water table aquifer into deeper aquifers at the sites. Tritium contamination at both of the plants has migrated down from the water table aquifer into deeper water bearing zones below the clay layers. At both sites, the deeper tritium contaminated aquifer has flow directions that are different than the water table aquifers. (0920-25 [Foster, Ruth])

Comment: Lines 30 to 33 indicate that current and future facilities are required to perform ground water monitoring to aid in determining the extent of existing and future contamination. In every case of leaks at the New Jersey facilities, the general monitoring well networks did not detect the plumes of tritium contaminated ground water. In lines 37 and 38 on this page and line 1, next page, it is stated that licensees that have ground water monitoring programs " ...consistent with Nuclear Energy Institute Groundwater Protection Initiative are considered to have an adequate program for the purposes of the Decommissioning Planning Rule (NRC 2011b)." Again the experience here in New Jersey has been that the facility general ground water monitoring well programs did not indicate any of the significant tritium (hundreds of thousands of pCi/L of tritium) leaks at the facilities. Furthermore, the contamination plumes tend to be very narrow. At Oyster Creek and Salem, contamination was found to drop from <100,000 pCi/L to less than detection limits in less than 100 feet between the monitoring points both on the sides of the plume and down gradient of the plume. (0920-28 [Foster, Ruth])

Comment: Licensees should not rely solely on the Groundwater Protection Initiative recommended by the Nuclear Energy Institute for developing monitoring programs to detect leaks. Groundwater protection programs should be supplemented by a more robust spent fuel pool and underground piping inspection and maintenance program to ensure that contaminated water from the spent fuel pool or buried piping does not leak into the environment. (0920-3 [Foster, Ruth])

Comment: According to Tables E-4 and G-1, about 17% of the spent fuel pools have already leaked. Some leaks were found fairly quickly and others, like Salem 1, were not found until several years after the leak started. The spent fuel leak at Salem 1 migrated down from the water table aquifer into a deeper confined aquifer. A tritium leak from piping at Oyster Creek has also migrated down from the water table aquifer through a local "confining clay" into a deeper aquifer. All the geologic/ground water reports used for the Oyster Creek plant design and operations indicate this clay layer would protect the deeper aquifer at the site, including the ones written after the leak was found. When contamination gets into deeper aquifers below local confining layers, the ground water flow does not have to be in the same direction as it is in the water table aquifer. (0920-30 [Foster, Ruth])

Comment: In this section it is stated when the plant closes there is less impact on the resource since the facility is using less water. This does not account for the fact that when the amount of ground water and surface water pumped at a site is reduced during and after closure of the power plant, the local ground water-surface water flow system at the site will definitely change. Also as people and industry move in to the area near the power plant a greater demand is placed on the local aquifers just off the plant site. In the case of Oyster Creek, the population, within 10 miles, went from 5,000 to 10,000 when construction started to over 150,000 before the first license extension. Now the population is approaching almost 200,000 people. With 100% of the population supplied by ground water, mainly from wells in the water table aquifer and shallow confined aquifers, local ground water flow is toward the pumping centers. (0920-33 [Foster, Ruth])

Comment: p. 4-26-- Lines 10 to 12 of the report indicate that a small number of spent fuel pool leaks have reached the environment and have not affected health of the public. According to Table E-4, 9 of the 16 plants listed had spent fuel pool leaks which reached the environment. This is not a small number. More than 55% of the pools that have leaked have reached the environment. (0920-34 [Foster, Ruth])

Comment: Chapter 8.0, p. 8-1---Lines 21 through 16 define SMALL, MODERATE and LARGE as related to the environmental effects on the important attributes of the resource. When Table 8-1 is examined, the impact of storage on groundwater quality and use is given as SMALL. Without knowing the demographics and water use around a plant; it is not possible to make a blanket assessment that the impact of a leak to the ground water would be SMALL. The reasoning is that spent fuel pools are designed not to leak, have monitoring systems in place that would detect any leak and there are monitoring wells at the plants to detect any ground water contamination. It is also indicated that any contamination will only affect the water table and migrate to the surface water body. (0920-39 [Foster, Ruth])

Comment: The source of the initial concentrations of spent fuel pool radionuclides of concern is unclear. NRC (2006b) "Liquid Radioactive Release Lessons Learned Task Force Final Report" is cited as the source of the initial concentrations in this table however no data on the concentrations of radionuclides in spent fuel pools could be found in the cited report. (0920-4 [Foster, Ruth])

Comment: Currently in New Jersey there are four reactors at two sites, one on a site on an estuary and the other three on at a site on a major river. Both sites are underlain by gently dipping (<65 feet per mile) gravel, sand and clay formations which makeup the confining layers and aquifers of the New Jersey Coastal Plain. Tritium contamination has affected the water table aquifer and deeper confined aquifers at both sites. At Oyster Creek, the water table and locally confined shallow aquifer is the major ground water source and producer for the region with nearly 200,000 people living within the 10 mile radius of the plant. At Salem, the water table aquifer is an extremely poor water producer, but the confined shallow aquifer is hydraulically and stratigraphically connected to a major aquifer which is heavily pumped across the river in Delaware. A large cone of drawdown has reached under the river into New Jersey and is just to the south of the plant sites. As the drawdown cone expands, it will also migrate up dip toward the shallow confined aquifer at the Salem plant site, which has tritium contamination. (0920-40 [Foster, Ruth])

Comment: Appendix E, p. E-6--Lines 1 to 4 indicate the NRC has found that the ground water monitoring conducted by the facilities is adequate. The is not supported by the data from any of the New Jersey plants since the routine REM monitoring wells did not detect any of the tritium leaks. (0920-41 [Foster, Ruth])

Comment: Appendix E, p. E-7-Lines 5 to 10 and 24 to 27 indicate that the plants are developing ground water monitoring programs and the programs will have conceptual and subsequent numerical models for the basis of estimating the dispersion of radionuclide releases to the ground water. The issue is that the NRC does require the plants use updated geologic and ground water information. (0920-42 [Foster, Ruth])

Comment: Appendix E, p. E-9--Lines 11 and 12 indicate that spent fuel pool leaks have been detected at 13 plant sites. It seems like NRC is trying to downplay the number of leaks. Table E-4 lists 13 sites, but at those 13 sites there are 16 spent fuel pools leaking. In lines 16 to 18 it is indicated that in most cases the liner and leakage monitoring prevent the spent fuel pool water from leaking undetected into the environment. Table E-4 indicates that 9 of the 16 spent fuel pool leaks did reach the environment. It should be noted that at least one of those leaks, Salem I, must have been leaking for at least two years as evidenced by the distance the plume of contaminated ground water had moved by the time the leak was discovered. None of the routine ground water monitor wells at the have detected the tritium plume. (0920-44 [Foster, Ruth])

Comment: Appendix E, p. E-10---Lines 15 to 22 indicate that the ground water monitoring makes it unlikely that a leak would remain undetected long enough for the contamination to migrate off site. Again, based on experience here in New Jersey, the Salem 1 and Salem 2 spent fuel pool leaks were not detected by any of the routine ground water monitoring wells. Also, the tritium leak at Oyster Creek was not detected in any of the routine ground water monitoring wells. (0920-45 [Foster, Ruth])

Comment: The basis for the initial concentrations of spent fuel pool radionuclides of concern is unclear. For example, with regard to tritium, it is not unusual for spent fuel pool concentrations to be an order of magnitude higher than the 2.9×10^{-2} micro curies/ml reported in this table. Is this an average value? Would it be more useful to report a range of concentrations? (0920-5 [Foster, Ruth])

Comment: Based upon the information provided in the text regarding the methodology for calculating the annual discharge rate associated with spent fuel pool leakage of 100 gallons per day, the estimated spent fuel pool leakage (Ci/yr) should be two orders of magnitude higher than the values reported in this table. Was a dilution factor applied that is not discussed in the GEIS? (0920-7 [Foster, Ruth])

Comment: Please provide the historical data for Salem Unit 2 that characterized this event as an inadvertent liquid radioactive release to the environment resulting from the occurrence of spent fuel pool leakage, as indicated in Table E-4. (0920-8 [Foster, Ruth])

Comment: Please find attached a double-sided pamphlet written (in Dec. 2012, and updated in Nov. 2013) by Beyond Nuclear board member Kay Drey of St. Louis, MO, entitled "ROUTINE RADIOACTIVE RELEASES FROM U.S. NUCLEAR POWER PLANTS." I submit it as public comment on NRC's Waste Confidence Draft Environmental Impact Statement, because whether re: impacts on Groundwater (Section E.2 .2.1), Surface Water (Section E.2.2.2), Soils (Section E.2.2.3), or Public Health (Section E.2.2.4), as summarized in Section E.2.2.5 on Page E-19, NRC has determined, incredibly, that the impact of radioactivity leakage from high-level radioactive waste storage pools is "SMALL." We beg to differ. This pamphlet, while focused on "routine radioactive releases," also touches on "leaks"-which, because they happen so often, unfortunately, could be referred to as "routine" at nuclear power plants-although there is nothing "routine" or "small" about them, in terms of their impacts on the environment and human health. (0925-1 [Kamps, Kevin])

Comment: Please note that this ""ROUTINE RADIOACTIVE RELEASES FROM U.S. NUCLEAR POWER PLANTS" pamphlet, on its flipside, includes a map of the U.S., showing atomic reactor sites, and the surface waters into which their pools either already do leak or have leaked (as documented in NRC's Table E-4 on Page E-20, at Hatch in GA. Indian Point in NY, Palo Verde in AZ, Salem in NJ, San Onofre in CA, Seabrook in NJ, and Watts Bar in TN; as documented by David Lochbaum of UCS, in his comments to this proceeding, at Yankee Rowe in MA, as well as Brookhaven National Lab on Long Island, NY), or else could yet leak someday. The NRC WC DGEIS, as at Table E-4, currently lacks specific information, as to which surface waters pools have leaked into, are yet leaking into, or could someday leak into. (0925-4 [Kamps, Kevin])

Comment: PNPS has been without any DEP monitoring for almost twenty years. It too has leaked tritium into the groundwater and the source of the leak, untested for years, was only "accidentally" found as reported in the newspaper. For this plan to have its impact on the environment to be labeled as small is beyond logic and scientific basis. No two reactors are

alike-----no two reactors sites are alike; they vary on environmental impact and should be evaluated based on individual characteristics. (0933-9 [Anonymous, Janet])

41. Comments Concerning Cumulative Impacts

Comment: I would like to refer to the impacts of climate change on waste. And that in fact, the rules insufficiently address this matter in 6.4.5.1 as it relates to short-term, long-term and indefinite storage onsite and offsite. The NRC concludes that the relative contribution from indefinite, long-term, short-term onsite storage of spent fuel to greenhouse gas emission levels would be small, quote-unquote. As it relates to the cumulative impacts, the -- in Section 6.4.5.1 and 2, the conclusion is that the cumulative impacts will be noticeable but not destabilizing with or without the greenhouse gas emissions from continuous storage, so over a period of 240,000 or 250,000 years one has to wonder if they've -- these projections have actually been made in that context. And as it relates to what is the revision of the Waste Confidence GEIS and the rule for possible revision, this is warranted by significant events that may call into question the appropriateness of the rule, so at the same time, the GEIS analyzed reasonably foreseeable events, and did not consider worst-case scenarios. I think it's time to look at the worst-case scenarios given what has been taking place in Fukushima, elsewhere, climate change, floods, potential seismic issues and so forth. (0163-5-1 [Wilson, Annie])

Comment: I also consider that the DGEIS requires "connective actions" to be analyzed if it is to fulfill the responsibilities of NEPA. Although the document is addressing the storage of nuclear waste material by private energy generators, the generation of waste material is a "cradle to grave" event. However benign or dangerous nuclear material is "in-situ" (e.g. its natural geologic setting), once uranium is mined, ore processed, material enriched, fuels used, fuels spent, and waste disposed, citizens should expect safety to body and environment. Review of the DGEIS does not provide any quantitative understanding of environmental impacts or risks from earlier nuclear material activities, origin of nuclear materials or connection to foreign or defense related activities. I contend that, not only should the DGEIS provide connective actions to other nuclear industries so the reader has a clearer understanding of the full impact to our human environment, the document should include some mention of global activities since there is no safe level of radiation and all nations that potentially lose material have the potential to contaminate "down wind." The human use of nuclear material is a scant 100 years, fraught with problems of poor use, ignorance, contamination and death, and you ask the citizens of this nation to simply trust that the NRC can manage it for millennia (0219-9 [Olmstead, Stan])

Comment: Lastly, the one thing I'd like to also mention is that the EIS kind of looks at this scenario of one leaking fuel pool, but it doesn't look at the likelihood or the probability of multiple failures, and what are the cumulative effects of that, especially when you have multiple reactors, especially when you're in sites that are ecologically sensitive like that of around Turkey Point. (0244-8-4 [Totoiu, Jason])

Comment: And then the NRC has failed and continues to fail to recognize the long-term damaging effects of radiation from numerous sources. We encourage the NRC decision-makers this time to give full consideration to all of the inherent negative aspects of adding more radiation to an environment already forever polluted by the dropping and testing of nuclear weapons; routine or accidental releases from nuclear power plants and weapons complexes; enrichment facilities; and supporting operations; and the release of radiation during and after hurricanes, tsunamis, earthquakes, and other natural disasters. (0250-51-7 [Thomas, Ellen])

Comment: Centuries of storage at multiple sites would surely have measurable effects on dedicated land use and terrestrial resources, if nothing else. (0262-5 [Patterson, Karen])

Comment: Specifically in this region of the Great Lakes Basin, 20 percent of the world's surface fresh water is in jeopardy from 60 nuclear power plants, 37 of which are directly in the watershed, an accident at any one of which would render 20 percent of the world's precious surface fresh water unusable. And, yet, we go on and do it. (0327-2-3 [Keegan, Michael])

Comment: The GEIS utterly fails to integrate even the information it contains. Systems, conditions, effects, and impacts all get divided into various categories and then each is treated as if each operates within some imaginary bubble. Simply from the elementary perspective of basic math, even if one were to accept the preposterous assertions that every possible individually identified impact classification would be - to use the GEIS's favorite word, "SMALL" - that by no means indicates the total sum of various impacts would be small. And - again, just using third grade math here - it certainly does not mean that the multiplicative impacts are small. (0341-2-4 [Mermelstein, Richard])

Comment: The same failure to look at additive and multiplicative and accelerative factors infects all aspects of the NRC's analysis of human health and environmental damage impacts. After a long, laborious slog through hundreds of pages of the GEIS, one comes to the "Cumulative Impacts" section. At last, calculus would be made of all the risks to health and environment from decades of radioactive effluent releases from the entire nuclear operations (military, civilian, medical, etc) and the nuclear waste stream (military, civilian, medical, devise, etc), from the beginning of the nuclear age, through the decades of extended (and new) nuclear power operation, and then for the envisioned centuries ahead. One would anticipate a thorough analysis, to incorporate the most current medical research and environmental studies. The realities of water source depletion, dwindling fisheries, polluted and heated waterways, algae growth... the list goes on and on. Surely the GEIS would evaluate the added burdens of heat and radioactive effluents into the groundwater and surface water as an added stressor that might well constitute a tipping point to major environmental crisis. Added too would be the estimation of more accidental releases - large and/or small - during regular nuclear power operation, since that would be just the starting point for analysis. No? Without a doubt, the findings of the National Academy of Sciences and all the other studies attesting to the additional vulnerabilities of environmental justice populations and of women, adolescents, children, babies and babies in utero will be given due consideration. And, most assuredly, the analysis would carefully examine the totality of all the cumulative effects of the hundreds of different radionuclides (with so many different pathways and effects) that have been, are being, and will ineluctably be, disgorged. Increased human populations and exposures would, of course, be calculated. After all, there will be thousands of tons more waste and millions more people. Alas, we are still waiting. (0341-2-7 [Mermelstein, Richard])

Comment: Similarly, the DGEIS fails to acknowledge the indirect impacts of evacuation in a severe accident. In the context of license renewal, NRC Staff noted that "in the [license renewal] GEIS, sever[e] accidents have been determined to have small impact. So I think, too, a point that wasn't made is that when we look at the evacuation question, because the impact has already been determined from a severe accident to be small, the evacuation -- the probability of it occurring would make it most likely a small impact as well." Transcript of Proceedings, Briefing On Proposed Rule To Revise The Environmental Review For Renewal Of Nuclear Power Plant Operating Licenses (Part 51) (Jan. 11, 2012), ML120180209 at 73. Unlike in the license renewal context, however, where these issues may be addressed again, no further discussion of the indirect storage of nuclear waste will take place after promulgation of 10 C.F.R. § 51.23. These

impacts must be analyzed in the context of this rulemaking. (0473-10-16 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: NRC Staff dismiss ALL of the following points (one way or another) on the basis that it finds the probability of a fuel pool fire to be so low that it concludes that such an event is "inconsequential." The odds cited are about 1 in 60,000...but that is for any one year, at only one reactor. Meanwhile there are still 99 reactors operational in the USA, and each will continue operating for more than one year. The odds rise to 1 a few thousand. NRC dismissing an enormous hazard solely because it is a "low-probability" event does not constitute protection of the public health and safety as it is charged by law to provide. (0552-2-1 [Macks, Vic])

Comment: For example: given the fact that spent fuel pools have already leaked, and continue to leak at Indian Point, the prospect of decades of additional pool storage during the 60-year post operating license timeframe implicates potential long-term impacts to the surrounding environment. NRC has failed to adequately consider such impacts. Notably, Indian Point is situated adjacent to recognized critical aquatic ecosystems; radionuclides have in the past been detected in fish samples near Indian Point, and spent fuel pool leaks may impact aquatic organisms in the future, especially since the radioactivity from spent fuel pool leaks at Indian Point will be releasing to the Hudson River indefinitely, and certainly throughout the 60-year post operating license timeframe. Yet, NRC has boxed its analysis into narrowly defined impact criteria and, as a result, failed to assess in any meaningful way the impacts to aquatic organisms posed by such cumulative and future spent fuel pool leaks. Notwithstanding what NRC considers its analytical framework, under NEPA, a complete analysis is required since impacts to aquatic ecosystems are reasonably foreseeable. (0710-21 [Brancato, Deborah] [Musegaas, Philip])

Comment: Section 6.3.1, page 6-4 and running through 6-8, identifies general trends and activities upon which the cumulative impacts are analyzed. These trends, while identified and supportable, are insufficient for analysis. The primary reason for the deficiency is that they do not take into account the chilling or negative effect that continued storage of spent fuel has or will have on an immediate area. So while table 6-1 can provide guidance on positive future events there is no guidance on the negative aspect of continued spent fuel. This too needs to be identified and evaluated within the scope of the Draft GEIS. (0783-3-10 [Harlan, Thomas])

Comment: The deficiencies cited by the City [Red Wing, MN] with the Draft GEIS previously set forth in this letter carry forward and manifest themselves in the analysis of the cumulative impacts of continued storage. These include, without limitation, the failure to analyze the indirect impact of continued storage, the failure to address mitigation and emergency preparedness, the continued reliance upon the assumptions set forth in section 1.8.3 as well as the absence of any discussion on the chilling effect that continued storage will have upon future development in the area. It is this last deficiency that is particularly poignant in the Draft GEIS's analysis of cumulative impacts. For the City, the cumulative impact is quite simple: continued storage of radioactive material, for short or long-term, will not allow for the natural growth and progression of the City. Development in that area will either lag or become unrealized since no one will want to be located next to the storage facility. The facility, itself, will have a disproportionate drag on public safety services since readiness demands that the City be prepared for an incident involving a radiological release. At that same time, the tax revenue from development that could normally offset this obligation would decrease or not materialize at all thereby shifting the burden of public safety costs on the other citizens of the City especially after the PINGP ceases operations. Despite these clear impacts, an analysis of these in the Draft GEIS is missing. In

order to fully complete an analysis of the cumulative impact of continued storage to satisfy NEPA requirements, this analysis must be included in the Draft GEIS. (0783-3-9 [Harlan, Thomas])

Comment: The NRC has failed to examine the full impacts upon the complete physical world from all cumulative leaks, considering past, present, and future timelines. Analysis of these impacts are complicated by the need for accurate identification of leak detection difficulties as well as monitoring and inspection issues, particularly surrounding similar patterns of problems occurring at two or more sites. All spent fuel pool leaks will create definite significant impacts at the point in time where they migrate outside of the site or they contact other water. This undeveloped messy area must be addressed fully with sufficient data points and sufficient decision tree criteria in order to satisfy the required scientific analysis for the highest and best standards for safety, but this has not happened. The Waste Confidence Draft Generic EIS unacceptably fails the tests of scientific thinking, methodology, and practices at its most fundamental level. The NRC has developed a flawed tool, the Draft Generic EIS, that fails to adequately protect physical environment as well as people from unfortunate impacts. (0823-53 [Michetti, Susan])

Comment: Further, the NRC fails to fully evaluate cumulative impacts in its DGEIS. The Court of Appeals explained that “a proper analysis of the risks [of SFP leaks] would necessarily look *forward* to examine the effects of the additional time in storage, *as well as examining past leaks*.” *New York*, 681 F.3d at 481 (first emphasis in original; second emphasis added). Under NEPA, the NRC must consider the “impact on the environment that results from the incremental impact of [its] action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-federal) or person undertakes such other actions.” 40 C.F.R. § 1508.7; *see also* 10 C.F.R. §51.45(c); *see also* 10 C.F.R. § 51.75, 10 C.F.R. § 51.45. This is because cumulative impacts “can result from individually minor but collectively significant actions taking place over a period of time.” *See* 40 C.F.R. § 1508.7. As numerous courts have explained, a meaningful cumulative impact assessment must therefore identify (1) the affected area, (2) the expected impacts of the project, (3) other past, present, proposed, and reasonably foreseeable actions that are expected to have impacts in the same area, (4) the impacts or expected impacts from such other actions, and (5) the overall expected impact in light of the accumulation of the individual impacts. *See Grand Canyon Trust v. FAA*, 290 F.3d 339, 345-46 (D.C. Cir. 2002). In other words, the agency “cannot treat the identified environmental concern in a vacuum.” *Id.* at 346. However, NRC has demonstrably failed to fully assess cumulative impacts in relation to SFP leaks. To begin with, the NRC does not consider impacts from multiple SFP leaks in close proximity (e.g., sites such as Turkey Point where there are multiple SFPs) or impacts from combined contamination of groundwater in areas where other waste sites are nearby (e.g., Plant Vogtle is located just across the Savannah River from the Savannah River Site, which contains a large amount of nuclear waste). In addition, NRC has failed to analyze the cumulative impacts that may result from past, present, and reasonably foreseeable future radiological leaks from *non*-SFP systems, structures, and components. It can logically be expected that future (and/or existing) leaks and contamination from SFPs will interact with and cause cumulative impacts with any past, current, and likely future leaks from other, non-SFP components. As one NRC licensing board has aptly explained, “if releases from SFP leaks encounter groundwater, then the radionuclides would co-mingle and coalesce with any impacts that might be present from other sources” and “it is unlikely” that “concentration levels” in groundwater “can be parsed into relative contributions from the separate sources that contribute to the overall groundwater contamination at the site, and that “[b]y necessity”, “the impacts to groundwater from SFP leaks and the subsequent discharges into” adjacent surface waters must be considered “on a site-wide basis.” In the Matter of Entergy Nuclear Operations, Inc. (Indian Point Nuclear Generating Units 2 and 3), Docket Nos. 50-0247-LR and 50-286-LR,

ASLBP No. 07-858-03-LR-BD01, Order (Granting in Part and Denying in Part Applicant's Motions *in Limine*) (March 6, 2012), at 29, ADAMS Accession No. ML12066A170. Thus, such cumulative radiological leakage impacts must be fully assessed in NRC's DGEIS. (0897-5-18 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Non-SFP leaking plant components at facilities around the country have already contaminated on-site and off-site groundwater and public waterways.¹⁵ [footnote 15 text: See *generally* Liquid Radioactive Release Lessons Learned Task Force Final Report, September 1, 2006, *available at*, ADAMS Accession No. ML062650312; *see also* Riverkeeper and Hudson River Sloop Clearwater Initial Statement of Position Regarding Consolidated Contention RK-EC-3/CW-EC-1 (Spent Fuel Pool Leaks) (December 22, 2011), at 41-43, *available at* ADAMS Accession No. ML12335A617 (describing various non-SFP component leaks that have occurred at Indian Point).] As of June 2011, NRC reported that 42 of 65 reactor sites, i.e., 65%, have experienced problems with radiological leaks.¹⁶ [footnote 16 text: See Leaks and Spills of Tritium at U.S. Commercial Nuclear Power Plants, Rev 9 (June 7, 2012), ADAMS Accession No. ML101270439; *see also* Union of Concerned Scientists, *Groundwater Events Sorted by Date*, September 27, 2010, *available at*, http://www.ucsusa.org/assets/documents/nuclear_power/Groundwater-Events-Sorted-by-Date.pdf; Jeff Donn, Radioactive tritium leaks found at 48 US nuke sites (June 21, 2011), *available at*, http://www.msnbc.msn.com/id/43475479/ns/us_n] The trend of accidental radiological leaking can be expected to continue and even increase as America's original nuclear fleet continues to age. Indeed, the basic engineering principle of the "bathtub" curve (see Lochbaum Declaration, pars. 7.37-7.43) indicates that as these aging nuclear plants reach the end of their operating lives, problems, such as component degradation and resulting leaks, can be expected to sharply increase. Historically, U.S. nuclear power plants have had leakage problems with difficult to inspect buried pipes and components. The United States Government Accountability Office ("GAO") conducted a study that concluded in 2011 that, "[t]he occurrence of leaks at nuclear power plants from underground piping systems is *expected to continue* as nuclear power plants age and their piping systems corrode."¹⁷ [footnote 17 text: Liquid Radioactive Release Lessons Learned Task Force Final Report, September 1, 2006, at 22 *available at*, ADAMS Accession No. ML062650312 (emphasis added).] GAO confirmed that because "underground piping systems tend to corrode" and are "largely inaccessible and difficult to inspect," the "*severity of leaks could increase* without mitigating actions."¹⁸ [footnote 18 text: *Id.* at 1.] Plant owners' aging management programs and more recent industry initiatives that allegedly are designed to "handle" leaks from the miles and miles of buried and inaccessible buried components fall far short of providing the necessary assurances the radiological leaks will be properly detected and prevented in the future.¹⁹ [footnote 19 text: Plant programs and industry initiatives are simply not designed to identify or stop *all* potential radiological leaks; alleged "enhanced" inspection commitments still only cover a small fraction of total amounts of onsite buried piping. See, e.g., In the Matter of Entergy Nuclear Operations, Inc. (Indian Point Nuclear Generating Units 2 and 3), ASLBP # 07-858-03-LR-BD01, Docket # 05000247, 05000286, Exhibit # NYS000164-00-BD01, Pre-Filed Written Testimony of Dr. David J. Duquette, Ph.D Regarding Contention NYS-5, ADAMS Accession No. ML12334A699 (explaining deficiencies in the "aging management program" at Indian Point for preventing and detecting corrosion of buried pipes and components).] The NRC must consider and account for this in its DGEIS. In addition, accidental spills and releases caused by human error have also resulted in releases of radioactivity to the environment at nuclear power plants.²⁰ [footnote 20 text: Liquid Radioactive Release Lessons Learned Task Force Final Report, September 1, 2006, at 34, *available at*, ADAMS Accession No. ML062650312; Riverkeeper and Hudson River Sloop Clearwater Initial Statement of Position Regarding Consolidated Contention RK-EC-3/CW-EC-1 (Spent Fuel Pool Leaks) (December 22, 2011) at 42, 53, *available at* ADAMS

Accession No. ML12335A617; GZA, GeoEnvironmental, Inc. Final IPEC Quarterly Long-Term Groundwater Monitoring Report, Quarter Two 2010 (Report No. 10) (February 15, 2011), IPEC00227561, at p.1-2, ADAMS Accession No. ML12275A555 (hereinafter "GZA IPEC Quarter 2 Groundwater Report") (Entergy's vendor describing a spill from a Reactor Waste Storage Tank ("RWST"), that resulted in a marked increase in the tritium plume present at the Indian Point site that Entergy attributes to the Unit 2 SFP leaks; this spill resulted in an increase in radionuclide levels in the groundwater that lasted for many months).] Such incidents will likely continue to occur, and NRC must consider cumulative impacts that may result from such accidental spills and releases. It is reasonably foreseeable that non-SFP components will continue to contaminate the environment around U.S. nuclear power plants prior to as well as during post-operation timeframes, and it is patent that such other radiological leaks may affect the nature and impact of any future SFP leak, i.e., result in cumulative impacts. NRC must fully analyze such cumulative impacts. Because the NRC's analysis fails to consider several reasonably foreseeable impacts, it directly violates NEPA. (0897-5-19 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The NRC evaluates the environmental impacts of pool storage of spent fuel in two different contexts: during reactor operation (in the license renewal rule) and afterwards. The NRC makes no attempt to integrate these analyses or assess the cumulative impacts of storing massive amounts of spent fuel in high-density storage pools at every reactor site around the country. This division of environmental analysis makes no sense from a technical basis, and results in an understatement of environmental impacts. (0897-7-15 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In Table 4-1 on Page 4-30, NRC shows that a reactor requires 1.152 BILLION gallons per day for once-through cooling: 800,000 gallons/minute X 60 mins/hr X 24 hrs/day = 1.152 billion gallons/day NRC also reveals that 10 BILLION BTUs per HOUR are discharged to environment, whether once-through cooling, or cooling towers, are used! These are, on their face, large impacts on the environment. But NRC yet again tries to present those large reactor impacts as somehow a justification for the smaller irradiated fuel pool impacts, of 2,800 gallons per minute water withdrawals for cooling, and discharge of 35 million BTU/hr of heat. But the pool impacts are in addition to the reactor impacts during operations. And even after the reactor permanently ceases operations, the ongoing pool impacts would be on top of the damage already done to the environment during 40, 60, or even 80 years of reactor (and pool) operations. As accumulative impacts, 60 additional years of pool impacts cannot be justified as "SMALL" by comparison. This is especially so given the radiological and other hazardous releases the pools are all too capable of. (0919-7-17 [Kamps, Kevin])

Comment: On Page 4-31, NRC continues its arguments that irradiated nuclear fuel storage impacts are small when compared to reactor operations. But exploiting the public's numbed "shock and awe" from by the damage already done by reactors does not justify or excuse additional, cumulative impacts from irradiated nuclear fuel storage. Two wrongs don't make a right. (0919-7-18 [Kamps, Kevin])

Comment: Table ES-5 indicates the cumulative effects range from small to moderate or to large in every category but three (public and occupational health and accidents both being small and climate change being moderate) with the impacts on socioeconomics; surface water, ground water, aquatic ecology, historical and cultural resources and waste management ranging up to large. This would imply that the environmental impact of each facility should be evaluated on its own, not lumped in a generic GEIS evaluation. (0920-19 [Foster, Ruth])

Comment: Specifically in this region of the Great Lakes Basin, 20 percent of the world's surface fresh water is in jeopardy from 60 nuclear power plants, 37 of which are directly in the watershed, an accident at any one of which would render 20 percent of the world's precious surface fresh water unusable. And, yet, we go on and do it. (0945-1 [Keegan, Michael J.]

42. Comments Concerning the Cost of Storage

Comment: I am also concerned about the sustainability of nuclear power. The EIS needs to evaluate the true costs of nuclear power after the subsidies are stripped away. The long-term costs of decommissioning need to be considered as well. The ongoing costs to US taxpayers should be transparent in this EIS. (0003-4 [Commenters, Multiple])

Comment: Inevitably, future transfer and replacement operations will be a financial burden for countless generations to come, so we should be committed to minimizing this burden. (0009-3 [Schwartzberg, Lora])

Comment: I am concerned that the true costs of the nuclear fuel cycle are not discussed in this document. The long-term social and monetary costs of the creation of radioactive waste are not evaluated, nor are the costs considered of potential accident or incident relating to spent fuel like a pool fire, pool leakage, long-term cask storage failure or transportation of radioactive waste. In addition, the costs of handling the existing on-site waste and restoration of the lands decimated by mining were ignored. (0030-12-3 [March, Leslie])

Comment: I'm proposing that the EIS meet its NEPA requirements by offering alternatives, considering each reactor site separately, and to evaluate all of the costs involved, not just how much it will cost to do an EIS, which is what it says right now. (0030-12-8 [March, Leslie])

Comment: What are the costs and risks and impacts of storing irradiated nuclear fuel for any period of time, let alone forevermore? Is having a new or extended reactor operating license worth the costs, risks, and impacts of storing high-level radioactive waste forever into the future? The answer to that question is no. Have these costs, risks, and impacts been mitigated? The answer to that is no. This generic environmental impact statement is completely devoid of this issue, which makes a mockery of the National Environmental Policy Act as well as the Court ruling on New York v. NRC. (0030-2-3 [Kamps, Kevin])

Comment: The true cost of nuclear power should be assessed in detail in the EIS, including the substantial front-end subsidies and the long-term costs of decommissioning and management of nuclear waste. Without the fuel cycle being included within the scope, the EIS will be derelict in its purpose and to the environment. The environmental, social, and economic costs associated with the fuel cycle need to be part of their report. Nuclear reactor owners and operators are not fully financially responsible for the disposal of their waste. Once the waste leaves the reactor site, the U.S. taxpayer is on the line for any accidents and liability. These long-term hidden costs must be made apparent and in full view and be a full cost accounting. (0030-21-4 [Carberry, Mike])

Comment: The economic analysis that was done in the environmental impact statement analyzes the cost of the analysis of the different options of which choice the EIS should choose, whether to look at -- the economic analysis is inadequate because it does not look at the real costs of managing the waste, and compare those costs. And there is no indication of where the costs for the long-term management will be. (0030-8-3 [D'Arrigo, Diane])

Comment: What is the cost of storing irradiated nuclear fuel for any period of time, let alone forevermore? ---- NRC does not even ask that question, let alone answer it, in this draft GEIS. Is having a new or extended reactor operating license worth all the costs, risks, and impacts of storing irradiated nuclear fuel? ---- The answer to that question is a resounding "NO"! (0034-2 [Wagner, Jim and Virginia])

Comment: I am also concerned about the sustainability of nuclear power. The EIS needs to evaluate the true costs of nuclear power after the subsidies are stripped away. The long-term costs of decommissioning need to be considered as well. The ongoing costs to US taxpayers should be transparent in this EIS. (0039-7 [Littlejohn, Nick])

Comment: As a financial professional I am concerned that the true cost of the nuclear fuel cycle are not discussed in this document. The long-term social and monetary costs of the creation of radioactive waste are not evaluated, nor are the costs related to the potential accident or incident related to fuel spent like pool fire, pool leakage, long-term cask storage, or transportation of radioactive waste. In addition, the costs of handling the existing on-site waste and restoration of the lands decimated by mining were ignored. (0045-11-5 [March, Leslie])

Comment: However, over the past few decades, American nuclear consumers have been forced to shoulder the increasing cost of nuclear waste management. Without a federal waste management system in place, utilities and consumers across the country have been shackled with the cost of maintaining nuclear waste on existing reactor sites, while continuing to pay \$750 Million Dollars annually, into the nuclear waste fund. (0045-4-2 [Martini, Shawn])

Comment: The National Environmental Policy Act requires consideration of all reasonably foreseeable environmental impacts of a proposed action from cradle to grave, yet in its Generic Environmental Impact Statement the NRC does not even consider the cost and risk of transporting and storing fuel (for any period of time, let alone forever) when making licensing and relicensing decisions. Given that cost (and risk), plus the cost of decommissioning, is nuclear power worth it, especially with the risk of terrorism? (0064-6 [Skud, Bruce])

Comment: New rules, yes! An Environmental Impact Statement and Rules that spell out the true unsubsidized costs of nuclear power, including decommissioning costs -- and that take full account of those true costs. (0075-1 [Hill, Barbara])

Comment: New rules, yes! An EIS that fully assesses the claims of nuclear power in terms of its claims to price competitiveness and environmental safety. (0075-5 [Hill, Barbara])

Comment: Obviously the costs of this ongoing HOSS are astronomical, and must be borne by the industry that generates the waste. Your responsibility is to deny licenses to new power plants unless they demonstrate how they will bear these future ongoing mitigation costs. If you had done this from the start, storage of these infinitely poisonous wastes that have been generated for many decades would not have become such an overwhelming problem. (0127-4 [Lee, Catherine])

Comment: The true costs of nuclear power should be assessed in detail in the EIS, including the substantial front end subsidies, and the long term costs of decommissioning and the management of nuclear waste. (0143-8 [Arauz, Jorge])

Comment: Even if there were, the net present cost would bankrupt the industry or the tax payers. (0155-2 [Preschle, Gus])

Comment: Nuclear energy is the most expensive to produce and the total costs of this dirty energy source skyrocket as the plants age and more waste is generated. (0158-2 [Payne, Joanne])

Comment: Why do we, as taxpayers, have to foot the bill of continued storage after Entergy sheds its corporate shell and walks away? (0163-15-9 [Garner-Ritter, Maureen])

Comment: And finally, I would just add, New Yorkers have paid, everyone in this room has paid \$4 billion for the state's nuclear waste to be in a repository taken from plants and put someplace else. That is something that we should be talking about and focusing on instead of rehashing the debate about Indian Point at a forum that has nothing to do with Indian Point. The rate payers of New York, the taxpayers of New York, deserve to get their money's worth and we would implore the NRC to be an advocate for solutions, be it Yucca Mountain or elsewhere, where this used fuel can go. (0163-19-5 [Steidler, Paul])

Comment: It costs billions to make. Where's the sense in us making some more. Who pays? Who pays for the waste? It's our taxes and kids. (0163-28-5 [Cypser, Betty])

Comment: [T]he biggest problem we [Radiation Public Health Project] have with the GEIS is a lack of cost considerations. It states that every hundred years the spent fuel -- the dry cask, if we get everything into dry cask, are going to be replaced. How is that going to be funded? We all just went through a government shutdown because we almost de-funded the government. How in the world can the NRC, in this GEIS, guarantee that there will be funding in the future. (0163-7-9 [Shapiro, Susan])

Comment: Looking at a more economic viewpoint, the cost for nuclear waste disposal is a big factor in this. As Joseph A. Lieberman states, "More money probably has been spent, and more scientific and technological effort concentrated, on facilities, operations, and research and development with regard to this industrial waste than on any other industrial contaminant we have know" (Lieberman, 1957). Although this was written in 1957, this statement is most definitely still on point today as nuclear energy is being used more than ever nowadays. If one were to look at the normal trends of technology, as times passes, the efficiency of said technology decreases. As efficiency decreases, the less productive the technology is. In this case, that means that the technology will not dispose the waste as much as it could in the past, so this means more money is needed to keep the technology running at full performance. This updated EIS can give the means to new technology, thus creating a less costly way to dispose of waste. The upfront cost of new technology is never cheap, but its long-term productivity is much higher, which means less money needed in the future, which makes it worth the upfront cost. (0192-9 [Einhorn, Jeremy])

Comment: I am also concerned about the sustainability of nuclear power. The EIS needs to evaluate the true costs of nuclear power after the subsidies are stripped away. The long-term costs of decommissioning need to be considered as well. The ongoing costs to US taxpayers should be transparent in this EIS. (0198-5 [Cerrito, Robert])

Comment: No honest estimates are provided for costs of storing spent fuel, ever. It is a scam. (0198-7 [Cerrito, Robert])

Comment: Taxpayers should not bear the financial burden of a permanent storage facility. Power companies should be taxed with the entire responsibility of the life of spent fuel until it becomes non-hazardous. (0202-3 [Hill, Jack])

Comment: Dedicate funding to local and state governments to independently monitor the sites: Funding for monitoring the HOSS facilities at each site must be provided to affected local and state governments. The affected public must have the right to fully participate. (0222-19 [Zeller, Lou])

Comment: At the same time, another thing of interest is, what are your assumed costs? Like, what is a small cost for progress? What are we putting on the line here? You guys are all pushing for progress and, you know, we want to bring this energy; however, at the cost of what? What are we sacrificing? (0244-15-10 [Zuccarini, Ana])

Comment: The plant owners and operators should pay for the long-term costs. They're the ones who profited from this disgusting mess they've gotten us into. It should not be citizens' and taxpayers' responsibility. (0244-6-5 [Steorts, Tim])

Comment: Currently, the Federal government is paying very large fines to utilities because of its failure to accept spent fuel for long-term storage by 1988. In other words, because Yucca Mountain was not finished, the Federal government is, they have to pay fines. Once spent fuel comes under Federal control, the government no longer will be required to pay these fines. (0245-29-2 [Shineflug, Marilyn])

Comment: How much will it cost to contain, watch over, move, clean up leakage for hundreds of thousands of years? Enough! Everything, everything leaks. (0245-42-4 [Rorem, Bridget])

Comment: I would like the NRC to actually look at the cost of this waste handling not 10, 50, even 100 years down the road. Let's have an in-depth analysis of the cost at 50,000 years. Let's not even go out to the life of the waste. Let's look at 50,000 years. But 65,000 years is actually how long this present human family has been on the face of this earth. We have a government installed now that has only been existence for 400, a colonization of this country that has only been in existence for 400 years. How can you folks be thinking that you can understand the cost of this 50,000 years from now? Under what monetary system? What government? What method? Where? How? What maintenance system? We are being sold a technology that we have now way of knowing what is going to cost us. So please, consider these finances. (0246-24-4 [McCune, Chuck])

Comment: This industry is broke and now they are panhandling out in the taxpayer base and in the world global economy to continue sucking the money out of these economies for a technology that we cannot even conceive of how much it is going to cost. (0246-24-6 [McCune, Chuck])

Comment: Those containments are financially ridiculous. (0246-29-3 [Hoffman, Ace])

Comment: But let me take that off the table, because the nuke is a way of nuclear welfare. What I'm saying it's not your dollars; it's all of our taxpayers' dollars. When you get to the point where you have to dig in your own pockets, then you'll come up with something better. (0250-8-5 [Utley, Charles])

Comment: Who will pay for the supervision of the nuclear waste after PG&E closes? (0291-3 [Mauter, Nancy])

Comment: Properly disposing of waste is worth whatever monetary cost. (0295-2 [Collier, Grant])

Comment: [W]hat I hear is everybody wants something, but who's going to pay for it? And I tell you who's going to pay for it, the people sitting here and the rest of the country because it's not going to be Sempra, and it's not going to be SDG&E or Pacific Gas and Electric, it's going to be us. And it's going to be us either through electrical rates or through taxes, because Sempra is going to sue the government for failing to build their underground depository. And who's going to pay? Well, the taxpayer is going to pay, or the rate payer is going to pay. So, what we've got to think about is how risky is this really in the big scheme of things. How much money do you want to spend? And if you spend all that money on this, you don't have that money to spend on something else. (0325-32-1 [Lord, Stephen])

Comment: All I'm trying to say is that we've got to look at the costs, and you've got to look at the tradeoffs. It's just like, you know, in my house my wife wants to put a new sink in the kitchen. Okay. Well, if we put that in, we don't do something else. And here we are, if we put all these safety precautions that aren't really needed, then we don't do something else. So, what I would like to encourage the NRC to think about is as it puts these things together, it thinks about what the cost is going to be. (0325-32-3 [Lord, Stephen])

Comment: [B]ut someone has got to pay the piper, and it's going to be us. (0325-32-6 [Lord, Stephen])

Comment: Secondly, I did a search on the document. I searched the word fiscal. It only brought up fiscal year. I searched the word fiduciary. No results. Searched the word responsibility, only in relation to the word environmental responsibility. Searched the word rate payer. No results. Brings up the question, you discussed costs, how much it'll cost; there is no mechanism for paying it. How can we assume the utility remains whole and fiscally solvent to maintain even the security that is required, the training, the workforce, that is required? What rate payer mechanism do they think the state will put in place to charge us money to guard something 100 years after the last kilowatt of revenue generating power left the facility? Who is going to pay for this? And I know there might be saying and feeling that the public utilities commissions are corrupt, for example, will pass on these charges, but I think at a certain point in the future, the realism will set in. You're creating what may be the largest unfunded government mandate associated with our energy program, and that needs to be addressed. (0326-13-2 [Weisman, David])

Comment: The issue of cost is often raised in the NRC's background reports about conversion to dry casks. Your own studies show that over a long period of time, the cost of security for storage in pools is about twice as much as the cost for storage in dry casks. Now, if you're on the customer side of the equation of nuclear power, you recognize that the Federal government is obligated by contract to take delivery of this waste, and we've been successful in securing hundreds of millions of dollars in court judgments to store the waste while we're waiting for the Federal government. From a cost standpoint, there's no question as to the benefit to rate payers from storing in dry casks. I ask you to give serious consideration to the recommendations from the state. (0326-7-2 [Geesman, John])

Comment: What is the cost of constructing nuclear waste facilities and maintaining them for 200,000-plus years? Are these costs included in the calculation of today's nuclear energy? (0327-30-2 [Parker, Bob])

Comment: The premise in the GEIS that the costs that need to be considered are the regulatory costs of environmental review is not the kind of costs that the GEIS should be addressing. The GEIS should be addressing what are the costs of long-term nuclear waste

storage, and how do we support the utilities in determining what those guidance, what those costs might be, and how to assure long-term funding for storage. (0328-12-5 [Eide-Tollefson, Kristen])

Comment: [O]r better yet, financing or money to pay for the storage over the periods of time analyzed in the GEIS is simply too important to assume. The GEIS, or better, the NRC should not assume that this is the case, but rather to start to require that power companies and other generators of spent fuel to create a reserve separate from the decommissioning fund to ensure that there is sufficient resources to meet these obligations. (0328-2-8 [Rauterkus, Ralph])

Comment: We don't know. And who's going to pay for this monumental construction and engineering activity every 100 years? One month ago today Xcel testified in its Minnesota Public Utilities Commission rate case that its installed per cask cost at Prairie Island is \$5.96 million, \$5.96 million per cask, which includes the cost for cask fabrication, loading, and licensing cost. That's \$372 million in today's dollars for the 63 additional casks that will be needed to store all of the waste generated during the PINGP's next 20-year license extension. And that would amount to another \$584 million in today's dollars to reload all 98 casks in 100 years. The plant is only licensed to operate another 20 years. Have these costs been factored into Xcel's rates? Have these costs been factored into the plant's decommissioning cost? (0328-3-5 [Mahowald, Philip])

Comment: Nationwide at the end of 2011, the United States commercial spent nuclear fuel inventory had reached about 224,000 fuel assemblies. I'm going to make my own assumptions. I'm not an economist so they're a little bit rough, but I think it gives you a sense of what we're talking about. I'm going to use the Prairie Island model for these assumptions. So, assuming 40 assemblies per cask, that amounts to about 6,000 casks. And I'm further going to assume that Xcel's per-cask cost at \$5.96 million can be multiplied by those casks, so we're talking about \$33.6 billion in today's dollars to reload those casks. Who knows what the cost will be in 100 years? But looking back 100 years, \$33.6 billion in 1913 dollars would cost \$794 billion today. And that's just for the first 100-year replacement. On what basis can the NRC assume that utilities will pay these costs? Have these costs been factored into the rates for all nuclear power plants around the country? And on what basis can the NRC assume that the United States Government, already more than \$17 trillion in debt, will expend or be able to expend these incredible sums every 100 years? (0328-3-6 [Mahowald, Philip])

Comment: What does it cost to do so? None of that's in here. There's no mention of it. We just assume we're going to do it. That's preposterous. (0328-7-6 [Crocker, George])

Comment: There's also the problem that the reactor operations by TVA are troubled elsewhere. For example, Browns Ferry 1 is the only red-tag reactor in the entire United States. And TVA has a severe question as to its financial stability. TVA has sold less energy year after year since 2008, and it is now completely abandoning, almost completely abandoning all plans to either engage in generation of renewable energy or to undertake further energy efficiency, even after it's closed down part of its coal fleet, which it's in the process of doing. In this situation, with declining annual revenues and annual deficits, it is hard to make a serious decision on a generic basis, and I think the NRC cannot do so. That, in fact, reactor operators will have the financial stability not only to finance cask storage but to refinance it and re-do it every hundred years or whatever interval seems to be necessary. (0329-12-4 [Paddock, Brian])

Comment: ALARA, lowest reasonably achievable does not refer to keeping costs down. If the nuclear industry cannot find a cost-effective way to resolve the waste problem, so be it. Then

the nuclear industry is not cost effective, and I think that's an okay thing. I think that would be a good thing. (0329-16-3 [Hoffman, Ace])

Comment: One unequivocal conclusion from my review of the NRC's analysis is that the financial cost of indefinite continued storage of spent nuclear fuel is unpredictable and unknowable and potentially astronomical. That is a category of confidence that is even worse than uncertain and open-ended, thus making the long-term business model of the nuclear industry unsustainable and absurd. (0329-7-5 [Schonberger, David])

Comment: I am also concerned about the sustainability of nuclear power. The GEIS needs to evaluate the true costs of nuclear power after the subsidies are stripped away. The long-term costs of decommissioning need to be considered as well. The ongoing costs to US taxpayers should be transparent in this EIS. (0336-12 [Lish, Christopher])

Comment: There is no wondrous solution. There is no clean solution. There is no solution that will not impose a massive financial burden upon the nation's treasury. (0341-1-3 [Mermelstein, Richard])

Comment: One would think that somewhere in the GEIS would be a frank acknowledgement of the estimated costs to the American public of the whole shebang. These costs include all the federal, state, and locality costs entailed in safety and security. The costs include government management and oversight of all the massive construction activities and all the transportation-related activities the GEIS notes. The costs include publically financed R&D for things such as trying to find out what the heck to do with the high-burnup fuel. The costs include all the potential financial and risks transferred to the public. The costs include all the potential remediation costs for past, present, and future toxic effluents. One would think. But one would think wrong. (0341-2-14 [Mermelstein, Richard])

Comment: The true costs of nuclear power should be assessed in detail in the EIS, including the substantial front end subsidies, and the long term costs of decommissioning and the management of nuclear waste. (0357-7 [Daily, G. Allen])

Comment: Unfair, Unethical, Immoral Financial Injustice: NRC abandons public interests with this scheme to transfer all the astronomical costs and endless financial responsibility for nuclear wastes onto taxpayers; The nuclear industry made a fortune producing lethal high-level radioactive wastes. They should be held financially responsible to store their own wastes on the site where it was produced in the safest way possible. Why should taxpayers be forced to foot the bill for massive amounts of nuclear waste transport, and endless storage and security, virtually forever? EPA set a million year health standard for a nuclear dump. Any nuclear plant owner who refuses should have its operating permit revoked immediately. (0377-2-16 [Cuthbert, Lewis])

Comment: Dry-cask storage facilities cost as much as \$20million to build and \$7 million a year to maintain. These dry-casks have to be rebuilt every 100 years. That is a lot of money to be paid by taxpayers for 500,000 years. Don't you think that wind, water and solar power is much cheaper to build and operate? (0406-4 [Gerleman, Douglas])

Comment: The report talks about evacuations but it doesn't say where the people will live and work and what they will do for a living afterwards. It doesn't even consider if an evacuation is possible at all from urban areas in the short time-frame required, or who will pay to set the people up with new lives in their new location. In my opinion, this insurance issue is the most

important political consideration in the future siting of any depository; and any truly public process for approving a site is bound to go nowhere without this assurance. Simply stating that the Government will bear the responsibility for compensation is not a convincing argument because of trust issues related to its performance after past contaminations. (0410-30 [Nelson, Dennis])

Comment: we as citizens are not billed for the ill advised investment in this technology. Those who invested need to be the ones to foot the bill. (0411-3 [Krumm, Paul])

Comment: In sound finance, the cost of future cleanup is estimated and actuarially amortized as an ongoing accrual expense, and thus, there are contingency funds available to help defray these enormous cleanup jobs. The nuclear industry is not being truthful about the amount of risk that is being passed on to future generations. This nuclear waste is an unfunded liability which governments are forced to assume after allowing these plants to operate. We need to demand a conversation about the finance of SAFE waste storage and attach the present value of this storage to the electric rate today. If nuclear energy generation is economically viable; let the cost of production reflect, collect, and pay for the full cost of safe storage, for the duration of the liability 100,000 years. The equity market collapse of 2007, occurring with 30 year mortgage instruments should teach us to look critically at financial models that are not sustainable, and are coupled to longer time horizons. One could argue that these unfunded cleanups pose inflationary pressures on the financial systems. Money supply growth is needed in order for governments to fund cleanups yielding monetary inflation. (0438-1 [Lamb, Charles])

Comment: The DGEIS does not indicate a funding mechanism for the ISFSI and DTS facility construction or replacement. The DGEIS not only assumes that ISFSI and DTS facilities will be constructed at every facility where they are needed, but also explicitly assumes ISFSI and DTS facilities will be replaced every 100 years, without identifying a funding source for either option or estimated costs. Little information is publicly available concerning costs of dry transfer systems, but a search of the NRC's Agencywide Documents Access and Management System (ADAMS) reveals a 1995 report prepared for Private Fuel Storage by Energy Resources International, Inc., which assumed dry transfer facility costs of \$8.1 million in 1995 dollars, based on an estimate by the Electric Power Research Institute. Energy Resources International, Inc., Utility At-Reactor Spent Fuel Storage Costs For The Private Fuel Storage Facility Cost-Benefit Analysis Revision 2 (Apr. 2000), ML003705093 at 6, citing Dry Transfer System for Spent Fuel: Project Report, A System Designed to Achieve the Dry Transfer of Bare Spent Fuel Between Two Casks, EPRI TR-105570 (Dec. 1995).²³ [footnote 23 text: Upon information and belief, this report is not publicly available.] This report includes dry transfer costs "for sites unable to handle large spent fuel storage and transport systems." Id. at 7 (implying that some sites are not able to handle large spent fuel storage and transport systems, rendering the DTS option a possibility only upon site-specific review in the Waste Confidence DGEIS as discussed above). Certainly, costs on that scale, multiplied by the number of sites at which the DTS systems as well as ISFSIs would be needed, is a substantial cost for the industry - and ultimately on the public - that has not been accounted for in the DGEIS. Without a reliable measure of costs, how the costs would be covered, and/or a cost-benefit analysis, the DTS option is more of the same NRC assumptions of future events that the courts have already rejected. In short: the DGEIS must analyze the potential impacts of long-term pool storage because the DTS and ISFSI options are not concrete enough at this point to form the basis for any facility's actual waste-storage planning. (0473-12-22 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: The numbers are simple, a dry cask can handle about 10 tons of material, and costs between \$1M to \$2M. There is roughly 60,000 tons of spent fuel in the USA that is not already Casked. USA generates around 2000 tons a year, and it takes 5 years to cool enough to be Casked, therefore $5 * 2000 = 10,000$ tons have to wait to be Dry Casked, leaving 50,000 tons that could be and SHOULD BE Casked now. At 10 tons per Cask, that is 5000 Casks. Material cost of \$1.5M each, that is \$7.5 B in Cask material cost. Let's allow 50% of the material cost as a labor cost related to making the slabs the Casks will sit on, and moving the fuel, documentation and testing, or \$3.75B. The security cost of monitoring and protecting the Dry Cask will be far less than securing the much more dangerous spent fuel pools, so there will out years savings on that cost item. So the total cost with labor and materials will be around \$11.25B to dry cask everything that can be Dry Casked now. This is about \$225,000 per ton. Let's say the process takes 7 years, an additional 14,000 tons will be created, that's another \$3.125B needed. Or a total of \$14.375B to dry cask ALL of the spent fuel in the USA up to 2020. But keep in mind \$4.8B of that will be going into the hands of US trade workers, who will immediately put that income back into the economy, and create a further economic boost when we need it the most. (0484-3 [Olsen, Steven])

Comment: Those who are responsible for creating the waste must pay for and facilitate its Safe storage. Not the people of this country, but the companies who profited from generating said waste. (0493-3 [Davis, Suzanne] [Davis, Tom])

Comment: The true costs of nuclear power should be assessed in detail in the EIS, including the substantial front end subsidies, and the long term costs of decommissioning and the management of nuclear waste. (0507-6 [Giese, Mark M.])

Comment: Who will pay for it down the road? How much will it cost to store for such a long period of time? It does not make economic sense and its not our right to decide what future generations must do. (0524-2 [Individual, Anonymous])

Comment: The numbers are simple, a dry cask can handle about 10 tons of material, and costs between \$1M to \$2M. There is roughly 60,000 tons of spent fuel in the USA that is not already Casked. USA generates around 2000 tons a year, and it takes 5 years to cool enough to be Casked, therefore $5 * 2000 = 10,000$ tons have to wait to be Dry Casked, leaving 50,000 tons that could be and SHOULD BE Casked now. At 10 tons per Cask, that is 5000 Casks. Material cost of \$1.5M each, that is \$7.5 B in Cask material cost. Let's allow 50% of the material cost as a labor cost related to making the slabs the Casks will sit on, and moving the fuel, documentation and testing, or \$3.75B. The security cost of monitoring and protecting the Dry Cask will be far less than securing the much more dangerous spent fuel pools, so there will out years savings on that cost item. So the total cost with labor and materials will be around \$11.25B to dry cask everything that can be Dry Casked now. This is about \$225,000 per ton. Let's say the process takes 7 years, an additional 14,000 tons will be created, that's another \$3.125B needed. Or a total of \$14.375B to dry cask ALL of the spent fuel in the USA up to 2020. But keep in mind \$4.8B of that will be going into the hands of US trade workers, who will immediately put that income back into the economy, and create a further economic boost when we need it the most. (0529-7 [Claybourne, Ana])

Comment: The GEIS is noticeably deficient in ascribing fiscal responsibility for the long term maintenance and safeguarding of the ISFSI. A "text" search of the entire GEIS document for the word "fiscal" brought up only the phrase "fiscal year." The word "responsibility" brought results only associated with the subject of "environmental responsibility." The words "fiduciary," and "ratepayer" brought no results. The GEIS provides multiple categories and scenarios for

potential costs, but no discussion of mechanisms for paying for these expenses. In fact, the GEIS assumes that somehow the utility that is in possession of an NRC license for the ISFSI remains financially liable[.] (0547-1 [Weisman, David])

Comment: During all this time, some entity must be responsible for paying the cost of labor and materiel needed for upkeep and security. Does the NRC assume that the federal government will cover this expense, and if so, can they point to the enabling legislation? Further, since this action could be taking place decades after the cessation of energy production-without revenue from the nuclear power plant-where does the NRC GEIS assume the money to pay for these ongoing activities will come from? How would a for-profit utility justify the outgoing expense to shareholders for a non-revenue producing obligation? How would a public utilities commission justify charging then-current (and future) ratepayers to store and maintain waste stockpiles decades after the last original ratepayers received any benefits? According to the GEIS, the licensee remains responsible for local property tax liabilities during long term storage. From what source would the utility pay this obligation given that the facility had long since abandoned any revenue generation? And if these local tax liabilities are not--or can not--be paid, what then happens to the infrastructure and institutions in the local host municipalities that were supported by that tax collection? (0547-6 [Weisman, David])

Comment: The purpose of my declaration is to evaluate whether the costs of nuclear waste management, including onsite spent nuclear reactor fuel storage and permanent disposal, are high enough to significantly affect the outcome of an analysis that compares the costs and benefits of nuclear reactors with other electricity sources. I understand that this type of analysis is generally conducted by the NRC in the course of its environmental review for new reactor license applications and applications for renewal of existing reactor licenses. In the discussion below, I analyze two of the most important costs of nuclear waste management -- the cost of "temporary" storage of spent fuel at reactors and the cost of building, filling, and operating a permanent repository for that fuel. The cost of decommissioning the reactors and closing the permanent repository are also costs of nuclear waste management, but I do not include them in this analysis. At present, the public is paying for the management of nuclear waste in three ways. Utilities pay a fee to the U.S. Department of Energy (DOE) for a Nuclear Waste Fund that is intended to pay for the repository. This fee is collected from ratepayers. The cost of temporary at-reactor storage is also being recovered by utilities from taxpayers in the form of penalties imposed on the federal government for the failure to execute its contractual commitment to take the spent fuel off reactor sites.¹⁰ [footnote 10 text: See, e.g., Ntl. Assoc. of Regulatory Util. Comm'rs v. United States DOE, 680 F.3d 819 (D.C. Cir. 2013).] This penalty is paid out of the U.S. Treasury and has not decreased the Nuclear Waste Fund. Finally, utilities collect funds from ratepayers for the decommissioning of reactors. Questions about the use of the funds and whether they are adequate are not the subject of my declaration, which focuses only on the question of the magnitude of the costs relative to the cost of power from nuclear reactors and the other potential resources that could be used to meet the need for electricity. Nevertheless, as discussed below, these advance payments have a bearing on the applicability of a discount rate to nuclear waste disposal cost estimates. My analysis shows that the costs of managing spent nuclear fuel are likely to be quite large in absolute value, running to hundreds of billions of dollars (in constant 2012 dollars). They are in the range of \$10 to \$20 per MWH (\$0.01 to \$0.02 per kWh), which is certainly large enough in relative value to affect the outcome of analyses that compare the cost of nuclear power to the alternatives available in the United States. Therefore, the cost of nuclear waste management is a significant cost that should be included in the NRC's economic comparisons of nuclear power with energy efficiency and other alternative energy sources. (0551-1 [Kysor, Jillian])

Comment: OUTPUT OF NUCLEAR REACTORS: The amount of power that the costs will be spread across is uncertain. The DOE's assumption is too high for several reasons. The DOE estimate shows a stream of output from nuclear reactors that start with a base in 2012 that is already 5% higher than the actual output.³⁴ [footnote 34 text: DOE, 2013.] The output is lower than expected because nuclear reactors were offline and have been retired early. That trend is likely to continue. The DOE assumption of a very high load factor is inconsistent with historical experience. It took a long time to build up to a high load factor; therefore, any new reactors that come online should not be assumed to immediately jump to a high load factor. Moreover, capacity factors for existing reactors have begun to decline as reactors age. In a recent paper, I showed that including early retirements in the calculation of load factors yields a load factor that is one-sixth lower than the very high assumptions being used in much comparative economic analyses.³⁵ [footnote 35 text: Mark Cooper, Renaissance in Reverse: Competition Pushes Aging U.S. Nuclear Reactors to the Brink of Economic Abandonment, July 2013 (hereafter, Aging Reactors).] The output of the nuclear fleet in 2013 will have declined from the peak in 2010 to the level achieved in 2004. DOE and many other analysts of waste management assume that reactor life will be 60 years.³⁶ [footnote 36 text: DOE, 2013.] While the license period might run that long, virtually all reactors that have been retired were retired before their licenses expired. The closure of Kewaunee and Vermont Yankee extend that pattern for reactors that were online when the retirement decision was made, while San Onofre and Crystal River extend the pattern of troubled reactors retiring early. DOE assumes an increase in capacity of almost 10 percent due to large scale uprates at existing facilities,³⁷ [footnote 37 text: DOE, 2013.] but virtually all large scale uprates pending have been cancelled due to a severe deterioration in the comparative economics of nuclear power.³⁸ [footnote 38 text: Cooper, Aging Reactors.] DOE assumes early online status for new reactors under construction and an "unplanned addition" of a new reactor which would add 2 percent to nuclear capacity.³⁹ [footnote 39 text: DOE, 2013.] Given the historical experience of new reactor cancellations and construction delays, the "unplanned addition" should certainly be dropped. Combining these observations, one can argue that the base case for NRC analysis should include actual 2013 output, which is 5% lower than the DOE analysis, an 80 percent load factor, without uprates and "unplanned additions." Under these assumptions, the output of the fleet would be at least 25% lower than assumed by DOE in its analysis of disposal system costs.⁴⁰ [footnote 40 text: This result is consistent with all remaining reactors plus five new ones -- Vogtle, Summer, Watts Bar -- running for a full 60 years at 90 percent capacity factor.] (0551-10 [Kysor, Jillian])

Comment: Lower output might lower the variable cost of at-reactor storage. Whether it lowers the cost of a permanent repository depends on whether one assumes that only one repository will be constructed. If adding nuclear capacity causes the construction of a second repository, fixed costs will increase substantially. The GAO analysis, adjusted for the discount rate and inflation, suggests that the cost of operating two repositories would be 32% higher than one, adding \$25 billion to the total cost.⁴¹ [footnote 41 text: GAO, 2009.] This would offset a substantial part of the variable cost savings. Put in another way, if denying licenses or license renewals allows a second repository to be avoided, the reduction in cost would be substantial including both fixed costs for the reactor and variable cost for spent waste storage. (0551-11 [Kysor, Jillian])

Comment: THE DISCOUNT RATE: There is a great deal of uncertainty and debate about the discount rate that should be used. In this case, as discussed below, it is my opinion that application of a discount rate is inappropriate. Therefore, the costs presented in Exhibit MNC-4 are not discounted. For purpose of long term analysis, analysts generally believe discount rates should be quite low.⁴² [footnote 42 text: Hamal, 2011.] The fact that costs of waste management are incurred a long time (i.e., hundreds or thousands of years) after the useful life of the facility

creates an intergenerational issue, since future generations will be incurring large costs without deriving any benefit. As GAO states: Although the concept of discounting is an accepted and standard methodology in economics, the concept of discounting values over a very distant future -- known as "intergenerational discounting" -- is still subject to considerable debate. Furthermore, no consensus exists among economists regarding the exact value of the discount rate that should be used to discount values that are spread over many hundreds or thousands of years.⁴³ [footnote 43 text: GAO, 2009, p. 28.]. Therefore the appropriate discount rate is a significant issue that should be addressed in the NRC analysis of the cost of waste management. (0551-12 [Kysor, Jillian])

Comment: In my opinion, there are two additional, important reasons why application of a zero discount rate is appropriate in these circumstances. First, the real increase in the cost of at-reactor storage and the permanent repository has been increasing substantially faster than the real, discount rate. Given the long time frames being considered, the real price increase can have a very large impact. An annual real rate of increase above the discount rate of one-half of one percent would more than double the cost of waste management. The second reason stems from the unique way that the financing of the repository is being handled. To the extent that the discount rate represents the time value of money (i.e., the value of the opportunity to use the money), the public is bearing the burden on the revenue side. The DOE analysis of fund adequacy takes credit for the earning of interest on the funds collected. Because those funds are being banked to make the fund whole, then the funds are not available to be used for other purposes. Much the same is true of the Treasury funds being paid to utilities because of the failure of the federal government to take the spent fuel. Because taxpayers are already being denied the opportunity to use their funds for other purposes, to discount the cost would be a double burden. Taxpayers and ratepayers would be bearing the full cost of the waste management, having been denied the opportunity to use the repository funds of penalties for storage costs for other purposes. Given these considerations, I believe it is reasonable to estimate the combined costs of at-reactor storage and a permanent repository in the range of \$10 - \$20/MWh (\$0.01 to \$0.02/kWh). I have rounded this estimate to one significant figure, to account for the uncertainties inherent in such estimations at the present time. In absolute value, given the EIA estimate of \$0.11/per kWh for the cost of nuclear power from new reactors, this is between 10% and 20% of the estimated cost.⁴⁴ [footnote 44 text: See EIA, 2013.] That is a substantial portion of new reactor costs and therefore strongly merits consideration by the NRC in its economic analysis of the relative costs and benefits of new nuclear reactors as compared to energy efficiency and other energy sources. For the above reasons, I believe that the bottom line in Exhibit MNC-5 provides cautiously low estimates of the cost of nuclear waste management. Therefore, in the remainder of this analysis I use the cost range of \$10/MWh to \$20/MWh to assess the importance of including nuclear waste management costs in the NRC's economic analysis. As discussed in more detail in Section IV, the cost of nuclear waste management is a much larger fraction of the cost of operating existing reactors than for new reactors. And it is large enough to affect the comparative cost of nuclear power from existing and new plants, relative to the available energy alternatives. Therefore, in the case of both new reactor licensing and license renewal for existing reactors, the costs of nuclear waste management could be high enough to affect decisions about which energy resources to develop. (0551-13 [Kysor, Jillian])

Comment: LEVELIZED COST ANALYSIS FOR NEW REACTOR LICENSES: The traditional approach to comparative resource selection for new reactors relies on the calculation of the levelized cost of electricity.⁴⁵ [footnote 45 text: Levelized cost is often cited as a convenient summary measure of the overall competitiveness of different generating technologies. It represents the per-kilowatt-hour cost (in real dollars) of building and operating a generating

plant over an assumed financial life and duty cycle. Key inputs to calculating levelized costs include overnight capital costs, fuel costs, fixed and variable operations and maintenance (O&M) costs, financing costs, and an assumed utilization rate for each plant type. http://www.eia.gov/forecasts/aeo/electricity_generation.cfm] For the purposes of this analysis, I start with the levelized cost of alternatives as estimated by EIA. I then add the cost of nuclear waste management to those costs and observe, qualitatively, whether it would alter the evaluation of the cost of nuclear power compared to the other options available. Exhibit MNC-5 shows the results using the range of estimates in the EIA analysis. Nuclear waste management costs of \$20/MWH would change the location of nuclear in the relation to other resources significantly. Nuclear moves: *• Out of the range of: > Conventional coal costs; > Gas Combined Cycle with CCS; > Advanced gas turbines; • Into the range of: > Advanced coal; > Advanced coal with CCS; • Much closer to and: > Slightly below gas turbines; > Slightly above Biomass. Waste disposal costs of \$10/MWH move nuclear costs in the same directions, but more modestly. Exhibit MNC-6 shows levelized cost estimates for a similar set of resources from the Pennsylvania, Jersey, Maryland Power Pool (PJM), a major Regional Transmission Organization (RTO) in an area of the country that is not especially well endowed with renewable resources (e.g. compared to the Midwest with a great deal of wind or the Southwest with a great deal of solar, or the Northwest with a great deal of hydro). Exhibit MNC-7 shows estimates from Lazard, which is a financial analysis firm. I include these two estimates because they not only represent different institutional points of view but also because both include efficiency as a resource. Both estimates demonstrate that efficiency is the least-cost resource by far. In fact, a significant amount of efficiency could be delivered at a cost that is close to the cost of nuclear waste management alone. Lazard also projects declining costs for solar, which I include in Exhibit MNC-7, which would make it cost competitive with even natural gas within a decade. As shown in Exhibit MNC-8, the cost trends for solar and offshore wind are expected to make them much more competitive over the next decade and would significantly affect all of the comparisons affecting nuclear power. Adding \$10 to \$20 per MWh to the cost of nuclear power generation would make a material difference in its attractiveness. Nuclear becomes even less attractive when one considers that other energy sources have little risk due to the short time from start of construction to finish. Looking at the cost of nuclear compared to the more costly alternatives in these analyses, the \$10 to \$20/MWH certainly can make a difference. Nuclear, which is almost the most expensive resource, could become the most costly. (0551-14 [Kysor, Jillian])

Comment: PORTFOLIO ANALYSIS: In the realm of electricity resource selection, I and many others have argued for an approach to analysis that deals more systematically with risk, uncertainty, vagueness, and ambiguity in the decision-making environment. I have developed a multi-criteria portfolio approach based on financial risk hedging and real option analysis, as well as a number of other efforts to deal with the challenge of ambiguity in the decision-making environment. For the purpose of incorporating the cost of nuclear waste management into the analysis, I will briefly describe the basic portfolio approach. The top graph in Exhibit MNC-9 presents the basic approach to financial portfolio analysis, as a publication from the National Regulatory Research Institute (NRRI) attempted to introduce it to regulators.⁴⁶ [footnote 46 text: Ken Costello, *Making the Most of Alternative Generation Technologies: A Perspective on Fuel Diversity*, NRRI, March 2005.] As shown in the upper graph, investors want to be on the efficient frontier, where risk and reward are balanced. They can improve their expected returns if they can increase their reward without increasing their risk or if they can lower their risk without reducing their reward. In the financial literature, risk is measured by the standard deviation of the value of the reward. In applying this framework to the evaluation of generation options, analysts frequently measure reward as kilowatts per dollar (a measure of economic efficiency). Reward is the inverse of cost (i.e., the lower the cost the greater the reward). Indeed, they use

efficiency and cost interchangeably.⁴⁷ [footnote 47 text: J.C. Jansen, L.W. M. Beurskens, and X. van Tilburg, Application of Portfolio Analysis to the Dutch Generating Mix, ECN, February 2006, p. 13 argue for a risk-cost frontier.] The lower graph in Exhibit MNC-9 shows the cost/risk relationship. Options that would move the portfolio toward the origin should be adopted since they embody lower cost and/or risk. Movement along the risk-cost frontier is neutral. Movement away from the origin raises either the cost or the risk. I use the array of resources to calculate a measure of the attractiveness of the reward. The distance of a resource from the origin measures the risk-cost characteristics of the resource (giving risk and cost equal weight). Resources that are farther from the origin (measured as the distance with each factor weighted equally) are less attractive. The distance from the origin can be expressed as the risk-adjusted cost or the expected cost. Exhibit MNC-10 shows the result of applying my approach to the EIA cost estimates, assuming that waste costs increase both the point estimate and the standard deviation of the cost estimates. Exhibit MNC-10 provides quantitative estimates that support the observations in the previous section. Waste disposal costs of the magnitude I have estimated make nuclear a much "closer" call in comparison to other alternatives, and they even reverse the direction of the conclusion in several comparisons. The top graph in MNC-10 focuses on the comparisons between resource costs that would be most affected by inclusion of waste management costs in the NRC's economic analysis. The bottom graph includes all of the resources. There are nine comparisons in which nuclear would be seen as a significantly less attractive asset to include in a resource portfolio. Including the trends for wind and solar cost and the cost of waste management, nuclear becomes almost the least attractive resource. (0551-15 [Kysor, Jillian])

Comment: ANALYSIS FOR LICENSE RENEWAL OF EXISTING REACTORS

I approach the analysis of the impact of waste management costs on the economics of aging reactors by examining these costs in relation to operating costs and margins. The economics of old reactors is already fraying and many are already on the economic "razor's edge."⁴⁸ [footnote 48 text: Cooper, Aging Reactors.] Uprates are already being abandoned because they are too costly. Old reactors are being shuttered because they are no longer economic. Proper consideration of waste disposal costs could play a part in pushing them over the edge. In my recent analysis of aging reactors I used a Credit Suisse analysis of operating costs and operating margins as the basic data to make the point that analysis of the economics of aging reactors that are still operating is challenging. Exhibit MNC-11 contains the estimated operating costs for almost all nuclear reactors online in 2012. Exhibit MNC-12 shows the "cash margins" that the reactors would yield, given the "round-the-clock prices" at different power hubs. It shows that in all but a few cases the cash margins -- revenues per MWh in excess of the offered hub price -- are less than \$20 per MWh. It also shows that the cash margins are less than \$10 per MWh in many cases. Exhibit MNC-12 also identifies reactors that have been retired recently or are scheduled to retire early, even though they were online and had significant periods before their licenses would expire. Major uprates that have recently been cancelled are also identified. The exhibit makes the point that cash margins of about \$9/MWH put reactors on the razor's edge because the cash margins are very thin.⁴⁹ [footnote 49 text: Credit Suisse, 2013, pp. 11-17, "Using current 2014 power price forwards and unit economics, we see modest cash margin expectations... Layering in typical parent overhead of \$5-7 / MWH, unit economics look even worse... We worry that rising operating and capital costs along with operational problems at some aging plants will force owners to continuously re-evaluate the useful lives of plants independent of license extensions especially as the time to absorb ongoing capex grows shorter."] Exhibit MNC-12 shows that 12 of the 18 license renewals pending or expected in the near future are on this razor's edge. The waste management costs identified above are clearly material in these circumstances. (0551-16 [Kysor, Jillian])

Comment: In conclusion, the calculations in this declaration indicate that spent fuel storage and disposal costs could be high enough to materially affect energy choices when the costs of new reactors or extension of the operating life of existing reactors are compared with energy efficiency and alternative energy sources. Therefore, in my opinion, the NRC should consider these costs in its licensing decisions for new reactors and renewal of existing reactor licenses. (0551-17 [Kysor, Jillian])

Comment: For the purposes of this analysis, I start with the most recent U.S. government estimates of costs of electricity generation and costs of spent fuel disposal: "Levelized Cost of New Generation Resources in the Annual Energy Outlook," prepared by the U.S. Energy Information Administration (EIA) in 2013¹¹ [footnote 11 text: Energy Information Administration, "Levelized Cost of New Generation Resources in the Annual Energy Outlook," Annual Energy Outlook, 2013 (hereinafter EIA 2013).] and the "Nuclear Waste Fund Fee Adequacy Assessment Report" prepared by the U.S. Department of Energy (DOE) in 2013.¹² [footnote 12 text: U.S. Department of Energy Nuclear Waste Fund Fee Adequacy Assessment Report, January 2013 (hereafter DOE, 2013)] Each of these studies has some limitations. I believe that the EIA has been wildly optimistic about the cost of nuclear power over the past decade, but I suspect that the NRC would be inclined to rely heavily on its estimates, and therefore I use it as my base case. I also show that the same conclusion would be reached if I were to rely on recent estimates from utility industry sources and Wall Street analysts. The DOE's recent analysis of the cost of a permanent nuclear waste repository is the most recent in a series of government analyses of those costs.¹³ [footnote 13 text: DOE, 2013.] Because it was prepared as part of DOE's legal obligation to assess whether current fees are adequate to fund a permanent repository, it takes a very narrow view of the costs considered. It does not consider at-reactor storage costs, and it assumes that the repository opens very quickly.¹⁴ [footnote 14 text: Id. p. 9, DOE 2013 assumes one pilot consolidated storage facility and one full-scale consolidated storage facility. It also assumes a time period of 34 years between the siting and opening of a repository.] Neither of these assumptions appears consistent with the current reality of nuclear waste management or sound economic analysis of waste management costs. As I show below, this view ignores at least half of the cost associated with nuclear waste management. Nevertheless, the DOE's analysis provides a useful starting point for estimating the cost of one component of nuclear waste management. (0551-2 [Kysor, Jillian])

Comment: The narrow costs of constructing and filling a permanent waste repository considered by the DOE can be a starting point for the analysis of the total cost of nuclear waste management. Exhibit MNC-1 shows a number of estimates, prepared by government agencies over the past thirty years, of the cost of this subset of waste management activities. I have endeavored to ensure that the comparisons involve only the specific set of costs associated with the repository. While at-reactor storage costs are included in some of the later estimates, I exclude these costs in order to maintain consistency with the DOE's analysis. I exclude historic costs that are sunk and not considered in each forward looking estimate. I convert all costs to real 2012 dollars using the Producer Price Index for intermediate goods (rather than the PPI for finished goods or the Consumer Price Index, which would include many types of distribution costs not included in an activity like the construction and operation of a repository).¹⁵ [footnote 15 text: GAO, "Nuclear Waste Management; Key Attributes, Challenges, and Costs for the Yucca Mountain Repository and Two Potential Alternatives," Government Accountability Office, GAO10-48, November 2010 (hereafter GAO 2009) presents analyses in discounted 2009 dollars where the discount rate reflects complex Monte Carlo simulations. Cliff W. Hamal, Julie M. Carey and Christopher L. Ring, Navigant, Spent Nuclear Fuel Management: How Centralized Interim Storage Can Expand Options and Reduce Costs, for the Blue Ribbon Commission on America's Nuclear Future, May 16, 2011. (Hereafter Hamal, 2011), have estimated the "best

estimate," which is 1.34 times the mean from GAO. Stating that in 2012 dollars yields an adjustment factor of 1.47. I use this to restate all GAO estimates in real, 2012, undiscounted dollars.] The cost per metric ton of uranium (used interchangeably with the term "heavy metal") is calculated based on the number of tons assumed in each of the individual studies.¹⁶ [footnote 16 text: This is the convention adopted by Hamal, 2011.] The most recent DOE estimate used just over 141,000 metric tons of heavy metal (MTHM) as the total amount of spent fuel that has been produced and will be produced given present reactor licenses and reactors under construction. Studies by the Government Accountability Office (GAO) and the Blue Ribbon Commission, in comparison, used just over 153,000 MTHM, but they counted civilian and defense material not associated with civilian nuclear reactors. (0551-3 [Kysor, Jillian])

Comment: The early estimates and the most recent estimate are for generic waste repositories. The others were for Yucca Mountain, which is generally assumed to be a bit more costly than a generic site. The DOE analysis of repository costs takes this into account.¹⁷ [footnote 17 text: DOE 2013, p. 12: "To derive a cost estimate for a generic repository, rather than one located at Yucca Mountain, the TSLCC [Total System Life Cycle Cost] cost estimate was reviewed and costs that were deemed specific to the Yucca Mountain site were removed from the estimate."] Exhibit MNC-1 shows the mid-point, or "best estimate" from each of the studies. Two things are clear from this history of cost estimation: First, the estimated cost of spent fuel disposal in a repository has been escalating dramatically, which is typical of cost estimates involving nuclear power. The trend is slightly stronger for the cost estimates since the 1990s. Second, the repository costs are very large in absolute value, reaching a hundred billion dollars. They are certainly large enough to be included in any economic analysis comparing the costs and benefits of nuclear reactor operation. As discussed below, the costs are also large enough to affect the economics of nuclear power compared to alternatives. While using the "best estimates" is useful to demonstrate a strong and consistent pattern of rising estimated costs, it hides a great deal of uncertainty about the cost. Exhibit MNC-2 shows the range of costs in the two most recent estimates. There is a great deal of uncertainty about cost in the most recent DOE study, which is typical of estimates involving nuclear power.¹⁸ [footnote 18 text: The standard deviation of the estimate of the repository costs is large compared to the "best estimate." The coefficient of variation (the standard deviation divided by the mean) is 0.75.] I will discuss my method for addressing this uncertainty below. (0551-4 [Kysor, Jillian])

Comment: The recent GAO analysis¹⁹ [footnote 19 text: GAO, 2009.] and the Blue Ribbon Commission study²⁰ [footnote 20 text: Hamal, 2011.] have recognized the increasing importance that onsite storage of nuclear waste plays in the overall cost of nuclear waste management. Onsite spent fuel storage is becoming the central cost driver of nuclear waste management because very long periods of onsite storage -- up to 300 years -- are being considered.²¹ [footnote 21 text: Dennis Vinson, Ron Kesterson, and Adrian Mendez-Torres, "Inventory and Description of Commercial Reactor Fuels within the United States," Prepared for U.S. Department of Energy Campaign Program Savannah River National Laboratory, March 31, 2011. Which is also noted in Eric M. Davied, Long-Term Interim Storage for Used Nuclear Fuel: Dry Cask Storage in Centralized Storage Facilities, Texas A& M University, 2011, identifying cask capacity at 10 to 15 MTU. (Hereafter, Davied 2011).] These costs are reflected in Exhibit MNC-3, which includes the GAO scenario in which waste remains on site for a long period of time (100 to 500 years). The GAO estimates in Exhibit MNC-3 suggest that the longer waste remains in storage on site, the higher the cost is likely to be. The Blue Ribbon Commission "best estimate" for 100 year at-reactor storage restated in 2012 dollars is just over \$100 billion.²² [footnote 22 text: Hamal, 2011, estimates just under \$72 billion for the large repository (including transportation) compared to the GAO estimate of \$53 billion. I use the difference $(71.46/53 = 1.348)$ to scale up to undiscounted dollars. Bringing the figure to 2012 dollars involves inflating

by a factor of 1.096. The adjustment factor is 1.477. Hamal's "best estimate" cost for the repository would \$78.3 billion in 2012 dollars compared to the DOE midpoint cost of \$88.9 billion.] (0551-5 [Kysor, Jillian])

Comment: Given that much longer periods of time for at-reactor storage are being contemplated, even this figure is too low for three reasons: First, when a nuclear reactor shuts down permanently, the waste at the reactor site becomes "stranded." That is, the site must be operated solely for the purpose of attending to the waste. This means that the costs of many activities that were once attributed to operating the reactor must now be allocated to managing the waste. The Blue Ribbon Commission study suggests that the cost of managing stranded waste is five times as high as the cost of managing waste at an operating site.²³ [footnote 23 text: This cost difference is derived from Hamal, 2011, p. 27. GAO, 2009 shows no difference between the average at-reactor storage costs for 100 years, which would include a substantial period in which spent fuel is not stranded, and the cost of 500-years of at-reactor storage. This suggests that stranding has not been taken into account, which was the central thrust of Hamal, 2011.] Second, over hundreds of years, storage casks will deteriorate and have to be replaced. I have assumed that cask replacement will be necessary every 100 years at a cost of \$1.6 million per cask, assuming no escalation in real costs.²⁴ [footnote 24 text: My assumption of cask replacement every 100 years is consistent with the NRC's Draft Waste Confidence Environmental Impacts Statement, p. xxviii, 2013. Davied, 2011, identifies cask capacity at 10 to 15 MTU.] Given this cost and the amount of material that will have to be stored, the GAO estimates of storage are low. Repackaging costs could be on the order to \$75 billion.²⁵ [footnote 25 text: GAO, 2009 uses the figure of \$1.6 million per cask. With 153,000 metric tons of waste and 10 tons per cask, the cost of repackaging all spent fuel is \$24.480 billion. Three repackaging operations would be just under \$75 billion.] Third, as with all nuclear costs, repackaging cost appear to be increasing dramatically.²⁶ [footnote 26 text: Michiel P.H. Brongers, Appendix CC, Nuclear Waste Storage, CC Technologies Solutions, Inc., N.D., p. cc-2, gives a figure of \$1.2 million; GAO, 2009, p. 56, puts the cost at \$1.6 million per cask, which is shown as a modification of the earlier assumption of \$1.2 million. GAO, 2009, reflects similar trends.] This analysis also excludes potentially significant costs associated with the repackaging and transportation of high burnup spent nuclear fuel over the next 30-50 years. For instance, in 2012 an expert with the National Academy of Engineering reported that "the technical basis for the spent fuel currently being discharged (high utilization, burnup fuels) is not well established" the NRC has not yet granted a license for the transport of the higher burnup fuels that are now commonly discharged from reactors. In addition, spent fuel that may have degraded after extended storage may present new obstacles to safe transport."²⁷ [footnote 27 text: National Academy of Engineering, "Managing Nuclear Waste", Summer 2012, pp 21, 31, <http://www.nae.edu/File.aspx?id=60739>.] Even the Nuclear Regulatory Commission (NRC) admits "there is limited data to show that the cladding of spent fuel with burnups greater than 45,000 MWd/MTU will remain undamaged during the licensing period" for dry spent fuel storage facilities.²⁸ [footnote 28 text: U.S. Nuclear Regulatory Commission, "Standard Review Plan for Spent Fuel Dry Storage Facilities, Final Report" NUREG-1567, March 2000. p. 6-15, <http://www.nrc.gov/readingrm/doc-collections/nuregs/staff/sr1567/sr1567.pdf>.] (0551-6 [Kysor, Jillian])

Comment: COMBINING AT-REACTOR STORAGE AND PERMANENT REPOSITORY COSTS Exhibit MNC-4 adds at-reactor storage costs to the most recent DOE estimates for the cost of the repository. The stranded waste costs are based on the difference in cost estimated in the Blue Ribbon Commission report between very rapid transfer of stranded waste to central storage and no transfer until 70 years later.²⁹ [footnote 29 text: Hamal, 2011 p. 41 shows stranded waste costs of \$477 million for a central storage facility taking 6000 MTU per year

starting 2020 and \$22.716 billion for a central storage facility taking 3000 MTU per year starting in 2090. The difference of \$22.239 billion in 2009 dollars equals \$24.4 billion in 2012 dollars.] That difference is slightly more than \$24 billion over the first 70 years. Extrapolating to 300 years, the difference in the stranded waste cost would be \$105 billion. Repackaging of waste is necessary as long as it is not deposited in a permanent repository.³⁰ [footnote 30 text: Hamal, 2011, p. 52.] Therefore, repackaging costs must be added. Assuming three rounds of repackaging in 300 years, repackaging adds another \$75 billion to the cost of managing spent fuel. Combining these cost estimates for storage and disposal of spent fuel yields a cost range of approximately \$210 to \$350 billion. (0551-7 [Kysor, Jillian])

Comment: OTHER POTENTIAL COSTS: The estimated cost range of \$210 to \$350 billion for spent fuel management leaves out significant costs. First, it does not include an escalation in the real cost of at-reactor storage and the escalation in the real cost of construction and operation of a permanent repository. Both of these have exhibited significant historical trends of increasing real cost. Second, the estimate in Exhibit MNC-4 does not include the cost or risk of accidents that may be significant with onsite storage of waste, especially during the very long period of onsite storage that is being contemplated. Large quantities of dangerous materials stored at sites close to population centers create a risk of accidents that can impose severe economic disruption and social dislocation. While much of the discussion of nuclear accidents focuses on public health issues, the economic and social impacts are substantial. The estimated economic costs of one accident run into the hundreds of billions, equaling or exceeding the entire cost of waste management and disposal.³¹ [footnote 31 text: Cooper, Nuclear Safety, discusses the general magnitude of these costs. Gordon R. Thompson, "Risk-Related Impacts from Continued Operation of the Indian Point Nuclear Power Plants", November, 28, 2007 examines the potential economic cost of a severe onsite storage accident, showing it is similar in magnitude to the general accident risk.] The fourth largest utility in the world was not thrown instantaneously into virtual bankruptcy by public health impacts, but it was destroyed by the economic cost of cleanup and compensation. While these are low probability events, keeping large quantities of nuclear waste onsite for long periods of time raises the probability of such an event. (0551-8 [Kysor, Jillian])

Comment: In addition, the above analysis does not include any escalation in the cost of decommissioning reactors. Decommissioning costs theoretically are included in calculations of levelized cost. But these costs have been rising dramatically in recent years.³² [footnote 32 text: David A. Krause, "Historical NDT Fund Balances, Annual Contributions and Decommissioning Cost Estimates", Nuclear Regulatory Commission Workshop, March 2011.] For the reactors that were retired in the past year, the total is approaching \$1 billion per site, significantly above the amount originally estimated.³³ [footnote 33 text: Decommissioning Cost Analysis for the Vermont Yankee Nuclear Power Station, February 2012; Kewaunee Power Station Post-Shutdown Decommissioning Activities Report, TLG Services, Inc., 2013; Decommissioning San Onofre Fact Sheet, 2013; Robert McCullough, et al., Economic Analysis of the Columbia Generating Station, December 2013, pp. 92-101, 110-130. Decommissioning Cost Escalation is a Global Phenomenon: Nuclear Decommissioning Authority, Managing Risk Reduction at Sellafield, Report by the Comptroller and Auditor General, November 7, 2012.] However, it is also important to recognize that the storage of spent fuel is included in the decommissioning cost estimates, and I have already included those costs in this discussion. In the case of Kewaunee, the spent fuel storage costs are one-third of the total decommissioning cost. At half a billion dollars per nuclear reactor, the total cost for decommissioning the entire fleet could be \$50 billion, which is quite significant, given the other costs that I have analyzed. It appears that utilities are going to ask for rate increases to cover decommissioning costs, which means they have not been collecting enough. Given the rising costs of decommissioning, it

remains to be seen if current cost estimates are adequate. For license renewals, there would be an additional question about whether extending the life of a reactor increases the decommissioning costs. In summary, I do not include decommissioning costs in this analysis, but these costs could well be another reason my estimate is low. (0551-9 [Kysor, Jillian])

Comment: NRC also has not provided the price tag for such future transfer and replacement operations. (0552-1-27 [Macks, Vic])

Comment: Over the past few decades American nuclear consumers have been forced to shoulder the increasing costs of nuclear waste management. Without a federal waste management system in place, utilities and consumers across the country have been shackled by the costs of maintaining its nuclear waste on existing reactor sites le continuing to pay \$750 million annually into the Nuclear Waste Fund. (0555-3 [Contreras, Raquel])

Comment: Reactors in regulated markets can pass costs on to ratepayers; consequently licensees are more likely to make investments in maintenance, both before and after operations cease, lowering the risk that mechanical malfunctioning and degradation will result in negative environmental impacts. Conversely, merchant reactors in deregulated markets increasingly cannot compete with cheaper sources of electricity and are losing money. Therefore, those licensees are not making the necessary investments in maintenance and personnel while operating and have a higher probability of failures after operations cease resulting in negative impacts on the environment from degradation and mechanical malfunctioning. Pilgrim provides an example. In 2013, using USB's analysis, Pilgrim is losing \$27 to \$30 million dollars a year. In 2013 alone Pilgrim had 18 event reports and 10 times more shutdowns than any other reactor. On November 6, the NRC announced that it had dropped Pilgrim's performance rating because of shutdowns with complications, placing it among 15 plants in the country requiring more oversight. Only a few days later, the NRC told Entergy that Pilgrim's rating is likely to drop again next month, placing it among the 8 worst performers. Therefore it is reasonable to bet that the overall condition of its pool and support structures will not be in adequate condition to face the many challenges over the 60 years after license expiration, 2092. After operations cease, it is unrealistic to expect licensees to spend monies on a site that is not generating income; and there is no assurance either the licensee will be around. Who pays? (0556-1-15 [Lampert, Mary])

Comment: The DGIS assumptions assume that the licensee will pay for the maintenance, personnel and new equipment purchases required such as the DTS. Nearly every licensee is a limited liability corporation. In deregulated markets, the merchant plants cannot compete with cheaper sources of electricity. Pilgrim, Vermont Yankee, and Fitzpatrick, for example, are in financial distress now, cutting personnel and maintenance. What basis is there to assume that licensees (or their parent corporations, which are shielded from liability) will invest monies that they do not have; and what basis is there to assume that these plants will not declare bankruptcy, leaving no party responsible? Actually there can be no basis. This summer, based on a 2.206 Enforcement Petition regarding the economic distress of Fitzpatrick, Pilgrim, and Vermont Yankee and its safety implications (G20130211), NRC Staff sent a request for information to Entergy to determine particulars regarding their economics. Entergy complained and NRC withdrew its request saying that it agreed with Entergy that economic inquiries were against previous practice¹⁷. [footnote 17 text: Senators Edward Markey & Bernie Sanders Letter to Chairman Allison Macfarlane, November 14, 2013] Moreover between closure and decommissioning there is a long time period. The decommissioning funds cannot be tapped for spent fuel management; the licensee has losses but no profits; so who does NRC believe is going to pay monies required for safe storage? (0556-2-10 [Lampert, Mary])

Comment: The unanswered questions are: who is going to pay for all of this replacement; will the NRC of 2192 (one hundred years after the end of Pilgrim's short-term time frame) require them; and even if required will NRC enforce the requirement, even if it can find some distant offspring of a current licensee? Judging from NRC's response to lessons learned from Fukushima, there is a consistent pattern that when industry finances clash with public safety, NRC sides with industry's economic interests. (0556-2-9 [Lampert, Mary])

Comment: I exhort you to employ the safest and most reliable storage method known, no matter the cost. (0570-3 [Boosinger, Marilyn])

Comment: Nuclear power plants are leaving behind an immense footprint of toxic and radioactive waste. No one wants to invest the huge amount of money it would require to secure such waste for hundreds if not thousands of years. (0596-1 [Shima, Tetsuo])

Comment: One unequivocal conclusion from my review of the NRC's Waste Confidence DGEIS is that the financial cost of indefinite "continued storage" of spent nuclear fuel is UNPREDICTABLE and UNKNOWABLE, a category and degree of "confidence" that is even worse than "uncertain and open-ended." In fact, the potentially ASTRONOMICAL cost over the long-run makes the business model of the nuclear industry entirely and absolutely absurd. The "elephant in the room" is the obvious fact that the "nuclear energy business plan" is not economically viable as an unsubsidized, independent commercial enterprise. (0603-25 [Schonberger, David])

Comment: Certainly, this proceeding can take administrative notice as to what these costs may reasonably be expected to be, and do with more efficiency and accuracy than can this commenter, considering the access to site specific knowledge and confidential costs enjoyed by NRC Staff. Regardless, there is support on the public record for certain of the numbers below in the testimony presented on December 4, 2013 by Mr. Phil Mahowald, Council for the Prairie Island Mdewakanton Dakota Community. In view of the apparent analytical challenges faced by NRC Staff, however, we provide below a rough estimate of one expenditure that is vital in terms of performing proposed Waste Confidence activities, the cost of casks, based on a reasonable framework for an initial calculation. The assumptions for this cost calculation are as follows: Cost per TN-40 dry storage cask .cel Energy testimony, 11.4.13, MPUC Rate Case \$5.96 M; Metric tons of irradiated fuel per reactor during 80 years of reactor operations Draft GEIS at 2-7 ---1,600 MTU; Estimated metric tons of irradiated fuel for 100 reactors during 80 years of reactor operations--- 160,000 MTU; Estimated number of fuel assemblies for a waste inventory of 160,000 MTU ---551,385 fuel assemblies; Estimated number of dry storage casks with capacity to each hold 40 fuel assemblies needed to contain 551,385 fuel assemblies--- 13,785 casks. The conclusion of this rough calculation is that the cost of new storage casks, per cask cycle, is about \$82.1 Billion in 2013 dollars. To this must be added several billion additional dollars per cask cycle to pay for a Dry Transfer System at each ISFSI facility and, of course, the cost of maintaining the necessary skilled work force. In addition, waste degradation (see discussion below) will require storage pools to be maintained throughout storage periods at each ISFSI facility in order to manage degraded waste that cannot be transferred from old casks to new in a DTS, and to contain degraded waste that may accumulate in the bottom of casks in patterns that result in criticality events. The cost of pool installation and maintenance throughout the storage period for each ISFSI must therefore also be included in the cost of maintaining institutional control. But just looking at the cost of casks, if \$82.1 Billion in 1913 dollars is equivalent to \$1,952 Billion in 2013 dollars, what do you think the equivalent of \$82.1 Billion in 2013 dollars will be in 2113 dollars? This staggering amount of money is absolutely required in order to pay for the functions the Draft GEIS presumes will be performed. Yet, seeing as how all

costs of performing these functions are totally ignored by the Draft GEIS, it is not surprising that there also is no discussion about where all this money might possibly come from. The question must be adequately addressed before Waste Confidence can be re-established, however, and it must be addressed in the context that for many prior years, decades, and centuries for any given dry cask replacement cycle, reactor operations will have been terminated and therefore there will be no incoming revenue stream to offset waste management costs. (0608-11 [Crocker, George])

Comment: This failure of the Draft GEIS profoundly illustrates the larger and generic failure of the commercial nuclear industry and its regulators, whereby present-day benefits, largely favoring industry cartel players and regulators, are harvested based on arbitrary, warped and stunted cost-benefit analysis, without reasonable or adequate accounting of societal costs and risks, and actual long-term operational costs. In this instance, the cost-benefit analysis (Chapter 7, Draft GEIS) is focused on an asserted cost differential of \$5-\$23 million among the presented administrative alternatives while failing to account for the many billions of dollars required to actually operate the waste management program. The justification for this behavior, evidently, is the following statement found on page 7-1 of the Draft GEIS: The costs and benefits do not include the environmental impacts of continued storage, an activity that will occur regardless of the alternative that the NRC selects to consider its impacts. This assertion can only be true, not that it necessarily will be, if actual waste management occurs in accordance with the timeframes and assumptions posited by the Draft GEIS, which presumes institutional control, which presumes the availability of many billions of unaccounted for dollars, repeatedly, into the dimmest distant future. Without the money, there is no foundation for the asserted environmental impacts. Where will the money come from? Until this question is answered with a high degree of confidence, any assertion that the present proceeding has re-established "Waste Confidence" is self-serving folly. (0608-12 [Crocker, George])

Comment: In addition funding for even short term storage, let alone long term storage cannot be assured, (0611-24 [Shapiro, Susan])

Comment: The GEIS glosses over and does not identify how funds will be made available in perpetuity to provide security for nuclear waste storage and for the replacement dry cask storage systems every 100 years. The brief discussion in Section 3.2.2 somehow magically assumes local taxes will cover the exploding, repeating costs of nuclear waste storage. This is unfounded and unsustainable for future generations who will not receive any benefits from the lethal nuclear legacy to continue funding replacement casks every 100 years. In a 100 years or more there the current tax based structure of government and society may not even exist. There is a real risk that financial commitments made by elected bodies may be subject to de-funding as we just witnesses during the recent Federal shutdown. (0611-45 [Shapiro, Susan])

Comment: Mark Cooper, senior fellow for economic analysis, Institute for Energy and the Environment, Vermont Law School, and author of "Renaissance in Reverse: Competition Pushes Aging U.S. Nuclear Reactors to the Brink of Economic Abandonment" (2013) and "Policy Challenges of Nuclear Reactor Construction, Cost Escalation and Crowding Out Alternatives" (2009), calculated the full price tag per megawatt hour of nuclear power in terms of the cost and risks of storing and disposing of the radioactive waste from reactors. Cooper found that the "hidden" cost of nuclear waste storage is rapidly rising, and is so massive that the NRC cannot ignore it when conducting its own economic analysis about the true cost of nuclear power. Yet the GEIS does ignore the cost impacts and realities of nuclear waste storage. Without question that cost considerations for High Burn Up fuel cannot not projected since there is no scientific basis for the methodology necessary for safe storage. It is arbitrary, capricious

and totally irresponsible for the NRC to leave funding of future replacement and repair of spent fuel storage to short term political whims. Failure to provide necessary funds for future safe storage will result in extremely dangerous situations for public health and safety and the future of the entire human race. (0611-47 [Shapiro, Susan])

Comment: Established a permanent revolving fund in perpetuity which can adequately address long term/permanent nuclear waste storage and security, including structural repairs and replacement, federal security teams, and research to reverse engineer man-made nuclear fission. (0611-56 [Shapiro, Susan])

Comment: Much of what the NRC depends upon for waste confidence is that a geological repository will be available when needed. This availability becomes a matter of timing. Timing does not stand alone. Our government, our money and all other issues that make up the nuclear fuel cycle must survive to an extent. I have raised the issue of money or financing earlier in response to Chairman MacFarlane's testimony before the House Energy and Commerce Subcommittee on 12/12/2013 wherein she stated that financing was the responsibility of the Congress and that the NRC responsibility was to present a budget (or words to that effect.) (0615-1 [Lewis, Marvin])

Comment: Furthermore, if the costs of waste disposal are so great as to make it impossible to operate nuclear power plants cost-effectively, that fact must be recognized. (0616-2 [Hoffman, Ace])

Comment: Timeframes Evaluated: For the PINGP ISFSI site, the short-term storage of no more than 60 years after the licensed life of a reactor could be to either 2094 or 2114, depending on whether the PINGP is relicensed for a second time; long-term storage of no-more than 160 years after the licensed life of the reactor would be until 2194 or 2214, depending upon a second renewal term; and indefinite on-site storage. The draft GEIS assumes that institutional controls will continue. We are concerned that the utility now operating the facility will even exist in 60 or 160 years, and we fail to see how the NRC can make this assumption. The NRC has failed to provide any factual basis to support this assumption with any confidence. With respect to the indefinite and the long-term scenarios, there is no certainty that current (and future) licensees will be responsible for the financial resources needed to support longterm and indefinite storage operations. What will happen if licensees cannot fulfill their legal financial obligations? Will the US Government provide sufficient resources and protection to ensure continued safe and secure storage? If so, will these sites become Federal storage sites? We have no basis for assuming that the current structure of financial assurances for spent fuel storage will continue to exist during the long-term and indefinite time periods. Furthermore, the final GEIS should discuss the impacts from the potential loss of institutional controls and oversight. How can we possibly know whether a utility (or any entity as we know them today) will be in business in 160 years or beyond? (0619-1-14 [Mahowald, Philip R.])

Comment: Chapter 7 discusses the costs and benefits associated with the Proposed Action, as well as the alternatives. There is no discussion regarding the significant costs (to the ratepayer or the taxpayers) to decommission ISFSIs, or to construct new ISFSIs and a DTS over the long-term and indefinite timer-periods. The draft GEIS assumes that there will be sufficient funding available for decommissioning the respective ISFSIs and constructing new ISFSIs, fabricating new dry casks, and constructing and operating the DTS (and eventually decommissioning it). Who will pay for this? What if State regulatory agencies (i.e., public utility commissions or public service commissions) simply refuse to allow the utilities (if they even exist) to pass along those costs to the ratepayers? If this draft GEIS is to support a revised

Waste Confidence Rule, shouldn't the cost of implementing the rule also be included? In a recent filing with the Minnesota Public Utilities Commission (MPUC) rate case, NSPM testified that its installed per cask cost at Prairie Island is \$5.96 million (which includes cask fabrication, loading and licensing costs).⁷ [footnote 7 text: See Direct Testimony and Schedules of Timothy J. O'Connor dated November 4, 2013 in Docket No. E002/GR-13-868 at pp. 49-52 and Appendix A] That's \$372 million in today's dollars for the 63 additional casks needed to store all of the waste generated during the PINGP 20-year license extension, and another \$584 million in today's dollars to re-load all 98 casks in a hundred years (if the plant is only licensed to operate another 20 years). The draft GEIS assumes a second reactor renewal term, which adds an estimated 33 additional dry casks for a total number of dry casks of 131. The 2013 cost to replace 131 dry casks is estimated to be \$781 million. This does not include costs to decommission the existing ISFSI, license and construct the DTS or any labor costs associated with the unloading of dry casks. We have no idea whether these costs have been factored into the PINGP's and ISFSI's respective decommissioning plans. Has the NRC performed this review? If not, then what is the factual basis for this assumption? This cost scenario will be repeated across the county and will be in the billions of dollars before the indefinite storage phase begins. According to a report issued by Oak Ridge National Laboratory, the current fleet of 104 commercial nuclear power plants annually discharge approximately 2,000 metric tons of heavy metals (MTHM) of spent nuclear fuel.⁸ [footnote 8 text: Available at <http://info.ornl.gov/sites/publications/Files/Pub40536.pdf> (February 2013).] As of the end of 2011 the inventory of commercial spent nuclear fuel was approximately 67,600 MTHM (the result 50 years of reactor operations). At the current rate of discharge, the current operating reactors will generate an additional 67,600 MTHM spent nuclear fuel over the next 30 years. That represents a total of approximately 135,200 MTHM of spent nuclear fuel that will be generated (or approximately 465,920 spent nuclear fuel assemblies).⁹ [footnote 9 text: See "Storage of Spent Nuclear Fuel," by Andrew C. Kadak, which was published in the National Academy of Engineers' Summer 2012 issue of The Bridge on Managing Nuclear Waste, available at <http://www.nae.edu/Publications/Bridge/59220/59226.aspx>: "by the end of 2011, the United States commercial nuclear waste inventory had reached approximately 65,000 metric tons of heavy metal (MTHM). This represents about 224,000 fuel assemblies." (at p. 25).] If we assume 40 assemblies per cask,¹⁰ [footnote 10 text: Based on the 40 fuel assembly capacity of the TN-40 and TN-40HT casks, but also recognizing that many casks are much smaller than the TN-40 and TN-40HT in use at the PI ISFSI.] that amounts to approximately 11,648 dry casks. Using the 2013 cost per cask at the PINGP, the conservative estimated cost for replacing these dry casts would be more than \$69 billion in today's dollars. This estimate doesn't include any costs related licensing, constructing and operating the DTS across the county, which one could assume would be in the billions of dollars as well. (0619-2-4 [Mahowald, Philip R.]

Comment: Whether the \$69 billion dollar figure is too high or low is irrelevant. The fact is, the NRC has not even considered the costs associated with its assumptions, and whether the cost to replace these casks will be borne by the ratepayer and/or the taxpayer. We have no assurance that the state regulators will allow the utilities to recover their costs. If the plants are no longer operating, will they have ratepayers from whom they can recover their costs? Will the utilities' shareholders be asked to cover these costs? A likely scenario is that utilities still operating or otherwise in control of the ISFSI sites will seek to recover their costs from the Federal government (due to partial breach of contract), like they have been doing for the last decade. As is stated in the draft GEIS, the Waste Confidence rule is not a licensing decision, but, the Waste Confidence Rule does, in fact, allow the Federal government to do nothing (i.e., develop and license a repository) because of its conclusions (i.e., that it is safe to store spent nuclear fuel on-site for the long-term or indefinitely). (0619-2-5 [Mahowald, Philip R.]

Comment: Not only is the individual owner/operator of the reactor unaccountable or liable for the care and final disposition of the results from which it has generated a profit, but the November 19, 2013 ruling by the U.S. District Court for the District of Columbia that the Department of Energy must discontinue the collection of fees from nuclear power reactor licensees for the purposes of funding the Federal repository program is further cause for concern about the long-term management of commercially-generated nuclear waste. (0620-10 [Rivera, Evelyn])

Comment: It is important to realise the crushing cost of generating or storing nuclear waste (spent fuel) in an unsafe manner. Here is a chilling real life example from the United Kingdom. When one of the Chernobyl NuclearPower Plant's reactors melted down more than 25 years ago the UK was seriously affected more than 1,300 miles away. Produce from 9,700 farms in the UK had to be quarantined and diverted as being unfit for human consumption. The UK is a continent away from Chernobyl. 25 years later, there were still more than 300 restricted farms in the UK, still too heavily contaminated with fall out to be allowed to sell their produce. (0634-5 [Cato, Michael])

Comment: I believe it is obvious that the long-term costs of waste disposal/storage are so great as to make it impossible to operate nuclear power plants cost-effectively. Nuclear waste management will become the most expensive component of using nuclear power. Not recognizing this fact is to side-step reality. (0640-3 [Geary, B.]

Comment: Over the past few decades American nuclear consumers have been forced to shoulder the increasing costs of nuclear waste management. Without a federal waste management system in place, utilities and consumers across the country have been shackled by the costs of maintaining its nuclear waste on existing reactor sites while continuing to pay \$750 million annually into the Nuclear Waste Fund. (0642-2 [Picking, Brian])

Comment: [T]he costs of waste disposal are so great as to make it impossible to operate nuclear power plants cost-effectively. Without state subsidies and taxpayer bail-outs, they never would have been built, especially since no insurance company will cover them. (0679-3 [Sorgen, Phoebe])

Comment: Currently, the NRC funding criteria for decommissioning does not account for short term, long term, or indefinite on-site storage of nuclear waste. The State of New York recommends that the NRC either include a financial plan for long-term spent fuel storage, or perform a revision to the NRC decommissioning certification of financial assurance to include the financial burden of on-site spent fuel storage. (0681-7 [Peterson, Alyse])

Comment: In addition, the total costs of providing electricity through nuclear power plants cannot be honestly calculated. It includes many unknowns that have been left out of the equation: such as the cost of unconceivable long term storage of spent fuel rods; the efficacy of even attempting to do that; the costs to future generations that our actions will impose upon them; the health risks imposed on the human race and the planet, the long term medical costs of caring for people negatively affected by the nuclear industry and its waste; the future costs on the environment for all inhabitants of the planet. When all is added together, it is clear that the real total cost of nuclear power is incalculable and therefore, morally unacceptable. (0686-9 [Malboeuf, Simone])

Comment: Nuclear power is too expensive and generating more nuclear waste too costly. (0690-6 [Eisman, Val])

Comment: No detailed cost analysis was done in this GEIS except comparing costs of a generic EIS to multiple site-specific ones. The cost analysis should have compared the costs and benefits of a geologic repository to long term or indefinite storage at reactors or away from reactors. It should have included total transportation costs and costs of the repeated replacement of casks and transfer facilities every 100 years or sooner. In addition, there are the growing liabilities associated with lawsuits by reactor owners over the failure to take the waste off their hands. Taxpayers have a right to fully understand the growing liabilities associated with continued production of high level radioactive spent nuclear fuel that will have to be successfully managed forever. (0693-1-13 [Warren, Barbara])

Comment: •No real analysis of the total costs of spent fuel nuclear waste management was in the GEIS including transportation, storage casks, transfer facilities, recontainerizing every 100 years, spills, accidents, cleanup costs, storage and disposal costs and the planned funding mechanism. The costs of severe accidents including permanent loss of property and businesses and who will bear the costs were also not evaluated. Taxpayers, ratepayers, and the general public have a right to understand the total costs and what costs they will be forced to bear, including whether major portion of the costs will be shifted or externalized from the nuclear industry onto the public sector. The absence of thorough analysis of future financial costs is a significant concern given what we are currently seeing related to the loss of institutional control over dangerous nuclear waste. The public can have no trust in promises about a future process when past promises are unfulfilled. (0693-4-3 [Warren, Barbara])

Comment: The handling of nuclear waste will over time be the most expensive piece of the puzzle -- possibly excepting disasters like Fukushima and Chernobyl. (0705-3 [Spring, Janet])

Comment: Furthermore, if the costs of waste disposal are so great as to make it impossible to operate nuclear power plants cost-effectively, that fact must be recognized. (0709-2 [Wythe Elnagar, Romi])

Comment: Despite this incredible confidence in the ability to manage waste in temporary storage facilities forever, NRC does not even bother to estimate the cost of doing so. Such costs are not trivial, even in the present-day United States of America, which is the wealthiest and most powerful nation-state in world history. Recent events demonstrate the folly of NRC assumptions, and the capriciousness of failing to analyze the costs of maintaining the presumed waste management regime. (0711-17 [Olson, Mary])

Comment: On November 19, 2013, the U.S. District Court for the District of Columbia ruled that the Department of Energy must discontinue the collection of fees from nuclear power reactor licensees for the purposes of funding the federal repository program. The court's ruling was based on the department's termination of the Yucca Mountain project and the lack of a credible cost assessment for the long-term management of commercial irradiated fuel without a viable repository project. This is, quite literally, the very situation envisioned in the Waste Confidence GEIS: the lack of a repository in which to permanently store irradiated fuel, forcing waste to be actively managed in temporary storage facilities indefinitely, forever. The government presently has no statutory basis on which to generate funds for such a program, which means that the existing High-Level Waste Fund would continue to be expended until it is exhausted. It is irresponsible for NRC to neglect to acknowledge that the "institutional controls" necessary to manage irradiated fuel in temporary storage facilities indefinitely would require statutory funding throughout that time, and to fail to offer an explanation of the amount of those funds and where they would come from. The GEIS does not, could not and must address the impacts of the D.C. Court's November 19th ruling, which included setting the Waste Fund Fee at

zero, creating a significantly changed circumstance that was not considered by the GEIS. (0711-19 [Olson, Mary])

Comment: This Generic Environmental Impact Statement is (as stated on page xxiii) on the "safety and environmental impact of storing spent nuclear fuel beyond the operating life for operations of a nuclear power plant." NRC's economic analysis is inadequate. The only economic analysis NRC carried out was a comparison of NRC's cost of doing ONE generic EIS versus the cost of doing numerous site specific EISs at each location that applies for a license or license extension. Those analyses did not consider the consequences of contamination at the sites. Even more egregious is the fact NRC did not even estimate how much the actual waste management would cost yet assumed that there will be institutional control and recontainerization every hundred years into the future. No assessment is made about the likelihood and costs of institutional controls existing, of basic costs of the new casks, presence of necessary facilities for carrying out recontainerization, or the remedial action needed based on the condition of the fuel as it deteriorates over time. No assessment is done of the consequences of NOT recontainerizing into the future. (0711-20 [Olson, Mary])

Comment: Full cost accounting is absolutely necessary. There has been no cost benefit analysis provided. Alternatives to the generation of more nuclear waste through re-licensing and issuance of new licenses for new build must be considered. According to National Environmental Policy Act project proponents must first take a "Hard Look" at alternatives. Regulators and Industry simply will not answer the question who will pay for repackaging of Dry Casks in perpetuity? Perpetual repackaging. What will be the cost of security for hundreds of years to come? (0713-4 [Keegan, Michael J.])

Comment: Will the NRC compare the risks and costs of isolating irradiated nuclear fuel for centuries with the costs of generating renewable energy (like solar and wind) and of increasing energy efficiency? (0715-5 [Drey, Kay])

Comment: To date, NRC's analysis has not included an acknowledgment and analysis of the cost to replace these drinking water resources that play a critical role in the daily life of New York City's residents. Replacing radionuclide-contaminated drinking water resources for millions of City residents would likely represent a substantial cost. (0718-1-4 [Sipos, John])

Comment: Even if society continues unhindered, who will pay to replace these facilities after the plant is shut down and the power company is bankrupt? Are these costs built in to the cost of the licensing of the facility? What guarantee is there that this maintenance will ever be done? (0724-4 [Gamble, Dan])

Comment: Additionally, NRC presumes the spent fuel can be safely stored in dry casks for a century, but will then need to be repackaged. This will involve complex remote handling and construction of repackaging devices. NRC assumes some institution will in fact take care of this task every hundred years, a difficult and expensive undertaking, given the hazard involved. These presumptions are predicated on the assumption that the utilities that own the reactor sites where the material will be stored will continue to exist and will have the resources and commitment to undertake these tasks over these very long periods. This is hard to countenance, given that no utility has been in existence that long, maintenance of funds for such a non-income-producing activity seems unlikely, and institutional memory at such utilities to carry out these functions difficult to maintain. (0738-11 [Hirsch, Daniel])

Comment: Since there is no viable economic value in re-purposing Nuclear waste, and certainly no recycling of the materials, the cost of operation including waste disposal is not viable. I can recall stating this in 1966 and it is now even more true today. (0755-1 [Calnan, Christopher])

Comment: The cost for creating these solutions for waste disposal is the sole responsibility of the producer. (0798-2 [deBruler, Gregory])

Comment: I have raised the issue of money or financing earlier in response to Chairman MacFarlane's testimony before the House Energy and Commerce Subcommittee on 12/12/2013 wherein she stated that financing was the responsibility of the Congress and that the NRC responsibility was to present a budget (or words to that effect.) (0818-2 [Lewis, Marvin])

Comment: NRC's preferred alternative is based upon the cost concerns of regulation to the agency and the utilities. This is an inappropriate priority. The cost concerns to be addressed in the GEIS, should be the costs of each of the storage timelines, including indefinite storage. And the costs of ongoing 100 year cask and facility replacement and funding for local, state, and federal collaboration - in enduring institutional controls, including monitoring, maintenance and management. (0820-13 [Eide-Tollefson, Kristen])

Comment: Certainly the NRC has not posed any evidence that a removal and re-storage in casks at a 100 year or any other long interval is practical. The NRC is not serious about the costs of decommissioning reactors. Your present formula for financial reserves for decommissioning are tragically short of what both experience and economic forecasting has shown to be the actual costs of decommissioning. If NRC cannot regulate funds for responsible decommissioning, how can the public believe the NRC will establish and enforce adequate financial responsibility so that future owners of surface cask storage sites will repackage cask stored waste? (0821-11 [Paddock, Brian])

Comment: It's not a question of IF, it's a question of WHEN we too realize the risks, costs and toxicity of spent nuclear fuel it too high when compared to alternatives. The NRC's Waste Confidence Generic Environmental Impact Statement delivers additional costs associated with short-term to mid-term (60 to 200 years) on-site storage of spent nuclear fuel and add yet another layer of real expense to the overly subsidized "too cheap to meter" vision of nuclear power. (0826-6 [Morgal, Rick])

Comment: There needs to be a national discussion on the subject of waste, that addresses the true costs of storing materials that remain highly radioactive, in the case of U-238 for 4.5 billion years, and in the case of Pu-239 for 24,000 years; but that's just the half-life. The true period of storage should be 10 times longer, in truth many times longer than the earth is likely to exist. (0834-6 [Thabit, Nick])

Comment: There is roughly 60,000 tons of spent fuel in the USA that are not stored in dry caskets, or "Casked". USA generates around 2000 tons a year, and it takes approximately five years to cool enough spent fuel to be Casked. Thus, approximately 10,000 tones are awaiting dry cask storage (i.e., 5 X 2,000 tons). This leaves approximately 50,000 tons that could be and SHOULD BE Casked immediately. The total cost with labor and materials will be around \$11.25 billion (US) B to dry cask all the spent fuel Dry Casked, or roughly about \$225,000 per ton. This approach is viable from a safety perspective, but also from an economical perspective. It will cost approximately \$14.375 billion (US) to dry cask ALL of the spent fuel in the USA up to 2020. However, this expense will be off-set by approximately \$4.8 billion (US) as an economic infusion

through job creation for US trade workers. Additional cost avoidance of approximately \$24 billion (US) from potential litigation can be gained with this Dry Cask Storage approach. Please note that other potential risks, such as risk of disaster or terrorist attacks, are not included in this calculation but could be significant and debilitating from an economic and/or social perspective. So, we can create US jobs and "fix" the spent fuel storage problem for the next 50 years (while we figure out a longer term solution) or we can risk litigation and the economic and environmental disaster that will surely accompany a natural, technological or/or human-made nuclear disaster. (0843-2 [Davis, Cherie])

Comment: Siting an interim repository is next to impossible because of the uncertainty that a permanent deep geologic repository will ever open in this country despite the assurances that the NRC is confident that one will. Without a deep geologic repository, the enormous costs of repackaging spent fuel every hundred years at various sites on into infinity is not taken into consideration in the NRC's EIS even though the draft EIS works hard to make the impression that it has taken into account all costs. (0851-10 [Thatcher, Tami])

Comment: While the NRC keeps pretending that the spent fuel is just not a problem, the Department of Energy has reported that "The current inventory of domestic [spent fuel] is massive, diverse, dispersed and increasing . . . [and] it represents a significant financial liability."⁵ [footnote 5 text: Wagner et al.] There are 137 variations of commercial spent fuel, each requiring specific research for storage design that the taxpayers will be paying for. (0851-7 [Thatcher, Tami])

Comment: Furthermore, if the costs of waste disposal are so great as to make it impossible to operate nuclear power plants cost-effectively, that fact must be recognized. (0856-2 [Fritz, John])

Comment: The DGEIS assumptions and the alternatives derived from them are examples of a normative forecast that describes a desirable future without sufficient reference to current conditions. For example, the DGEIS assumes funding will be sufficient without regard to the existing conditions of an industry in decline. An explorative forecast would have examined the current funding conditions and sought to create a more realistic description of the future from that basis. It would have possibly identified a forthcoming funding shortage as nuclear power declines and utilities decrease revenues from NPP operations. Such a funding shortfall would have impacts on institutional control, regulatory viability and environmental impacts. (0867-1-2 [Griffin, William])

Comment: Scenarios are typically extensive narratives that highlight likely possible alternatives. In this case, the NRC could have examined the problem of lost agency financing from the perspective of several different funding scenarios. Such analysis would have at a minimum addressed the possibility that the funding streams that underlie the very existence of the NRC may change. (0867-1-5 [Griffin, William])

Comment: Reactor operators are not obligated to retain funds for post-decommissioning activities, such as indefinite storage and maintenance of SNF. There is currently no program for the disposal of the SNF and such long term funding is essential to address. States and local governments, acting to protect their citizens ultimately may become responsible for some minimum level of activity at the site. This may include security, monitoring or supervision of maintenance. In any event, the time, attention, and funding to carefully observe the site will necessarily remain with the state. It will be necessary to pay for trained, knowledgeable staff, monitoring equipment, and a public safety program in the area. The DGEIS does not acknowledge this problem and does not address this unfunded mandates that could reasonably

be expected to infringe on the state. Nor does the DGEIS acknowledge that all these costs will ultimately be borne by the public in the form of increased taxes. (0867-3-10 [Griffin, William])

Comment: The NRC assumes that the funding will be available for the indefinite storage of the materials. This assumption may not be valid. (0867-3-2 [Griffin, William])

Comment: The assumption that funds will be available for the management and disposal of spent nuclear fuel is problematic. First, there is no requirement for nuclear power plant operators to maintain funds to manage spent nuclear fuel following decommissioning. Currently, reactor operators are required to maintain decommissioning accounts. NRC has developed a formula it uses to calculate the adequacy of the decommissioning funds. Based on this formula, those accounts are currently estimated to be sufficient (NREG 1577). Funding assurance for decommissioning nuclear power plants is governed by 10 CFR 50.33(k), 50.75, and 50.82. However, these cost estimates do not include the costs for long-term management of the fuel or the site. As the NUREG states: "In addition, the costs of managing and storing spent fuel on site until transfer to the Department of Energy for permanent disposal are not included in NRC cost formulas." (NUREG 1577 p. 16) The reason power plant operators were not responsible for long-term management of spent fuel was because of the assumption that long-term storage would be provided by DOE. In advance of this assumption, the power plant operators were being assessed fees to support the nuclear waste fund. However, the recent decision by the United States Circuit Court of Appeals has invalidated collection of those fees (*NARUC v. DOE*). Currently, there is no requirement for NPP operators to maintain a fund for the long-term management of SNF. Even today, the NRC's assumptions about funding are unfounded. It is easy to envision a future in which funding is not available. (0867-3-3 [Griffin, William])

Comment: Second, funding the long-term management of spent fuel requires a dramatic change in the way the United States manages the oversight of commercial nuclear waste. Currently, oversight is performed by the NRC. The NRC, however, receives 90% of its funding from fees assessed from operating NPP's (NRC Press Briefing). As reactors close, there will be fewer funds available for oversight of the stewardship and management of the materials. The NRC assumption of eternal funding for these activities will require Congressional action to change current policy, the funding of either the current organization, or the development of a new organization. (0867-3-4 [Griffin, William])

Comment: Third, the DGEIS makes the unrealistic assumption that funding is an either/or question. That is, either sufficient funding is available forever, or that it is not. A much more likely outcome is that funding from energy companies will dwindle and backfill funding from the Federal government will have to compete with other priorities and rather than be entirely eliminated, it will be gradually reduced. In this event, affected States may be compelled to supplement the maintenance or oversight of waste facilities with their own funds. If so, the sites will inevitably become unfunded mandates on the states. (0867-3-5 [Griffin, William])

Comment: Ultimately, funding is difficult to forecast. As the NRC said: "It is difficult to determine costs that could be incurred 50 to 100 years in the future. Changes in technology, regulation, or public policy could all have a profound effect on the actual cost. The purpose of including costs is to try to discern the benefit for the expedited transfer alternative. Of course, this analysis is based on best estimates of current spent fuel strategies and cost. If the U.S. government were to take possession of the spent fuel in order to provide storage at a non-operating plant site for extended periods, the costs could be heavily discounted, and the differences between storage alternatives in this analysis might be reduced" (COMSECY-13-0030 p.7). It is likely that if funding becomes unavailable for a short or an extended timeframe,

that states will be forced to provide essential services and protection to the facilities. This then is an example of how SNF could become an unfunded mandate on states. (0867-3-6 [Griffin, William])

Comment: There is no environmental impact statement where the NRC discusses the significant costs of a repository and spent fuel storage in a cost-benefit analysis for licensing of nuclear reactors. The only environmental document where costs related to spent fuel disposal are considered is Table S-3, but Table S-3 reports only that if there are no radiation releases from a repository there will be no costs. Table S-3 says nothing about the costs of a repository. And the DGEIS says nothing about the costs of spent fuel storage. As discussed in the declaration of Mark Cooper, costs of spent fuel storage and disposal could be high enough to tip the cost-benefit analysis in a reactor licensing or re-licensing decision away from a recommendation to license a reactor. But NRC provides no mechanism for integrating the high costs of spent fuel storage and disposal into the cost-benefit analysis and comparison of energy alternatives for reactor licensing cases. (0897-7-13 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In addition, the costs of avoiding or mitigating those impacts are significant. For instance, the NRC's finding that it is feasible to have a geologic repository raises questions of cost. What will it cost to isolate spent fuel for many thousands of years? Is the cost affordable when compared with the profit that a nuclear reactor will yield? As discussed in the declaration of Mark Cooper, these costs are so large they must be considered. Conservatively estimating the costs of spent fuel storage and disposal, Mr. Cooper estimates total costs in the range of \$210 to \$350 billion, in real, undiscounted dollars. Cooper Declaration, p. 10. That is a figure that is certainly large enough to demand consideration by the Nuclear Regulatory Commission. Moreover, converting those costs to costs per unit of output, he concludes that the costs would be in the range of \$10 to \$20 per megawatt hour (\$0.01 to \$0.02/ kWh) of electricity generated by the reactors that produce the waste. Cooper Declaration, p. 4. This is equal to 10 to 20 percent of the cost of nuclear power from newly constructed reactors as calculated by the Energy Information Administration. Compared to the cost of the other resources included in the Energy Information Administration analysis, the cost of waste management would make nuclear power much less attractive as a resource. The Cooper Declaration also shows that the cost of nuclear waste management is often larger compared to the operating costs and margins of existing reactors. Several operating reactors have recently been abandoned because their operating margins can be as low as \$9/MWh, which is insufficient to cover their costs and meet the revenue requirements that their owners demand and others may face a similar fate. Cooper Declaration, pp. 20-21. Waste management costs of \$10 to \$20 per MWh must be considered very significant in evaluating the economics of aging reactors. The majority of the license renewals that are pending at the NRC, or expected to come before the NRC in the next few years, involve reactors whose operating costs and margins are no better than the margins for reactors that were recently retired before their licenses expired. (0897-7-5 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Costs of Spent Fuel Storage and Disposal Could Tip the Balance Of Reactor Licensing Decisions[.] As demonstrated by the Cooper Declaration, the costs of spent fuel storage and disposal could tip the balance of reactor licensing decisions away from licensing and in the direction of renewables and energy efficiency. As discussed above, spent fuel costs are equal to 10 to 20 percent of the cost of nuclear power from newly constructed reactors. These costs are also significant for existing reactors, which face increasing operating costs as a result of aging. Cooper cites estimates of the cost of electricity resources prepared by the mid-Atlantic grid operator PJM and Lazard, a Wall Street analysis firm, which show that a significant amount

of energy efficiency can be achieved at a cost that is lower than the cost of waste management alone. Cooper Declaration, p. 17. (0897-7-6 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Finally, even under the assumption of institutional controls for an indefinite period, the Draft GEIS fails to address the expense of those measures, the risk that they may fail, and how such costs and risks may impact reactor licensing and license extension decisions. (0898-1-6 [Curran, Diane] [Makhijani, Arjun])

Comment: In this context, it is important to note that this entire exercise is part of the process of licensing new reactors or extending the licenses of existing reactors. Cost is therefore a very material consideration. Long-term storage (or longer) followed by disposal in one repository could add up to between \$214 billion and \$351 billion. A second repository could add \$34 billion to \$171 billion.¹¹⁷ [footnote 117 text: Cooper 2013. Exhibit MNC-4, p. 25] These are huge sums of money. The NRC must take these into account when assessing the reasonableness of its assumptions regarding long-term storage followed by disposal - or indefinite storage, which would be even more expensive. (0898-4-14 [Curran, Diane] [Makhijani, Arjun])

Comment: Even under the assumption of institutional controls for an indefinite period, the Draft GEIS fails to address the expense of those measures, the risk that they may fail, and how such costs and risks may impact reactor licensing and license extension decisions. (0898-5-18 [Curran, Diane] [Makhijani, Arjun])

Comment: My analysis shows that the costs of managing spent nuclear fuel are likely to be quite large in absolute value, running to hundreds of billions of dollars (in constant 2012 dollars). They are in the range of \$10 to \$20 per MWH (\$0.01 to \$0.02 per kWh), which is certainly large enough in relative value to affect the outcome of analyses that compare the cost of nuclear power to the alternatives available in the United States. Therefore, the cost of nuclear waste management is a significant cost that should be included in the NRC's economic comparisons of nuclear power with energy efficiency and other alternative energy sources. (0900-1 [Cooper, Mark] [Curran, Diane])

Comment: There is a great deal of uncertainty and debate about the discount rate that should be used. In this case, as discussed below, it is my opinion that application of a discount rate is inappropriate. Therefore, the costs presented in Exhibit MNC-4 are not discounted. For purpose of long term analysis, analysts generally believe discount rates should be quite low.⁴² [footnote 42 text: Hamal, 2011.] The fact that costs of waste management are incurred a long time (i.e., hundreds or thousands of years) after the useful life of the facility creates an intergenerational issue, since future generations will be incurring large costs without deriving any benefit. As GAO states: Although the concept of discounting is an accepted and standard methodology in economics, the concept of discounting values over a very distant future--known as "intergenerational discounting" is still subject to considerable debate. Furthermore, no consensus exists among economists regarding the exact value of the discount rate that should be used to discount values that are spread over many hundreds or thousands of years.⁴³ [footnote 43 text: GAO, 2009, p. 28.] Therefore the appropriate discount rate is a significant issue that should be addressed in the NRC analysis of the cost of waste management. In my opinion, there are two additional, important reasons why application of a zero discount rate is appropriate in these circumstances. First, the real increase in the cost of at-reactor storage and the permanent repository has been increasing substantially faster than the real, discount rate. Given the long time frames being considered, the real price increase can have a very large impact. An annual real rate of increase above the discount rate of one-half of one percent would more than double the cost of waste management. The second reason stems from the unique

way that the financing of the repository is being handled. To the extent that the discount rate represents the time value of money (*i.e.*, the value of the opportunity to use the money), the public is bearing the burden on the revenue side. The DOE analysis of fund adequacy takes credit for the earning of interest on the funds collected. Because those funds are being banked to make the fund whole, then the funds are not available to be used for other purposes. Much the same is true of the Treasury funds being paid to utilities because of the failure of the federal government to take the spent fuel. Because taxpayers are already being denied the opportunity to use their funds for other purposes, to discount the cost would be a double burden. Taxpayers and ratepayers would be bearing the full cost of the waste management, having been denied the opportunity to use the repository funds of penalties for storage costs for other purposes. Given these considerations, I believe it is reasonable to estimate the combined costs of at-reactor storage and a permanent repository in the range of \$10 - \$20/MWh (\$0.01 to \$0.02/kWh). I have rounded this estimate to one significant figure, to account for the uncertainties inherent in such estimations at the present time. In absolute value, given the EIA estimate of \$0.11/per kWh for the cost of nuclear power from new reactors, this is between 10% and 20% of the estimated cost.⁴⁴ [footnote 44 text: See EIA, 2013.] That is a substantial portion of new reactor costs and therefore strongly merits consideration by the NRC in its economic analysis of the relative costs and benefits of new nuclear reactors as compared to energy efficiency and other energy sources. For the above reasons, I believe that the bottom line in Exhibit MNC-5 provides cautiously low estimates of the cost of nuclear waste management. Therefore, in the remainder of this analysis I use the cost range of \$10/MWh to \$20/MWh to assess the importance of including nuclear waste management costs in the NRC's economic analysis. (0900-10 [Cooper, Mark] [Curran, Diane])

Comment: As discussed in more detail in Section IV, the cost of nuclear waste management is a much larger fraction of the cost of operating existing reactors than for new reactors. And it is large enough to affect the comparative cost of nuclear power from existing and new plants, relative to the available energy alternatives. Therefore, in the case of both new reactor licensing and license renewal for existing reactors, the costs of nuclear waste management could be high enough to affect decisions about which energy resources to develop. (0900-11 [Cooper, Mark] [Curran, Diane])

Comment: In the previous section I showed that a very cautious estimate of waste management costs would be in the range of \$0.01 to \$0.02 per kWh. In this section I examine whether costs of that magnitude could affect the economic analysis of nuclear power compared to other resources. For the analysis of licenses for new reactors I examine the addition of waste management costs to the levelized cost of energy that are frequently used to evaluate new resources. For the analysis of the renewal of licenses for existing reactors I analyze the addition of waste management costs to the operating costs and margins of existing reactors. (0900-12 [Cooper, Mark] [Curran, Diane])

Comment: The traditional approach to comparative resource selection for new reactors relies on the calculation of the levelized cost of electricity.⁴⁵ [footnote 45 text: Levelized cost is often cited as a convenient summary measure of the overall competitiveness of different generating technologies. It represents the per-kilowatt-hour cost (in real dollars) of building and operating a generating plant over an assumed financial life and duty cycle. Key inputs to calculating levelized costs include overnight capital costs, fuel costs, fixed and variable operations and maintenance (O&M) costs, financing costs, and an assumed utilization rate for each plant type. http://www.eia.gov/forecasts/aeo/electricity_generation.cfm] For the purposes of this analysis, I start with the levelized cost of alternatives as estimated by EIA. I then add the cost of nuclear waste management to those costs and observe, qualitatively, whether it would alter the

evaluation of the cost of nuclear power compared to the other options available. Exhibit MNC-5 shows the results using the range of estimates in the EIA analysis. Nuclear waste management costs of \$20/MWH would change the location of nuclear in the relation to other resources significantly. Nuclear moves: • Out of the range of o Conventional coal costs o Gas Combined Cycle with CCS o Advanced gas turbines • Into the range of o Advanced coal o Advanced coal with CCS • Much closer to and o Slightly below gas turbines o Slightly above Biomass[.] Waste disposal costs of \$10/MWH move nuclear costs in the same directions, but more modestly. Exhibit MNC-6 shows levelized cost estimates for a similar set of resources from the Pennsylvania, Jersey, Maryland Power Pool (PJM), a major Regional Transmission Organization (RTO) in an area of the country that is not especially well endowed with renewable resources (e.g. compared to the Midwest with a great deal of wind or the Southwest with a great deal of solar, or the Northwest with a great deal of hydro). Exhibit MNC-7 shows estimates from Lazard, which is a financial analysis firm. I include these two estimates because they not only represent different institutional points of view but also because both include efficiency as a resource. Both estimates demonstrate that efficiency is the least-cost resource by far. In fact, a significant amount of efficiency could be delivered at a cost that is close to the cost of nuclear waste management alone. Lazard also projects declining costs for solar, which I include in Exhibit MNC-7, which would make it cost competitive with even natural gas within a decade. As shown in Exhibit MNC-8, the cost trends for solar and offshore wind are expected to make them much more competitive over the next decade and would significantly affect all of the comparisons affecting nuclear power. Adding \$10 to \$20 per MWh to the cost of nuclear power generation would make a material difference in its attractiveness. Nuclear becomes even less attractive when one considers that other energy sources have little risk due to the short time from start of construction to finish. Looking at the cost of nuclear compared to the more costly alternatives in these analyses, the \$10 to \$20/MWH certainly can make a difference. Nuclear, which is almost the most expensive resource, could become the most costly. (0900-13 [Cooper, Mark] [Curran, Diane])

Comment: In the realm of electricity resource selection, I and many others have argued for an approach to analysis that deals more systematically with risk, uncertainty, vagueness, and ambiguity in the decision-making environment. I have developed a multi-criteria portfolio approach based on financial risk hedging and real option analysis, as well as a number of other efforts to deal with the challenge of ambiguity in the decision-making environment. For the purpose of incorporating the cost of nuclear waste management into the analysis, I will briefly describe the basic portfolio approach. The top graph in Exhibit MNC-9 presents the basic approach to financial portfolio analysis, as a publication from the National Regulatory Research Institute (NRRI) attempted to introduce it to regulators.⁴⁶ [footnote 46 text: Ken Costello, *Making the Most of Alternative Generation Technologies: A Perspective on Fuel Diversity*, NRRI, March 2005.] As shown in the upper graph, investors want to be on the efficient frontier, where risk and reward are balanced. They can improve their expected returns if they can increase their reward without increasing their risk or if they can lower their risk without reducing their reward. In the financial literature, risk is measured by the standard deviation of the value of the reward. In applying this framework to the evaluation of generation options, analysts frequently measure reward as kilowatts per dollar (a measure of economic efficiency). Reward is the inverse of cost (i.e., the lower the cost the greater the reward). Indeed, they use efficiency and cost interchangeably.⁴⁷ [footnote 47 text: J.C. Jansen, L.W. M. Beurskens, and X. van Tilburg, *Application of Portfolio Analysis to the Dutch Generating Mix*, ECN, February 2006, p. 13 argue for a risk-cost frontier.] The lower graph in Exhibit MNC-9 shows the cost/risk relationship. Options that would move the portfolio toward the origin should be adopted since they embody lower cost and/or risk. Movement along the risk-cost frontier is neutral. Movement away from the origin raises either the cost or the risk. I use the array of resources to calculate a measure of

the attractiveness of the reward. The distance of a resource from the origin measures the risk-cost characteristics of the resource (giving risk and cost equal weight). Resources that are farther from the origin (measured as the distance with each factor weighted equally) are less attractive. The distance from the origin can be expressed as the risk-adjusted cost or the expected cost. Exhibit MNC-10 shows the result of applying my approach to the EIA cost estimates, assuming that waste costs increase both the point estimate and the standard deviation of the cost estimates. Exhibit MNC-10 provides quantitative estimates that support the observations in the previous section. Waste disposal costs of the magnitude I have estimated make nuclear a much "closer" call in comparison to other alternatives, and they even reverse the direction of the conclusion in several comparisons. The top graph in MNC-10 focuses on the comparisons between resource costs that would be most affected by inclusion of waste management costs in the NRC's economic analysis. The bottom graph includes all of the resources. There are nine comparisons in which nuclear would be seen as a significantly less attractive asset to include in a resource portfolio. Including the trends for wind and solar cost and the cost of waste management, nuclear becomes almost the least attractive resource. (0900-14 [Cooper, Mark] [Curran, Diane])

Comment: I approach the analysis of the impact of waste management costs on the economics of aging reactors by examining these costs in relation to operating costs and margins. The economics of old reactors is already fraying and many are already on the economic "razor's edge."⁴⁸ [footnote 48 text: Cooper, Aging Reactors.] Uprates are already being abandoned because they are too costly. Old reactors are being shuttered because they are no longer economic. Proper consideration of waste disposal costs could play a part in pushing them over the edge. In my recent analysis of aging reactors I used a Credit Suisse analysis of operating costs and operating margins as the basic data to make the point that analysis of the economics of aging reactors that are still operating is challenging. Exhibit MNC-11 contains the estimated operating costs for almost all nuclear reactors online in 2012. Exhibit MNC-12 shows the "cash margins" that the reactors would yield, given the "round-the-clock prices" at different power hubs. It shows that in all but a few cases the cash margins - revenues per MWh in excess of the offered hub price - are less than \$20 per MWh. It also shows that the cash margins are less than \$10 per MWh in many cases. Exhibit MNC-12 also identifies reactors that have been retired recently or are scheduled to retire early, even though they were online and had significant periods before their licenses would expire. Major uprates that have recently been cancelled are also identified. The exhibit makes the point that cash margins of about \$9/MWH put reactors on the razor's edge because the cash margins are very thin.⁴⁹ [footnote 49 text: Credit Suisse, 2013, pp. 11-17, "Using current 2014 power price forwards and unit economics, we see modest cash margin expectations... Layering in typical parent overhead of \$5-7 / MWH, unit economics look even worse... We worry that rising operating and capital costs along with operational problems at some aging plants will force owners to continuously re-evaluate the useful lives of plants independent of license extensions especially as the time to absorb ongoing capex grows shorter."] Exhibit MNC-12 shows that 12 of the 18 license renewals pending or expected in the near future are on this razor's edge. The waste management costs identified above are clearly material in these circumstances. (0900-15 [Cooper, Mark] [Curran, Diane])

Comment: In conclusion, the calculations in this declaration indicate that spent fuel storage and disposal costs could be high enough to materially affect energy choices when the costs of new reactors or extension of the operating life of existing reactors are compared with energy efficiency and alternative energy sources. Therefore, in my opinion, the NRC should consider these costs in its licensing decisions for new reactors and renewal of existing reactor licenses. (0900-16 [Cooper, Mark] [Curran, Diane])

Comment: I believe that the EIA has been wildly optimistic about the cost of nuclear power over the past decade, but I suspect that the NRC would be inclined to rely heavily on its estimates, and therefore I use it as my base case. I also show that the same conclusion would be reached if I were to rely on recent estimates from utility industry sources and Wall Street analysts. The DOE's recent analysis of the cost of a permanent nuclear waste repository is the most recent in a series of government analyses of those costs.¹³ [footnote 13 text: DOE, 2013.] Because it was prepared as part of DOE's legal obligation to assess whether current fees are adequate to fund a permanent repository, it takes a very narrow view of the costs considered. It does not consider at-reactor storage costs, and it assumes that the repository opens very quickly.¹⁴ [footnote 14 text: *Id.* p. 9, DOE 2013 assumes one pilot consolidated storage facility and one full-scale consolidated storage facility. It also assumes a time period of 34 years between the siting and opening of a repository.] Neither of these assumptions appears consistent with the current reality of nuclear waste management or sound economic analysis of waste management costs. As I show below, this view ignores at least half of the cost associated with nuclear waste management. Nevertheless, the DOE's analysis provides a useful starting point for estimating the cost of one component of nuclear waste management. (0900-2 [Cooper, Mark] [Curran, Diane])

Comment: First, the estimated cost of spent fuel disposal in a repository has been escalating dramatically, which is typical of cost estimates involving nuclear power. The trend is slightly stronger for the cost estimates since the 1990s. Second, the repository costs are very large in absolute value, reaching a hundred billion dollars. They are certainly large enough to be included in any economic analysis comparing the costs and benefits of nuclear reactor operation. As discussed below, the costs are also large enough to affect the economics of nuclear power compared to alternatives. (0900-3 [Cooper, Mark] [Curran, Diane])

Comment: The recent GAO analysis¹⁹ [footnote 19 text: GAO, 2009.] and the Blue Ribbon Commission study²⁰ [footnote 20 text: Hamal, 2011.] have recognized the increasing importance that onsite storage of nuclear waste plays in the overall cost of nuclear waste management. Onsite spent fuel storage is becoming the central cost driver of nuclear waste management because very long periods of onsite storage - up to 300 years - are being considered.²¹ [footnote 21 text: Dennis Vinson, Ron Kesterson, and Adrian Mendez-Torres, "Inventory and Description of Commercial Reactor Fuels within the United States," Prepared for U.S. Department of Energy Campaign Program Savannah River National Laboratory, March 31, 2011. Which is also noted in Eric M. Davied, *Long-Term Interim Storage for Used Nuclear Fuel: Dry Cask Storage in Centralized Storage Facilities*, Texas A& M University, 2011, identifying cask capacity at 10 to 15 MTU. (Hereafter, Davied 2011).] These costs are reflected in Exhibit MNC-3, which includes the GAO scenario in which waste remains on site for a long period of time (100 to 500 years). The GAO estimates in Exhibit MNC-3 suggest that the longer waste remains in storage on site, the higher the cost is likely to be. The Blue Ribbon Commission "best estimate" for 100 year at-reactor storage restated in 2012 dollars is just over \$100 billion.²² [footnote 22 text: Hamal, 2011, estimates just under \$72 billion for the large repository (including transportation) compared to the GAO estimate of \$53 billion. I use the difference ($71.46/53 = 1.348$) to scale up to undiscounted dollars. Bringing the figure to 2012 dollars involves inflating by a factor of 1.096. The adjustment factor is 1.477. Hamal's "best estimate" cost for the repository would \$78.3 billion in 2012 dollars compared to the DOE midpoint cost of \$88.9 billion.] Given that much longer periods of time for at-reactor storage are being contemplated, even this figure is too low for three reasons: First, when a nuclear reactor shuts down permanently, the waste at the reactor site becomes "stranded." That is, the site must be operated solely for the purpose of attending to the waste. This means that the costs of many activities that were once attributed to operating the reactor must now be allocated to managing the waste. The Blue Ribbon

Commission study suggests that the cost of managing stranded waste is five times as high as the cost of managing waste at an operating site.²³ [footnote 23 text This cost difference is derived from Hamal, 2011, p. 27. GAO, 2009 shows no difference between the average at-reactor storage costs for 100 years, which would include a substantial period in which spent fuel is not stranded, and the cost of 500-years of at-reactor storage. This suggests that stranding has not been taken into account, which was the central thrust of Hamal, 2011.] Second, over hundreds of years, storage casks will deteriorate and have to be replaced. I have assumed that cask replacement will be necessary every 100 years at a cost of \$1.6 million per cask, assuming no escalation in real costs.²⁴ [footnote 24 text My assumption of cask replacement every 100 years is consistent with the NRC's Draft Waste Confidence Environmental Impacts Statement, p. xxviii, 2013. Davied, 2011, identifies cask capacity at 10 to 15 MTU.] Given this cost and the amount of material that will have to be stored, the GAO estimates of storage are low. Repackaging costs could be on the order to \$75 billion.²⁵ [footnote 25 text: GAO, 2009 uses the figure of \$1.6 million per cask. With 153,000 metric tons of waste and 10

tons per cask, the cost of repackaging all spent fuel is \$24.480 billion. Three repackaging operations would be just under \$75 billion.] Third, as with all nuclear costs, repackaging cost appear to be increasing dramatically.²⁶ [footnote 26 text: Michiel P.H. Brongers, *Appendix CC, Nuclear Waste Storage*, CC Technologies Solutions, Inc., N.D., p. cc-2, gives a figure of \$1.2 million; GAO, 2009, p. 56, puts the cost at \$1.6 million per cask, which is shown as a modification of the earlier assumption of \$1.2 million. GAO, 2009, reflects similar trends.] This analysis also excludes potentially significant costs associated with the repackaging and transportation of high burnup spent nuclear fuel over the next 30-50 years. For instance, in 2012 an expert with the National Academy of Engineering reported that "the technical basis for the spent fuel currently being discharged (high utilization, burnup fuels) is not well established...the NRC has not yet granted a license for the transport of the higher burnup fuels that are now commonly discharged from reactors. In addition, spent fuel that may have degraded after extended storage may present new obstacles to safe transport."²⁷ [footnote 27 text: National Academy of Engineering, "Managing Nuclear Waste", Summer 2012, pp 21, 31, <http://www.nae.edu/File.aspx?id=60739>.] Even the Nuclear Regulatory Commission (NRC) admits "there is limited data to show that the cladding of spent fuel with burnups greater than 45,000 MWd/MTU will remain undamaged during the licensing period" for dry spent fuel storage facilities.²⁸ [footnote 28 text: U.S. Nuclear Regulatory Commission, "Standard Review Plan for Spent Fuel Dry Storage Facilities, Final Report" NUREG-1567, March 2000. p. 6-15, <http://www.nrc.gov/readingrm/doc-collections/nuregs/staff/sr1567/sr1567.pdf>.] (0900-4 [Cooper, Mark] [Curran, Diane])

Comment: Exhibit MNC-4 adds at-reactor storage costs to the most recent DOE estimates for the cost of the repository. The stranded waste costs are based on the difference in cost estimated in the Blue Ribbon Commission report between very rapid transfer of stranded waste to central storage and no transfer until 70 years later.²⁹ [footnote 29 text: Hamal, 2011 p. 41 shows stranded waste costs of \$477 million for a central storage facility taking 6000 MTU per year starting 2020 and \$22.716 billion for a central storage facility taking 3000 MTU per year starting in 2090. The difference of \$22.239 billion in 2009 dollars equals \$24.4 billion in 2012 dollars.] That difference is slightly more than \$24 billion over the first 70 years. Extrapolating to 300 years, the difference in the stranded waste cost would be \$105 billion. Repackaging of waste is necessary as long as it is not deposited in a permanent repository.³⁰ [footnote 30 text: Hamal, 2011, p. 52.] Therefore, repackaging costs must be added. Assuming three rounds of repackaging in 300 years, repackaging adds another \$75 billion to the cost of managing spent fuel. Combining these cost estimates for storage and disposal of spent fuel yields a cost range of approximately \$210 to \$350 billion. (0900-5 [Cooper, Mark] [Curran, Diane])

Comment: The estimated cost range of \$210 to \$350 billion for spent fuel management leaves out significant costs. First, it does not include an escalation in the real cost of at-reactor storage and the escalation in the real cost of construction and operation of a permanent repository. Both of these have exhibited significant historical trends of increasing real cost. Second, the estimate in Exhibit MNC-4 does not include the cost or risk of accidents that may be significant with onsite storage of waste, especially during the very long period of onsite storage that is being contemplated. Large quantities of dangerous materials stored at sites close to population centers create a risk of accidents that can impose severe economic disruption and social dislocation. While much of the discussion of nuclear accidents focuses on public health issues, the economic and social impacts are substantial. The estimated economic costs of one accident run into the hundreds of billions, equaling or exceeding the entire cost of waste management and disposal.³¹ [footnote 31 text: Cooper, Nuclear Safety, discusses the general magnitude of these costs. Gordon R. Thompson, "Risk-Related Impacts from Continued Operation of the Indian Point Nuclear Power Plants", November, 28, 2007 examines the potential economic cost of a severe onsite storage accident, showing it is similar in magnitude to the general accident risk.] The fourth largest utility in the world was not thrown instantaneously into virtual bankruptcy by public health impacts, but it was destroyed by the economic cost of cleanup and compensation. While these are low probability events, keeping large quantities of nuclear waste onsite for long periods of time raises the probability of such an event. In addition, the above analysis does not include any escalation in the cost of decommissioning reactors. Decommissioning costs theoretically are included in calculations of levelized cost. But these costs have been rising dramatically in recent years.³² [footnote 32 text: David A. Krause, "Historical NDT Fund Balances, Annual Contributions and Decommissioning Cost Estimates", Nuclear Regulatory Commission Workshop, March 2011.] For the reactors that were retired in the past year, the total is approaching \$1 billion per site, significantly above the amount originally estimated.³³ [footnote 33 text: *Decommissioning Cost Analysis for the Vermont Yankee Nuclear Power Station*, February 2012; *Kewaunee Power Station Post-Shutdown Decommissioning Activities Report*, TLG Services, Inc., 2013; *Decommissioning San Onofre Fact Sheet*, 2013; Robert McCullough, et al., *Economic Analysis of the Columbia Generating Station*, December 2013, pp. 92-101, 110-130. "Decommissioning Cost Escalation is a Global Phenomenon: Nuclear Decommissioning Authority, *Managing Risk Reduction at Sellafield*, Report by the Comptroller and Auditor General, November 7, 2012.] However, it is also important to recognize that the storage of spent fuel is included in the decommissioning cost estimates, and I have already included those costs in this discussion. In the case of Kewaunee, the spent fuel storage costs are one-third of the total decommissioning cost. At half a billion dollars per nuclear reactor, the total cost for decommissioning the entire fleet could be \$50 billion, which is quite significant, given the other costs that I have analyzed. (0900-6 [Cooper, Mark] [Curran, Diane])

Comment: In order to bring these waste management costs into the economic evaluation of nuclear power compared to other resources, I translate the aggregate estimates of costs into per kWh costs. This involves several challenges. The bottom row in Exhibit MNC-4 shows an effort to do so. There are two important issues that affect this calculation: output of nuclear reactors and a determination of the appropriate discount rate. (0900-8 [Cooper, Mark] [Curran, Diane])

Comment: The amount of power that the costs will be spread across is uncertain. The DOE's assumption is too high for several reasons. The DOE estimate shows a stream of output from nuclear reactors that start with a base in 2012 that is already 5% higher than the actual output.³⁴ [footnote 34 text: DOE, 2013.] The output is lower than expected because nuclear reactors were offline and have been retired early. That trend is likely to continue. The DOE assumption of a

very high load factor is inconsistent with historical experience. It took a long time to build up to a high load factor; therefore, any new reactors that come online should not be assumed to immediately jump to a high load factor. Moreover, capacity factors for existing reactors have begun to decline as reactors age. In a recent paper, I showed that including early retirements in the calculation of load factors yields a load factor that is one-sixth lower than the very high assumptions being used in much comparative economic analyses.³⁵ [footnote 35 text: Mark Cooper, Renaissance in Reverse: Competition Pushes Aging U.S. Nuclear Reactors to the Brink of Economic Abandonment, July 2013 (hereafter, Aging Reactors).] The output of the nuclear fleet in 2013 will have declined from the peak in 2010 to the level achieved in 2004. DOE and many other analysts of waste management assume that reactor life will be 60 years.³⁶ [footnote 36 text: DOE, 2013.] While the license period might run that long, virtually all reactors that have been retired were retired before their licenses expired. The closure of Kewaunee and Vermont Yankee extend that pattern for reactors that were online when the retirement decision was made, while San Onofre and Crystal River extend the pattern of troubled reactors retiring early. DOE assumes an increase in capacity of almost 10 percent due to large scale uprates at existing facilities,³⁷ [footnote 37 text: DOE, 2013.] but virtually all large scale uprates pending have been cancelled due to a severe deterioration in the comparative economics of nuclear power.³⁸ [footnote 38 text: Cooper, Aging Reactors.] DOE assumes early online status for new reactors under construction and an "unplanned addition" of a new reactor which would add 2 percent to nuclear capacity.³⁹ [footnote 39 text: DOE, 2013.] Given the historical experience of new reactor cancellations and construction delays, the "unplanned addition" should certainly be dropped. Combining these observations, one can argue that the base case for NRC analysis should include actual 2013 output, which is 5% lower than the DOE analysis, an 80 percent load factor, without uprates and "unplanned additions." Under these assumptions, the output of the fleet would be at least 25% lower than assumed by DOE in its analysis of disposal system costs.⁴⁰ [footnote 40 text: This result is consistent with all remaining reactors plus five new ones – Vogtle, Summer, Watts Bar – running for a full 60 years at 90 percent capacity factor.] Lower output might lower the variable cost of at-reactor storage. Whether it lowers the cost of a permanent repository depends on whether one assumes that only one repository will be constructed. If adding nuclear capacity causes the construction of a second repository, fixed costs will increase substantially. The GAO analysis, adjusted for the discount rate and inflation, suggests that the cost of operating two repositories would be 32% higher than one, adding \$25 billion to the total cost.⁴¹ [footnote 41 text: GAO, 2009.] This would offset a substantial part of the variable cost savings. Put in another way, if denying licenses or license renewals allows a second repository to be avoided, the reduction in cost would be substantial including both fixed costs for the reactor and variable cost for spent waste storage. (0900-9 [Cooper, Mark] [Curran, Diane])

Comment: Replacing dry casks, canisters, pads, and dry transfer systems once every hundred years is not "too cheap to meter," despite Lewis Strauss, Chair of the U.S. Atomic Energy Commission's, infamous words to the contrary in 1954. He was speaking about nuclear power, but irradiated nuclear fuel is the inevitable byproduct of commercial nuclear power. In fact, electricity is but the fleeting byproduct. The actual product is forever deadly high-level radioactive waste. (0919-2-2 [Kamps, Kevin])

Comment: In addition to the replacements described on Page 1-13, the "routine maintenance," for a million years or longer, would add to the on-site and/or away-from-reactor costs even more. Again, NRC has not described how much maintenance and replacement forevermore will cost, nor identified where those funds will come from. Given that the U.S. Circuit Court for the District of Columbia last month ruled that DOE should ask Congress to end the collection of the Nuclear Waste Fund fee from nuclear electricity consumers, there will be even less money to

work with in the future than there has been in decades past, concerning high-level radioactive waste management. (0919-2-20 [Kamps, Kevin])

Comment: In fact, Dr. Mark Cooper of Vermont Law School, expert witness on behalf of a coalition of dozens of environmental groups, including Beyond Nuclear, has provided NRC expert comments on the costs of such repeated replacements of dry cask storage infrastructure over time. Dr. Cooper's analysis foresees staggering costs that future generations - which derived no benefit from the nuclear generated electricity that led to the production of the forever deadly radioactive waste - will be forced to pay, in order to isolate the irradiated nuclear fuel from the environment forevermore. Remarkably, NRC has neither estimated the costs of such activities, nor ventured a guess as to who would actually pay those costs, where that funding would come from. (0919-2-4 [Kamps, Kevin])

Comment: If the EPA's acknowledgement, that commercial irradiated nuclear fuel will remain hazardous for a million years, is the figure we use, that represents 10,000 replacements of dry cask storage under NRC's "indefinite storage" (which also could be dubbed "infinite storage") timeframe: 1,000,000 years X 1 replacement/100 years = 10,000 replacements. Dr. Mark Cooper has provided expert estimates as to what those staggering costs would be just for the first few replacements - around \$100 billion per century! But multiplying such price tags by 10,000 replacements boggles the mind in terms of costs future generations will face. Of course, it'll be worse than that, due to inflation (even in the first century!), not to mention worsening problems of fuel degradation, which could be quite significant and boost the price tag astronomically! (0919-2-9 [Kamps, Kevin])

Comment: Given that DOE has estimated Yucca's price tag, had it been constructed, opened, and operated, would have approached \$100 billion (for just the first 63,000 MTHM of commercial irradiated nuclear fuel, per the limit set in the Nuclear Waste Policy Act of 1983, as Amended), how much does NRC calculate future commercial irradiated nuclear fuel disposal will cost, all told? Where will that money come from? Who will pay it? These questions are not answered in NRC's DGEIS. (0919-3-3 [Kamps, Kevin])

Comment: If the costs of waste disposal are so great as to make it impossible to operate nuclear power plants cost-effectively, that fact must be recognized. (0931-1 [Masullo, Ginny])

Comment: The true costs of nuclear power should be assessed in detail in the EIS, including the substantial front end subsidies, and the long term costs of decommissioning and the management of nuclear[.] Nuclear Reactor owners and operators are not fully financially responsible for disposal of their waste. Once the waste leaves the reactor site, the US taxpayer is on the line for any accidents and liability. These long term hidden costs must be made apparent, in full view and via "full cost accounting." (0938-10 [Sondheim, Steven])

Comment: The tax payer is on the hook for any accidents, why?? The NRC should not be receiving subsidies from the taxpayer. The NRC should provide your own insurance. (1003-1 [Cartmell, Cathy])

43. Comments Concerning Decommissioning

Comment: So, where does a generic environmental impact statement figure into the decommissioning process? The situation in Zion and Fukushima changes from moment to moment, not only on the physical level, which we can see, but even more critically at the

molecular and subatomic level. This is a quote from an authority from Canada, Dr. Gordon Evers: "The central fact about radioactivity is that no one knows how to turn it off. Radioactive materials continue to emit atomic radiation at a rate which cannot be influenced by any of the usual factors, heat, pressure, chemical reactions, absorption, dilution, nothing can be used to speed up, slow down, or stop the process of radioactive disintegration from occurring." This central fact means that 'radioactive cleanup' is a very misleading phrase. It suggests to ordinary people that we can somehow get rid of radioactive contamination. But we cannot do so, at least not in any actual sense. All we can do is move the contamination from one place to another. If you decontaminate one site, you must be contaminating another site. The contamination, whether repackaged, consolidated, or managed are made less available to the environment of living things but it cannot be eliminated. Governments and their electorates have been misled by the nuclear industry into believing false notions about nuclear waste. Lots of impact, millions of dollars spent, they do not know how to do this. There is no way to clean up or dispose of radioactive waste. (0245-10-2 [Lewison, Linda])

Comment: There's still spent fuel stored in pools at nuclear plant sites where the reactors have been decommissioned, and we need to take care of those spent fuel rods right away. (0250-29-8 [Rivard, Betsey])

Comment: As far as jobs, decommission these plants, every single one in the United States. You'll have more jobs than you could possibly think of. First off, decommission would probably take 10 years, maybe 20 years to get rid of the plants. On top of that is that then we'd have to move into robotics because it's not safe to deal with and bring in a whole other industry that the community colleges would force in the neighborhoods there and the universities would go into the research of robotics in order to decommission these facilities. (0327-44-3 [Chavez, Tim])

Comment: And the assumption that decommissioned reactors and reactors that may actually have been disassembled and removed and, yet, the cask storage will be subject to adequate monitoring, inspection, enforcement, and leak detection is contrary to the experience and to the existing regulation concerning what remains at a deactivated site. (0329-12-8 [Paddock, Brian])

Comment: The NRC has determined that it is no longer necessary to have permanent inspectors on site during the decommissioning process. The quantity of radioactive materials stored on site is nearly 90 times that released by the Chernobyl accident. (0433-2 [Stone, Gene])

Comment: A for profit energy company with its profit/risk tables cannot make the decommission plans. Unit 1 at SONGS is proof, 20 years buried still in progress for decommissioning. The world has changed in its dangers for nuclear spent fuel. We must act now. (0481-2 [Magda, Marni])

Comment: Something way beyond leaving spent fuel rods sitting in place at Oyster Creek and any other decommissioned nuclear plants has to be arranged quickly. We are all watching the horrors of what an uncontrolled nuclear mess looks like and the thought of leaving 50,000 casked but nevertheless still radiated rods right in between two of the most heavily traveled roads in New Jersey is beyond the pale. (0510-1 [Holmes, Helen])

Comment: Make decommissioning a priority at all costs, no matter what they are. (0526-2 [Arnott, Melissa])

Comment: Currently decommissioning funds are inadequate to safely decommission nuclear facilities throughout the country. In 2003 the GAO Report dated October 2003 found that the

NRC Needs More Effective Analysis to Ensure Accumulation of Funds to Decommission Nuclear Power Plant, yet since that time the NRC irresponsibly allow Entergy to gamble Indian Point decommissioning fund on the stock market, which resulted in a significant loss in the 2008 stock market crash. (0611-46 [Shapiro, Susan])

Comment: The NRC does not address ownership of the waste or responsibility post decommissioning in the DGEIS-other than the oft-repeated phrase that the federal government is expected to develop a deep geological permanent repository for radioactive waste 60 years after the end of the licensed life of each nuclear plant. The DGEIS presents no confidence that such storage will be available in any amount of time. In the case that such storage does not occur, the NRC should explain ownership of spent nuclear fuel post decommissioning in the DGEIS. (0622-1-9 [Vale, Karen])

Comment: The Decommissioning Plant Coalition was formed over a decade ago in response to the government's continuing failure to meet its obligation to remove the SNF/GTCC from reactor sites beginning in 1998 and to highlight the issues unique to permanently shutdown reactor sites undergoing decommissioning and operating on-site dry cask storage facilities. We have and will continue to safely store the SNF/GTCC stranded at our sites; however, as we highlighted in our prior comments and reiterate now, the federal government's continued default on its obligations under the standard contract and the resultant indefinite storage of this material at our shutdown reactor sites cannot be endorsed as acceptable public policy. (0637-3 [Norton, Wayne])

Comment: The DGEIS and rule also increase the risk that the obligations for SNF disposal may ultimately be transferred to the states and to their ratepayers, despite the long legal and regulatory history involving federal government promises and commitments that SNF disposal was to be a national and federal obligation. The Commission appears to ignore the reality that available legal and corporate strategies exist that can provide for the transfer of nuclear plants and ISFSI's, and the SNF itself, to unfunded separate limited liability companies that can easily abandon SNF at existing sites once the economic value of the generating plants are exhausted. (0704-8 [Callen, Ronald C.] [Keskey, Donald L.]

Comment: No spent fuel pools should be used to store a decommissioned plant's spent fuel rods once the fuel rods are cool enough to be transferred to a dry cask. (0826-13 [Morgal, Rick])

Comment: Additionally there is increased likelihood of an unintentional loss of cooling power to the spent fuel pool during the decommissioning process that could result in a spent fuel pool fire. It is suggested that that NRC motivate the shut down plant's owner/operator to quickly move the spent fuel into dry casks by tying the availability of decommissioning funds to the act of placing all the spent fuel into dry casks as soon as it is thermodynamically possible. This simple approach would not require the owner/operator to place the spent fuel into dry casks but with the uncertainty of sufficient decommissioning funds the owner/operator would be motivated to move the spent fuel quickly into casks to receive decommissioning funds more swiftly. Making sure the plant owner sees access to decommissioning funds tied to the movement of spent fuel from pools into casks will expedite the closure of the spent fuel pools. It is understood that the last spent fuel rods may take up to ten years to sufficiently cool before they can be installed into dry casks but given the 60 year timeline to decommission a plant ten years would not be that long of a wait before the plant begins to be dismantled using decommissioning funds. (0826-17 [Morgal, Rick])

Comment: It appears that utilities are going to ask for rate increases to cover decommissioning costs, which means they have not been collecting enough. Given the rising costs of decommissioning, it remains to be seen if current cost estimates are adequate. For license renewals, there would be an additional question about whether extending the life of a reactor increases the decommissioning costs. In summary, I do not include decommissioning costs in this analysis, but these costs could well be another reason my estimate is low. (0900-7 [Cooper, Mark] [Curran, Diane])

Comment: It is now generally accepted that those nuclear plants either decommissioned or closed are now the sites of a nuclear waste facility and will remain so for thousands of years. The plants themselves were licensed to run only when producing electrical energy and all designed to be safe and functional for forty years. (0933-3 [Anonymous, Janet])

Comment: The public oversight, accountability and transparency is totally inadequate relative to the enormous risks of the decommissioning project. Irradiated fuel transfers have never been attempted on this scale before. So, where does a generic environmental impact statement figure into the decommissioning process? The situation at Zion and Fukushima changes from moment to moment, not only at the physical level, which we can see, but, even more critical, at the molecular and subatomic level. This is a quote from Dr. Gordon Edward, a Canadian physicist and noted authority on radioactive waste: "The central fact about radioactivity is that no one knows how to turn it off. Radioactive materials continue to emit atomic radiation at a rate that cannot be influenced by any of the usual factors-heat, pressure, chemical reactions, absorption, dilution-nothing can be used to speed up, slow down, or stop the process of radioactive disintegration from occurring." This central fact means that 'radioactive cleanup' is a very misleading phrase. It suggests to ordinary people that we can somehow get rid of radioactive contamination. But we cannot do so, at least not in any actual sense. All we can do is move the contamination from one place to another. If you decontaminate one site, you must be contaminating another site. The contamination, whether repackaged, consolidated, or managed, is made less available to the environment of living thing, but it cannot be eliminated. Governments and their electorates have been misled by the nuclear industry into believing false notions about nuclear waste. Lots of impact, millions of dollars spent, they do not know how to do this. There is no way to clean up or dispose of radioactive waste. (0934-2 [Lewison, Linda])

44. Comments Concerning Emergency Planning

Comment: Additionally, currently power companies can end 10-mile radius emergency planning zones within 12 to 18 months post-reactor shutdown, whereas these contingency plans will be needed and should be carried out indefinitely. (0009-4 [Schwartzberg, Lora])

Comment: We have a problem in Philadelphia at bridges. Have a problem. We are trying our best and we're doing a very good job of bringing I-95 up to date, but it's a big, big highway that goes through here. Our emergency planning, how can I put it? Well, let's skip emergency planning. I don't like to say bad things about my city. Emergency equipment, we got emergency equipment, but let us say I hope the groups that are supposed to come out from the Federal Government for emergency problems do it fast. (0030-14-2 [Lewis, Marvin])

Comment: The chances of contamination of storage sites and all resources in large geographic areas necessitate better planning that we have seen thus far. If you must think only of the bottom line, make it the continuation of human existence. (0069-2 [Spangenberg, Samuel])

Comment: If New York State declares emergency evacuation due to nuclear explosion, Long Islanders have no where to go and New York streets are not meant for evacuation route. Remember during the Hurricane Sandy or Irene, or snowstorm, moment people heard the news, all New England colonies went to get gas before major storm hit and evacuated. Some people will not evacuate because they think they'll be safe. Long Islanders has no way to evacuate, unless ferry companies reach to help. Just like in movie, evacuation means heavy traffic jam. If this happens during the rush hour, it's impossible to evacuate because millions of peoples will be stuck in traffic. (0114-2 [Endo, Yuki])

Comment: I had to respond to fires and oil pollution and collisions. And I had patrol boats, harbor tugs and a helicopter to respond to these emergencies, but I later realized that if there was an incident at Indian Point, which is along the Hudson River, we did not have sufficient resources or training to respond to a radioactive emergency. And I wonder whether those resources and the training exists today. (0163-16-4 [Wolf, Peter])

Comment: Thirdly, I was group readiness officer and was involved in planning to respond to a major calamity in the port. The knowledge I gained made me dubious that a successful evacuation of significant proportions to be undertaken if there was a serious accident at Indian Point. When contemplating a nuclear mishap, I also ponder where the hundreds of thousands of evacuated people will go and how they will pay for their expenses if they suddenly have no job and their most important asset, their home, is suddenly worthless because it's in a nuclear contaminated zone. (0163-16-5 [Wolf, Peter])

Comment: In fact, a worker at Indian Point was exposed to radiation and the hospital emergency room took hours for a single one-person incident. What would a big disaster cause? (0163-20-8 [Gellert, Sally Jane])

Comment: Radiation covers entire New York State, portion of Connecticut, and New Jersey. If the state declares emergency evacuation due to nuclear explosion, Long Island -- Long Islanders have nowhere to go and New York streets are not meant for evacuation route. Remember during Hurricane Sandy, or Irene, or snowstorm, moment people heard the news, all New England colonies went to get gas before major storm hit and evacuated. Some people will not evacuate because they think they will be safe. Long Islanders has no way to evacuate unless ferry companies reach to help. Just like in the movie, evacuation means heavy traffic jam. If this happens during the rush hour, it will be impossible to evacuate because millions of people will be stuck in traffic. (0163-27-2 [Endo, Yuki])

Comment: Could people be evacuated safely if there's a fire at a waste fuel pool? Past experience with comparatively minor accidents like Windscale, Three Mile Island, Chernobyl and Fukushima suggests not. But in order to maximize the externalization of radioactive waste costs, within just a couple of years of final reactor shutdown the NRC will not require evacuation planning. This is reckless disregard for public safety and public health. (0230-3 [Garb, James])

Comment: FEMA has stated that they are not ready for any kind of -- stated to me they are not ready for the "big one." The big one meaning the New Madrid Fault. We have 23 reactors there. (0246-24-1 [McCune, Chuck])

Comment: The people in Japan fled into areas of high radiation. The NRC should be required to post nuclear events and status reports seven days a week, not this five days a week with holidays off. The USGS provides 24/7 reporting. So can the NRC. (0246-3-4 [Gray, Erica])

Comment: [E]xpand the emergency planning zones and include the people. Enlarge the planning zone to 50 miles, not ten miles. We're between those two zones, and we do not feel safe. (0250-11-4 [Kerr, Julius])

Comment: [S]o how far away is safe? Ten miles is the industry standard, but our own U.S. Government sets the distance for Americans in Japan at least 50 miles away. (0250-40-5 [Kerr, Beverly])

Comment: Just imagine trying to conduct an evacuation under real emergency conditions like those we've seen in other countries. Emergency planning has not been advanced over the years and must be expanded from 10 to 50 miles. State and local governments are responsible for all emergency response outside of nuclear plant gates. Outside the gates is where the industry's responsibility ends. (0250-40-6 [Kerr, Beverly])

Comment: It is very interesting that our comments tonight are being held in Charlotte, home of Duke Energy. I am a long-term resident of Charlotte. I grew up in the western part of the county. For about five years, I lived in the shadow of McGuire Nuclear Plant. There was a warning siren just down the street from me. If I lived there now, I would know how to evacuate if there was a nuclear emergency. I would be eligible for potassium iodide tablets. I now live in Charlotte, 14 and 17 miles from 4 nuclear reactors. I am not having that same level of protection if there is a nuclear accident at one of those 4 nuclear reactors. This needs to be addressed by the NRC. (0250-64-1 [Gupton, William])

Comment: It would be impossible to evacuate the millions of people living near California's Waste. Of the 34 million people in California, over 8.5 million reside within 50 miles of San Onofre!! (0284-7 [Borchmann, Patricia])

Comment: We need to get that fuel moved, it is deadly. And to say that it's a moderate risk is insane. People have talked about the kind of risk. I was in the Laguna fire in 1993. I watched the absolute -- you couldn't get six miles out of town with only 30,000 of us trying to get out, not 8.4 million. Thirty-thousand, we had one road going in to town, and every lane on Pacific Coast Highway going out and it took six hours to go four miles to get to Crown Valley Parkway. We have firestorms every year that are deadly. They've come up to the doorstep of San Onofre. We cannot be waiting for a solution. (0325-12-3 [Magda, Marni])

Comment: I'd like to take a little show of hands, how many people have had to move from their homeland because of power environmental destruction? Four? Can I get a hand? Okay. We got one person over there. I'm going to raise my hand too. My family lived along the river valley in El Salvador. We got, basically, flooded out due to the damming of Rio Lempa, which is the biggest river in El Salvador. And my family and generations forward have not recovered from this. Imagine if tomorrow you heard the sirens and you had to leave. That's what 160,000 near Fukushima, within 12 miles, were standing, probably around 9 miles from Diablo as the crow flies, as radiation clouds fly. I loved surfing, so I watch the weather; I watch wind patterns. The prevailing winds tend to be 8 to 10 miles an hour from Diablo. That means you have an hour to leave as soon as the sirens go. And that means -- so we're right here is Los Osos Valley Road. It's the only place in the county that probably has consistent traffic, and my children go to school between Los Osos Valley Road and Higuera. I would not be able to pick them up within an hour if the sirens went off. How many people have had family, or themselves, had cancer? Raise the hands. Okay. What would you have done to prevent that? Would you give up, you know, some financial gain, some benefit, maybe possibly, a job? My father died of stomach cancer. I don't

wish that on anybody. I would have done anything to prevent that. Within an hour, all of us would probably have some kind of cancer. (0326-47-1 [Monge, Roberto])

Comment: Dry cask storage at Daiichi survived the number nine earthquake much better than reactors there and the fuel pool. The NRC assumes that surrounding populations will be successfully evacuated in the event of a fuel pool fire. After the Daiichi explosions, the U.S. advised any Americans within 50 miles to leave. The head of the Japan Atomic Energy Commission warned that if cooling pool number four collapsed, and that risk continues today, an evacuation of 10 million people within 250 kilometers might be required. If that were undertaken in Japan or, similarly, at Indian Point in New York or at Fermi 2 or at Davis-Besse or anywhere in the U.S., it would be impossible to achieve in a necessary timely manner. (0327-27-4 [Macks, Vic])

Comment: Furthermore, we would need an evacuation plan with routes, destinations, immediate notification, long-term housing facilities, competent medical care for radiation exposures, funding for large displaced populations, and full disclosure of the realtime radioactive release measurements. None of that is or has ever been available in the U.S. The de facto plan of the nuclear industry and the NRC for the public is shelter in place and suck it up. (0327-27-5 [Macks, Vic])

Comment: The city as the host community is the first responder to any incidents at the facility. The city is obligated to maintain the necessary police, fire, and other emergency personnel, equipment, and facilities to respond in a timely and meaningful fashion. The city is obligated under the NRC and the State of Minnesota regulations to provide reasonable assurance that it can meet the emergency preparedness plan for the Prairie Island Plant, and accompanying independent spent fuel storage systems. The city as a host community is the recipient of certain tax payments from Xcel Energy that are used to pay for a portion of the necessary public safety services required to satisfy the emergency preparedness plan. While I'm not going to go into the detail tonight about those taxes, suffice it to say that those have declined greatly over the years. In fact, since 1995 there has been a dramatic shift in the tax base from the power plant to other tax payers in the Red Wing community. (0328-2-2 [Rauterkus, Ralph])

Comment: First, regarding emergency preparedness, the NRC has chosen to not include that within the scope of the GEIS. The city believes that this is a mistake. The key factor in any environmental impact statement is to examine the ability to mitigate any potential release or harm that may arise from the activity that is being examined. One of the primary ways mitigation occurs is through emergency preparedness and the response in the event of any incident. The purpose of a response is not to only mitigate, but also to contain and perhaps prohibit any further damage from any release, or a threatened release. It should be noted that for any operation of an ISFSI, that there is requirement that there be in place an emergency response plan; yet, this is found nowhere within the GEIS. Instead, the GEIS simply relies upon the robust characteristics of the containment vessels themselves, whether that be a pool or dry cask storage. Without emergency preparedness, an analysis of mitigation and containment in the event of a release or escape from a containment vessel, the GEIS fails. It must be part of the GEIS in order to be a fair and complete evaluation to be provided. (0328-2-5 [Rauterkus, Ralph])

Comment: Could people be evacuated safely if there's a fire at a waste fuel pool? Past experience with comparatively minor accidents like Windscale, Three Mile Island, Chernobyl and Fukushima says no. But in order to maximize the externalization of radwaste costs, within just a couple of years of final reactor shutdown the NRC will not require evacuation planning. This is altogether unacceptable. (0348-9 [Agnew, David] [Roscoe, Lee])

Comment: As things are now, hot radioactive waste is stored in tanks that, should they lose their cooling water, would not be able to contain the resulting emissions of radiation. This would be disastrous in an area for which no credible evacuation plan has been (or, realistically, can be) devised. (0351-2 [Stein, Robert])

Comment: Could people be evacuated safely if there's a fire at a waste fuel pool? Past experience with comparatively minor accidents like Windscale, Three Mile Island, Chernobyl and Fukushima says no. But in order to maximize the externalization of radwaste costs, within just a couple of years of final reactor shutdown the NRC will not require evacuation planning. This is altogether unacceptable. (0352-9 [Roscoe, Lee])

Comment: Could people be evacuated safely if there's a fire at a waste fuel pool? Past experience with comparatively minor accidents like Windscale, Three Mile Island, Chernobyl and Fukushima says no. But in order to maximize the externalization of radwaste costs, within just a couple of years of final reactor shutdown the NRC will not require evacuation planning. This is altogether unacceptable. (0373-9 [O'Malley, Brian])

Comment: Densely populated regions near nuclear plants like Limerick, clearly cannot be evacuated safely: - For example: NRC knew before Limerick construction was completed that within 30 miles Limerick had over double the population density than could be evacuated safely. Now there are four times as many people. In 2011, PA Safety Officials informed NRC that the Infrastructure could not support safe evacuation. Nuclear utilities are allowed to store HLRW in pools for many decades after reactors permanently shut down, in order to defer the costs of dry cask storage as far off into the future as possible, despite the inherent risks -At the same time, NRC allows utilities, via exemptions from regulations, to do away with 10-mile radius emergency planning zones (EPZs) within as soon as 12 to 18 months post-reactor shutdown. This, despite the lingering risk of storing HLRW in pools at such shutdown reactor sites. -How can populations be evacuated, if EPZs have been dismantled?! (0377-6-3 [Cuthbert, Lewis])

Comment: Unfortunately, history shows us that early post event evacuations are the exception rather than the rule. It seems to be human nature for nuclear managers to attempt first to cover-up the incident and only later reluctantly agree to evacuation. No mention is made in the report of how an emergency evacuation would be carried out to avoid the radioactive hot spots in the contamination plumes. In Fukushima, for example, some people were actually evacuated from an area of lower radiation level to an area of higher radiation because there was a failure to monitor the plumes and coordinate the evacuation based on the monitoring data. (0410-10 [Nelson, Dennis])

Comment: Could people be evacuated safely if there's a fire at a waste fuel pool? Past experience with comparatively minor accidents like Windscale, Three Mile Island, Chernobyl and Fukushima says no. But in order to maximize the externalization of radwaste costs, within just a couple of years of final reactor shutdown you will not require evacuation planning. So anyone with a shred of commonsense can see that 'safe' and 'NRC radwaste plans' fit in one sentence no better than 'containment' and 'vent' do. (0419-9 [Agnew, David])

Comment: If Dai-ichi fuel cooling pool number 4 collapsed---that risk continues today---and evacuation of 10 million people within 250 kilometers was undertaken in Japan, or a similar large population evacuation was necessary at Indian Point in New York, Fermi 2 in Michigan, or anywhere else in the U.S., it would be impossible to achieve in a necessary timely manner. Furthermore, we would need an evacuation plan with routes, destinations, immediate notification, long term housing facilities, competent medical care for radiation exposures,

funding for large displaced populations and full disclosure of real time radioactive release measurements. None of that is or has ever been available anywhere in the U.S. The de facto plan of the nuclear industry and the NRC for the public is shelter in place and suck it up. (0552-2-12 [Macks, Vic])

Comment: Moreover, a 10 mile evacuation is inadequate and misleading. It hides or obfuscates the seriousness of the risk---effectively a denial of the risk level. (0552-2-5 [Macks, Vic])

Comment: Dry cast storage at Dai-ichi survived the number 9 earth quake, tsunami, loss of the electrical grid, and loss of back up diesel generators much better than the reactors themselves and their fuel pools. The NRC assumes that surrounding populations will be successfully evacuated in the event of a fuel pool fire. After the Dai-ichi explosions, the U.S. advised any Americans within 50 miles to leave: Statement by U.S. Ambassador John V. Roos on March 16, 2011: "The United States Nuclear Regulatory Commission (NRC), the Department of Energy and other technical experts in the U.S. Government have reviewed the scientific and technical information they have collected from assets in country, as well as what the Government of Japan has disseminated, in response to the deteriorating situation at the Fukushima Nuclear Power Plant. Consistent with the NRC guidelines that apply to such a situation in the United States, we are recommending, as a precaution, that American citizens who live within 50 miles (80 kilometers) of the Fukushima Nuclear Power Plant evacuate the area or to take shelter indoors if safe evacuation is not practical." <http://www.whitehouse.gov/issues/foreign-policy/japan-earthquake-tsunami>. (0552-2-9 [Macks, Vic])

Comment: • Further, PW showed in its 2.206 Enforcement Petitions that NRC/FEMA's findings of adequacy of the KLD Estimates systems for notifying the public are insufficient.³⁶ [footnote 36 text: Pilgrim Watch's 2.206 Petition To Modify, Suspend, Or Take Any Other Action To The Operating License Of Pilgrim Station Until The NRC Can Assure Emergency Preparedness Plans Are In Place To Provide Reasonable Assurance Public Health & Safety Are Protected In The Event Of A Radiological Emergency (August 30 2013) and Amendment And Supplement To Pilgrim Watch's 2.206 Petition To Modify, Suspend, Or Take Any Other Action To The Operating License Of Pilgrim Station Until The NRC Can Assure Emergency Preparedness Plans Are In Place To Provide Reasonable Assurance Public Health & Safety Are Protected In The Event Of A Radiological Emergency (Nov 22, 2013)] So that even before emergency planning is officially ended, reasonable assurance is not provided. (0556-5-4 [Lampert, Mary])

Comment: There needs to be an open air policy warning the public if/when a nuke accident occurs, along with preventative measures and medications to be taken. (0623-2 [Individual, Anonymous])

Comment: Through further exemptions from regulations the NRC allows utilities to eliminate the 10-mile radius emergency planning zones (EPZs) required for each facility within as little as 12 to 18 months after a reactor is shutdown. As noted above, this clearly ignores the risk of storing HLRW in pools at such shutdown reactor sites. APV has spoken out publicly in the past about the need, not only to enforce the EPZs, but to expand them to a 50 mile radius. We are concerned for populations who may be largely ignorant of the risks or unaware that the EPZs have been dismantled. And of course such problems are only magnified as we move centuries and millennia into the future. (0648-12 [Price, Scott])

Comment: That the NRC doesn't have its own version of a SWAT team, which should be fully funded by the industry it serves, is really what is missing, imho, in the Nuclear Waste Confidence Arsenal. The containment of nuclear disaster is still a thing of guessing, hoping and praying. To still have this kind of questionable response to disasters that can alter the entire eco-system of the earth, well, you really see the point of those calling for a complete shutdown of this industry. I can say that as a mother, I do echo those conservative views. (We've got scores of natural disaster teams and several of them should be cross-trained and, oh, yeah, that's probably already being done we just haven't seen the reality tv show yet!) (0703-3 [Vandel, Nikohl] [Vandenberg Clermont, Elaine])

Comment: The incredibly ill-suited location of Indian Point makes emergency evacuation all but impossible. As stated by a director of the NRC over 30 years ago: "it is insane to have a three- unit reactor on the Hudson River in Westchester County, 40 miles from Times Square, 20 miles from the Bronx... [Indian Point is] one of the most inappropriate sites in existence."¹¹ [footnote 11 text: *Report of the Office of the Chief Counsel on Emergency Preparedness to the President's Commission on the Accident at Three Mile Island*, October 31, 1979, p. 5.] The high surrounding population around the facility results in significant traffic congestion that would prevent authorities from evacuating the residents living within the artificially small ten- mile Emergency Planning Zone ("EPZ") (let alone the residents beyond that zone) in the event of an emergency. Roads and bridges would not be able to handle the amount of traffic leaving the 10-mile radius and beyond in an emergency situation.¹² [footnote 12 text: See, e.g., Randi Weiner & Steve Lieberman, *Multiple Accidents Close Tappan Zee, Snarl Traffic for Hours*, The Journal News, July 28, 2007 (reporting two accidents—one on each side of the Tappan Zee Bridge, and a raft of fender-benders that blocked breakdown lanes and hindered commuters for hours).] According to an independent analysis of Indian Point's emergency plans commissioned by former New York Governor George Pataki in 2003 and authored by former FEMA director James Lee Witt, the radiological emergency plan for Indian Point is badly flawed, unworkable and key components are unfixable. Witt found that "the current radiological response system and capabilities are not adequate to ... protect the people from an unacceptable dose of radiation in the event of a release from Indian Point."¹³ [footnote 13 text: Review of Emergency Preparedness of Areas Adjacent to Indian Point and Millstone, p. viii, James Lee Witt Associates, 2003, *accessible at*, <http://www.riverkeeper.org/about-us/publications/reports/>, under the "Indian Point Reports" toggle (last accessed Dec. 20, 2013).] On October 8, 2013 a panel of nuclear experts, including the former chairman of the NRC, Gregory Jaczko, confirmed that alleged emergency plans at Indian Point are not designed to protect the public from unhealthy doses of radiation and that it would be best if the plant closes down.¹⁴ [footnote 14 text: See Jim Polson & Peter Ward, Indian Point Nuclear Plant Should be Shut, Jaczko Says, Bloomberg News (Oct. 8, 2013), *available at*, <http://www.bloomberg.com/news/2013-10-08/indian-point-nuclear-plant-should-be-shut-jaczkosays.html> (last visited Oct. 28, 2013).] Thus, the absence of a workable emergency evacuation plan puts the public around the plant at immense risk in the event of an emergency.] (0710-3 [Brancato, Deborah] [Musegaas, Philip])

Comment: As an adult I am only too aware of how inadequate our safety preparations for possible nuclear events, such as the ongoing one which continues from Fukushima Japan. (0733-1 [Vanderlan, Kelly])

Comment: •It would be impossible to evacuate the millions of people living near California's waste. Of the 34 million people in California, over 8.5 million are within 50 miles of San Onofre. (0764-5 [Gilmore, Donna])

Comment: On page 2-14, lines 25-28, the Draft GEIS should indicate, in some fashion, that there are certain minimum requirements associated with storage. This should include statements regarding emergency preparedness and a specific analysis of the same. (0783-2-16 [Harlan, Thomas])

Comment: Under section 4.18, starting on page 4-67 and carrying over to page 4-83, there is an analysis of the environmental impacts and postulated accidents. On page 4-68, lines 1-9, there are discussions of "additional measures ... designed to mitigate the consequences of failures in the first line of defense." The discussion goes on to reference emergency preparedness plans and protective action measures. And that is it. There is no further analysis. In order to meet NEPA requirements, the emergency preparedness plans and other proactive measures must be more fully discussed and explored. These are, as acknowledged in the Draft GEIS, the mitigating measures used in a failure of the containment vessel. (0783-3-8 [Harlan, Thomas])

Comment: I was a Councilman when the plant was licensed and have spoken publicly at many FEMA hearings about the impossibility of evacuating the population of San Clemente and the surrounding communities within the 10 mile radius and it is unbelievable to think of evacuating a 50 mile radius as was requested after the Fukushima disaster. (0785-1 [Korsen, Alan])

Comment: Since the evacuation plan for SONGS was erroneously approved by FEMA in the early 1980's until today no new evacuation routes have been made available, no plan to adequately evacuate the students has been formulated, a major railroad line and highway that links two major cities of Los Angeles and San Diego still run immediately adjacent to the plant. The plant is still in an earthquake zone and stands on a bluff that is susceptible to Tsunamis. (0785-3 [Korsen, Alan])

Comment: Referring to the NRC's website entitled "Spent Fuel Storage in Pools and Dry Casks Key Points and Questions & Answers" located at <http://www.nrc.gov/waste/spent-fuel-storage/faqs.html#26>, the last question regarding emergency planning of plants undergoing the decommissioning process states that: "Offsite emergency planning may be eliminated when the fuel has been removed from the reactor and placed in the spent fuel pool, and sufficient time has elapsed, such that there are no longer any *postulated accidents* that would result in offsite dose consequences large enough to require offsite emergency planning." Regarding the above NRC statement, the NRC needs to include the *postulated accident* of a successful terrorist aircraft attack on the spent fuel pool and its contents being exposed to air due to sufficient aircraft impact and the resulting explosive fireball being forceful enough to excavate sufficient cooling water out of the spent fuel pool to initiate a zirconium cladding fire of the pools contents. With this scenario in mind, the radioactive contents of the spent fuel pool do not significantly reduce over time to a level where offsite dose consequences would be so small that offsite emergency planning could be eliminated. Given the equality of a spent fuel pool fire to a severe nuclear reactor fire (as stated above and in NUREG-2157 section F.2.2) and the numerically indeterminable probability of a successful terrorist attack on a spent fuel pool (stated in Paragraph 4.19.1 of Draft NUREG-2157), it would seem unlikely that there would ever be a time that offsite emergency planning could be eliminated until the spent fuel pools were entirely emptied. There can be no sense of confidence in the NRC's waste storage plan when offsite emergency planning is eliminated before all the spent fuel is removed from the spent fuel pools. The NRC needs to level with the public and state that there are several postulated accidents that make dry cask storage systems more robust and safer than spent fuel pools. Tsunami, earthquake and a successful terrorist aircraft attack are three examples of such postulated accidents that could result in a spent fuel pool fire. Once the NRC accepts the above statement

and steps are taken to expedite the transfer of all the spent fuel from pools to casks before elimination of offsite emergency planning the beginning of a sense of confidence regarding spent fuel could emerge. (0826-22 [Morgal, Rick])

Comment: In a post Fukushima era, the "local community" is now considered to be a 50 mile radius which places over EIGHT MILLION PEOPLE within San Onofre's "local community". (0826-8 [Morgal, Rick])

Comment: Approximately 111- 120 million people, about 40 percent of all the Americans, live within 50 miles of a nuclear plant in the US. Policies which rely on temporarily storing waste in spent fuel pools anywhere near populated areas, are reckless. Population evacuation in response to a serious reactor or spent fuel pool accident is a wishful fantasy. (0840-11 [Taylor, Tom])

Comment: We do not have any evacuation plan from San Onofre site. 10 miles is not enough. We have to learn from Fukushima. Tokyo is 150 miles away from Fukushima Daiichi plant generator, but there are so many hot spots. If something is happen, we could lose much of California. (0850-1 [Bay, Miki])

Comment: On page 2-5, citing Decommissioning GEIS, the process of "storing spent fuel" is described as a delaying up to 60 years. This is an on-going threat to the sacrifice land as well as to the community of a standard 50 mile evacuation zone from Palisades-in which Grand Rapids [my family's homes] suburbs are included, but not the city itself. DOES THAT MEAN WE ARE SAFE IN AN EMERGENCY??? WHERE AND HOW DO WE ACQUIRE THAT INFORMATION??? [it used to be in the telephone book}. (0910-10 [Carey, Corinne])

Comment: NRC's statement, at line 21-22, that "A licensee will also maintain an emergency response plan for ISFSI-related events," is a significant admission that ISFSI emergencies are indeed possible. Whether or not the emergency response plan is adequate is a significant question. And Dominion Nuclear has requested an exemption from NRC, as of June 2013, that it not be required to have any Emergency Planning Zone requirements in place - even though its pool is still full. So any claims by NRC that emergency preparedness will remain in place for dry casks is suspect - as it appears poised to relieve Kewaunee of any such requirement re: its pool! (0919-4-1 [Kamps, Kevin])

45. Editorial Comments on the *Federal Register* Notice

Comment: Rule Package, FR 56779, first column towards bottom. In the discussion of the law suits that led to the 2010 waste confidence rule remand, discussion should be added that describes NRC's illegal actions terminating the Yucca Mountain licensing process. NRC is currently under a writ of mandamus to restart the licensing process and has announced it will complete the Yucca Mountain Safety Evaluation Report. (0544-15 [Enriquez, Elizabeth])

Comment: Rule Package, FR 56791, middle column towards bottom. The accurate, but incomplete, statement is made, "The NRC's review [Yucca Mountain license application] did not identify any issues that would challenge the feasibility of geological disposal." A statement should be added that the Yucca Mountain license application and NRC staff review of that application have shown a safe repository to be technically feasible. (0544-16 [Enriquez, Elizabeth])

Comment: GEIS, Section ES.19, p. Ixii. It's difficult to understand how the NRC unilateral action to terminate the Yucca Mountain licensing process, that led to the lawsuits resulting in the

remand of the 2010 waste confidence rule, would not be included as an area of controversy. At the time of the draft GEIS, it was the subject of ongoing litigation, and subsequently the court has issued a writ of mandamus to NRC that it must restart the Yucca Mountain licensing process. (0544-21 [Enriquez, Elizabeth])

Comment: In the interest of openness and transparency, the final rulemaking package and GEIS should recognize the fact that the Court of Appeals for the DC Circuit has now ruled that the unilateral actions directed by the former NRC chairman to suspend the Yucca Mountain licensing process were illegal. A writ of mandamus has been issued ordering NRC to restart the licensing process; and NRC has publicly stated it intends to complete and release the final Yucca Mountain Safety Evaluation Report. (0544-8 [Enriquez, Elizabeth])

Comment: In addition to the scenarios evaluated and analyzed, the final rulemaking package should recognize that completion and operation of a Yucca Mountain repository continues to be required by the NWPA. (0544-9 [Enriquez, Elizabeth])

Comment: Plain Writing: The actual proposed changes/amendments to the Rule text (10 CFR Part 51) -- as stated on 78 FR 56804 -56805, PART 51, Blocks 1 - 6 -- belong on 78 FR 56776 immediately preceding the SUPPLEMENTARY INFORMATION section of the document. The present organizing order is unclear, ineffective and confusing because, ordinarily, supplementary information is intentionally and appropriately placed BEHIND (after) essential information, not in front of (before) it. Furthermore, the lack of clarity and efficiency is exacerbated by the omission on 78 FR 56776 of any indication of page number for locating the actual proposed changes/amendments to the Rule text. Note that the Table of Contents (78 FR 56776 - 56777) is only applicable to the SUPPLEMENTARY INFORMATION section of the document. Draft Generic Environmental Impact Statement (DGEIS): Pertinent comments exist throughout this document. CITATIONS: 1) 78 FR 56783, SUPPLEMENTARY INFORMATION: Section III, Discussion, A21 -- What should I consider as I prepare to submit my comments to the NRC? 2) 78 FR 56799, SUPPLEMENTARY INFORMATION: Section IV -- Additional Issues for Public Comment, Issues 1 - 4. 3) 78 FR 56803, SUPPLEMENTARY INFORMATION: Section VIII -- Plain Writing. 4) 78 FR 56803, SUPPLEMENTARY INFORMATION: Section X -- Draft Environmental Impact Statement: Availability. (0603-20 [Schonberger, David])

Comment: As the NRC stated in the draft GEIS, the purpose of the document is to prepare a single document that reflects the NRC's current understanding of these environmental impacts. We suggest that the final GEIS include a discussion of the current status of the Yucca Mountain project (which remains the official geologic repository under the NWPA) and the political realities of licensing a national repository. As a host community for the PIN GP ISFSI, our Tribe has grown tired of relying on the NRC's wishful thinking. (0619-1-13 [Mahowald, Philip R.])

Comment: The draft FRN for the final rule currently states that, "(T)he analysis in the GEIS provides a regulatory basis for the final rule." ² [footnote 2 text: Fed. Reg. 56780, Sept 13, 2013, AI.] We believe that this statement should be clarified to convey that the NRC envisions that Transfer Systems and ISFSIs would require rebuilding at some point either at reactors or away from reactors and that 100 years is being used as a reasonable analytical surrogate while research continues. This will also improve the validity of the statement, "(T)he analyses in the GEIS are based on current technology and regulation."³ [footnote 3 text: Fed. Reg. 56788, Sept. 13, 2013, 89.] (0637-9 [Norton, Wayne])

Comment: The above definitions [of "confidence" and "spent"] are language standards, the opposite from NRC uses, deliberately misleading and therefore unacceptable and revealing of NRC policies and principles. (0910-3 [Carey, Corinne])

Comment: My Comment: In all NRC language, use standard language definitions, not twists. (0910-4 [Carey, Corinne])

46. Editorial Comments on the GEIS

Comment: GEIS Section 1.8.1, p. 1-15, lines 6-15 and footnote. Footnote 2 on pages 1-14 and 1-15 is a good addition to the review draft of the GEIS. The discussion regarding the no-action alternative in the Yucca Mountain Final EIS (about halfway down the second page of the footnote on p. 1-15), however, has some factual errors. First, the reference should be to the Final EIS (2002) versus the 2008 reference. The 2008 document is the Supplemental EIS and has no new no-action analysis except the update to dose conversion factors to estimate latent cancer fatalities. The FEIS (DOE 2002) is incorporated by reference in the Supplemental EIS. (0544-25 [Enriquez, Elizabeth])

Comment: TVA identified a few additional changes that should be made to the DGEIS to accurately reflect TVA's plants: •DGEIS Table G-1 ("Capacity of Spent Fuel Pools for Operating Nuclear Power Reactors") should be revised to list Sequoyah as a site with a shared SFP.¹⁴⁸ [footnote 148 text: DGEIS at G-6.] •DGEIS Table G-1 should be revised to list WBN as a site with a shared SFP.¹⁴⁹ [footnote 149 text: *Id.* at G-7.] •DGEIS Table G-4 ("ISFSIs with General Licenses under Part 72") should be revised to change the System Design for Sequoyah from "HI-STORM 10" to "HI-STORM 100S."¹⁵⁰ [footnote 150 text: *Id.* at G-10.] (0694-3-22 [Shea, Joseph])

Comment: There appears to be a typographical error on page F-2 of the DGEIS. The reference to "radioactive heat transfer" should be either "radiation" or "radiative" heat transfer. (0697-3-3 [Bessette, Paul] [Kuyler, Raphael])

Comment: Under section 3.3, page 3-10, lines 31-37, the Draft GEIS should be amended to reference that the PINGP is located within the City [Red Wing, MN] limits. (0783-2-22 [Harlan, Thomas])

Comment: [GEIS Section...4-3:] On GEIS 4-11, line 27, the 15-85 should be 20-85 to be consistent with Section 4.2.1. (0827-7-18 [Ginsberg, Ellen])

Comment: Page 1-22 Lines 1-3 "The storage of spent fuel during the initial licensed term for operation of a nuclear reactor is considered within the site-specific EIS for either a 10 CFR Part 50 or 10 CFR Part 52 licensing review." I think this is again a problem of wording. Probably you mean during the license term prior to ceasing power operations, because the license persists for up to 60 years, and as I mentioned, SCE believes it cannot terminate the license until the ISFSI is decommissioned as well. (0836-37 [Davis, Anonymous])

Comment: Additionally, I refer to the Draft Report length and page numeration which disguises repetitious materials, again at disadvantage to standard public uses. (0910-13 [Carey, Corinne])

Comment: Also on Page 10-1 Index, etc, there are no definitions in standard usage of terms. (0910-14 [Carey, Corinne])

Comment: Even NRC's citation on Page 1-15 creates confusion. NRC cites DOE's "Final EIS for Yucca Mountain (DOE 2008)." But DOE's FEIS for Yucca is dated February 2002. Perhaps NRC is referring to a Supplement to the Yucca FEIS, of which there were a number? (0919-2-18 [Kamps, Kevin])

Comment: This NRC rush job may explain the large number of typos, grammar errors, and other mistakes in the DGEIS text, such as this one: Line 10, "...construction of a new ISFSI pads adjacent to, or nearby, the initial pads" (0919-4-15 [Kamps, Kevin])

Comment: At line 27, NRC wrote "underground" where it meant to write "underwater." (0919-5-19 [Kamps, Kevin])

Comment: On Page 2-14, line 6, NRC makes another spelling error: pernitevery. (0919-7-16 [Kamps, Kevin])

Comment: Page 1-22 Lines 1-3 "The storage of spent fuel during the initial licensed term for operation of a nuclear reactor is considered within the site-specific EIS for either a 10 CFR Part 50 or 10 CFR Part 52 licensing review." I think this is again a problem of wording. Probably you mean during the license term prior to ceasing power operations, because the license persists for up to 60 years, and as I mentioned, SCE believes it cannot terminate the license until the ISFSI is decommissioned as well. (0930-2-11 [Lutz, Ray])

47. Comments Concerning Opposition to Rule or GEIS

Comment: I therefore oppose the Impact Statement. (0021-3 [Biddle, Lynn])

Comment: [O]ne of the NRC officials mentioned a statement of no significance. This particular statement should never be considered in this case. (0030-12-9 [March, Leslie])

Comment: NIRS has obviously a lot of input to provide on the Waste Confidence rule. NIRS has been one of the primary nuclear watchdog groups in the U.S. for the last 35 years. We've seen the evolution of this regulation throughout that time and we believe obviously that the Waste Confidence rule should be withdrawn and want to provide our thoughts on that. (0030-17-1 [Judson, Tim])

Comment: [NIRS] want to address, you know, really the proposed action, which is to essentially re-institute the Waste Confidence rule. And, you know, we believe that this regulation is completely out of date and out of touch with reality, and this is, you know, with no disrespect to the work of the NRC staff that have prepared these documents and the Federal Register notices of the proposed action. (0030-17-2 [Judson, Tim])

Comment: And in fact the very basis, the very underpinning for having a Waste Confidence rule has essentially been invalidated, you know, by reality at this point. I mean the very term "waste confidence" is based on a notion that the NRC is confident that nuclear waste has a solution. And there's really no policy basis or factual basis for that as a matter for streamlining the licensing process of nuclear reactors in this country at this point. (0030-17-4 [Judson, Tim])

Comment: It's amazing that a 20 yr contract is given for radioactive material removal, when there has been established NO QUALITY SPECIFIC PLAN OF PROTECTION ! How crazy, lazy and incompetent can this be? (0036-1 [Maier, Marie])

Comment: Fortunately the courts are now requiring the NRC to have a moratorium on licensing until they do an environmental impact statement on the radioactive waste. Now we have a chance to protect the river by demanding that the waste be stored safely. The Nuclear Regulatory Commission is now developing new rules for the long-term storage of highly radioactive waste from the nation's nuclear reactors. These rules will determine whether or not your state becomes a transportation route for thousands of shipments of highly radioactive waste on super-trucks, or a storage site for some or all of the 70,000 tons of radioactive waste. The federal government is now taking public comments on these rules: please tell the NRC to enact strong rules to protect our communities and environment. We have a very unique opportunity to have a say in how our country handles radioactive waste from nuclear reactors in the future. If we don't step up and comment, we will have lost our ability to protect our grandchildren, and many generations to come, from the deadly dangers of radiation. Let the NRC know that we are not confident with the current way they have regulated radioactive waste they need to do more. Thank you for everything you do for the environment. (0039-3 [Littlejohn, Nick])

Comment: The waste confidence, I shuddered when I heard that word, confidence, waste confidence, it sounds like a con game. It sounds like what you're trying to do is create some kind of techno legalese babble to get around the Court trying to enforce the protections that we put in place by law to protect us from nuclear dangers. (0045-12-2 [Kinsey, Bob])

Comment: It's feasible, yes, it's technically feasible just like, you know, you can, it's feasible to write a way around the ruling of the Court, but it won't happen. It's, what is this? A way to grease the so-called nuclear renaissance so that the nuclear industry can move ahead and build more nuclear plants and create the whole fuel cycle that endangers the planet. And as a clergy man I have to say it's immoral to do that, to take those kinds of risks. If I were a medical person I would say that the precautionary principle says why take the risk? Why reduce the cost? Why reduce the cost to license nuclear plants and not include the costs that it will take to in any way responsibly handle the waste? (0045-12-8 [Kinsey, Bob])

Comment: I don't have any confidence that that can be done politically or humanly in a capitalist system that will bend all kinds of corners to make a buck rather than be responsible if they can get away with it. There's no way that you can create waste confidence in my mind given the long-term dangers of nuclear waste. (0045-12-9 [Kinsey, Bob])

Comment: I appear today, to comment on the Draft GEIS on Waste Confidence. I reviewed the document, and will continue to do more in-depth analysis of it, and while I'm grateful that the courts mandated this process, I find that the NRC response to that mandate is not only insufficient in many technical areas, but lacks in honesty and integrity. (0045-6-2 [Andrews, Richard])

Comment: The Draft GEIS simply fails to address the realities of the dangers of spent nuclear fuel. In fact, throughout the document, it continually denies the dangers of inherent catastrophic consequences at any of the many causes of potential system failures. Failing to even legitimately describe those consequences. (0045-6-4 [Andrews, Richard])

Comment: But the nicer the waste confidence looks, the more the industry feels comfortable in creating more nuclear waste, which again, if I wasn't able to recycle plastic at my house, if it just turned up in a bin in the backyard for the animals to choke on and to fill up my yard over time, we would stop using the plastic and start looking for something else to use instead. (0045-8-5 [Bartlett, Bill])

Comment: I am very troubled by the NRC DWC GEIS statement's lack of agreement with, or even acknowledgement of, certain basic scientific facts and established theories, as well as other major mistakes. They include: (0052-1 [Tietjen, Jamie])

Comment: The breadth of these failures in this DWC GEIS suggest many questions about the NRC of its competency and corruption. (0052-4 [Tietjen, Jamie])

Comment: The Draft GEIS is nothing more than distraction, denial and deception. It should be withdrawn and totally redirected using reality as a guide toward a sane and safe future. (0059-16 [Andrews, Richard])

Comment: I appear today to comment on the draft GEIS on waste confidence. I have reviewed the document and while grateful that the courts have mandated this process, find that the NRC response to that mandate is not only insufficient in many technical areas but lacks in honesty and integrity. (0059-2 [Andrews, Richard])

Comment: The DGEIS simply fails to address reality of the dangers of SNF, in fact throughout the document continually denies the dangers of inherent catastrophic consequences from any of many potential causes for system failures, failing to even legitimately describe consequences. (0059-4 [Andrews, Richard])

Comment: When NRC ignores actual experience while relying on theoretical and wishful probabilities, we the people can have NO CONFIDENCE in their regulations. (0089-2 [Shaw, Sally])

Comment: Many of us already have no confidence in the NRC. (We don't know how many of their policies are colored by this kind of money.) Nor do we believe anyone can have "confidence" in so-called solutions that allow for waivers, or for the continued production, and storage, of nuclear substances in our midst. (0102-4 [Woodward, Julie])

Comment: I have no confidence. The State of Vermont has no confidence. The New England region doesn't have any confidence. And if you put it out there to the regular people all around this country, there's not a lot of confidence to be had with such a foolish plan. (0112-15-5 [Williams, Chris])

Comment: When the NRC ignores actual experience while relying on theoretical and wishful probabilities, we, the people, have no confidence in their regulations. (0112-18-3 [Shaw, Sally])

Comment: [W]e do not support the GEIS that is one of the two major supporting documents on which the NRC relies, frankly because it is not site-specific, and that the rationale for it is that they want to achieve efficiency. I would suggest that the proper rationale is let's achieve the public health and safety in a way that is reasonable and beyond inexpensive. (0112-2-5 [Lampert, Jim])

Comment: And I have no confidence in what you are doing with the GEIS and I would like to, but I do not. (0112-24-6 [Darling, Ann])

Comment: The Waste Confidence is a sham. Everybody knows it's a continuation of the sham that began with the Atomic Energy Commission back in the 50s which told us that they were going to care for the wastes from cradle to grave. And now here we are today, everybody's got their hands on their head saying what are we going to do with this waste? (0112-34-1 [Chichester, Ben])

Comment: And there is not one ounce of the waste that has been permanently disposed since it has been produced in secret outside of any democratic process by corporations in this country who are still designing and exporting this dangerous technology. And three of them are burning holes to China as we speak, out of control. And you're here today to ask us to have confidence, which was a ploy so that you continue the juggling act that you've been doing for all these years with the nuclear waste. It is a ploy and it has to stop because the people are onto it. (0112-34-2 [Chichester, Ben])

Comment: So you come up with the nifty phrases like interim storage and permanent disposal and below regulatory concern. All these clever phrases to mask what is really a crime against humanity to produce waste that will last for thousands of years to pass on to future generations. It's wrong. And it should be stopped. Stop the charade. Who profits? (0112-34-4 [Chichester, Ben])

Comment: There's no way to make sure it is permanently safe, okay. We need to take a lot of steps back and really think about the safest way to do this. (0112-35-4 [Boyes, Pam])

Comment: So, we do not have confidence in this process or in this GEIS and we think this is really what the NRC stands for, no confidence, no competence. (0112-5-11 [Bogen, Doug])

Comment: Oh, we want to approve the NRC's GEIS. We want to say it's fine. You guys, go ahead, you've got it all under control. We know that, we trust you because you're so open with us. (0112-8-4 [Sachs, Gary])

Comment: The claims made by the NRC in the new DGEIS are so flimsy and full of "wishful thinking" that they should be readily be rejected. It is beyond me how such an agency as the NRC could make such profoundly incomplete and potentially dangerous statements. (0130-1 [Cox, Bruce])

Comment: Yet the NRC plans to have a new rule in place inside of two years, by September 2014. To meet its tight deadline, the NRC plans to adopt a revised rule (10 CFR 51.23) based on a general study of the environmental impacts of continued high-level nuclear waste storage, a so-called generic environmental impact statement. Further, the new generic rule would state that environmental analyses for all future nuclear plants and nuclear fuel storage facilities would not need to consider the environmental impacts of continued storage at each specific site, this defies logic. Rather, the NRC should shut down all generators of nuclear waste until waste storage and environmental impacts are proven safe for as long as the waste remains a threat to our health and environment. The NRC's generic rule approach remains utterly inadequate to satisfy the requirements of the Atomic Energy Act and the National Environmental Policy Act. The Commission is abrogating its responsibility to allow the public to participate in decisions which affect them. A generic basis for nuclear power plant licensing, allowing the creation of more irradiated nuclear reactor fuel, should be accompanied by plant-specific safety and environmental impact studies at the nation's 65 reactor sites, not the one-size-fits-all generic approach now underway. For the above reasons, I respectfully request that the NRC reject the generic Environmental Impact Statement and the revised rule (10 CFR 51.23). (0144-3 [O'Nan, Margaret S.])

Comment: The purpose of NRC's Waste Confidence rule is to streamline nuclear plant licensing by ignoring the million-year, multi-billion dollar problem of what to do with radioactive waste. The only problem Waste Confidence solves is how to permit nuclear plants to continue making this waste when there is no solution for it. (0147-2 [Fallon, Gloria])

Comment: [T]he Draft EIS is significantly flawed. (0163-1-1 [Schneiderman, Eric])

Comment: As such, the Draft EIS fails to meet the requirements of the Circuit Court's ruling by making decisions based on an unsubstantiated hope that the waste will be gone by then. (0163-1-7 [Schneiderman, Eric])

Comment: Attorney General Schneiderman led the successful challenge to the temporary storage rule because he believes that communities that serve as De Facto long-term nuclear waste repositories deserve a full and detailed accounting of the environmental public health and safety risks. Unfortunately, he believes that the Waste Confidence Draft EIS, as presented, fails to provide such a full and detailed accounting, and therefore, fails our communities. Attorney General Schneiderman looks forward to the Commission addressing the Draft's deficiencies in this ongoing rulemaking process and expresses his appreciation to the NRC for the opportunity to comment on the Draft EIS and looks forward to submitting additional written comments during the comment period. (0163-1-8 [Schneiderman, Eric])

Comment: The report itself is really rather absurd honestly. 200 years -- what, 100 years in the short term, other than -- there's a little kid over there -- I don't mean to embarrass you, he'll still be alive, the rest of us won't be. (0163-12-1 [Lee, Michelle])

Comment: So Ms. Jaffee says that GEIS, DEIS, EIS, FEIS, this is the fourth environmental study I've been involved with this year, and I'm alarmed at how Environmental Impact Statements increasingly bend toward industry and away from the public good...And I appreciate and respect the work of the NRC. I do believe there is a level of arrogance and to put this in common parlance, we need more Leonard and a little less Sheldon....That's a Big Bang reference from the Assemblywoman's favorite program. (0163-13-1 [Jaffee, Ellen])

Comment: As I understand it, the NRC is charged with the oversight, not the defense of the nuclear industry, and with all due respect, the GEIS seems to be a huge attempt at legitimizing the continued production of irradiated waste for which we have no true solution. You can monitor, matrix, and massage the facts, but it's all a con, and we need to stop making the waste now. So perhaps a more suitable name for the report is the Waste Con or How to Waste the Confidence of the American People. So, I'm not an engineer and -- but I am a special ed teacher -- sometimes I have to put things in simplistic terms for myself, as well as my students, so here is an analogy. (0163-15-4 [Garner-Ritter, Maureen])

Comment: [W]e're [RiverKeeper] going to go into a lot of detail about why and how we think this generic EIS is both legally and factually completely deficient and why the NRC has to go back to the drawing board and do this over. (0163-2-1 [Musegaas, Philip])

Comment: So I have zero confidence in any kind of policy and rulemaking that doesn't think about women, mothers, young people, kids, you know, people of color. (0163-31-3 [Tonohira, Yuko])

Comment: And I'm speaking also as a New Yorker who is deeply concerned about the con job that seems to be going on here. I have absolutely no confidence in this Waste Confidence Rule nor in this Generic Environmental -- the GEIS Plan. (0163-33-1 [Geist, Sheila])

Comment: This reveals the true nature of the Waste Confidence Rule. It's not about confidence in an existing plan. It's about confidence that if reactors are allowed to continue to create dangerous waste, future humans will, out of necessity, take on the responsibility for

dealing with that waste to the best of our ability precisely because it's so dangerous. Basically, this is a policy of spew it, and they will have no choice but to deal with it. (0163-34-10 [Azulay, Jessica])

Comment: And now the NRC has crafted this superficial new document to justify the same old policy. This is a policy that deprives people like me from the ability to challenge the continued production of radioactive waste at reactors near where we live even when we can clearly see there is still no actual plan for storing it or removing it. (0163-34-3 [Azulay, Jessica])

Comment: I imagine they won't be amused by the rosy predictions in this Generic Environmental Impact Statement just as I am not amused by the prediction from 1979 that a centralized repository would be ready around 2009. (0163-34-7 [Azulay, Jessica])

Comment: The previous Waste Confidence was a house of cards built on a foundation of wishful thinking and it's clear that everybody here or majority of the people here are saying we don't want another wishful thinking document. That the only function that this Waste Confidence decision seems to be providing is aid and comfort to the industry to continue business as usual. (0163-36-1 [Brown, Jeffrey])

Comment: Many of us already have no confidence in the NRC. It's been said tonight. We don't know how many of their policies are colored by this kind of money, nor do we believe anyone can have confidence in any so-called solutions that allow for waivers or for the continued production and storage of nuclear substances. (0163-37-4 [Woodward, Julie])

Comment: The process by which the risks are being evaluated are unacceptable and I would ask the NRC most respectfully to reject -- answer the two questions in the negative. I don't think we have shown that the safely -- we can safely store spent nuclear fuel for the -- after the operational life of the reactor. And I don't think we're going to have an answer in 60 years. (0163-42-3 [Fry, Mark])

Comment: This GEIS, the flaws in this GEIS make this clear that there are conflict-of-interest issues. No matter how much detail goes into these designs, there will be unforeseeable circumstances in the future that future generations will have to bear. With all due respect, the engineers who have made these assumptions in the GEIS should be ashamed of themselves. These are real people lives that we're talking about. (0163-48-6 [Meyer, Bill])

Comment: So on top of that, the, as has been stated by other people, this GEIS is fatally flawed for a variety of reasons. (0163-7-2 [Shapiro, Susan])

Comment: First of all, there is no solution to the problem of nuclear waste. The Waste Confidence Rule amounts just to "Trust us." My third point is that it ignores the problems with waste, the leaks, the fires, the security issues and the other items that other people have testified about and will testify further this evening. The Waste Confidence Rule deals with waste, which is a major environmental issue, not a public relations issue. (0163-9-2 [Gerard, Daniele])

Comment: Nuclear Waste Confidence is bull. How can you really think this will work? Not only money, war, and environmental issues are affected but people! (0166-1 [Ryan, Kate])

Comment: "Nuclear Waste Confidence" is false. We cannot allow more radioactive releases into the environment. Please stop allowing more waste. Prevention is also a Solution! (0170-1 [Morgan, Leona])

Comment: I am against the "Nuclear Waste Confidence." I am deeply concerned with the creation of this waste and do not want any more nuclear waste on our planet! (0172-1 [Drotar, Laura])

Comment: We, members of Environmentalists Inc. (EI) and Women's International League for Peace and Freedom (WILPF), support the statements made by those who object to the Nuclear Regulatory Commission (NRC)'s conclusion that spent nuclear fuel can be stored safely above ground forever. (0174-1 [Thomas, Ellen] [Thomas, Ruth])

Comment: Attorneys and their consultants (some of whom brought the lawsuit against the NRC) call attention to what is wrong with the NRC Draft Waste Confidence Generic Environmental Impact Statement (DWCG EIS) and back up their criticism with numerous examples of failing to comply with federal laws, faulty decision-making practices, and poor operating histories. The Waste Confidence Decision approved by the NRC Commissioner leaves out repository disposal as a part of the waste confidence decision. Furthermore, this policy prevents intervenors from raising questions about the effects of continuing to produce spent nuclear fuel without a repository. (0174-5 [Thomas, Ellen] [Thomas, Ruth])

Comment: The NRC fails to abide by the intent, language, and provisions of the Atomic Energy Act (AEA) and the National Environmental Policy Act (NEPA). (0174-8 [Thomas, Ellen] [Thomas, Ruth])

Comment: I have zero confidence in the Nuclear Regulatory Commission to address the risks of nuclear waste disposal near my home here on the NC/SC border! (0175-1 [Arnason, Deb])

Comment: I am a biologist, a writer, and an activist for clean, safe, renewable energy. I was excited momentarily when I heard that the NRC had been ordered to set aside its "Waste Confidence" policy and assess the environmental impacts of nuclear waste. But after reading about the draft of your new policy, my excitement has waned. I'm a realist. I've spoken at a lot of energy hearings, and one thing I've learned is that government agencies and commissions that are supposed to be protecting the public are generally controlled by the corporations they're supposed to be regulating. Along those lines, the NRC has the reputation of looking out for the interests of the nuclear industry. Reading about your current proposal confirms to me that your goal is to ensure the future of nuclear energy, an industry that should have no future. I see no hint that you have any intention of trying to protect the public, now or in the future. What makes me think that? - Your claim that spent fuel can be managed at reactor sites or other above-ground storage facilities forever; - Your failure to address the vulnerability of these spent fuel pools to catastrophic fire caused by an attack; - Your declaration that the impacts of pool leaks will be insignificant; - Your plan to transfer radioactive spent fuel to new storage casks every 100 years - forever. These and many more absurdities are based on the assumption that government institutions will function safely for hundreds of years, an assertion that is inconsistent with human history and the NRC's own regulations. Your policy is also inconsistent with the mandate of the NWPA that above-ground storage is acceptable only on an interim basis. I'm asking you to behave as though you actually are acting on behalf of public safety, and stop protecting corporations that are profiting from nuclear energy. I'm asking you to behave as though we still have a government that serves people not corporations. You still have some power to make that a reality, in perhaps the most dangerous industry there is. (0185-1 [Kneidel, Sally])

Comment: Abandon the NRC Radioactive Waste Policy to assure safety. There is NO confidence in it. Abandon it, please! (0193-1 [Doyle, Rosemary])

Comment: I REJECT the U.S. Nuclear Regulatory Commission's (USNRC's) high-level radioactive waste confidence Draft Generic Environmental Impact Statement (DGEIS). In fact, the USNRC should WITHDRAW IT--AND DO A COMPLETE REVISION. In other words, I HAVE ABSOLUTELY NO CONFIDENCE IN THE USNRC'S "SO-CALLED 'WASTE CONFIDENCE!!'" (0196-1 [Nelson, Dennis R])

Comment: A generic address of spent nuclear fuel storage is not acceptable considering the history and potential hazards that cannot be seen in future events. Neither should impacts on the environment be considered generic. Sensitive subjects such as these require specific and detailed rulings. (0202-1 [Hill, Jack])

Comment: 30+ years later, we are discussing the future of nuclear waste again and the mounting spent fuel rods. Your 'waste confidence' has been challenged by the courts and now, these years later, the NRC has an environmental impact study. I am not sure why this was not a precedent after the first or second or even third nuclear accident in these past 30+ years. Now, we have Fukushima, and we are told again to not worry. I really cannot understand how so much money can go into this industry without considering the unknown accidents and violations perpetrated within the Energy Sector itself. Your arrogance defies logic. How can the consumer and taxpayer justify an industry that we simply can not trust? (0204-3 [Stein, Tami])

Comment: I respect the difficult decision that the NRC has to make but overall, I oppose the passing of this rule. My comment discusses the potential negative effects of on-site nuclear waste storage, including environmental contamination and psychological stress on the public, the dubious future of a long-term national repository, and possible alternative actions the NRC may be interested in considering. (0205-1 [Lyons, Laura])

Comment: This rule, proposed by the Nuclear Regulatory Commission concerning nuclear waste storage, is attempting to change the wording of 10 CFR 51.23. It would alter the way the code discusses a potential long-term national repository and the environmental impacts of storage at nuclear waste reactors by including a generic environmental impact statement. Although it is beneficial to have an EIS for all reactors, as it will ease the licensing process, there are several problems with passing this rule. (0205-15 [Lyons, Laura])

Comment: For these reasons, I do not support this rule and feel that it should be reconsidered. (0205-18 [Lyons, Laura])

Comment: I oppose this proposed rule because I feel that the negative impacts of its passing would surpass the benefits. I suggest that the NRC reevaluate its options and present a new proposal. (0205-5 [Lyons, Laura])

Comment: We deserve a credible plan for nuclear waste storage! (0209-1 [Hughes, Kevin])

Comment: For reasons stated by the public, and safety advocates, NRC should REJECT the proposed Draft Generic Environmental Impact Statement, and Proposed Rulemaking, and start over, with a more rigorous, full-disclosure analysis of potential impacts, with a Site Specific Environmental Impact Statement for San Onofre's Storage of Nuclear Waste. It is with greatest apprehension that citizens in southern California call upon all NRC Commissioners to fully perform your duty, and take action in the PUBLIC INTEREST, and for short and long term public health and safety, not necessarily in Licensee's interest to protect their profit margin. (0218-10 [Borchmann, Patricia])

Comment: In 2012 New York's Attorney General Eric T. Schneiderman successfully led the legal challenge to NRC's Temporary Storage Rule, because he believed that 'communities that serve as de facto long-term nuclear waste repositories deserve a full and detailed accounting of the environmental, public health, and safety risks. In 2012, a federal circuit court agreed with Attorney General Schneiderman that federal law requires NRC to complete a thorough analysis of public health, safety and environmental hazards such storage would pose before allowing long-term storage of nuclear waste in communities. In reaching its decision, the circuit court found the spent nuclear fuel stored on-site at nuclear power plants "poses a dangerous, long-term health and environmental risk". Another important finding which NRC must recognize is the similarity between San Onofre (SONGS) and the 2012 case led by New York Attorney General Eric Schneiderman, where he faulted NRC for assuming, with no factual basis, that all nuclear waste will be removed from nation's nuclear power plants by 60 years after plants are closed. Since there is no available off-site storage location to store high-level nuclear waste from these facilities, the DGEIS fails to meet requirements of circuit court's ruling, by making decisions based on -unsubstantiated hope' that sufficient, licensed off-site radioactive waste storage capacity will be available to accept nuclear plant waste within 60 years. The same conditions exist here in southern California, where use of high burn-up fuel is also ignored. (0218-2 [Borchmann, Patricia])

Comment: It is my argument that not only should the storage of spent fuels not be perpetually stored at the existing nuclear energy facilities but the facilities once no longer in operation should in a short term (arbitrary) be reclaimed to near natural lands, free of hazardous material and available for future civilizations or other species without ill effect. (0219-11 [Olmstead, Stan])

Comment: I ask that the Nuclear Regulatory Commission rewrite the Draft Generic Environmental Impact Statement for Waste Confidence[.] (0219-12 [Olmstead, Stan])

Comment: My review of the NRC's DGEIS concludes: No Confidence in Waste management by the Commission. (0219-4 [Olmstead, Stan])

Comment: Instead of acknowledging the potentially catastrophic impacts of leaving spent fuel on the surface of the earth indefinitely, the NRC claims that no serious impacts will happen. In place of the previous assumption that a safe repository will be licensed, the NRC has substituted a new and even more absurd assumption -- that spent fuel can and will be safely managed at reactor sites and in other above-ground storage facilities for the indefinite future. This assumption is inconsistent with the Nuclear Waste Policy Act (NWPA); it violates NRC's own regulations and runs counter to common sense and the experience of human history. (0221-1 [Ferguson, Tom])

Comment: By eliminating repository disposal as part of the Waste Confidence Decision, and by protecting licensing decisions from intervenors who raise questions about the environmental effects of continuing to generate spent fuel without a repository, the NRC effectively would institutionalize extended spent fuel storage as a de facto means of spent fuel disposal. This result is inconsistent with Congress' policy in the NWPA, and completely unacceptable from an environmental standpoint. The Draft GEIS should be sent back to the drawing board and the proposed rule should be scuttled. (0221-3 [Ferguson, Tom])

Comment: If we have indeed the confidence and the technology to say that we are okay to go ahead with these projects, you know, I would suggest that we have a trial site, maybe a storage of these fuels maybe going for a couple years, and if you guys are really confident in your technologies, maybe it could be at your offices and then that way we could see the effects of

these, you know, nuclear waste on you guys, you know, and then we could really assess if this is a small cost or not instead of the small communities and population or low-income people who might be easily deceived by progress. (0244-15-11 [Zuccarini, Ana])

Comment: You know, long-term storage, there's not really like a specific time line. You know, just have a little more science with it would be my recommendation. (0244-15-12 [Zuccarini, Ana])

Comment: The proposed action of the draft GIS is to issue a rule that, if adopted, would not require consideration of the environmental impacts of continued onsite surface storage at individual reactor sites. This is absurd and unacceptable and it fails to address the circumstances at individual reactor locations. (0244-3-4 [Hancock, Mandy])

Comment: I am opposed to this rulemaking. It is an enormous waste of time, money, and resources. It must stop. The NRC should take no action to generically address the environmental impacts of continued storage. (0244-6-2 [Steorts, Tim])

Comment: I would just ask that the NRC -- I know it's tough, it's a tough ask, but to really start over and make a really more concerted effort to prepare a EIS that really examines all these impacts. (0244-8-5 [Totou, Jason])

Comment: We oppose the Nuclear Regulatory Commission's waste confidence draft GEIS and ask NRC to withdraw it for a thorough revision. We have no confidence in the NRC's lack of a plan in place. (0245-10-4 [Lewison, Linda])

Comment: In addition, the waste problem is further convoluted by NRC's proposal to include in reactor licenses their idea that spent fuel can be stored safely aboveground forever which would end any public discussion about permanent storage and creation of more waste since there is no problem. (0245-14-5 [Kurz, Carol])

Comment: We ask that the NRC withdraw its proposed DGEIS until the NRC provides substantial proof and scientific evidence of the safety of their conclusions. (0245-14-9 [Kurz, Carol])

Comment: It's important that they get it right, which is why they should be withdrawing this current plan and going back to the drawing board. (0245-19-11 [Smith, Ed])

Comment: The draft GEIS reinstitutes 'kick the can down the road' approach that has failed to address the magnitude of our nuclear waste problem and legacy. (0245-19-6 [Smith, Ed])

Comment: Putting the GEIS into effect after the operating life of a nuclear reactor is a sham and in no way a proper approach to spent fuel management. (0245-19-8 [Smith, Ed])

Comment: As a conclusion, the updated decision is not even a reality, when necessary it's science fiction or fantasy. The Commission hasn't performed a thorough and comprehensive analysis of the future dangers and consequences on the site, onsite storage 60 years after cessation, and offers only a retrospective - Yet, we all know that past performance is not necessarily indicative of future results. (0245-24-5 [Conn, Corey])

Comment: In a nutshell, I'll finish up, the Waste Confidence Proposed Rule here tonight lacks any sufficiently thorough scientific analysis with many options, especially considering spent fuel pool and cask fires, leaks, and waste storage. (0245-29-8 [Shineflug, Marilyn])

Comment: The first point we want to make is that we submit that the GEIS, as written, is inadequate to both the task of satisfying the directives of the 2012 Court of Appeals and it's also inadequate in protecting the health and safety of the public and the environment. For these reasons, we would ask the NRC to withdraw the current DGEIS. (0245-3-2 [Kraft, David])

Comment: We find that NRC's finding of no significant impact regarding issues like spent fuel pool fires, spent fuel pool leaks, the vulnerability of the spent fuel pools and dried cask sites to natural disasters and terrorist assaults, and the NRC's belief in the adequacy of generic findings of reactors to be unfounded, inadequate to the protection of the public health and safety, and in contradiction to the NRC's own definition of what constitutes a nuclear safety culture. (0245-3-5 [Kraft, David])

Comment: I'm a resident of Illinois living in the southwest suburbs of Chicago. I'm circled by nuclear facilities in Illinois all the way to Michigan. The residents of Illinois do not agree to become the nation's nuclear waste dump. But slowly and ever so quietly over time, the residents of Illinois have come to live with the largest amount of high-level radioactive nuclear energy waste of any state in the country. If the NRC's draft Generic Environmental Impact Statement and Rule are adopted, all nuclear facilities will officially become permanent nuclear waste dumps. Discovering that no real individual environmental impact study has been done as to how 30 plus years of nuclear waste will impact an area makes the current situation even more unacceptable. Even more shocking is the government and nuclear industry's current plan to plan that the waste may end up staying onsite forever. I, of course, realize NRC's - and I would add DOE's - unrealistic handling of the nation's nuclear energy waste and are forcing them to face reality which unfortunately is not accomplished in the NRC's draft GEIS and Rule. (0245-30-1 [Snyder, Gail])

Comment: So, the League does not have confidence in the NRC's waste confidence and draft Generic Environmental Impact Statement, and the document should be thoroughly revised on the basis of objective or review of scientific data which includes NRC's own performance data. (0245-41-2 [Cella, Dr. Francine])

Comment: I guess I'm obviously demonstrating the fact that I have no confidence in the waste confidence, and that as a person who has lived in this kind of nuclear necklace of 11 nuclear power plant sites, I am feeling, I really feel trapped by the planned releases of nuclear gases, by the millions of gallons of tritium-contaminated water that was released to the Kankakee River and then to groundwater on Kankakee from the Braidwood Plant, and for all of the other kinds of oopsies that were not acknowledged by the plants, by Exelon, and by other companies that run nuclear power plants. And the NRC hasn't seemed to have done a real good job of protecting us from this. And so, as a mom and a potential grandma and a person who lives here and pays taxes and just retired working as a nurse for 40 years, you know, I object. (0245-45-3 [Aguilar, Margaret])

Comment: I do not support and have absolutely no confidence, and when there was a slight mishap here, I got involved because I called the governors, I called the senators. They didn't know what had happened. I called and they said talk to the DOE. DOE said you got to talk to Emergency Management. They have no clue. I did not like have people, like Tim and I were some stupid idiot. I am not and neither is the rest of this planet. (0245-47-2 [Grace, Karli])

Comment: And I'm coming here today to explain why I do not have the confidence in this Generic EIS and why you shouldn't either. I do not have confidence when I see reactor licenses being renewed without exception regardless of a plant's track record. (0245-6-1 [Headington, Maureen])

Comment: I have absolutely no confidence that the NRC has investigated every single possibility at every single power plant for fires, leaks, natural disasters, and terrorist attack. So, I for one and every single person that put their hand up has no confidence in the NRC's supposed Environmental Impact Statement. (0245-7-4 [Chamberlain, Lora])

Comment: However, rather than pressing forward, we really need to not continue with publishing a Rule that enables the creation of not only more and more of this waste, but also more dangerous waste. (0246-13-5 [O'Leary, David])

Comment: I guess we reject the NRC's Waste Confidence DGEIS and we ask for it to be withdrawn for thorough revision. We have no confidence in the NRC's Waste Confidence for the same reasons that the Court found. (0246-16-1 [Michetti, Susan])

Comment: The Waste Confidence Statement should be rejected. (0246-17-1 [Dugdale, Jane])

Comment: There is no way that we, in 2013, can say that we know in 3013 that the enormous amount of long-lasting radioactive waste that is being generated won't have an environmental impact. It simply defies logic, it defies morality and it is legally -- the document is legally inadequate to justify reinstating confidence. The NRC is supposed to show in this process that it will never have an impact for 60, 160, or virtually forever. Yet, you don't even know the impacts that it is having now. There is not adequate monitoring. (0246-2-4 [D'Arrigo, Diane])

Comment: So, our conclusion is that the NRC should not proceed with this rulemaking and should not be giving new licenses. (0246-2-8 [D'Arrigo, Diane])

Comment: [W]e believe that the environmental analysis represented by the draft GEIS and ordered by the Court of Appeals in New York last year is woefully inadequate. It is not in the spirit of what the Court intended. And it certainly is not fulfilling the purpose of the National Environmental Policy Act. And therefore, it doesn't provide a sufficient basis for eliminating consideration of nuclear waste disposal and storage impacts from reactor licensing proceedings. (0246-22-1 [Fisher, Allison])

Comment: This is the behavior of the Nuclear Regulatory Commission. This is who we are supposed to have confidence in to allow nuclear waste to be stored onsite indefinitely at nuclear facilities around the country. I do not have confidence in the Nuclear Regulatory Commission or their draft Generic Environmental Impact Statement and the accompanying Rule. (0246-25-4 [Snyder, Gail])

Comment: However, the current Draft Rule and Environmental Impact Statement failed to meet the standard established by the D.C. Circuit Court. (0246-7-2 [Zeller, Lou])

Comment: In closing I want to quote from the movie Pandora's Promise, or as many of us refer to it as Pandora's Broken Promises, which was mentioned in Oakbrook two nights ago when the people in Chicago came and gave testimony. A person was walking through the ruins at Fukushima and looked around and said, "This wasn't supposed to happen this way." That is

why we can't have any confidence in a Generic Environmental Impact Statement and why we do not support this document. (0246-9-7 [Lewison, Linda])

Comment: The waste confidence statement in the draft environmental impact study under consideration should be rejected. (0249-1 [Dugdale, Jane])

Comment: There is NO SAFE SOLUTION for deadly wastes that will remain dangerous and cause a huge financial burden on the public, virtually forever. How can a "waste confidence" statement be approved without answers to the above questions? The "confidence statement" must be rejected. (0249-14 [Dugdale, Jane])

Comment: Unless credible answers can be found to our many questions, the waste confidence statement is simply sweeping these risks under the carpet and the NRC is recklessly endangering our communities. Unless you give the draft statement a vote of NO CONFIDENCE, the risks described below should make the NRC liable for regulatory mismanagement. (0249-3 [Dugdale, Jane])

Comment: The Nuclear Regulatory Commission should abandon the generic approach. It should heed the advice and the direct order of the United States Circuit Court for the District of Columbia. (0250-1-7 [Zeller, Lou])

Comment: I was excited for a moment when I heard that the NRC had been ordered to set aside its Waste Confidence policy and assess the environmental impacts of nuclear waste. But after reading through the draft of the new policy, my excitement quickly evaporated. I'm a realist. I've spoken in a lot of energy hearings, and one thing I've learned is that government agencies and commissions that are supposed to be protecting the public are generally controlled by the corporations that they're supposed to be regulating. Along those lines, the NRC has the reputation of looking out for the interests of the nuclear industry. Reading about your current proposal confirms to me that your goal is to ensure the future of nuclear energy, an industry that should have no future. I see no hint that you had any intention of trying to protect the public, now or in the future. What makes me think that, that you're protecting the nuclear industry? Your claim that spent fuel can be managed at reactor sites or other above-ground storage facilities forever ; your failure to address the vulnerability of these spent fuel pools from catastrophic fire caused by an attack; your declaration that the impacts of pool leaks will be insignificant; your plan to transfer radioactive spent fuel to new storage casks every hundred years forever. These and many other absurdities are based on the assumption that government institutions will function safely for hundreds of years, an assertion that is inconsistent with human history, as others have said already tonight, and inconsistent with the NRC's own regulations. Your policy is also inconsistent with the mandate of the NWSA that aboveground storage is acceptable only on an interim basis. So I'm asking you, members of the NRC, to behave as though you actually are acting on behalf of public safety, and stop protecting corporations that are profiting from nuclear energy. I'm asking you to behave as though we still have a government that serves people, not corporations. You still have some power to make that a reality, in perhaps the most dangerous industry there is. (0250-16-1 [Kneidel, Sally])

Comment: Okay. I'll get back on to the waste issue. Okay. This white paper, or the general, Generic Environmental Impact Statement, I've got a feeling, you know, I've noticed that when somebody is speaking the truth and they really want to make things clear for you, they can say what they need to say in just a few sentences, maybe a few paragraphs. You know, when people have to go on and on for pages and pages, and use a bunch of big words, and do a bunch of verbal mumbly-jumbly; it's obfuscation, people. They're trying to fool you. They're

trying to make a joke out of what they're saying. They want you to -- they want your eyes to glaze over, and for you to throw it to the side and say hell, I can't understand this. (0250-23-2 [Ashe, Kenneth])

Comment: [T]he draft Generic EIS fails people and our planet by not adequately addressing the real risks of nuclear waste once again. (0250-28-4 [Embrey, Monica])

Comment: We do not have confidence in this ruling, or in the ability of companies like Duke to manage their nuclear plants; see Crystal River in Florida. (0250-28-6 [Embrey, Monica])

Comment: I think the EIS needs a great deal of reworking. I think certain basic tenets need to profuse and underlie everything in that study. (0250-31-2 [Clark, Terry])

Comment: We have had more than 50 years of wasted confidence and it's time for a real solution. This GEIS is the Generic Environmentally Ignorant Singsong that does, indeed, require a good spanking and ought to be filed where the sun don't shine, and never be heard of again. We deserve better than this. (0250-34-2 [Sorenson, Ole])

Comment: I have zero confidence in the Nuclear Regulatory Commission to address the risks of nuclear waste disposal near my home here on the North Carolina/South Carolina border. (0250-42-2 [Arnason, Deb])

Comment: And, with all due respect, I have no confidence in the NRC to regulate this dangerous industry. I have no faith in your so-called Generic EIS. Waste confidence for hundreds of thousands of years? (0250-48-2 [Hanrahan, Carol])

Comment: The draft GEIS is completely inadequate, all 585 pages of it. It needs to be started over. It's full of questionable assumptions that go from questionable to not even beginning to be credible. It does not satisfy the Nuclear Waste Policy Act or the federal court order. It took a federal court order to throw out this rule and start this process, because the NRC would not do it itself, and this document is more of the same stuff. (0250-5-3 [Safer, Don])

Comment: Just in conclusion -- I assume I'm out of time -- while it is true that paper will block alpha radiation, the reams of paper being used in this bureaucratic process will not enhance public safety. I'm sure the Japanese went through this whole process, something very similar. Look at how it's protecting the people and the biota in the Pacific Ocean. (0250-5-9 [Safer, Don])

Comment: Attorneys and their consultants, some of whom brought the lawsuit against the NRC which led to this hearing today, back up their criticism with numerous examples of the NRC's failure to comply with federal laws, faulty decision-making practices, and poor operating histories. The NRC fails to abide by the intent, language, and provisions of the Atomic Energy Act and the National Environmental Policy Act. (0250-51-4 [Thomas, Ellen])

Comment: I urge the Nuclear Regulatory Commission not to adopt the ruling. I oppose the EIS. (0250-59-1 [Krotz, Susan])

Comment: The American people have little basis to find confidence in both the Generic Environmental Impact Statement and the concept of nuclear waste storage outside the regulated community, as evidenced by the commenters and comments made at this evening's session. (0250-63-1 [Kasher, Brian])

Comment: The NRC can start by changing this one simple aspect of the nuclear energy framework by disavowing Waste Confidence in the shortcut generic approach to U.S. nuclear policy. (0250-63-5 [Kasher, Brian])

Comment: We thank the NRC for hearing our comments tonight, but we strongly oppose the draft comments of the EIS statement. (0250-64-6 [Gupton, William])

Comment: Redevelop what it is and what we know. You all are smart enough to come up with something better than this. Even our court system realized it, from Washington down, and let us go back and do what we need to do. Bring back something that the public can take hold to[.] (0250-8-3 [Utle, Charles])

Comment: In view of the above mentioned hazard at Fukushima, I reject any confidence in NRC's plan to relicense any nuclear power plants and NRC's confidence in storage of Diablo's waste in spent fuel storage ponds. Please consider the points made by the SLO [San Luis Obispo] Mothers For Peace and adopt their recommendations. (0251-4 [Baker, Sheila])

Comment: The U.S. Nuclear Regulatory Commission (NRC) has "confidence" that the high-level radioactive nuclear waste problem will be solved sometime in the future. So the "regulator" declared that it could continue to give 20-year license extensions to aging, brittle, accident-prone nuclear reactors without an objective, scientific study of safety, storage and disposal of thousands of tons of radioactive waste. (0256-2 [Harkins, Lynne])

Comment: We don't agree. Neither did the Court of Appeals in Washington, D.C., which overturned the NRC waste confidence ruling. In response, the NRC has written a new Waste Confidence Environmental Impact Statement, restating the same unsupported, unsafe, industry-friendly "confidence" in new packaging. (0256-3 [Harkins, Lynne])

Comment: Waste Confidence is a Radioactive ConGame. The purpose of NRC's Waste Confidence rule is to streamline nuclear plant licensing by ignoring the million-year, multi-billion dollar problem of what to do with radioactive waste. The only problem Waste Confidence solves is how to permit nuclear plants to continue making this waste when there is no solution for it. Obey the Court's Ban on Licensing Nuclear Reactors. There is no safe storage solution for nuclear waste, and NRC's new Waste Confidence policy is no more credible than the one the courts threw out. There is no safe dose of radiation, and to pursue licensing on the base of Waste Confidence is illegal and immoral. (0256-5 [Harkins, Lynne])

Comment: In summary, the "Waste Confidence" EIS must be revised to include and to consider all of the above issues. The public deserves and will accept nothing less! (0256-7 [Harkins, Lynne])

Comment: I have no confidence in the guidelines submitted by the NRC in the future of waste disposal. (0264-1 [Gutierrez, Ruth])

Comment: The NRC and DOE have not completed their research on extended storage and transportation, so there is no confidence in the draft GEIS conclusions. (0267-1 [Rodarte, Ron])

Comment: I understand you have complete confidence that nuclear waste will always be securely stored. In that case, to simplify the matter and for your agency to have an excellent vantage point, you should create a storage facility in the basement of your offices. (0268-1 [Rosenstein, Carl])

Comment: We submit that the DGEIS as written is inadequate to both the task of satisfying the directives of the 2012 Court of Appeals; and also inadequate to protecting the health and safety of the public and the environment; and for these reasons was ask NRC to withdraw the DGEIS. (0274-2 [Kraft, David])

Comment: These assertions will be elaborated upon in detail in our subsequent submittal. The first rule of holes is, when one finds oneself in the bottom of a hole, STOP DIGGING. NRC finds itself in a very deep hole, narrowly within the details of its inadequate DGEIS, and more broadly in its irrational defense of permitting the generation of more high-level radioactive waste absent an operational disposal facility. In 2012 the Court of Appeals abolished the NRC's magic linguistic detoxification wand known as the " waste confidence rule." NRC must now provide hard proof, based on real evidence, to back up its assertions. This DGEIS fails in this regard. We ask that NRC withdraw its proposed DGEIS. (0274-6 [Kraft, David])

Comment: We ask that NRC to withdraw it's proposed DGIS until the NRC provides substantial proof based on scientific evidence of the safety of their conclusions. (0276-10 [Kurz, Carol])

Comment: In addition, the waste problem is further convoluted by NRC's proposal to include in reactor licenses their idea that spent fuel can be stored safely above ground forever which would end any public discussion about permanent storage and creation of more waste since there is no problem. (0276-6 [Kurz, Carol])

Comment: Nuclear waste is toxic. "Clean" and "safe" are not terms that you can use to describe nuclear waste or its production. And yet members of the Nuclear Regulatory Commission (NRC) and their staff are repeatedly trying to sell to the public those falsehoods. Therefore, one wonders how the members of the NRC could determine an environmental assessment "finding of no significant impact" regarding nuclear waste and its storage resulting in the recommendation of a generic treatment with no further oversight for a 100 plus years. (0277-1 [Pierman, Bette])

Comment: This member of the public does not share your confidence! (0277-3 [Pierman, Bette])

Comment: Low Level Waste/Indefinite Storage = DOE/NRC; Where's the confidence? (0282-5 [Haber, Jim])

Comment: For reasons stated by the public, and safety advocates, NRC should REJECT the proposed Draft Generic Environmental Impact Statement, and Proposed Rulemaking, and start over, with a more rigorous, full-disclosure analysis of potential impacts, with a Site Specific Environmental Impact Statement for San Onofre's Storage of Nuclear Waste. It is with greatest apprehension that citizens in southern California call upon all NRC Commissioners to fully perform your duty, and take action in the PUBLIC INTEREST, and for short and long term public health and safety, not necessarily in Licensee's interest to protect their profit margin. (0284-12 [Borchmann, Patricia])

Comment: In 2012 New York's Attorney General Eric T. Scheiderman successfully led the legal challenge to NRC's Temporary Storage Rule, because he believed that communities that serve as de facto long-term nuclear waste repositories deserve a full and detailed accounting of the environmental, public health, and safety risks. In 2012, a federal circuit court agreed with Attorney General Schneiderman that federal law requires NRC to complete a thorough analysis of public health, safety and environmental hazards such storage would pose before allowing long-term storage of nuclear waste in communities. In reaching its decision, the circuit court found the spent nuclear fuel stored on-site at nuclear power plants "poses a dangerous, long-

term health and environmental risk". Another important finding which NRC must recognize is the similarity between San Onofre (SONGS) and the 2012 case led by New York Attorney General Eric Schneiderman, where he faulted NRC for assuming, with no factual basis, that all nuclear waste will be removed from nation's nuclear power plants by 60 years after plants are closed. Since there is no available off-site storage location to store high-level nuclear waste from these facilities, the DGEIS fails to meet requirements of circuit court's ruling, by making decisions based on "unsubstantiated hope" that sufficient, licensed off-site radioactive waste storage capacity will be available to accept nuclear plant waste within 60 years. The same conditions exist here in southern California, where use of high burn-up fuel is also ignored. (0284-2 [Borchmann, Patricia])

Comment: The draft Waste Confidence GEIS and rule being discussed at this meeting do not offer solutions. They only perpetuate the unjustified assumption that spent fuel can be stored for a quarter of a million years at reactor sites with no serious impact on the environment. The wording incorporates this assumption into the licenses for all reactors, thereby fencing out any further public discussion in individual reactor licensing actions. (0287-2 [Swanson, Jane])

Comment: Mothers for Peace asserts that these Waste Confidence drafts are not worth the paper they are written on. Scrap them. Start over to find the least dangerous ways to store the wastes already created. And shut down all operating nuclear plants in an orderly way so that NO MORE of this terrible radioactive poison is created. (0287-7 [Swanson, Jane])

Comment: [I urge that] a new, final Rule squarely place into its central focus all matters of public safety and health of our environment, not continued industry accommodation, convenience, and profit. (0303-17 [Lamberts, Frances])

Comment: As stated in the Background section in the Federal Register (September 13, 2013), the Commission's "reasonable confidence" decisions on safety spent nuclear fuel, its current management and eventual geologic disposal, goes back all the way to 1977, reinforced by various later laws and regulatory actions. But in the nearly half-century since then, and fully seven decades since the problem was first created, we are not anywhere near a proper solution. We have only made it to yet another law, still to be passed, under which a "mission Plan" is to be produced on how to deal with the accumulated (and still accumulating) high-level and spent-level-waste byproducts of the way we produce a portion of our electricity. In other words, nothing concrete toward a solution has been achieved in these many decades. (0303-2 [Lamberts, Frances])

Comment: The Commission acknowledges (p. 56778) that its "reasonable assurance" of completion of "one or more mined geological repositories ... by the years 2007-2209" was not materialized. Nevertheless, and despite this historic fact, the Rule repeatedly offers a new confidence conclusion – now of a "25-35 year timeline" – for the needed repository capacity to be built. This seems unjustified on the face of it. Even more unjustified is another stated assertion: that the SNF could be safely kept at the reactor sites "for a total of 160 years" after reactors' operational licensed lifetimes, or even indefinitely if a repository were never built. Propositions like these make the Rule as proposed quite unacceptable. They further undermine public trust in a safe solution for this intractable problem. They counteract, as well, the intent of Congress in the Nuclear Waste Policy law. (0303-6 [Lamberts, Frances])

Comment: There is no confidence in the NRC Radioactive Waste Policy to assure safety. (0304-3 [Young, Roberta])

Comment: There is no confidence in the NRC Radioactive Waste Policy to assure safety. (0305-1 [Norman, M. Jean])

Comment: The Waste Confidence Proposal is sorely lacking in reality-based reasoning. (0309-2 [Green, Jeanne])

Comment: This GEIS is the generic environmentally ignorant sing-song that does indeed require a good spanking and ought to be filed where the sun don't shine and never to be heard of again. We deserve better than this. (0314-2 [Sorensen, Ole])

Comment: NRC has refused to address the incredible risks these facilities pose. The NRC must abandon its so-called 'Waste Confidence' rule because it pretends the low likelihood of an accident makes the extreme consequences irrelevant. This is an evasion of the federal law requiring that the NRC demonstrate that all waste, regardless of quantity, generated by nuclear reactors will be managed safely. NRC's new Waste Confidence policy is no more credible than the one the courts declared illegal. (0319-11 [Nichols, John])

Comment: The NRC must obey the federal law requiring it to demonstrate that nuclear waste will be managed safely. The Waste Confidence rule was declared illegal by a federal court because the NRC has failed to demonstrate that, and NRC has not adequately considered the environmental impacts of the waste that new and relicensed reactors would generate. (0319-3 [Nichols, John])

Comment: [W]hat's frightening to me in this summary is to see small, small, small under environmental impacts at reactor's continued storage. Seeing in here that it's fine to stay 60 years. They will change the casks after 100 to 140 years. (0325-12-1 [Magda, Marni])

Comment: First of all, I want to tell you that there are three things that are really disappointing about human beings, lies, damn lies, and Generic Environmental Impact Statements. This is how -- (Applause.) This is how human beings have learned to lie to themselves. Somehow you put enough words in a document, you say that things are small, and now we're confident that we're okay. Let me tell you how this lying is done. (0325-19-1 [Lutz, Ray])

Comment: This is just a piece of crap that we're supposed to feel good about because it's already over there and we can't stop it. And this is supposed to make us feel confident for some reason. What does it do? Why does it make us feel -- doesn't at all. And we know, the word is out. NRC is lying, and we're not going to believe it any more. This has to go. We have to move the fuel out of this sensitive area. (0325-19-6 [Lutz, Ray])

Comment: The impacts in this Generic EIS are classified as mostly small impacts; that is, until an accident occurs. Is Fukushima small? This EIS does not solve the problem. I have no confidence in this approach or this EIS. (0325-29-8 [Feathers, Jösan])

Comment: [P]lease clean up this report. There's a lot of improvement that's needed. (0325-31-8 [Johnson, Roger])

Comment: The Proposed Waste Confidence Rule is severely flawed on many accounts. Many assumptions are based on outdated studies, wishful thinking, and declarations of confidence. I strongly agree with organizations, such as Union of Concerned Scientists, Nuclear Information Research Service, your own Nuclear San Luis Obispo Mothers for Peace, Alliance for Nuclear Responsibility, as well as with hundreds of citizens, groups, scientists, and individuals, locally and nationwide, which have correctly identified the many problems with this Rule. I make their

comments part of my own. Personally, I believe it is time to scrap the entire document and start all over. (0326-15-2 [Schumann, Klaus])

Comment: Let me just add that, in a tour of Diablo Canyon, I had the privilege of sitting next to a member of the Independent Safety Committee, with over 20 years of experience in the States and with the International Atomic Energy Agency, and he told me, off-the-cuff, we have to stop building these nuclear reactors until we know what to do with the waste. My level of confidence in his assessment is higher than that for any official comment from the NRC and industry spokespersons during the last decade. As for my level of confidence in the environmental and public safety of permitting long-term storage of nuclear waste at Diablo Canyon, it couldn't be lower. (0326-19-4 [Carrigan, Milton])

Comment: [T]he World Business Academy can only conclude that the Waste Confidence Rule is a confidence game and we have no confidence in it. (0326-4-6 [Brown, Jerry])

Comment: I want to mention I do not support the GEIS. I find it flawed. I've read EIS's and I don't think it's fully considered. Consider the slide that was so quickly breezed over where the man mentioned that we could use the NRC as the NRC's own check and balance if, maybe, we don't need to do another site analysis. That sounds to me like the wolf guarding the hen house. That's crazy. You can't just carte blanche they will check themselves. People have expressed concern about where's the licensing, the follow-through. Sure. Confidence? No, I don't have confidence. I'm concerned. (0326-55-2 [Krist, Mark])

Comment: I'm here because of love, love for my children, all children. It's too late to believe that you believe in your Waste Confidence. It's now time for the truth. As members of the NRC you must completely shelve the present Draft EIS and start anew with the truth and with us. We're not asking please, but with a strong and fair demand, to write a truly factual account of the liabilities and how spent fuel rods in open pools on a web of faults, grids of destruction on massive tectonic plates, will affect our land, our state, our country. (0326-58-1 [Davis, Adrienne])

Comment: I'm not happy to be here and I don't appreciate that the NRC has called this meeting. They have to call this meeting. I'm actually really disturbed that 34 years after the first NRC meeting I went to we're still discussing the exact same unmet safety needs. It's exactly the same. The same promises were made that, oh, by the time we run out of room we will have come up with a way to store it. Now we're being asked, once again, oh, in 60 years we'll have come up with a way to store it. I'm not buying it. I don't have any confidence. I have no confidence in that. I have no confidence in the availability of mine storage 60 years after plant closure. I have no confidence in dry cask storage because you're not doing it. You can make all the regulations you want. If you don't enforce them they're meaningless. My mom taught me that when I was a toddler. She counted to three and whacked me. She didn't abuse me, but I knew there was a consequence. (0326-61-1 [Henry, Anita])

Comment: A Generic Environmental Impact Statement. I've been going through these things for a lot of years but this is a new low. This is ridiculous. We've got to stop what we're doing. (0326-64-2 [Nelson, David])

Comment: The Draft Waste Confidence GEIS and Rule being discussed at this meeting do not offer solutions. They only perpetuate the unjustified assumption that spent fuel can be stored for a quarter of a million years at reactor sites with no serious impacts on the environment. The wording incorporates this assumption into the licenses for all reactors, thereby, fencing out any further public discussion of individual reactor licensing actions. (0326-8-2 [Swanson, Jane])

Comment: Mothers for Peace asserts that the Waste Confidence Drafts are not worth the paper they're written on. Scrap them. Start over to find the least dangerous ways to store the waste already created and shutdown all operating nuclear power plants in an orderly way so that no more of this terrible stuff is created. (0326-8-7 [Swanson, Jane])

Comment: I'm also here because I think you, NRC, need to be reminded of what your job really is. In this Draft GEIS, you hurriedly tried to address the issues that are so significant to us. (0326-9-1 [Seeley, Linda])

Comment: Well, they say a picture is worth a thousand words, so this pretty much sums up about Waste Confidence. The first picture says -- oh, the title of the cartoon is "The Three Biggest Whoppers." It's from 1989, so speaks to how long this has been going on. The first picture says, "The check is in the mail." The second says, "Of course, I'll respect you in the morning." It's two kids making out in a car. And the last one says, "I'm from the NRC, DOE and I just need to leave this here temporarily." (0327-11-1 [Kline, Connie])

Comment: If U.S. or foreign operatives contaminated 75 sites in 33 states with eternally lethal radioactive waste we would call them terrorists. Instead, we call them the nuclear industry, the NRC, and the DOE. Rarely have I perused, because I certainly couldn't read all 600 pages of the draft Environmental Impact Statement, but rarely have I perused something that spoke in more generalities and was less substantive -- I've rarely seen documents that were less substantive. The GEIS speaks in terms of 100, 150 years. The longevity and the hazard of this waste is measured in millions of years. There's a real disconnect there. (0327-11-3 [Kline, Connie])

Comment: I think the jig is up, NRC. The smoke and mirrors have cleared. Your solutions are delusions. (0327-11-6 [Kline, Connie])

Comment: My comments at today's public meeting, December 2nd, 2013 in Perrysburg, Ohio pertain specifically to the U.S. NRC's Waste Confidence DGEIS and Proposed Waste Confidence Rule, 10 CFR 51.23. So, I do not support the proposed NRC Rule that is the subject of this meeting, and I emphatically dispute both the premises and the conclusions of the Waste Confidence DGEIS which are codified in the Rule and form the regulatory basis for promulgating it. I also have serious doubts and concerns about the independence and integrity of the NRC's administrative rulemaking process. As Abe Lincoln famously said, "You cannot fool all of the people all of the time." (0327-17-2 [Schonberger, David])

Comment: Thirdly, regarding both supplemental additional issue number 1, and additional issue number 2, I believe that it is duplicative and more than a little duplicitous and deceptive to include inside an official CFR Rule, policy statements and language that are out of bounds of the force of law, as well as beyond the scope and authority of the Agency, NRC, to guarantee, implement, or enforce. I believe that such disingenuous language, policy statements in the Proposed Rule regardless of previous tradition, unintentionally invites the NRC's critics to correctly characterize the Proposed Rule as a con, and as a false assurance based on a foundation of [hubris], fantasy, and delusion. (0327-18-3 [Schonberger, David])

Comment: I've been tracking the nuclear power industry for 33 years, and I see this is the Waste Confidence meeting. This is a Waste Confidence game. This is a con game, and I suggest you shorten the name to Nuke Con Game. (0327-2-1 [Keegan, Michael])

Comment: There's no basis in science engineering, the behavior of the nuclear industry, and the NRC for confidence that high-level radioactive withdrawn fuel rods can or will be managed

with no risk to the biosphere for as long as the radioactivity lasts. For the NRC and the nuclear industry to assert probabilistic assessments of what will happen to radioactive material over 240,000 to a billion years is a fraud and a con game. (0327-27-1 [Macks, Vic])

Comment: I'm here to stand together with my comrades and deliver the message to the NRC that we have no confidence in your draft Generic Environmental Impact Statement. (0327-39-1 [Izant, Carol])

Comment: We cannot accept a newly revised Waste Confidence regulation that continues the fraud of this failed Federal policy, not for our generations, and certainly not for our next seven generations of our people, indeed, of all Americans who will be the first left to face the consequences of our nation's broken promises. (0328-1-7 [Johnson, Ron])

Comment: We're here tonight in a proceeding that, to me, is a little bit muddled because we're talking about a GEIS, we're also talking a Rule. It seems to me, I have here the Executive Summary and the GEIS, that with all due respect to the folks in the room who produced it, is an exceptionally weak, inadequate, and unconvincing document. I won't go on at great length about that, but I'd like to read to you at Executive Summary Section 20, the question is asked, "Are there any remaining issues to be resolved?" And the answer is, "The NRC believes there are numerous sources of the requisite technical data and information available. Therefore, there are no remaining issues that require resolution." That's a rather irrational statement, in my opinion. It's indefensible, and this and many, many other sections of this document need to be revised. (0328-11-1 [Muller, Alan])

Comment: I think this is a historic document. In so far as it -- it finally carries the claims of nuclear waste confidence to its ultimate conclusions, which are somewhat absurd. I think that's well recognized and documented. I mean, we're no longer playing a game of what short-term, long-term, and indeterminate storage means. That's laid out in the charts there, and I'm really grateful for that, because we've been sort of working with that bean game for a long time. So, I think what I really appreciate about this document is that it lays out the reality of the situation we're in. And what I'm deeply concerned about about the document is that with my focus on responsible nuclear waste management as a citizen and as a township planning commissioner, all of the necessary ingredients for responsible long-term storage are essentially scoped out of this document by the assumptions that it makes. Now, it's taken me many years to try to wrap my head around the way that NRC thinks about these things. And the -- my major -- and the assumption that we make that nothing will go wrong until it does is a really disabling assumption. And I think it disables not only NRC, but disables the utilities, and the communities, and everyone else who really cares. And I know that the utilities care, I know the NRC cares, and I know that the communities all care about responsible nuclear waste storage. But, unfortunately, the approach that is taken here undermines our ability to actually grapple with those very specific steps that would, in fact, come as close as we can as human beings in this time frame to ensure responsible nuclear waste management. (0328-12-1 [Eide-Tollefson, Kristen])

Comment: So, as much as I would like to say thank you to the NRC for having this public comment period, I think that creating this, what is it called, the Environmental Impact Statement, it's a sham. And I'm going to continue to fight and speak out against this. (0328-13-3 [Wagner, Sam])

Comment: So, I have no confidence, and we know what this is, we've called it what it is, and we hope you do go back and do it over, because it doesn't cut it. (0328-14-8 [Overland, Carol])

Comment: Our people around the world are human -- the whole human family, the NRC, Confidence Rule, denies them confidence -- denies the confidence in the people around the world, in the scientists around the world. It denies the confidence of the people to create something better, and I'm asking you please use your conscience and do the right thing at every turn. You can't have a generic code or whatever. (0328-16-8 [Bonniwell, Colleen])

Comment: We certainly don't envy the NRC staff. They've been given the impossible task of drafting the Waste Confidence regulations for our nation's failed nuclear waste policy. The District of Columbia Circuit Court of Appeals struck down the NRC's last revision because it was based on hope and not fact. Unfortunately, the Draft Environmental Impact Statement fails for the same reasons. (0328-3-7 [Mahowald, Philip])

Comment: Nothing in the NRC's draft NUREG-2157 changes these facts. Rather than managing a thoughtful reexamination of the NRC's radioactive waste policies and priorities which would have taken considerable time and effort, the NRC chose to hurriedly slap together a document whose only purpose is to provide a paper rationale for lifting the agency's moratorium on reactor licensing and renewal procedures. (0328-9-3 [LaForge, John])

Comment: I reject the NRC's Waste Confidence Draft Generic Environmental Impact Statement and ask the NRC to withdraw it for thorough revision. I don't have any confidence in the NRC waste confidence. There needs to be much more discussion. Just the whole idea of a generic format and discussing high-level nuclear waste is ridiculous. (0329-17-1 [Gray, Erica])

Comment: So I encourage you in the strongest possible terms to please go back to the drawing board and create a new environmental impact statement. (0329-28-5 [Wilansky, Laura])

Comment: I do not support the Proposed NRC Rule that is the subject of this teleconference, and I emphatically dispute both the premises and the conclusions of the Waste Confidence DGEIS, which are codified in the Rule and form the regulatory basis for promulgating it. (0329-7-2 [Schonberger, David])

Comment: I was in attendance at the meeting in San Luis Obispo on Weds. November 20, 2013 and I have to truthfully say that I have no confidence in the proposed rule's change or for the NRC to do what is right. (0330-1 [Beccia, John])

Comment: The NRC's draft document fails to do this [have a waste management system that is designed to handle myriad possible accidents]. I urge the NRC to create a document that ensures public health and safety regarding radioactive waste. (0331-2 [Miller, Kirk])

Comment: This proposed rule foregoes the imperatives of active public participation in agency decision-making, the role of the government in safeguarding national security and the precautionary principle of allowing an industry without adequate solutions to continue with hopes of future innovators to find one. It is not enough to equate all proposed actions and alternatives' impacts to the preferred rule by the agency to ensure agency efficiency. Holding agency efficiency above human health and safety does not parallel the agency's established mission in "regulat[ing] the Nation's civilian use of radioactive materials to protect public health and safety, promote the common defense and security and protect the environment." Please consider the concerns of the current public and future generations. (0339-4 [Wilmott, Emily])

Comment: In candor, we fear that your agency has lost perspective as to what is at stake. If the NRC goes forward with implementation of this GEIS, it will do something that no agency in

the history of America has ever done. It will enable the vast expansion of a threat that will be visited upon thousands of future generations. Make no mistake, this GEIS will be used to assure policy makers and the public that materials with the potential to unleash vast destruction can be allowed to continue to accumulate and remain controllable forever. (0341-1-1 [Mermelstein, Richard])

Comment: This is a point which must be stressed: In the area of nuclear safety, the nations of the world look to the NRC for leadership and guidance. You, as decision makers at the NRC, will set the standards for spent fuel safety. Your assessment will be used to make security determinations worldwide. You may not have sought it when you assumed the job, but an enormous historic responsibility has been leveled upon you. For these reasons we implore drastic revision of the GEIS. The current draft utterly fails to appreciate or honestly convey the level of risk. Worse, it sets a course that may be unalterable. Please be worthy of your public trust. (0341-1-6 [Mermelstein, Richard])

Comment: The Indian Point Safe Energy Coalition (IPSEC) asserts vigorous objection to the methodology, assumptions and core conclusions advanced by the Nuclear Regulatory Commission (NRC) in the Sep 2013 Waste Confidence Generic Environmental Impact Statement Draft Report (hereafter referred to as the "GEIS").[1] [Footnote 1 Text: IPSEC does not want to waste the time of NRC staff by redundantly proffering points previously or concurrently being advanced in filings by other citizen and public interest groups and watchdog organizations. Accordingly, please deem these IPSEC Comments to incorporate and heartily support the comments of the following groups: Alliance for Nuclear Accountability; Beyond Nuclear; Blue Ridge Environmental Defense League; Center for a Sustainable Coast; Citizens Allied for Safe Energy; Citizens Environmental Alliance; Don't Waste Michigan; Ecology Party of Florida; Friends of the Earth; Georgia Women's Action for New Directions; Hudson River Sloop Clearwater; Institute for Energy and Environmental Research; Missouri Coalition for the Environment; NC WARN; Nevada Nuclear Waste Task Force; New England Coalition; Nuclear Information and Resource Service; Nuclear Watch South; Physicians for Social Responsibility; Public Citizen; Riverkeeper, Inc; San Luis Obispo Mothers for Peace; SEED Coalition; Sierra Club Nuclear Free Campaign; Southern Alliance for Clean Energy; and Union of Concerned Scientists.] Simply put: Our vote is: NO CONFIDENCE. (0341-1-7 [Mermelstein, Richard])

Comment: The Draft GEIS is based on poor evaluation of inadequate criteria. It promulgates hypotheses as evidence, unrealistically bounds scenarios, disregards likely malfunctions, discounts human error, minimizes all risks, and shows profound indifference to the effects of radiation upon human health and the environment. The GEIS conclusions of "SMALL," "SMALL," "SMALL," for every time scale imaginable defy both experience and reason. That such a simplistic load of bunk would be presented by the nuclear regulator of the United States after 50 years of nuclear plant "near-misses" and leaks, following 9/11, and in the wake of the Fukushima disaster is unconscionable. This is willful denial. Please, we know there are people within the NRC who do care and work every day to protect the environment and the citizens of our great nation. We need you to speak up and act more forcefully within your agency. We need you to present an honest picture to the public. (0341-2-17 [Mermelstein, Richard])

Comment: Petitioners and intervenors have called attention to what is wrong with the NRC Draft Waste Confidence Generic Environmental Impact Statement (DWC GEIS) and backed up their criticism with numerous examples of failing to comply with federal laws, faulty decision-making practices, and poor operating histories. But many of these concerns and facts have been ignored. The NRC fails to abide by the intent, language, and provisions of the Atomic Energy Act (AEA) and the National Environmental Policy Act (NEPA). We endorse Principles for

Safeguarding Nuclear Waste at Reactors from the Institute for Energy and Environmental Research. (0348-12 [Agnew, David] [Roscoe, Lee])

Comment: Although it never agreed to do so, Massachusetts is forced to host a high-level nuclear waste dump for up to 380 years - if the industry's and regulator's promises are kept. But past promises (40 years of reactor operations and no waste dump) were not kept. Given this history, NRC confidence in a waste plan does not give us any confidence. (0348-5 [Agnew, David] [Roscoe, Lee])

Comment: The environmental impact statement the Nuclear Regulatory Commission prepared for its "Waste Confidence Rule" in response to New York v. NRC is woefully inadequate. (0351-1 [Stein, Robert])

Comment: Petitioners and intervenors have called attention to what is wrong with the NRC Draft Waste Confidence Generic Environmental Impact Statement (DWC GEIS) and backed up their criticism with numerous examples of failing to comply with federal laws, faulty decision-making practices, and poor operating histories. But many of these concerns and facts have been ignored. The NRC fails to abide by the intent, language, and provisions of the Atomic Energy Act (AEA) and the National Environmental Policy Act (NEPA). We endorse Principles for Safeguarding Nuclear Waste at Reactors from the Institute for Energy and Environmental Research. (0352-12 [Roscoe, Lee])

Comment: Although it never agreed to do so, Massachusetts is forced to host a high-level nuclear waste dump for up to 380 years - if the industry's and regulator's promises are kept. But past promises (40 years of reactor operations and no waste dump) were not kept. Given this history, NRC confidence in a waste plan does not give us any confidence. (0352-5 [Roscoe, Lee])

Comment: The draft of the proposed "Waste Confidence Rule" is severely flawed. Many assumptions are based on outdated studies, wishful thinking and declarations of "confidence". I strongly agree with Organizations, such as Union of Concerned Scientists, Nuclear Information and Resource Service, Beyond Nuclear, SLO Mothers for Peace, Alliance for Nuclear Responsibility, as well as with hundreds of citizen groups, scientists and individuals, locally and nationwide, which have correctly identified the many problems with this draft. I make their comments part of my own. (0358-1 [Schumann, Klaus])

Comment: Regarding the DGEIS, I believe it is time to scrap the entire document and start all over. (0358-10 [Schumann, Klaus])

Comment: At the very least, I beg you to keep the present moratorium on nuclear licensing in place & then, be ethical enough to give a deep & thorough review to the up-to-this-date-impossible-to-solve problem of disposing of nuclear waste. And when the true facts are in, we will mostly likely need to muster the courage to close down the existing nuclear plants across this country which have come into old age & have become more unsafe than ever. (0361-4 [Greenfield, Jan])

Comment: Perhaps you could store the waste in the sand with your heads? (0363-1 [Mull, Steven])

Comment: I believe that the proposed GEIS regarding nuclear waste is hopelessly optimistic and not scientifically valid. Please reject this document and direct staff to come up with a document that more accurately reflects the true dangers of nuclear waste. (0370-1 [Wolf, Robert S.])

Comment: Petitioners and intervenors have called attention to what is wrong with the NRC Draft Waste Confidence Generic Environmental Impact Statement (DWC GEIS) and backed up their criticism with numerous examples of failing to comply with federal laws, faulty decision-making practices, and poor operating histories. But many of these concerns and facts have been ignored. The NRC fails to abide by the intent, language, and provisions of the Atomic Energy Act (AEA) and the National Environmental Policy Act (NEPA). (0373-12 [O'Malley, Brian])

Comment: Although it never agreed to do so, Massachusetts is forced to host a high-level nuclear waste dump for up to 380 years - if the industry's and regulator's promises are kept. But past promises (40 years of reactor operations and no waste dump) were not kept. Given this history, NRC confidence in a waste plan does not give us any confidence. (0373-5 [O'Malley, Brian])

Comment: We have summarized our many significant concerns about the high-level radioactive wastes stored at Limerick Nuclear Plant in dangerous fuel pools and casks, and we outlined the many valid reasons we oppose NRC's plan for transport and interim storage. We believe NRC's transport and interim storage plan is really about NRC helping Exelon and other nuclear plant owners to avoid full and permanent financial responsibility and liability for their high-level radioactive wastes. (0377-1-1 [Cuthbert, Lewis])

Comment: ACE rejects NRC'S Generic Environmental Impact Study to make long-term conclusions for nuclear waste storage at Limerick Nuclear Plant or any other nuclear plants in our nation ACE rejects NRC's plan to exclude Limerick from new rules resulting from this NRC Nuclear Waste Study (0377-1-5 [Cuthbert, Lewis])

Comment: NRC is doing the bidding of the nuclear industry and compromised politicians by supporting transport and interim storage of nuclear wastes. NRC is making dangerous decisions that benefit the nuclear industry, but that can be devastating to taxpayers. (0377-2-14 [Cuthbert, Lewis])

Comment: Writing in the GEIS that the environmental impacts caused will be "small" or "small to moderate" is not a substitute for protection. It overlooks the many very possible and probable catastrophic events that can occur and have occurred. It takes no imagination. Just look at the present and the past. (0381-4 [Fasten, Susan])

Comment: I do not have confidence in NRC's Draft NUREG-2157. There are no realistic plans for long-term storage of high level radioactive waste, and I do not believe holding this waste in spent fuel pools and dry cask storage has been adequately studied as a safe indefinite alternative for waste disposal. (0404-1 [Smith, Roger])

Comment: The Draft Generic Environmental Impact Statement (DGEIS) allows the nuclear industry to continue to generate more radioactive waste even though there is no agreed to disposition site for this waste. This makes no sense. I ask the NRC to withdrawn this DGEIS until a safe depository actually exists. (0406-1 [Gerleman, Douglas])

Comment: First, I wish to state my observation that the draft report is massively redundant with much mind-numbing repetition. It seems to have been assembled on a word processor with a few "boiler plate" phrases and paragraphs repeated hundreds of times. I estimate that two-thirds to three-quarters of the report could safely be deleted without any loss of information content at all. A report loaded with so much excess verbiage is not more credible just because it is longer. Instead it buries the significant facts in a mountain of refuse. The report should rather focus on

presenting and developing the factual content in the analyses, by examining scenarios from all sides, and refrain from generalized statements of opinion. Second, the risk analyses in the document are very weak and cannot be supported by the facts. (0410-1 [Nelson, Dennis])

Comment: I urge that you revise the GEIS keeping these principles in mind. (0417-12 [Clark, Terrence])

Comment: The draft GEIS is not consistent with the NRC mission statement. The mission statement of the NRC starts with "protection of human health". (0417-2 [Clark, Terrence])

Comment: The proposed rule should not be adopted. (0422-1 [Dudley, Chris])

Comment: Realistic options must be explored and implemented before time runs out. I strongly object to the seemingly arbitrary change in the NRC policy stating that it will now be okay to leave the nuclear waste where it is, for however long it takes the federal government to create a permanent waste site. That is simply unacceptable. (0423-4 [Graves, Caryn])

Comment: I have no confidence in the Generic Environmental Impact Statement (GEIS) from the Nuclear Regulatory Commission. It is ridiculous to store this waste at this site. There are many potential dangerous events that may occur in this heavily populated and economically important area to allow storage of such hazardous substances at this location. I have no confidence in the NRC. What have they done to gain the public's confidence, nothing. (0426-1 [Morris, Wendy])

Comment: We commend and endorse the Blue Ribbon Commission position and we suggest that the GEIS, in concept and as drafted, is neither compatible with nor supportive of this wise and well-considered approach. (0431-16 [Pascall, Glenn] [Watland, George])

Comment: Residents Organized For a Safe Environment (ROSE) AND MANY CALIFORNIANS, OBJECTS TO THE GENERIC ENVIRONMENTAL IMPACT STATEMENT FROM THE NUCLEAR REGULATORY COMMISSION CONCLUDING THAT NUCLEAR WASTE CAN BE STORED AT SAN ONOFRE INDEFINITELY. OUR PEOPLE SEEK A MORE ACTIVE ROLE IN THE DECOMMISSIONING OF THE SAN ONOFRE NUCLEAR GENERATING STATION (SONGS). WITH SO MUCH EXPOSURE TO DANGER OVER THE FORESEEABLE FUTURE, IT IS ENCUMBERT ON US TO ACT RESPONSIBLY AND OPPOSE THIS GENERIC PLAN. (0433-1 [Stone, Gene])

Comment: We will strongly oppose becoming a permanent nuclear waste site by default, simply because other solutions have failed to materialize or have not been fully explored. With this Resolution, ROSE does formally object to the NRC's incomplete GEIS and seeks to become more actively involved in discussions leading to the best outcome possible concerning this very real and immeasurable threat to ourselves and neighboring communities. It is our fiduciary responsibility to do so on behalf of the citizens. (0433-5 [Stone, Gene])

Comment: I have NO Confidence in the NRC ability to protect citizens of the USA or the world from spent radioactive materials. Please withdraw the draft generic environmental impact statement and provide a thorough and scientifically based revision. (0435-2 [Coor, Kristen])

Comment: The NRC's Waste Confidence Generic Environmental Impact Statement is an exercise in speculation dressed up as science. Simply put, the document relies on the low probability of an accident to justify its position that reactor licensing and relicensing may

resume. I was very young when my mother taught me that by playing with fire, I was going to be burned. The NRC is playing with the "fire" of nuclear waste and putting us all at the risk of being burned. Everyone knows the risks of nuclear waste. Also, everyone knows that storage of high-level radioactive waste in fuel pools and dry casks is not a permanent solution. The whole Yucca Mountain permanent disposal site proposal, read: debacle, would never have been undertaken unless the NRC knew that pools and casks are not a "forever" solution. Yet, the NRC's draft document makes that assertion. (0443-1 [Sabo, Betty])

Comment: The NRC either cares more about its ability to license and re-license nuclear reactors or it cares more about protecting the public from the radioactive poisons that would be released from a radioactive waste accident. The current document proves the NRC cares more for the former and not at all about the later since it uses weak and even shameful arguments for its position. My mother also taught me to assess my life by daily asking myself as I put my head on the pillow at night, "Did I do the best I could today?" The NRC would do well to adopt my mother's test because if the "best" the NRC can do is push nuclear power by using faulty arguments about waste storage then the NRC is not only lying to us but to itself. (0443-11 [Sabo, Betty])

Comment: The NRC should dump this obfuscating, lengthy document and do its job. The NRC should be insisting on a robust waste management system intentionally designed to handle conceivable accidents whether through equipment failure, natural disasters, operator error or any other cause that could release radioactive materials to the environment. (0443-8 [Sabo, Betty])

Comment: It is not your job to "mollify the masses" by protecting the nuclear industry with claims that the environmental risks are "small to moderate" and that nuclear power is one solution to global warming. We are not stupid. We all understand that the damage and threat to humanity and the world by nuclear technology makes global warming look like child's play. (0445-2 [Fasten, Susan])

Comment: What follows are my written comments on the draft Waste Confidence Generic EIS. I have reviewed the document and while grateful that the courts have mandated this process, find that the NRC response to that mandate is not only insufficient in many technical areas but lacks in honesty and integrity. (0447-1-2 [Andrews, Richard])

Comment: Many other elements of the DGEIS are worthy of comment, but my statement will not cover all of the DGEIS deficiencies. (0447-1-9 [Andrews, Richard])

Comment: The companion proposed rulemaking is consequently also seriously flawed both legally and technically, and is inappropriate as public policy and directives to the government and nuclear power industry. (0447-2-10 [Andrews, Richard])

Comment: The Draft Waste Confidence GEIS is nothing more than distraction, denial and deception. It should be withdrawn and totally redirected using reality and honest commitment to prompt solutions for ultimate disposal as a guide toward a sane and safe future. (0447-2-18 [Andrews, Richard])

Comment: Due to the above noted severe inadequacies and inaccuracies of the draft Waste Confidence Generic EIS major revisions must be made or the document abandoned with a report back to the courts that truthfully states these failures of the government to perform its duties to the citizenry. (0447-2-6 [Andrews, Richard])

Comment: In your generic EIS, the impacts are classified as mostly small - that is, until an accident like Fukushima occurs. This EIS does not adequately address, much less, solve the problem. I have NO confidence in your approach or this EIS. (0453-7 [Feathers, Jösan])

Comment: The proposed new Rule on Waste Confidence is deficient in the following three fundamental respects: 3. It does not require the establishment of a permanent National Waste Storage Repository before new or extended licenses are granted. (0454-3 [Waldstein, Joe])

Comment: Realistic options must be explored and implemented before time runs out. I strongly object to the seemingly arbitrary change in the NRC policy stating that it will now be okay to leave the nuclear waste where it is, for however long it takes the federal government to create a permanent waste site. That is simply unacceptable. (0472-4 [Sheridan, Paul])

Comment: The DGEIS fails to fulfill the D.C. Circuit Court's mandate "to properly examine future dangers and key consequences" of spent fuel storage at reactor sites on lands held in trust by the United States for the benefit of federally-recognized Indian tribes. See *New York v. NRC*, 681 F.3d at 473. (0473-16-5 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: In conclusion, it is our opinion the Draft GEIS is inadequate to support a finding that continued storage is safe across sites, and that no further analysis of this issue should be required at the time of site-specific licensing decisions. (0473-4-3 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: I have no confidence in the NRC's waste confidence Draft Generic Environmental Impact Statement. It should be removed for thorough revision. (0475-1 [Graham, Candace])

Comment: The GEIS prepared by the NRC is wholly inadequate and without basis. The GEIS fails to take into consideration costs and environmental impacts of indefinite long term nuclear waste storage in violation of federal law. (0490-4 [Chin, Rebecca])

Comment: This statement also supports the comments of Mary Lampert, Director of Pilgrim Watch regarding the NRC proposed Waste Confidence rule. In total, I respectfully request the NRC to reject the GEIS. (0490-8 [Chin, Rebecca])

Comment: Nothing in the NRC's Draft NUREG-2157 changes these realities. It is apparent that rather than undertake a thoughtful re-examination of the NRC's radioactive waste policies and priorities--which admittedly might have taken considerable time and effort, the NRC chose to hurriedly slap together a document whose only purpose is to provide a thin veneer of a cover to overturn the agency's forced moratorium on reactor licensing and renewal procedures. (0491-3 [Commenters, Multiple])

Comment: Please rethink your proposed rule. (0492-4 [Maghakian, Carol])

Comment: [A]ny NRC policy on Reactor Waste management needs to better address the problems listed above - the present proposal is not acceptable. (0495-7 [Grigg, Richard])

Comment: Until this life-threatening situation is addressed, the World Business Academy can only conclude that the proposed Waste Confidence Rule and EIS is nothing more than a preposterous Con Game, and gives it a resounding vote of NO CONFIDENCE. (0501-5 [Brown, Jerry])

Comment: The purpose of the GEIS is to establish general presumptions regarding the environmental impacts of NRC's licensing decisions regarding "continued storage"¹ [footnote 1 text: The period after the end of the licensed life of operations for a nuclear reactor, and before final disposal in a permanent repository], which may not then be challenged in licensing decisions regarding particular reactors or reactor sites--thereby increasing the efficiency of site-specific licensing processes. (0505-2 [Williams, Jim])

Comment: I DO NOT CONCUR WITH THE PROPOSED RULE AS SAFETY GUIDELINES AND PROTECTIONS ARE NOT INCLUDED.. NRC is in error to say its safe to store spent fuel BEYOND the licensing period for the reactor. This just protects the company operating the spent fuel storage. This proposed rule is not in the best interests of our country, the USA. (0517-1 [Anonymous, JEC])

Comment: NRC is proposing it is feasible to safely store spent nuclear fuel beyond the licensed life for operation of a reactor and to have a mined geologic repository within 60 years following the licensed life for operation of a reactor. Because of the supposition, NRC should add the above comments to the Proposed Rule to insure safe implementation of NRC nuclear spent fuel waste storage. If ALL Items 1 - 7 above, are not feasible or not added to the ruling, then the proposed rule is flawed and should NOT be implemented. (0517-4 [Anonymous, JEC])

Comment: I strongly object to the seemingly arbitrary change in the NRC policy stating that it will now be okay to leave the nuclear waste where it is, for however long it takes the federal government to create a permanent waste site. That is simply unacceptable. Realistic options must be explored and implemented. (0528-1 [Brown, Susan])

Comment: We are opposed to all licensing activities that rely on the Waste Confidence rule and question the adequacy of the new Waste Confidence Generic Environmental Impact Statement. CWFNC also finds that the proposed rule (10 CFR. 51.23) is insufficient for realistically predicting potential environmental impacts of indefinite spent fuel storage. The Draft GEIS should be sent back to the drawing board, the proposed rule should be voided[.] (0531-1-1 [Morgan, Sally])

Comment: In creating the GEIS and new rule, the NRC is prioritizing agency efficiency and cost effectiveness, rather than prioritizing health and environmental safety[.] (0531-1-10 [Morgan, Sally])

Comment: The NRC has treated the Waste Confidence issue as a public relations issue, not as a serious concern for safety and environment. The US has no solution for nuclear waste, and the NRC refuses to admit to the immediate and future risks it poses. Waste Confidence is simply a policy of false promises, used to promote the industry by pretending its real problems don't exist. (0531-1-13 [Morgan, Sally])

Comment: There is no safe storage solution for nuclear waste, and NRC's new Waste Confidence policy is no more credible than the one the courts threw out. (0531-1-15 [Morgan, Sally])

Comment: The NRC's Waste Confidence rule, as well as the new GEIS and rule, serve to streamline nuclear plant licensing while still effectively ignoring the problem of what to do with the radioactive waste. (0531-1-9 [Morgan, Sally])

Comment: We are opposed to all licensing activities that rely on the Waste Confidence rule and question the adequacy of the new Waste Confidence Generic Environmental Impact

Statement. CWFNC also finds that the proposed rule (10 CFR. 51.23) is insufficient for realistically predicting potential environmental impacts of indefinite spent fuel storage. The Draft GEIS should be sent back to the drawing board, the proposed rule should be voided[.] (0531-2-1 [Morgan, Sally])

Comment: In creating the GEIS and new rule, the NRC is prioritizing agency efficiency and cost effectiveness, rather than prioritizing health and environmental safety[.] (0531-2-10 [Morgan, Sally])

Comment: The NRC has treated the Waste Confidence issue as a public relations issue, not as a serious concern for safety and environment. The US has no solution for nuclear waste, and the NRC refuses to admit to the immediate and future risks it poses. Waste Confidence is simply a policy of false promises, used to promote the industry by pretending its real problems don't exist. (0531-2-23 [Morgan, Sally])

Comment: There is no safe storage solution for nuclear waste, and NRC's new Waste Confidence policy is no more credible than the one the courts threw out. (0531-2-25 [Morgan, Sally])

Comment: The NRC's Waste Confidence rule, as well as the new GEIS and rule, serve to streamline nuclear plant licensing while still effectively ignoring the problem of what to do with the radioactive waste. (0531-2-9 [Morgan, Sally])

Comment: The GEIS fails to take into consideration costs and environmental impacts of indefinite nuclear waste storage in violation of federal law. (0537-4 [Commenters, Multiple])

Comment: I respectfully request the NRC reject the GEIS as inadequate, without basis in violation of NEPA. (0537-9 [Commenters, Multiple])

Comment: The Nuclear Regulatory Commission (NRC) should dismiss the findings of its Waste Confidence Generic Environmental Impact Statement. The study is flawed and should not become the excuse for leaving dangerous nuclear waste behind at closed nuclear plants. I oppose the GEIS findings that highly radioactive nuclear waste can be safely stored in current temporary facilities above ground for the long term on the grounds of the closed San Onofre plant and at similar temporary facilities near all other nuclear plants closed or still operating nationwide. (0540-1 [Watland, George])

Comment: The U.S. Nuclear Regulatory Commission seeks public input on NRC NUREG-2157, also known as the Waste Confidence Generic Environmental Impact Statement. The apparent intent of this Statement is to justify storing nuclear fuel waste on-site at closed nuclear power plants for decades or even longer, with no requirement to move the waste at any point to a less hazardous location. The NRC Statement rates the risks of on-site storage as almost insignificant. This is not credible at any site. (0540-3 [Watland, George])

Comment: The NRC should recognize that the attempt to use a GEIS to wish away this problem is fundamentally flawed, and should return to the sound policy proposed by its own Commission. (0540-9 [Watland, George])

Comment: The woefully inadequate draft GEIS is too generic -- it fails to address the complicated and long-lived dangers of managing and storing highly radioactive, spent nuclear fuel. (0542-1 [Paleias, Lewis] [Paleias, Linda])

Comment: First, I reject the NRC's waste confidence draft Environmental Impact Statement (DGEIS), and I ask the NRC to withdraw it for thorough revision. (0543-2 [Senkiw, Sheryl])

Comment: To summarize, the GEIS may be more adroit in analyzing and solving technical challenges, but in terms of analyzing and answering to the political and administrative challenges posed, is poised to create one of the greatest "unfunded mandates" in U.S. history-- a challenge will not be solved by simply ignoring its existence. (0547-5 [Weisman, David])

Comment: There is no basis in science, engineering, the behavior of the nuclear industry and the Nuclear Regulatory Commission (NRC) for confidence that high level radioactive withdrawn fuel rods ("spent fuel") can or will be managed with no risk to the biosphere for as long as the radioactivity last . For the NRC and the nuclear industry to assert probabilistic assessments of what will happen to radioactive material over 240,000 (plutonium) to a billion years is a fraud and a con game. There is insufficient data for such probabilistic assessments to have validity. Apart from that, even a small likelihood of the risk of a serious untoward event involving spent fuel could be catastrophic for all life forms, air, water and land. Nuclear accidents cannot be undone. (0552-1-1 [Macks, Vic])

Comment: NRC is treating nuclear waste not as a major human health and an environmental problem, but as a public relations issue. The U.S. has no solution for nuclear waste, and NRC refuses to address the immediate risks it poses. Waste Confidence is simply a policy of false promises, used to promote the industry by pretending its real problems don't exist. The NRC's new Waste Confidence policy is no more credible than the one the Appeals Court in DC vacated in 2012. (0552-1-15 [Macks, Vic])

Comment: What should be done? The draft study should be withdrawn and efforts to incorporate it into the NRCs regulatory framework should be halted. NRC should start with a clean slate and sponsor a proper investigation of the physics and chemistry of pool fires. Given that NRC lacks the in-house credibility to do this work, the agency should reach out to a broader pool of expertise and follow scientific principles. (0552-2-28 [Macks, Vic])

Comment: Pilgrim Watch (Herein after "PW") provides comment regarding the Proposed Waste Confidence Rule and its supporting documents that apply to storage of spent fuel after the end of operator's licensed life. PW disagrees with the rulemaking's and supporting document's methodology, assumptions and conclusions. (0556-1-1 [Lampert, Mary])

Comment: The proposed rule that accompanies the DGEIS incorporates the latter's baseless conclusions, and would continue to prohibit any public intervention of spent fuel issues in future licensing decisions. The Proposed Rule and Draft GEIS should be shredded. (0556-1-4 [Lampert, Mary])

Comment: Rather, the NRC should do what the Court of Appeals ordered. In *New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012), the Court ordered NRC to conduct a "full analysis" of "the potential environmental effects" of storing spent fuel onsite at nuclear plants "on a permanent basis." 681 F.3d at 479 NRC did not do the "full analysis." It simply assumed that permanent storage was safe. NRC must do a new EIS that complies with the Court's order, examines the probability that an environmentally justified offsite repository will be built and by what date. To do so, the NRC also must conduct a science-based analysis showing the public health and environmental consequences of spent fuel fire risks (including acts of malice) and spent fuel leaks that may occur if offsite storage is unavailable. (0556-1-5 [Lampert, Mary])

Comment: The proposed Waste Confidence Rule rests largely on supporting documents - the draft GEIS, seriously outdated referenced documents, and the NRC's Draft Consequence Study of a Beyond-Design- basis Earthquake Affecting the Spent Fuel Pool for a US Mark I Boiling Water Reactor. The document's methodology, assumptions and findings are faulty. (0556-1-8 [Lampert, Mary])

Comment: PW does not support the DGEIS's environmental assessment of "small impact." The DGEIS' findings are not "real," but were concocted to reach a desired, not a correct, result. (0556-1-9 [Lampert, Mary])

Comment: PW supports NRC going back to the drawing board to perform a sufficient scientifically defensible document. (0556-5-11 [Lampert, Mary])

Comment: In 1979, as an intervener for the Trojan Nuclear Power Plant Spent Fuel Pool Expansion (50-344), the NRC refused to allow me to raise the issue of the time period that wastes would or could remain in the Trojan spent fuel pool. I was told that within 5 years the federal government said that it would have an available repository. The NRC panel thus refused to allow me to ask the question. When I showed new information, obtained subsequent to licensing, that Trojan could not withstand an earthquake that was twice what the reactor was built to withstand, the NRC panel told me it was res judicata, and wouldn't allow the issue to be raised. Well, here we are today, more than 30 years later, with the NRC and its horde of lawyers still floundering about in a state of abysmal denial about the back end of the fuel cycle and with no long term plan to store or dispose of about 80,000 tons of nuclear waste. Spent fuel pools are bulging with re-racked waste subject to fires, terrorist attacks, airplane crashes and earthquakes. The NRC generic statement is just another shell game to keep building and operating nuclear power plants and deny the problem of continuing to generate the waste. In the face of Chernobyl and Fukushima, the NRC pretends nothing has happened or can happen to threaten life on the planet from meltdowns or a terrorist attack on a spent fuel pool. (0559-1 [McCoy, Dave])

Comment: 1. First, the opening statement in the Draft GEIS demonstrates a bias towards licensing a storage or disposal facility. NRC states: "Since the inception of nuclear power, the U.S. Nuclear Regulatory Commission (NRC) (including its predecessor, the Atomic Energy Commission) has worked to find a disposal solution for spent nuclear fuel ... generated by commercial nuclear power reactors"¹ [footnote 1 text: Draft GEIS at 1-1] Congress granted NRC "all the licensing and related regulatory functions of the AEC [Atomic Energy Commission]."² [footnote 2 text: P.L. 93-438 § 201(f)] Given its safety and regulatory obligations, it is essential that NRC not engage in the search for a site specific disposal or storage solution. If NRC is to perform its statutory duties to protect public health and safety, it is critical that NRC's licensing and regulatory evaluations be clearly independent, objective and not biased towards finding a disposal solution. The Blue Ribbon Commission on America's Nuclear Future ("BRC") similarly emphasized that "clearly independent, competent regulators [are] essential" in the evaluation of storage and disposal facilities.³ [footnote 3 text: The Blue Ribbon Commission on America's Nuclear Future, Report to the Secretary of Energy (BRC Report), January 2012, at x; see also at 62 (expressing that accountability is effective with independent regulatory oversight); 66 (independent radiological health and safety)] Utah appreciates and acknowledges Chairman Allison M. Macfarlane's recognition that "NRC is not the responsible Government authority in leading or making decisions on national policy in the back end of the nuclear fuel cycle" and the need for NRC to remain independent of site selection to protect public health, safety, and the environment.⁴ [footnote 4 text: NRC Notation Vote, SECY-13-0061-Proposed Rule: Waste Confidence-Continued Storage of Spent Nuclear Fuel (RIN 3150-AJ20), Chairman Allison M.

Macfarlane (July 12, 2013) at 2] The State of Utah urges Chairman Macfarlane to reflect her position in the final GEIS. (0579-1 [Smith, Amanda])

Comment: In conclusion, I hereby unequivocally cast a "No Confidence" vote on the current version of the proposed Waste Confidence Rule, and I strongly agree with the NRC's critics who correctly characterize the proposed Rule as a "con" and as a "false assurance" based on a foundation of "hubris, fantasy and delusion." (0603-19 [Schonberger, David])

Comment: I do NOT support the proposed NRC Rule that is the subject of these comments, and I emphatically dispute the premises, assumptions and conclusions of the Waste Confidence DGEIS. Therefore, I declare my opposition to using the DGEIS: (a) to support and form the regulatory basis for promulgating the proposed revised Rule, and (b) to codify the DGEIS determinations and conclusions into the text of the proposed revised Rule. (0603-2 [Schonberger, David])

Comment: Delete, vacate, remove and withdraw all of the proposed revisions and all of the proposed conforming amendments and language changes to 10 CFR Part 51. (0603-5 [Schonberger, David])

Comment: The DGEIS, which serves as the technical supporting basis and rationale for promulgating the proposed revised Rule, is fundamentally and fatally flawed, and its generic structure and presuppositions are inherently erroneous and absurd. Garbage in, garbage out. (0603-8 [Schonberger, David])

Comment: The "Waste Confidence Rule" GEIS prepared by the Nuclear Regulatory Commission (NRC) does not adequately address the future impacts of nuclear waste storage at U.S. nuclear reactors, especially for specific reactors such as Indian Point nuclear power plant in Buchanan, NY. (0604-1 [Pisha, Gayla])

Comment: We write to raise concerns about the Draft Generic Environmental Impact Statement on Waste Confidence (DGEIS). In particular, we urge the NRC to further consider plant-specific impact analysis, dry cask storage of nuclear waste, and the impacts of long term plant-based nuclear waste storage. (0607-1 [Messinger, Michael])

Comment: We appreciate the work that the NRC put into crafting the DEGIS. Our comments address what we see as deficiencies in the document, and hope that the NRC will consider our proposals as they move forward with the rulemaking process. (0607-7 [Messinger, Michael])

Comment: Nevertheless, the North American Water Office (NAWO) is at a loss in terms of understanding how otherwise seemingly rational and decent human beings could possibly have put such an insane, absurd pile of crap as this Draft Generic Environmental Impact Statement (GEIS) out for public comment. Yet there it is. (0608-3 [Crocker, George])

Comment: It is arbitrary and disingenuous for the NRC to base its GEIS on false assumptions and non-existent data. The circumstances and facts at Indian Point are contradictory to the main foundational assumptions of the GEIS. Any findings made based on this inaccurate and misleading GEIS will be invalid evaluating the environmental impacts of long term or permanent storage of radioactive waste at Indian Point. (0611-38 [Shapiro, Susan])

Comment: [T]he GEIS is incomplete and inadequate and cannot be used as a basis for any Decisions or Determinations regarding Waste Confidence. (0611-6 [Shapiro, Susan])

Comment: For all of the above reasons, the GEIS fails to satisfy the requirements of a NEPA environmental review and must be rejected as arbitrary, capricious, inaccurate, incomplete and invalid. (0611-61 [Shapiro, Susan])

Comment: I DO NOT HAVE CONFIDENCE IN THE WASTE CONFIDENCE RULE ISSUED BY THE NUCLEAR REGULATORY COMMISSION. (0612-7 [Takarabe, Tamae])

Comment: I absolutely reject NRC's waste confidence Draft Generic Environmental Impact Statement (DGEIS) and demand that you withdraw it for thorough revision. Based on the horrifying reality of nuclear waste and its toxic potential for thousands of years, I have NO confidence in NRC's waste confidence. (0617-1 [Zure, Lisa])

Comment: As a resident of San Clemente, CA, I would like to strongly oppose the GEIS report. (0618-1 [Johnson, Roger])

Comment: The plan should be based on science, not on PR considerations. The GEIS report reads like a PR document promoting the nuclear industry. It minimizes, ignores, dismisses and trivializes true dangers. It grossly overstates safety and expresses blind faith in the most optimistic possibilities. Its excessive reliance on probabilistic risk analysis is unwarranted and unprofessional. Everyone knows that risk analysis is heavily flawed and full of questionable assumptions. (0618-13 [Johnson, Roger])

Comment: Nuclear waste has been accumulating here since 1968. We have housed it long enough (about a half-century) and it is outrageous that you want to keep it here for another 60 years (or 160 or forever). The GEIS report is not a plan. Rather it is an avoidance of responsibility. The NRC logo says "protecting people and the environment" but this is a plan to do the opposite. The idea of labeling this time period as "short term" and "temporary" is irresponsible. Since the GEIS report is not a plan but rather a continuation of doing nothing, you need to completely revise it with a serious plan. (0618-5 [Johnson, Roger])

Comment: First, I find it inexcusable that the NRC, with its massive allocation of taxpayer funding, huge staff and powerful responsibility to oversee (or "regulate") the most dangerous, expensive, and problem-fraught industry in the history of the world has drafted and released a statement and proposed rule that make a mockery of the National Environmental Policy Act, the needs of the American people, and our legal system. Issuing a "generic impact" statement that ignores the main focus of the U. S. Court of Appeals, D. C. circuit ruling and its own purported mission that includes "to protect public health and safety...and protect the environment" the Commission has provided a the document that appears to be another smokescreen for not only the 56 years of accumulated high-level radioactive waste in this country but for allowing the creation of "waste" products from the mining, milling, enrichment and generation of power to continue unabated. (0620-1 [Rivera, Evelyn])

Comment: In my opinion, the Generic Environmental Impact Statement has not addressed the three deficiencies identified by the Court, is inconsistent with the requirements of the original Waste Confidence Rule, as updated, is grossly misleading in applying a "generic" rather than site-specific approach. In addition, it failed to admit that without site designation, design, and realistic time frame for completion of a permanent site for safe disposal of radioactive waste there can be no confidence in the proposal and the accompanying. (0620-11 [Rivera, Evelyn])

Comment: The NRC has, once again, illustrated that its concerns are with the "efficiency" of the industry rather than concerns for the safety of the American people. (0620-4 [Rivera, Evelyn])

Comment: I absolutely reject NRC's waste confidence Draft Generic Environmental Impact Statement (DGEIS) and demand that you withdraw it for thorough revision. Based on the horrifying reality of nuclear waste and its toxic potential for thousands of years, I have NO confidence in NRC's waste confidence. (0621-1 [Casebier, William])

Comment: We believe there are many issues not properly addressed by the DGEIS, specifically related to the storage of hazardous nuclear spent fuel at Entergy's Pilgrim Nuclear Power Station in Plymouth, Massachusetts (Pilgrim). (0622-1-1 [Vale, Karen])

Comment: These regional issues are challenging and require unique understanding, preparation, and mitigation strategies. The DGEIS attempts to legitimize destruction to the environment by complying with the letter of the law, but not with the spirit or true intent of the law, which is to preserve the environment as we develop industry to suit our needs. (0622-1-6 [Vale, Karen])

Comment: There are many technical shortcomings in the DGEIS; many issues that are not addressed properly in the report. (0622-4-13 [Vale, Karen])

Comment: There is no real way to manage nuclear waste, therefore no extension should be granted to find a solution to waste. If the Nuke industry cannot figure after 60 years what to do with their waste products, an extension will not make a difference. (0623-4 [Individual, Anonymous])

Comment: I am adamantly against any extension of the current time constraints with respect to spent nuclear fuel being 'stored in place' at any generating plant anywhere on the planet. (0629-1 [Individual, Anonymous])

Comment: The draft Environmental Impact Statement is inconsistent with the Nuclear Waste Policy Act and does not adequately protect human life or the environment. It should be withdrawn. The proposed Waste Confidence rule does not move national policy toward a sustainable solution to nuclear waste management. Instead it strives to find a waste policy that will allow the NRC to license new reactors without public input regarding spent fuel storage. The proposed rule should be withdrawn. (0646-23 [Hanson, Courtney])

Comment: APV [Alliance for Progressive Values] is deeply skeptical of recent NRC's proposed Waste Confidence Draft Generic Environmental Impact Statement (DGEIS), and we ask the NRC to withdraw it for thorough revision. Below is our critique and suggestions for revision. (0648-1 [Price, Scott])

Comment: APV opposes the NRC draft plan for Waste Confidence DGEIS. (0648-13 [Price, Scott])

Comment: I doubt you have the cajones to exercise the appropriate amends, but you ought to feel compelled to do everything you can, beginning NOW, by rejecting this absurd farce of a Propose Rule. (0651-3 [Wells, Jim])

Comment: The latest Waste Confidence document is simply more fraudulent language making promises and predictions that can not and will not be accomplished or attained. You are obviously kicking the can down the road, again. (0652-4 [Maurer, William])

Comment: This document is "generically" smoke and mirrors.....labeled as "confidence" in title only. Shame on you for passing this document off as science when it's little more than wishful and magical thinking designed to create the perception of confidence. (0652-6 [Maurer, William])

Comment: Are we as a nation capable of such an undertaking? Can we legitimately say it is in our people's interest to keep generating nuclear waste? Do we have an obligation to the other people and creatures of this planet to stop making nuclear waste? Re-write this law with sanity at it's core instead of madness. (0662-8 [McClintock, Francene])

Comment: The Generic Environmental Impact Statement is inappropriate and should be rejected across the nation[.] (0665-2 [van Thillo, Grace])

Comment: Finally, analysis in the draft GEIS should be strengthened to address unsupported assumptions, discrepancies and omissions as identified above. (0669-18 [Walter, Joan])

Comment: As such, the document fails to rigorously and objectively evaluate the no-action alternative, and other reasonable alternatives, and it undermines NEPA's purpose of promoting informed decision making and citizen involvement. (0669-2 [Walter, Joan])

Comment: Millions of people in this country living within close proximity to these radioactive wastes are depending on you to ensure that they are 100 percent safely and securely stored for the indefinite future. That is certainly a daunting task, but it is made all the more uncertain by the false and poorly defended assurances contained in your draft GEIS. (0680-3 [Bogen, Doug])

Comment: The people of San Luis Obispo, California, including myself, who are not employed by PG&E, have NO CONFIDENCE in the Waste Confidence Rule. I urge you to begin the of decommissioning Diablo Canyon Nuclear Power Plant immediately. (0686-21 [Malboeuf, Simone])

Comment: For these reasons and many others, the Draft GEIS is not scientifically valid and remains no more than a hope. I urge you to reject the Draft GEIS... (0686-6 [Malboeuf, Simone])

Comment: I encourage you in the strongest possible terms to go back to the drawing-board with a new EIS. (0687-6 [Wilansky, Laura])

Comment: I frankly have no confidence that the Draft Environmental Impact Statement and the current plans for disposal of nuclear waste are adequate, safe or sufficient. (0687-8 [Wilansky, Laura])

Comment: The GEIS as proposed by NRC and supported by the nuclear industry is a deliberate effort to close out all public due process rights on unresolved nuclear waste issues arising from new licensing and relicensing of nuclear facilities. (0691-1 [Gunter, Paul])

Comment: The Nuclear Regulatory Commission and the nuclear industry are now charting a similar attempt to unreasonably disassociate the expansion and extension of the nuclear waste hazard site-by-site from a reviewable environmental impact statement and a scientifically responsible and demonstrated waste management plan for that nuclear waste. This effort constitutes what amounts to "a confidence game" where the perpetrator seeks to defraud its victim by falsely winning their trust and confidence. (0691-12 [Gunter, Paul])

Comment: Beyond Nuclear therefore opposes the current reframing of the Waste Confidence Decision and the associated rulemaking. (0691-14 [Gunter, Paul])

Comment: The lack of both scientific and societal acceptance for the long-term management of nuclear waste gives rise to legal, civil and humanitarian violations of future generations. The public reasonably recognizes that the current Waste Confidence Decision seeks to disconnect irresponsible nuclear waste dumping from unlimited nuclear waste production. (0691-4 [Gunter, Paul])

Comment: The public recognizes that without a site-specific review and no limits on the production of nuclear waste, it is not reasonable to have confidence in responsibly managing nuclear waste once it is generated for the time frames imposed. (0691-6 [Gunter, Paul])

Comment: As discussed above, until the requested actions are completed, the rulemaking and DGEIS are patently defective. (0692-18 [Skov, Jeff])

Comment: We have NO Confidence in the NRC's ability to safely deal with the enormous problem of nuclear waste. The federal government continues to promote nuclear energy and weapons, and given this reality we have NO confidence that the government is capable of a comprehensive plan to deal with the mounting problem of nuclear waste in a manner that sufficiently protects the public and the environment for millions of years and future generations. (0693-1-1 [Warren, Barbara])

Comment: The regulatory analysis provides part of the reason for the con. "[T]his regulation does not establish any requirements that would place a burden on licensees." (Fed Reg, 10 CFR Part 51 Waste Confidence Proposed Rule, Sept, 13, 2013 p.56803.) NRC's approach to the GEIS has ensured that reactor owners (licensees) will not be burdened at all. While most of us have focused our concern on the terrible treatment of health and environmental impacts, the reality is that if this draft GEIS is allowed to stand, this nation will never need a geological repository because the NRC has determined that there are no significant environmental impacts associated with indefinite storage of spent fuel at reactors or at independent installations. This is despite the fact that long term storage at reactors was never part of the original licensing process, and therefore not thoroughly evaluated. (0693-1-14 [Warren, Barbara])

Comment: The Draft Generic EIS we were presented with starts with an enormous set of problems: •Scientific and technological failure for more than 60 years to solve the "simple" problem of nuclear waste. (0693-1-3 [Warren, Barbara])

Comment: Numerous members of the public have testified in public hearings to their lack of confidence in waste management by the nuclear industry and the NRC, including the con job they believe is being perpetrated on the public regarding this waste confidence activity. A "con" can be a verb or a noun. As a verb it means to trick or cheat somebody dishonestly, by first convincing the victim of something that is untrue; in other words, to lie. As a noun it is a dishonest trick or ploy that takes advantage of somebody's trust. It can also be an argument against doing something or saying it should not be done. (0693-1-8 [Warren, Barbara])

Comment: The NRC faced a fundamental challenge when it was ordered by the court to study the environmental impacts of the failure to obtain a geological repository. Since the nation had determined that only a geological repository represented safe disposal, in the absence of one, how could the Agency deal with long term and indefinite storage of spent fuel? We now know the answer-- by limiting the analysis to situations of low impact, by using inappropriate assumptions, by rigging the analysis and the outcome, by misrepresenting the truth or lying, and by providing no scientific or factual support for the results. (0693-1-9 [Warren, Barbara])

Comment: I. The Draft Generic EIS lacks the science and technical analysis usually found in environmental impact analyses. Instead the NRC continues to advance its own belief system-- its "confidence" in its ability to deal with nuclear waste, originally first expressed in 1984, but eventually struck down by the court in 2010 for the lack of analysis. Even the NRC belief system was undermined when 30 years after its original waste confidence decision, there is no geologic repository available and the agency is forced to revise its beliefs to include indefinite on-site storage of used nuclear fuel. Still nothing has really changed by the production of this GEIS. NRC is still operating with a belief system- "waste confidence"- that is divorced from reality and that has no scientific or technical support. (0693-2-1 [Warren, Barbara])

Comment: III. We Oppose the Proposed Action which is to adopt a rule incorporating the conclusions of the draft GEIS, ensuring that site-specific NEPA analyses of continued spent fuel storage and the associated environmental impacts are never adequately reviewed. (0693-2-11 [Warren, Barbara])

Comment: The GEIS is a completely unscientific document. It is based on faulty assumptions and it avoided looking at the most significant environmental impacts. Therefore, it has absolutely no future value. The GEIS should be discarded as unscientific, inadequate for the stated purpose and unresponsive to the Court order. See our detailed discussion of GEIS failings in Section VII. (0693-2-12 [Warren, Barbara])

Comment: The fundamental lack of science in the draft GEIS provides a substantive reason for it to be discarded and never used in the future by the NRC. (0693-2-5 [Warren, Barbara])

Comment: VII. The GEIS has a long list of significant problems and as a result it cannot be relied on as any kind of reference document for the environmental and public health impacts of spent nuclear fuel and its storage. (0693-3-10 [Warren, Barbara])

Comment: In general, the NRC has failed since its first Waste Confidence decision to establish a factual basis for its "confidence" instead it has regularly adjusted its timeline of when it believed waste would be handled by a permanent repository. In 1984, spent fuel would be handled on-site for a maximum of 70 years. Forty years of the reactor license and 30 years beyond that when a repository would be available. The Commission finding included reasonable assurance that one or more repositories "will be available by the years 2007-2009." (Fed. Reg, Proposed Rule, Sept. 13, 2013, p.56778) In 2008, the NRC assumed 40 years of the first license and 2 renewals-- 80 years and then 60 years of storage on site for a total of 140 years, double the estimate in 1984. Then NRC merely said a repository would be available when necessary. The GEIS defines short term storage as 140 years. Long term storage is for another 100 years, a total of 240 years. Indefinite storage continues indefinitely to the future. None of this storage has any potential significant environmental or health impacts according to the NRC, despite the nature of the hazard. The GEIS like the Waste Confidence decision reflects an opinion or point of view with no substantiation. (0693-3-2 [Warren, Barbara])

Comment: (Tune: "Little Drummer Boy") Not So Little Draft GEIS[.] The GEIS Report is Dumb dumb dumb dumb[.] With assurances that are Dumb dumb dumb dumb[.] Like old spent fuel pools will last A hundred more year Nothing to fear Dumb dumb dumb dumb[.] And corporations wrapped in LLC Won't cut out and flee Dumb dumb dumb dumb [.]And contractors won't make a mistake Cut me a break That's just Dumb dumb dumb dumb[.] (0699-1 [Lee, Michel])

Comment: And who can forget how Davis-Besse Was nearly a big Nuclear messy[.] GEIS is just so Dumb dumb dumb dumb Dumb dumb dumb dumb[.] (0699-3 [Lee, Michel])

Comment: The draft Environmental Impact Statement is inconsistent with the Nuclear Waste Policy Act and does not adequately protect human life or the environment. It should be withdrawn. The proposed Waste Confidence rule does not move national policy toward a sustainable solution to nuclear waste management. Instead it strives to find a waste policy that will allow the NRC to license new reactors without public input regarding spent fuel storage. The proposed rule should be withdrawn. (0700-7 [Women's Action for New Direction, Georgia])

Comment: I have No Confidence in the theory that an indefinite storage solution will ever be a reality. (0701-6 [Wilson, Greg])

Comment: I believe the DGEIS should be withdrawn and totally revised. I have NO confidence in it! (0702-1 [Scarff, Steve])

Comment: So, back to the FEDERAL REGISTER, not some Industry Pamphlet ... While they are wonderful ideas and THANK YOU for expanding the nuclear energy projects and, THANK YOU to whomever it was at the NRC to at least point out that it is all untested and we don't know what will happen disclaimers, of course, the question is -- How does this serve the mission of the NRC? When all the people are sick and dead, how does this kind of approach to rule making serve the mission of the NRC? It doesn't. Why is this in the Federal Register?! Thank you at least for putting my comments in the record. (0703-13 [Vandel, Nikohl] [Vandenberg Clermont, Elaine])

Comment: We thus recommend that the Commission go back to the drawing boards on this DGEIS and proposed rule, and provide for a process that ensures a more balanced and effective approach to promoting nuclear energy by ensuring the safe disposal of SNF at a federal responsibility in accordance with the NWPA, the Standard Contracts, and the long history of federal commitments for SNF disposal that gave rise to the attendant authorization for civilian development of nuclear energy in the first instance. (0704-11 [Callen, Ronald C.] [Keskey, Donald L.])

Comment: The DGEIS and proposed rule do not provide a credible path to ensure SNF disposal at any reasonable future time period. (0704-2 [Callen, Ronald C.] [Keskey, Donald L.])

Comment: The DGEIS and proposed rule appear aimed at promoting the further development of nuclear energy by detaching any concrete obligations for the safe disposal of the SNF generated from nuclear energy. (0704-7 [Callen, Ronald C.] [Keskey, Donald L.])

Comment: In September 2013 NRC issued its Draft GEIS, intending to comply with the Court's Waste Confidence Decision and the subject of today's comments. However, NRC's Draft GEIS fails to comply with the D.C. Circuit's plain direction, thus violating (again) the National Environmental Policy Act, 42 U.S.C. § 4321, et seq. The institutional, legal and regulatory history of managing and, perhaps one day, disposing of nuclear waste, is complicated. But the issue of the agency's failure in this instance and what it must do to rectify this failure is straightforward. (0706-1-1 [Fettus, Geoffrey])

Comment: As per the Court's direction, NRC must: 1) properly identify the major federal action necessitating an environmental impact statement; 2) evaluate the environmental effects of failing to secure permanent storage, with associated alternatives and mitigation strategies; and 3) properly examine future dangers and key consequences with respect to spent fuel pool fires and leaks. NRC has failed to perform each of these actions. (0706-1-2 [Fettus, Geoffrey])

Comment: In closing I want to quote from the movie Pandora's Promise, or, more accurately, Pandora's Broken Promises, which was mentioned in Oakbrook two nights ago, when the people in Chicago came and gave testimony. A person was walking through the ruins at Fukushima, looked around and said, "This wasn't supposed to happen this way." But it did. And reassurances that have no basis in fact continue to erode our trust in the NRC. That is why we can't have any confidence in a Generic Environmental Impact Statement. (0708-7 [Lewison, Linda])

Comment: Based on the foregoing, NRC's DGEIS is inadequate for failing to consider or account for numerous site-specific concerns implicated by the prospect of storing thousands of tons of nuclear waste at reactor sites for long-periods of time. As a result, the DGEIS does not justify or support the proposed rule, which would effectively preclude the consideration of the environmental impacts of waste storage in future reactor and waste storage licensing proceedings. (0710-24 [Brancato, Deborah] [Musegaas, Philip])

Comment: We groups, composed of and representing people impacted by NRC licensing, fundamentally oppose being treated as a "cost" to be systematically "reduced" for the nuclear industry "benefit". If there is a nuclear disaster or any environmental contamination (fast or slow, planned or accidental) we all lose, future generations too. (0711-1 [Olson, Mary])

Comment: As stated in the text of our comments, the Draft GEIS violates NEPA and NRC regulations as well as UN principles and higher moral laws, such as the precautionary principle, and basic logic. (0711-24 [Olson, Mary])

Comment: Statutes and Principles[:] We make these comments under the National Environmental Policy Act, the regulations of the NRC and the laws that empower the NRC to propose the "Waste Confidence" rule (78 Fed. Reg. 56,776 (Sept. 13, 2013)) and the Draft "Waste Confidence" Generic Environmental Impact Statement (Draft GEIS, NUREG 2157). Since these federal statutes and regulations as currently interpreted do not adequately protect our health and security, or that of future generations, we also make these comments under the authority of principles established by The Permanent People's Tribunal on Chernobylⁱⁱ [footnote ii text: Chernobyl: Environmental, Health And Human Rights Implications, Vienna, Austria, 12 - 15 April 1996 (Permanent People's Tribunal Session) January 1, 1999. Solange Fernex (Editor).], The Universal Declaration of Human Rights,ⁱⁱⁱ [footnote iii text: Articles 3 and 6 in particular. http://www.ohchr.org/EN/UDHR/Documents/UDHR_Translations/eng.pdf.] The United Nations Declaration on the Rights of Indigenous People^{iv} [footnote iv text: See: http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf, particularly Articles 19 and 29 and 32.], and most importantly the Principle of Precaution.^v [footnote v text: See: <http://www.sehn.org/state.html#w> Most simply: Do No Harm; if there might be harm, then Protect First, Study Second; Act Third. If there is already (or could be) harm, those who advocate for the harmful practice are the ones who should pay the costs associated with preventing, reversing and redressing the harm while conforming to 1, 2, and 3.] Further we support the Principles invoked at the NRC GEIS comment meeting in Perrysburg OH, hard won in the 20th Century: it is not sufficient to say "it was my job description" or "I was following orders."^{vi} [footnote vi text: See oral comments by Michael Keegan, Don't Waste Michigan, and also: http://legal.un.org/ilc/texts/instruments/english/draft%20articles/7_1_1950.pdf.] A sustainable future does not include production (or authorization of production) of any more radioactive waste. The impacts NRC is dismissing as SMALL and "insignificant" from waste generation, management, storage, transport are financially and environmentally costly, and potentially deadly. (0711-5 [Olson, Mary])

Comment: The reliance on the "Human Exceptionalist Paradigm" which suggests that although we don't know what to do with it now, we'll figure it out later because we are so exceptional is snake oil. Societal costs have been exorbitant, loss of liberty, loss of health, loss of finances. This is a Confidence Game and it has always been such. (0713-2 [Keegan, Michael J.])

Comment: [T]he DGEIS is unacceptable as a basis for Rulemaking. (0714-1-9 [Edwards, Gordon])

Comment: In any event, the existing DGEIS is inadequate as a basis for NRC rulemaking. (0714-2-7 [Edwards, Gordon])

Comment: NEIS submits that the DGEIS as written is inadequate to both the task of satisfying the directives of the U.S. Court of Appeals in *New York v. NRC*, 681 F.3d 481 (D.C. Cir. 2012); and also inadequate to protecting the health and safety of the public and the environment; and for these reasons was ask NRC to withdraw the DGEIS. (0716-1 [Kraft, Dave])

Comment: *NRC's "finding of no significant impact" regarding: 1.) spent fuel pool fires; 2.) spent fuel pool leaks; 3.) vulnerability of spent fuel pools and dry cask sites to natural disasters and terrorist assaults; and 4.) NRC's belief in the adequacy of generic findings at reactors -- to be unfounded, inadequate to the protection of the public health and safety, and in contradiction to NRC's own definition of what constitutes a "nuclear safety culture".* NEIS concurs with the detailed statements provided by Attorney Diane Curran et al in comments provided on 20 December, 2013, titled, *Comments by Environmental Organizations on Draft Waste Confidence Generic Environmental Impact Statement and Proposed Waste Confidence Rule And Petition to Revise and Integrate All Safety and Environmental Regulations Related to Spent Fuel Storage and Disposal*; and those views presented in supporting Declarations Exhibits A through D to that document. Some examples should suffice to demonstrate how inadequately NRC has investigated these issues[.] (0716-11 [Kraft, Dave])

Comment: *The DGEIS as written is inadequate to both the task of satisfying the directives of the U.S. Court of Appeals in New York v. NRC, 681 F.3d 481 (D.C. Cir. 2012); and also inadequate to protecting the health and safety of the public and the environment[.]* NEIS concurs with the detailed statements provided by Attorney Diane Curran et al in comments provided on 20 December, 2013, titled, *Comments by Environmental Organizations on Draft Waste Confidence Generic Environmental Impact Statement and Proposed Waste Confidence Rule And Petition to Revise and Integrate All Safety and Environmental Regulations Related to Spent Fuel Storage and Disposal*; and those views presented in supporting Declarations Exhibits A through D to that document. (0716-23 [Kraft, Dave])

Comment: NEIS finds that NRC's "finding of no significant impact" regarding: 1.) spent fuel pool fires; 2.) spent fuel pool leaks; 3.) vulnerability of spent fuel pools and dry cask sites to natural disasters and terrorist assaults; and 4.) NRC's belief in the adequacy of generic findings at reactors -- to be unfounded, inadequate to the protection of the public health and safety, and in contradiction to NRC's own definition of what constitutes a "nuclear safety culture"[.] (0716-4 [Kraft, Dave])

Comment: The First Rule of Holes applies: if you find yourself in the bottom of a hole, stop digging. If you find yourself buried under a "Mountain of Waste, 70 Years High," stop making it, at least until you solve the disposal problem for what you've already created. NEIS therefore urges the NRC to maintain its present moratorium on new licenses and license extensions at U.S. nuclear reactors. The same voluminous amounts of unresolved issues pertaining to HLRW

storage, treatment, transportation will exist for any proposed CIS facilities. Until such time as NRC can provide a credible DGEIS on these matters, the nation should not create more contaminated waste sites with the same unresolved problems, just so the nuclear industry can continue to compound the waste problem with more waste from continued operation. (0716-8 [Kraft, Dave])

Comment: I am aware that the NRC responded to a Federal court order to justify its continued storage of nuclear waste in cooling pools and dry casks in an embarrassingly flimsy way -- despite the length of the document. (0719-1 [Hibbard, Angela])

Comment: Blue Ridge Environmental Defense League has referenced the Waste Confidence Rule in several of our legal interventions in nuclear power plant licenses during the last six years—Bellefonte, North Anna, William States Lee, Vogtle, Sequoyah—cases which raised safety and/or environmental concerns regarding management of irradiated nuclear reactor fuel, dubbed "spent" fuel by the industry. Specifically, we brought the following interventions: Blue Ridge Environmental Defense League Waste Confidence Contentions[:]

Date	Docket/s	Type	Applicant	Reactor/s	Site
December 11, 2006	52-011	ESP	Southern Nuclear Operating Company, Inc	Plant Vogtle Units 3 and 4	Waynesboro, Georgia
May 9, 2008	52-017	COL	Dominion Virginia Power	North Anna Unit 3	Mineral, Virginia
June 6, 2008	52-014 52-015	COL	Tennessee Valley Authority	Bellefonte Nuclear Power Plant, Units 3 and 4	Hollywood, Alabama
June 27, 2008	52-018 52-019	COL	Duke Energy Carolinas	William States Lee III Units 1 and 2	Gaffney, South Carolina
May 6, 2013	50-327 50-328	LR	Tennessee Valley Authority	Sequoyah	Soddy-Daisy, Tennessee

Attached in abbreviated form are the relevant actions and contentions which we have brought. At the five sites above, general and specific issues were raised. Until the DC Circuit ruled, four of them were deemed inadmissible by their respective Atomic Safety and Licensing Board three-judge panels. The fifth, filed after the vacatur, has been held in abeyance but not admitted. This represents a virtual stone wall of refusal regarding the long-term storage of high-level nuclear waste at these plants. The draft GEIS and rule now under review would return us to the *status quo ante*. This is unacceptable to us, and contravenes both the letter and the meaning of the *New York v. NRC*. (0720-2 [Zeller, Louis])

Comment: The Court's order was quite clear, stating that irradiated reactor fuel "will seemingly be stored on site at nuclear plants on a permanent basis" unless and until the federal government established a permanent repository.⁶ [footnote 6 text: *Id.*, *New York v. NRC* at 13] The Court rejected the NRC's arguments against the vacatur, stating, "Overall, we cannot defer to the Commission's conclusions regarding temporary storage because the Commission did not conduct a sufficient analysis of the environmental risks." The Court specified that "a generic analysis must be forward looking and have enough breadth to support the Commission's [licensing] conclusions. Furthermore, as NEPA requires, the Commission must conduct a true EA regarding the extension of temporary storage."⁷ [footnote 7 text: *Id.* *New York v. NRC* at 20] A solution to the long-term disposal of highly radioactive "spent" nuclear fuel may still lie decades in the future. There was a period of twenty years—from 1982 to 2002—from the passage of the Nuclear Waste Policy Act to the US Department of Energy's recommendation of

Yucca Mountain as a suitable site for repository development; this finding was itself overturned in 2010. The Gordian Knot presented by nuclear power plants which must be unraveled by the NRC involves the management of an intractable waste problem with long-term public health and environmental justice impacts. In light of the foregoing, the Commission must develop an environmental impact statement and a rule which truly encompasses on-site and beyond-60 year high-level radioactive waste storage at every reactor site in the nation. However, as detailed in our comments filed today and previously, we maintain that the NRC has not done what the Court ordered in its remand. (0720-3 [Zeller, Louis])

Comment: In your rush to promote nuclear energy, you have put the cart before the horse. Your generic proposals as in the G EIS are an insult and nothing more than a quickie means of bypassing the kinds of responsible studies that actually would require depth and breadth. There is simply no evidence of that here. Just politics as usual. (0722-4 [Headington, Maureen])

Comment: I praise the court for intervening. I have no confidence in a process that continues to produce waste without a safe way in which to dispose of it. (0722-6 [Headington, Maureen])

Comment: It is patently clear that NRC is only obtusely aware of, or minimally responsive to, the instructions of the Federal Court inasmuch as the Court effectively advised against warming over the assumptions of the past, but NRC Staff's first reaction to the Commission's assignment to produce a new, inclusive and technically defensible rule was to say, in effect, "no need to re-invent the wheel, we got plenty of good stuff in the work that we have already done." Besides ignoring the Court's attempt to throw the agency a credibility life ring, the Staff's knee-jerk approach of "Oh, we can answer that concern" doomed the new attempt to go back to the optimistic, definitely non-scientific, not technically defensible assumptions that bred and fed earlier illegitimate conclusions. (0723-1 [Shadis, Raymond])

Comment: I would ask the Commission in a sober moment of reflection to consider if an uninformed, evasive, cynical, and lacking in intellectual integrity, approach to regulation such as the waste confidence DEIS is not a disservice to the United States of America; driving a public that has already lost confidence in government even further afield in its allegiances. (0723-5 [Shadis, Raymond])

Comment: The Waste Confidence Draft Generic Environmental Impact Statement is categorically inappropriate. (0724-1 [Gamble, Dan])

Comment: "Licensed life for operation of a reactor"--There is a reason that licenses for operation are granted. To store spent nuclear fuel behind the "licensed life for operation of a reactor" is akin to sweeping dirt under the rug instead of cleaning one's house. This public opinion votes "NO" to storage beyond licensed life. (0728-2 [Anonymous, Anonymous])

Comment: The American citizens, their beloved children, and land we live on, were NOT created to be utilized as a nuclear waste dump site. To protect our health, and the health of our children, we will not accept the trafficking of radioactive waste "to or through" our homeland. I reject NRC's waste confidence Draft Generic Environmental Impact Statement (DGEIS), and ask NRC to withdraw it for thorough revision. I have NO confidence in NRC's "waste confidence". (0730-1 [Lawhorn, Larry])

Comment: The Nuclear Regulatory Commission is on the verge of adopting a grossly inadequate plan for storing nuclear waste. (0731-1 [Brotine, Howard])

Comment: I urge the NRC to find a better solution than THE GROSSLY INADEQUATE plan for storing nuclear waste. (0732-1 [Green, Jeane])

Comment: The GEIS is flawed. We are dealing with something that will stay lethal for tens of thousands of years but the study does not take any of that into consideration. (0734-1 [Hisasue, Carole])

Comment: I reject the nrc waste confidence proposal and u must reject it. (0735-1 [Velazquez, Lisette])

Comment: The history of waste practices to date has been one of irrational exuberance, misplaced confidence that things will just work out. But the historical evidence suggests the opposite. And despite that long history of failure, the NRC repeatedly asserts, "this time will be different." The latest iteration of the Waste Confidence Rule relies on a remarkable regulatory fiction: that just leaving large amounts of extraordinarily hazardous and long-lived material sitting on storage pads at numerous locations around the country will not result in unacceptable environmental impacts because institutions will continuously guard, regularly maintain, and periodically repackage the waste for hundreds of years, or even hundreds of thousands of years. This seems, to use a favorite phrase of the NRC, "non-credible." (0738-17 [Hirsch, Daniel])

Comment: The Draft Generic Environmental Impact Statement (DGEIS) is inadequate. (0739-1 [Quarterman, John S.])

Comment: I purpose that all get a start on a NEW EIS! that includes THE PEOPLE! and hold and keep through time. (0744-2 [Bonniwell, Colleen])

Comment: I reject NRC's waste confidence Draft (GEIS), and ask NRC to withdraw it for thorough revision. I believe it has no scientific validity. I have NO confidence in NRC's Waste Confidence. (0757-3 [Lynch, Laura])

Comment: These few examples I have given point out the need to reject this DGEIS. As a resident of New York City and a citizen of these United States, in all due respect, I recommend the NRC go "back to the drawing board" as these proposed generic regulations are completely unacceptable. (0762-6 [Skopic, Catherine])

Comment: I reject NRC's waste confidence Draft Generic Environmental Impact Statement (DGEIS), and ask NRC to withdraw it for thorough revision. I have NO confidence in NRC's "waste con-fidence"! (0763-1 [Freeman, Susan])

Comment: Stop the Waste Con: The NRC Draft Waste Confidence Generic Environmental Impact Statement Report is unacceptable. Much of it appears to be based on unsubstantiated hope. (0764-1 [Gilmore, Donna])

Comment: In the GEIS Executive Summary, the stated purpose of this ruling is for the efficiencies that would be gained, minimizing expenditures and avoiding delays in licensing reviews. This apparent bias towards the industry seems to contradict the sole purpose of the NRC in protecting the public and the environment. (0774-2 [Revilla, Oscar])

Comment: I absolutely reject NRC's waste confidence Draft Generic Environmental Impact Statement (DGEIS) and demand that you withdraw it for thorough revision. Based on the horrifying reality of nuclear waste and its toxic potential for thousands of years, I have NO confidence in NRC's waste confidence. (0775-1 [Zure, Lisa])

Comment: I reject NRC's waste confidence Draft Generic Environmental Impact Statement, and ask NRC to withdraw it for thorough revision. (0791-1 [Mierzwicki, Tony])

Comment: Your plan for storing nuclear waste is inadequate. We can't kick this can down the road any longer. Please listen to the many well informed advocates asking for a better, safer approach. (0803-1 [Bosold, Patrick])

Comment: We have lost all confidence that you have our best interest in mind. We have lost confidence that you will ever do the right thing. Prove us wrong. (0811-3 [Paulsen, Carol])

Comment: We are emphatically opposed to the NRC's proposed Waste Confidence Rule (10 CFR 51.23) as well as the premises, assumptions and conclusions of the NRC's Waste Confidence DGEIS. (0815-1 [Gunter, Keith] [Izant, Carol])

Comment: In summary, NRC risk calculations are demonstrably wrong, the assumptions made by the NRC are absurd and the NRC has not proposed a realistic plan for coping with spent nuclear reactor fuel. (0815-9 [Gunter, Keith] [Izant, Carol])

Comment: As in the NRC Perrysburg Waste Confidence hearing, where I offered oral testimony, I encourage "NO ACTION" on this propose rule. The rule change would make the relicensing of future operations of existing nuclear power plants and the storage of spent fuel rods and radioactive waste contingent on a Generic Environmental Impact Statement. The GEIS would not take into account any site-specific concerns that have arisen such as the lack of confidence in the NRC to develop a long term waste repository. (0816-1 [Stansberry, Mark])

Comment: I recommend the NRC to take "NO ACTION" on the NRC waste confidence rule change proposed in Docket ID No. NRC-2012-0246. (0816-4 [Stansberry, Mark])

Comment: I oppose the DGEIS and Proposed Rule, because both are based on scientifically and technologically unsubstantiated assurances and unproven assumptions. (0819-1 [Kline, Connie])

Comment: In my estimation, generic is suitable for breakfast cereal and soft drinks, not spent nuclear fuel. There may never be a permanent repository and the likelihood of creating centralized interim storage facilities is slim to none considering past attempts to do so and the failure, and/or closure of LLRW sites. The DC Circuit Court of Appeals in *New York v NRC* stated: ["] Both the Supreme Court and this court have endorsed the Commission 's ... practice of considering environmental issues through general rulemaking in appropriate circumstances ... (We) see no reason that a comprehensive general analysis would be insufficient to examine on-site risks that are essentially common to all plants ... Nonetheless, whether the analysis is generic or site-by-site, it must be thorough and comprehensive ... (We) conclude that the Commission has failed to conduct a through enough analysis here to merit our deference.["] The DGEIS is a perfect example that size doesn't matter. In 600 pages of baseless assumptions, the Commission has still failed to "conduct a thorough and comprehensive analysis of environmental issues." (0819-15 [Kline, Connie])

Comment: To add insult to injury, the Proposed Rule would incorporate into every reactor license this DGEIS conclusion that spent fuel can be safely stored above ground at reactor sites in perpetuity. This would prohibit challenging continued generation of spent fuel without means of safe, permanent disposal in individual reactor license actions. (0819-3 [Kline, Connie])

Comment: These documents don't even address the Court's mandate in *New York v NRC* which required the NRC to "examine the risks" associated with spent fuel storage not merely assume that storage would be safe . The NRC has still "failed to examine the environmental consequences of failing to establish a repository when one is needed." The NRC has arbitrarily, capriciously, and repeatedly changed the rules in midstream for the convenience and profit of the nuclear industry it purports to regulate. "The waste can be safely stored on-site for 30 years beyond reactor closure. No, make that 60 years beyond reactor closure. There may be no geological repository. No problem. We'll just leave the waste at reactors, and hope that a repository is available 'when necessary.' DOE withdraws its license application for Yucca Mt. Still no problem. We'll just leave the waste onsite forever and allow still more waste to be generated." (0819-4 [Kline, Connie])

Comment: At some point Congress will figure out that NRC's proposal is to make forever storage of high level waste a permanent public charge. A new "entitlement program" for the nuclear power industry seems unlikely. A panel of the Court of Appeals for the D.C. Circuit has already chastised the NRC for its disregard of the Nuclear Waste Policy Act requiring a geologic depository for high level waste and its inability to calculate an appropriate fee for the fund to implement such a repository. The proposed rule and the "blinders on" approach of the DGEIS show the NRC is ignoring the statute by proposing indefinite onsite storage. (0821-14 [Paddock, Brian])

Comment: NRC needs to admit waste disposal solution is unknown and move forward logically, transparently, and openly, to best solve "impossible" problems. We are all on this finite planet together and need to work together to move forward seeking progress[.] The causal acceptance, or complacency, of radioactive leakage into the environment violates scientific methods and practices; it also demonstrates that failure of scientific thinking is in operation at the level of NRC oversight, which represents its highest decision-making authority. The NRC's safety claims impossibly co-exist with practices of ignoring public complaints to stop radioactive leakage into the environment. The public complaints would not exist if safety existed. To ignore evidence that the safety assurances are flawed is unacceptable, but this has happened repeatedly and continues to happen. It is time to call for the brightest and best scientists to try to brainstorm a range of possibilities for intensive research toward the type of discoveries most likely to provide the safest solution for the lethal waste to best attempt to attain reliable isolation for thousands of years, if such a solution is even possible. It is time to move forward logically, instead of behaving as a group of lemmings going over a cliff to die en masse from craziness and faulty thinking. The sooner NRC admits its errors and stops being in denial that the waste solution appears impossible, the quicker we can move forward to deal with the remaining actual problem, which is the vast amount of lethal non-disposable waste that we have generated that we must somehow find a way to isolate and keep contained away from the environment and humanity. It is unacceptable for the NRC to continue to play the irrational denial role and interfere in this way with moving forward seeking progress. (0823-13 [Michetti, Susan])

Comment: Emerging and developing issues-- including those growing from errors in previous assessment, analysis, and practices-- require special timely treatment that enables safety issues to be prioritized and appropriately addressed within a reasonably timely timeframe. Scientific assessment and open-ended methods should be applied to permit submission of official concerns at any point in time, rather than being potentially inappropriately delayed for a specific scheduled review, while safety is compromised. (0823-17 [Michetti, Susan])

Comment: NRC's flawed irrational waste confidence rule of 9-13-2013 requires rejection. The Waste Confidence Draft Generic EIS unacceptably fails the tests of scientific thinking,

methodology, and practices at its most fundamental level. The NRC has developed a flawed tool, the Draft Generic EIS, that fails to adequately protect physical environment as well as people and other living organisms from unfortunate impacts. (0823-55 [Michetti, Susan])

Comment: Waste Confidence Generic Draft EIS does not lend itself to safely addressing an horrendous nuclear waste problem with unknown solution transparently; Unacceptably, the GDEIS evades reality of impossible safe solution. (0823-60 [Michetti, Susan])

Comment: The problem that precludes the Waste Confidence Decision from the Draft GEIS remains the lack of appropriate oversight and the lack of appropriate prioritization of full environmental safety at the top of the decision tree. It is irrational to make decisions to permit operations that generate such lethal waste, when any solution for storage and disposal with safety is impossible. The problem that allowed this irrationality to arise was insufficiency in the scientific assessment. A sufficient scientific assessment would have prioritized the storage and disposal with full environmental safety to be identified and solved, prior to permitting operations by granting license applications and license extensions to nuclear power plants to create the waste. (0823-62 [Michetti, Susan])

Comment: The present generic waste confidence rule critically fails to provide adequate rigorous scientific consideration regarding spent fuel disposal impacts as well as to spent fuel storage impacts and their major safety flaws. (0823-69 [Michetti, Susan])

Comment: We request that the US NRC stop its claims that any "confidence" can be found in any "generic" safe solution for permanent storage of high level nuclear waste. The safety prerequisite for the environment and all living organisms requires that the complete timeframe of potential impacts be considered. That timeframe exists for thousands of years, or perhaps millions, for some of the ionizing isotopes. The NRC waste "confidence" uses an unacceptable and inappropriate arbitrary timeframe that fails to cover even a major fraction of the impact timeframe. (0823-75 [Michetti, Susan])

Comment: In the past fifty years, the nuclear industry has not determined how to address the issue of storing spent nuclear fuel generated by commercial nuclear power plants. Now the public is being asked to comment on the NRC's Draft Waste Confidence Generic Environmental Impact Statement. As an engineer and concerned citizen, it is my duty to state that I have little, to no, confidence in the NRC's Waste Confidence Generic Environmental Impact Statement based upon a myriad of issues and the manner in which these issues have been historically addressed by the NRC. (0826-1 [Morgal, Rick])

Comment: The NRC's Waste Confidence Generic Environmental Impact Statement is another evolutionary step in the process of upping the public's exposure to a potential catastrophic nuclear accident. (0826-3 [Morgal, Rick])

Comment: Please do not approve this. Nuclear waste has a proven track record of mis management and envrionmental contamination. The worst imaginable thing you could do is put it near large bodies of fresh water. The potential impacts are everything from human well being to economic to envrionmental. By approving this you are signing off and our children's death certificates. (0832-1 [Smith, Adam])

Comment: The GEIS is not ready to be approved, and should not be approved. (0836-2 [Davis, Anonymous])

Comment: The NRC should not approve the Waste Confidence Generic Environmental Impact Statement, since they do not have sufficient data on extended storage of high burnup to have confidence this waste can be safely stored or transported. (0836-6 [Davis, Anonymous])

Comment: We find the Waste Confidence Generic Environmental Impact Statement to be fraught with errors, unfounded optimisms, omissions, and obvious obfuscations. (0836-64 [Davis, Anonymous])

Comment: Please review this document AND BE HONEST about the risks. Please do not sweep them under the "out of scope" carpet. (0836-69 [Davis, Anonymous])

Comment: The GEIS is not ready to be approved, and should not be approved. There are many unresolved issues, despite the statement in the introduction that "all issues have been resolved." (0836-8 [Davis, Anonymous])

Comment: I would have to say, based on the fact that I could not find in all of those words in the Federal Register anything that gave me confidence that THIS industry here in the United States of America would not do the same thing their peer did in Japan. In which case, this NRC Generic Rule MUST be way more detailed in the specifics than it currently is. (0838-6 [Clermont, Elaine])

Comment: The NRC should abandon its Waste Confidence policy, stop the creation of nuclear waste, and come up with a plan that actually mitigates the enormous risks associated with existing nuclear waste. The Waste Confidence policy is founded on overconfidence. I am confident that the waste can never be safely contained for as long as it poses a hazard. Creation of radioactive waste puts the public at grave risk and it transfers the financial and physical responsibility for waste management to future generations. (0840-1 [Taylor, Tom])

Comment: The U.S. has no solution for nuclear waste, and the NRC up to this point has done little to address the immediate risks it poses. It is not in the public interest to ignore underlying risks, technical deficiencies, and base a licensing policy on false confidence. (0840-7 [Taylor, Tom])

Comment: Waste Confidence ignores 1) the absence of a technological solution to safely store waste until it is not hazardous; 2) the absence of a nuclear waste facility in which waste can be permanently stored; 3) the ongoing high level risks associated with Spent Fuel Pool Storage, and the proximity of said fuels near millions of US citizens. There is no safe storage solution for nuclear waste. The NRC's new Waste Confidence policy is no more credible than the one the Court threw out. The NRC should throw out this overly optimistic policy, observe the Court's ban on licensing nuclear reactors, and come up with a realistic plan that safely and permanently stores waste until it is not hazardous and that does not attempt to pass the burden and costs of managing radioactive waste to future generations or to taxpayers. (0840-9 [Taylor, Tom])

Comment: I totally reject NRC's waste confidence Draft Generic Environmental Impact Statement (DGEIS) and demand that you withdraw it for thorough revision. Based on the toxic pollution that lasts for thousands of years, I have NO confidence in NRC's waste confidence. (0844-1 [Anonymous, Anonymous])

Comment: The Waste Confidence Generic EIS must not be approved because there is no acceptable solution for safely handling highly radioactive waste. (0846-1 [Wells, Gerald])

Comment: The "waste confidence" policy must be abandoned. There is no confidence in storing nuclear waste. The waste itself is extraordinarily toxic, deadly and extremely long-lasting. The government has failed to demonstrate that nuclear waste will be managed safely and the NRC has not adequately the environmental impacts of the waste that new and relicensed reactors would generate. (0849-2 [Nichols, Susan])

Comment: The fact is that a spent fuel nuclear catastrophe that may destroy many people's livelihoods, their health, and perhaps the nation is acceptable to the NRC. That the NRC ranks these accident consequences (and likelihood) as a SMALL impact says more about the mentality of the NRC than the impacts of indefinite spent fuel storage. Because the NRC places the health of the nuclear industry ahead of this nation's health and will state they have confidence that safely storing spent nuclear fuel and obtaining a repository is technically feasible while keeping a straight face, I suggest that citizens should not place any confidence in the NRC. (0851-12 [Thatcher, Tami])

Comment: Submitted because I believe it's time for people to understand that despite assurances from the nuclear industry, spent nuclear fuel poses serious health and economic risks to this country. The waste confidence decision is still an emperor with no clothes and it's time for people to understand the truth, despite the bland and distorted conclusions of NRC's generic waste confidence EIS. (0851-14 [Thatcher, Tami])

Comment: This draft EIS is reasonable only if the promotion of the nuclear industry is our country's highest priority, above national security and stability, health, and prosperity. The NRC knows that promotion of the nuclear industry requires the NRC to keep pretending that finding long term solutions for spent nuclear fuel will magically get easier as time goes on. It requires the NRC to keep pretending that the costs of repackaging spent fuel or building a repository that generated our electricity will not be a burden for future generations. And it requires the NRC to keep pretending that nuclear catastrophes are simple mundane affairs that may cause some unenlightened people to experience depression because they've had to vacate their homes permanently, their country and community may be bankrupt, and they and their land are being poisoned by widespread radionuclide contamination. (0851-2 [Thatcher, Tami])

Comment: What you are doing is so very wrong; no ifs ands or buts about it. (0862-1 [Thompson, Tammy])

Comment: I stand by my comments I made at both NRC meetings that were held in Maryland and the last meeting that was a telephone conference. STOP THE NUKE CON JOB!!!! (0865-1 [Gray, Erica])

Comment: The arguments above point out how the choices made by the agency impact the analytical viability of the analysis and thus how the DGEIS does not respond to the task of properly evaluating the environmental consequences of the major federal actions it is evaluating and alternative actions which can mitigate those consequences. (0867-3-18 [Griffin, William])

Comment: In short, the NRC has created a fictional world for its DGEIS that does not and cannot exist. It has created a weighty document with no real substance. It has failed in its obligation to take the mandated hard look, and failed to meet the obligations the agency had under NEPA. (0867-3-33 [Griffin, William])

Comment: The NRC public meeting had to take place to affirmatively respond, to a NUREG-2157 requirement. The meeting and the literature presented was an attempt to cajole the public

into agreeing that they felt confident in dry cask storage. Your report to NUREG should show that about 90%, of the attendees expressed "NO CONFIDENCE" in the NRC's draft. (0868-2 [Tilbury, Don])

Comment: I am even LESS confident about waste storage than before the meeting. (0872-1 [Wilvert, Calvin])

Comment: THE GENERIC ENVIRONMENTAL IMPACT STATEMENT IS ALSO A JOKE. (0887-4 [Chappellet, Carissa])

Comment: What was the purpose: confidence? I now have less (zero) confidence[.] (0888-1 [Wilvert, Rosemary])

Comment: In *Calvert Cliffs*, CLI-12-16, the NRC suspended all reactor licensing and re-licensing while it responded to the Court's order in *New York*. 76 NRC 63 (2012). As the Commission recognized, "[w]aste confidence undergirds certain agency licensing decisions, in particular new reactor licensing and license renewal." *Id.* at 66. The NRC has not satisfied the Court's order, NEPA, or the Atomic Energy Act. Therefore, licensing and re-licensing of reactors must remain suspended unless and until the NRC complies with the law. (0897-1-19 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: THE PROPOSED RULE FAILS TO SATISFY ATOMIC ENERGY ACT REQUIREMENTS FOR LICENSING AND RE-LICENSING REACTORS (0897-2-6 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The proposed rule marks a turning point for the NRC. After thirty years of making baselessly optimistic "reasonable assurance" findings about the future availability of a disposal solution for spent reactor fuel, and having allowed many thousands of tons to accumulate at reactor sites around the country based on those findings, the NRC has finally stopped issuing them. Instead of confidently assuring the public that human health and the environment will be protected from highly radioactive spent fuel as long as it remains dangerous, the NRC now claims only to have hope in a theoretical possibility. But hope cannot satisfy the Atomic Energy Act. The NRC has effectively conceded that it lacks a statutory basis for licensing the further generation of spent fuel. It must therefore continue to suspend all reactor licensing unless and until some basis for reasonable assurance findings are restored. The DGEIS cannot cure this fundamental failure to satisfy the Atomic Energy Act. And even if it could, the DGEIS is utterly inadequate to satisfy NEPA. (0897-7-22 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: The NRC Draft Generic Environmental Impact Statement's arguments in favor of DCR are fundamentally flawed; they are clearly drawn up to support PG&E's financial interests. (0907-2 [Bethlenfalvay, Marina])

Comment: For these reasons and many others, the Draft GEIS is not scientifically valid and remains no more than a hope. (0908-6 [Mikkelsen, Sara])

Comment: My Comment: Despite the obvious extensive work and organization of Draft participants, I FIND, FOR THE ABOVE REASONS [AND MORE] THE CURRENT WASTE DRAFT UNACCEPTABLE. (0910-15 [Carey, Corinne])

Comment: Clearly, this "Generic Environmental Impact"-Office of Nuclear Material Safety and Safeguards is misnamed and misleading to the public and all. I compare this misuse to the continuing use in this Draft and elsewhere of the term "spent", as in "spent fuel", which is so

highly irradiated that it cannot continue in use at nuclear power plants, and which contains so many highly radioactive elements as to be non-disposable and permanently hazardous. (0910-2 [Carey, Corinne])

Comment: We, the undersigned, call on the NRC to redo its draft environmental impact assessment and scuttle the proposed rule to remove nuclear waste issues from the reactor licensing process. The NRC has not conducted an adequate environmental impact analysis as ordered by the Court of Appeals in New York. Nor does the Draft GEIS provide an environmental analysis that is sufficient to justify eliminating consideration of spent fuel disposal impacts or storage impacts from every licensing proceeding. Finally, the NRC's proposed finding that spent fuel can be safely stored indefinitely, rather than temporarily, is inconsistent with the Nuclear Waste Policy Act and federal policy. The NRC must conduct a new environmental impact study and suspend the proposed rule to prohibit licensing challenges based on high-level radioactive waste management issues. (0912-1 [Fisher, Allison])

Comment: Comments on NRC's WC DGEIS ("Waste Confidence" Draft Generic Environmental Impact Statement In the Executive Summary and Introduction, NRC speaks about 80 years of reactor operations - that is, two 20-year license extensions. For example, on Page 1-12, in Figure 1-1, "Continued Storage Timeframes" (line 17), NRC speaks of "Reactor Licensed Life" as "40 years of reactor operation on original license" and "Up to 40 years of additional renewed license (up to 2 license renewals)." What is most significant about NRC's apparent plans - to someday grant rubberstamps for not just 20-years of extended operations, but an additional 20-years on top of that - is that this WC DGEIS would grease the skids for just such license extension approvals. This, despite NRC's claims to the contrary. (0919-1-1 [Kamps, Kevin])

Comment: In a New York Times article by Matthew L. Wald, entitled "3 States Challenge Federal Policy on Storing Nuclear Waste," dated February 15, 2011 (posted online at <http://www.nytimes.com/2011/02/16/nyregion/16nuke.html>, submitted here as Exhibit J), it was reported: "...David McIntyre, a spokesman for the Nuclear Regulatory Commission, said the lawsuit by the attorneys general had mischaracterized the nature of the December [2010 Nuclear Waste Confidence] decision. He described it as a commission "opinion" on how long waste could be safely stored rather than a rule permitting any plant to store spent fuel. But people who favor building new reactors said the adoption of the policy was important because it helped outline a legal basis for approving the construction of new reactors and long-range plans for handling their spent fuel...". Thus, the NRC's "nuke waste con game," and deceptive, misleading claims that NRC's Nuclear Waste Confidence Decision, Rule, and Policy have nothing to do with new reactor licensing or old reactor license extensions, have been played in one of the major media outlets in the nation. (0919-1-19 [Kamps, Kevin])

Comment: How then, can NRC grant *carte blanche* to the nuclear utilities to generate as much irradiated nuclear fuel as they want, as it proposes to do by finalizing this DGEIS and issuing a Record of Decision?! (0919-3-4 [Kamps, Kevin])

Comment: All the more ironic is the fact that NRC is essentially parroting itself here, claiming "Waste Confidence" vis a vis so-called "low-level" radioactive waste. For, in 2010, although it dared no longer give a "date certain" for the opening of a high-level radioactive waste repository, NRC nonetheless expressed its "confidence" that one would open "when needed." But, as reported by the New York Times, the D.C. Circuit Court of Appeals didn't buy NRC's "Waste Confidence" regarding such rosy prospects for the opening of a repository: "The commission apparently has no long-term plan other than hoping for a geologic repository," the

appeals court wrote.' ("Court Forces a Rethinking of Nuclear Fuel Storage," by Matthew L. Wald, New York Times, June 8, 2012, posted online at http://www.nytimes.com/2012/06/09/science/earth/court-says-nuclear-agency-must-rethink-fuel-storage.html?_r=2&). The article is submitted as Exhibit N. (0919-3-7 [Kamps, Kevin])

Comment: Those risks are potentially catastrophic, whether they unfold from pools or dry casks, whether due to accident, attack, or leakage. But so few people have been assigned to worry about such risks, it seems. And, as evidenced by this DGEIS itself, even those assigned to analyze the risks - under court order - have not done so. They have downplayed the risks, to the point of ignoring and even denying them, while here examining supposed benefits. This is very telling, not only about the nuclear utilities' attitude toward irradiated nuclear fuel risks, but even that of the NRC staff. (0919-5-7 [Kamps, Kevin])

Comment: With this new GEIS for the spent fuel, no new evaluations of the environmental impacts are being looked at. For example, as indicated earlier, the New Jersey plants continue to use the geologic and ground water information from the original reports from the building of the plants, not any new geologic mapping or interpretations. (0920-43 [Foster, Ruth])

Comment: According to the NRC, in this document the impact from the continued storage of the spent fuel at the plant sites will have only a small impact on the local environment. The major problem is that NRC makes many statements and assumptions but presents no data, studies or reviews from outside unbiased scientific groups or agencies. Specific comments listed below illustrate some of the areas where NRC is over simplifying the issues and problems or which contradict some of NRC's assumptions. (0920-9 [Foster, Ruth])

Comment: Citizens rejecting NRC's "waste confidence" ruling at public meetings by wide margin. At the recent NRC public meeting in Chicago, one of the commenters, a woman from Michigan, made a statement that, more and more, seems to be the defining answer to NRC's question about public sentiment towards its "waste confidence" rule: "This member of the public does not share your confidence!" (0921-2 [Kamps, Kevin])

Comment: I indicated during my oral comment submission that I would submit for the record a copy of the "Deja vu ...all over again!" Lucy (NRC) and Charlie Brown (the public) cartoon. It is attached. But while I am at it, I would like to attach three related placards. All four were generated by the Nuclear Energy Information Service of Chicago for use at the Oak Park, IL public comment meeting on Nov. 12th. When members of the public heard the words "Waste Confidence", "safe", "safely store". etc., uttered, they held up the placards. In this sense, this was a version of the game "Nuclear Bingo", as has been "played" by the public at various NRC meetings in the past. If the NRC insists on playing Nuclear Waste Con Games, then the can respond with games of their own! Just for sanity's sake, if nothing else. The three Nuke Waste Con Game additional nuclear bingo placards attached here are: "NRC: Putting the CON in was CON-fidence"; "What part of NO [in many languages] does NRC NOT understand?"; and "NO confidence in NRC's Waste Confidence." (0923-1 [Kamps, Kevin])

Comment: I do not share NRC's "confidence" that high-level radioactive waste storage pools across the U.S. are safe, sound, and secure, whether in the here and now, during up to 80 years of reactor operations, for 60 years beyond reactor shutdown, for a century beyond the end of decommissioning, or forevermore into the future (what NRC calls "indefinite storage," which could also be called "infinite storage"). (0926-2 [Kamps, Kevin])

Comment: The GEIS is not ready to be approved, and should not be approved. There are many unresolved issues, despite the statement in the introduction that "all issues have been resolved." (0930-1-1 [Lutz, Ray])

Comment: We find the Waste Confidence Generic Environmental Impact Statement to be fraught with errors, unfounded optimisms, omissions, and obvious obfuscations. (0930-3-16 [Lutz, Ray])

Comment: Please review this document AND BE HONEST about the risks. Please do not sweep them under the "out of scope" carpet. (0930-3-21 [Lutz, Ray])

Comment: Under the license terms for a given nuclear power plant, the entire plant must be decommissioned and restored to unlimited or partial use within 60 years of the end of operations. This is the underlying "contract" with the public when these plants were installed. Now, the NRC is suggesting in Section 4 that the ISFSIs can remain in operation for centuries. We believe this is WRONG for the NRC to suddenly change this contract with the public. (0930-3-5 [Lutz, Ray])

Comment: [W]e oppose the Nuclear Regulatory Commission's waste confidence draft GEIS and ask NRC to withdraw it for a thorough revision. We have no confidence in the NRC's lack of a plan in place. (0934-4 [Lewison, Linda])

Comment: Please do not allow this reckless and disputed policy to become law. (0935-8 [Uhls, Agnes])

Comment: The draft EIS should be rejected and revised to reflect the true and looming risks posed by nuclear waste. I have no confidence in NRC's "waste con-fidence." (0936-2 [Laney, Nan S.])

Comment: [Q]uit promoting the beleaguered greedy and highly toxic nuclear industry by acting like your so-called "Purpose" needs to be met. Thorough environmental review combined with useful alternatives with which to gauge comparative safety from different modes of radioactive waste storage are needed, and are sorely lacking in this aiming to be meaningless (except to accelerate rubber-stamping of licenses down the line) Waste Confidence Generic EIS document. (0937-28 [Campbell, Bruce])

Comment: All of the threat from the radwaste must be seriously analyzed, not treated as a bureaucratic joke intended as a steppingstone to get this inadequate and vague generic document adopted in order to help this leeching industry. If this WCGEIS can incorporate various documents by reference, you can incorporate by reference studies by Sandia and others which estimate risks from all of the nuclear power facilities in the USA. (0937-30 [Campbell, Bruce])

Comment: I reject NRC's waste confidence Draft Generic Environmental Impact Statement (DGEIS), and ask NRC to withdraw it for thorough revision. I have NO confidence in NRC's "waste con-fidence"! (0939-1 [Marschak, Cheryl])

Comment: I oppose the Draft Generic Environmental Impact Statement (DGEIS). (0941-1 [Scott, Sabra])

Comment: The Nuclear Regulatory Commission, in it's recent Draft Generic Environmental Impact Statement on Waste Confidence (DGEIS), has made changes to the long-term storage

of spent fuel rods that are concerning as it relates to the Pilgrim Nuclear Power Plant in Plymouth, Massachusetts. Spent fuel rods continue to pose a major risk to public health for many years after they are useful and it is important to properly store them. Pilgrim Nuclear Power Plant is a particular concern to me as it is within close proximity to my district. Should there be an accident or an attack at that plant, many of my constituents and the surrounding communities would be affected for years to come. The Commission must reconsider the changes that are being proposed to the long-term storage of spent fuel rods. The health and safety of the residents that live near Pilgrim rely upon the safe storage of spent fuel rods. (0943-1 [Hedlund, Robert L.])

Comment: The Nuclear Regulatory Commission (NRC) should dismiss the findings of its Waste Confidence Generic Environmental Impact Statement. The study is flawed and should not become the excuse for leaving dangerous nuclear waste behind at closed nuclear plants. (0944-1 [Pascall, Glenn] [Watland, George])

Comment: The NRC should recognize that the attempt to use a GEIS to wish away this problem is fundamentally flawed, and should return to the sound policy proposed by its own Commission. (0944-10 [Pascall, Glenn] [Watland, George])

Comment: I oppose the GEIS findings that highly radioactive nuclear waste can be safely stored in current temporary facilities above ground for the long term on the grounds of the closed San Onofre plant and at similar temporary facilities near all other nuclear plants closed or still operating nationwide. (0944-2 [Pascall, Glenn] [Watland, George])

Comment: The U.S. Nuclear Regulatory Commission seeks public input on NRC NUREG-2157, also known as the Waste Confidence Generic Environmental Impact Statement. The apparent intent of this Statement is to justify storing nuclear fuel waste on-site at closed nuclear power plants for decades or even longer, with no requirement to move the waste at any point to a less hazardous location. (0944-4 [Pascall, Glenn] [Watland, George])

Comment: For these reasons and many others, the Draft GEIS is not scientifically valid and remains no more than a hope. (0951-6 [Commenters, Multiple])

Comment: STOP LYING TO US. LOOKS TO ME THAT THE DRAFT NUREG-2157 WAS WRITTEN BY AN NRC CARTEL OF TERRORISTS WHO CARE NOTHING ABOUT THE CONSEQUENCES OF YOUR IRRESPONSIBLE FOLLY. FOR SHAME! (1004-4 [Dimondstein, Carla])

Comment: HOW CRAZY ARE YOU PEOPLE? WORLD-WIDE HUMANITY NEEDS FOR THE NRC TO NOT BE MAKING THESE VITAL DECISIONS! AS A 'REGULATORY' (haha) AGENCY, IT IS CLEARLY INCAPABLE OF WORKING IN THE PUBLIC TRUST, MUCH LESS IN THE PUBLIC INTEREST: THE NRC RELENTLESSLY SUBMITS SUBSTANDARD CRITERIA, DELUSIONAL THINKING SUCH AS 'LOW PROBABILITY OF INCIDENTS'! AS THE BASIS FOR GENERATION, MAINTENANCE, CLOSURE AND PERMANENT STORAGE CONCERNS. WASTE CONFIDENCE?! THAT'S YOUR BEST SHOT? WE HAVE NO CONFIDENCE IN ANY OF YOUR BOY'S CLUB DEADLY SHENANIGANS. (1004-7 [Dimondstein, Carla])

48. Comments Concerning Support for Rule or GEIS

Comment: This plan should go forward because the NRC's plan is going to meet its purpose and goals. this is the most major aspect of the whole proposal that it should meet its goals. The plan should also go forward because the environmental risks associated with this project are small to moderate at the worst. (0007-1 [Anonymous, Anonymous])

Comment: I have just a few comments on the development of the generic EIS. The NRC and its staff are widely recognized for their technical expertise. The GEIS appropriately draws upon that expertise and upon evaluations performed by the technical staff. (0030-7-5 [Matthews, Tim])

Comment: I Thank you for your efforts to minimize the danger from radioactive waste. I hope that we can do more to improve both on and off site storage of such waste and to include the overall costs of such actions in all consideration and licencing of nuclear plants. (0041-1 [Groff, Inga] [Groff, Joe])

Comment: In short, ConverDyn supports the NRCs fundamental Waste Confidence conclusion that used fuel can be safely stored at reactor sites or at off-site locations and the time interval between reactor shut down and the ultimate recycling or disposal of the fuel. This conclusion is supported by many decades of safe, secure, on-site storage of used fuel in spent fuel pools and in dry storage systems both in the United States and abroad. (0045-14-2 [Frankland, Chris])

Comment: We'd [Arizona Public Service Company] also like to compliment you and the Staff, on the quality of the document you prepared. I mentioned outside before the meeting started, that given the time constraints that you were facing, the documents were all very, very well done. (0045-2-1 [Green, Michael])

Comment: The draft Environmental Impact Statement that was prepared, could be done, and was done, on a generic basis, because first, continued storage will involve spent fuel storage activities, for which environmental impacts of operation are sufficiently well understood, as a result of lessons learned and knowledge gained from operating experience. Second, activities associated with continued storage are expected to be within this well-understood range of operating experience, thus the environmental impacts can be reasonably predicted. And third, changes in the environment around spent fuel storage facilities, are sufficiently gradual and predictable, to be addressed using this generic approach. (0045-2-4 [Green, Michael])

Comment: The 575-page Draft Generic Environmental Impact Statement contains abundant and comprehensive analyses of the issues remanded by the Court through the Commission, as well as all issues that should be considered in the Environmental Impact Statement process. Consequently, there is substantial evidence to support the conclusions regarding at reactor, and away from reactor storage, as well as the conclusions regarding commutative impacts of those scenarios, when combined with other federal and non-federal actions. (0045-2-5 [Green, Michael])

Comment: Notwithstanding the fact that some stakeholders may disagree with your technical conclusions and argue that you have not reached a correct decision, the record contains substantial evidence to support your conclusions. In closing, the analyses contained in the Waste Confidence Draft Generic Environmental Impact Statement support what the Commission and the Industry have long known. (0045-2-7 [Green, Michael])

Comment: In the meantime, the NRC can and should issue its revised Waste Confidence Decision. (0045-2-9 [Green, Michael])

Comment: The analysis contained in the Draft Waste Confidence Generic and Environmental Impact Statement supports what the industry has long known. If necessary, used nuclear fuel can continue to be stored in a safe, environmentally sound manner, for a long period, while we wait the political process to reach agreement on the disposal solution. In the meantime, the NRC can and should issue its Waste Confidence Rule. (0045-5-6 [Cannon, Tom])

Comment: For many reasons nuclear energy is a vital part of our nation's electricity system. It's essential for the Nuclear Regulatory Commission to complete the Waste Confidence rulemaking and move forward with issuing renewed operating licenses for existing nuclear plants and license to build and operate new plants. (0045-9-8 [Baker, Tammera])

Comment: Environmental Assessment vs. Environmental Impact: Several lawsuits in 2010 and 2012 have forced the NRC to change the original determination stated in the 1984 "Waste Confidence Decision". This decision declared that during the permitting process used in the granting of the thirty (30) year operations license of a nuclear generating station, an environmental assessment of the environment and sociological effects of short term storage of radiological waste would be sufficient when considering the issuance of this operations license. For the criteria used in the granting of the thirty (30) year renewal license an "Environmental Assessment" would be sufficient until permanent storage facilities are made available. With the decision of the U.S. Court of Appeals District of Columbia Circuit Court, it became clear that an "Environmental Assessment" could not be considered sufficient in determining environmental and/or sociological area impact regarding on site spent fuel storage when granting licenses to operate. This could only mean that an "Environmental Impact Statement" would be required in order to evaluate the various conditions involving onsite storage of radiological waste. -- Site Specific EIS vs. Generic EIS: The court decision of New York v. NRC determined that an Environmental Impact Statement of some kind would be required in order to issue, or reissue, the operations license. So the question beckons which type of EIS should be required, a Generic EIS or a Site Specific EIS? -- The "U.S. Energy Information Administration" lists sixty-five (65) operating nuclear power generating facilities in the United States. Should it be determined that a Site Specific EIS is required it would command sixty-five (65) individual Environmental Impact Statements that would need to be performed in order to issue a thirty (30) year operations renewal license. The use of a "Generic Environmental Impact Statement" would be tailored for all the generating stations thus requiring only site specific updates for each location. -- Local 51 Plumbers and Pipefitters Position: It is the position of the United Association of Plumbers and Pipefitters Local 51 that the use of a "Generic Environmental Impact Statement" (GEIS) would be preferred rather than the use of "Site Specific Environmental Impact Statements" (SSEIS). The crafting of a GEIS would be done utilizing the standardized guidelines promulgated by the NRC for the issuing of the renewal license. Guidelines for the completion of the EIS would obviously include the sampling of ground water for radioactive contamination as well as air quality sampling for any release of radioactivity, and any other required testing. The cost of an individual EIS would have to be borne by the station requesting the license renewal. This cost would ultimately be passed on to the consumer thus increasing the total cost of megawatt generation in an already expensive and competitive industry. The use of a GEIS promotes responsible cost management coupled with adherence to the environmental concerns of those living near these generating facilities. The town of Plymouth Massachusetts and the subsequent owners of the Pilgrim Nuclear Station have enjoyed productive relations through the years and there is nothing to suggest the use of a Generic Environmental Impact Statement over any Site Specific Impact statement would be any less lenient in protecting our very important and valued natural resources. (0096-1 [Byrne, Timothy])

Comment: I am here tonight in support of what currently exists in the proposed rule. (0112-1-1 [Giunta, Tony])

Comment: If we do not ensure a reliable electrical grid, we will reverse this trend that we are seeing of industry returning back to New England. And I look to the NRC to make sure that our grid is reliable for the future. So to end, I support the adoption of the Waste Confidence rule and the draft Environmental Statement. As adopted it will ensure the continued availability of sustainable, reliable, affordable nuclear power to the New Englander grid. (0112-1-4 [Giunta, Tony])

Comment: I appreciate the opportunity to support the Commission's work in this area and to highlight the public's awareness to the scientific and engineering basis that gives me confidence as an engineer working with the numbers. That although the rhetoric might sound uncertain, it's backed up by numbers that engineers devote their lives to getting and the people put their trust in for our ability to safely manage used nuclear fuel. But myths and scare tactics threaten this healthy discussion on the science and engineering of material safety systems. As engineers we welcome when people bring legitimate concerns that we can take a look at, that we can evaluate, and we can see if they're worth looking into and if they're worth the rhetoric. But when things escalate and we are unable to have a discussion on the merits, it's unhealthy for us to continue moving forward. (0112-12-3 [Garcia, Diego])

Comment: Tonight there have been many questions, as there have been in previous meetings, regarding whether the NRC can and should generically address the so-called Waste Confidence issues. I'm here to explain my view and to provide some input and information regarding how that question has been answered by the courts. The bottom line is the question has been answered in the affirmative both by the courts and by the Commission. As time is short, I will largely limit my comments to the legal basis for proceeding generically as reinforced by both the early decisions by the U.S. Court of Appeals for the District of Columbia in *Minnesota v. NRC*, which case was the first case to prompt the NRC to review the environmental impacts following license expiration, but before disposal -- pick up for disposal. (0112-19-1 [Ginsberg, Ellen])

Comment: But before I even mention my analysis of that decision [*Minnesota v. NRC*], I wanted to mention also that the Supreme Court, itself, has affirmed the Commission's longstanding practice of considering environmental issues through rulemaking in appropriate circumstances. Thirty years ago, in 1983, the Supreme Court in a case some of you may be familiar with, *Baltimore Gas and Electric*, concluded that the generic method chosen by the Agency is clearly an appropriate method for conducting the hard look required by NEPA. That's exactly what the NRC is doing with this rulemaking. (0112-19-2 [Ginsberg, Ellen])

Comment: So returning now to the initial decision that addressed Waste Confidence, which was the *Minnesota v. NRC* decision, I would highlight that the Court of Appeals said they're very -- in a very straightforward fashion where factual issues do not involve particularized situations, an agency may proceed by comprehensive resolution of the questions rather than re-litigating the question in each proceeding in which it is raised. Parsing the issue further, The Court in *Minnesota* said we agree with the Commission's position that it could properly consider the complex issue of nuclear waste disposal in a generic proceeding such as rulemaking and then apply its determinations in subsequent adjudicatory proceedings. Applying the legal principles set forth in *Minnesota*, which were also affirmed in the 2012 decision on the most recent revisions to the Waste Confidence rule, the Commission now has directed the NRC staff to prepare a GEIS and rule. This responds to the remand. (0112-19-3 [Ginsberg, Ellen])

Comment: NEI [Nuclear Energy Institute] supports the Commission's approach. We believe it's both legal and, as a practical matter, appropriate. The present rulemaking evaluates the environmental impacts from continued storage of spent fuel after the end of the reactor licensed life or operation but before it is placed in a repository. This rulemaking does not substitute for licensing actions that require site-specific NEPA analysis such as original licensing. The NRC's EIS on the instant issues does account for conditions at all reactor sites. (0112-19-4 [Ginsberg, Ellen])

Comment: We [Nuclear Energy Institute] also support this rulemaking because it's a reasonable use of NRC, licensee, and public resources. It avoids duplicative and inefficient site-specific reviews of continued spent fuel storage issues. We thoroughly concur, as well, that, for example, the no-repository scenario affects all sites similarly. Further, there's been no evidence presented that suggests that the issues of potential leaks or fires require site-specific consideration. The GEIS includes well-supported bounding analysis, which is to say these analysis encompass all reactor sites and operations. (0112-19-5 [Ginsberg, Ellen])

Comment: I support the updates that are proposed by the NRC. I believe that they are technically sound. That they represent an appropriate interpretation of the professional consensus of the nuclear engineering community. (0112-27-1 [Curtis, Daniel])

Comment: And I think the industry is doing a great job nowadays and we need to continue on that path. To the point I can state that the NRC has a good approach into the rulemaking and the technical basis is sound and reasonable. (0112-28-2 [Diaconeasa, Mihai])

Comment: Although the federal government has not completed its plans to develop a national repository so that used nuclear fuel can be removed from nuclear plants nationwide, we encourage you to continue efforts to clarify the issues, process, and findings regarding the safe and secure storage of used nuclear fuel storage. (0118-4 [Westchester, Business Council of])

Comment: Members of the NRC staff, and to the commissioners of the NRC, we ask you to hear our voices. Used nuclear fuel is being safely stored, can be safely stored and will be safely stored with confidence. Please pass the new waste confidence rule. (0138-11 [Cook, Dr. Andrew G.])

Comment: We believe that a Generic Environmental Impact Statement is the preferred tool to use to assess continued storage of spent fuel at the end of the reactors licensed life for operation, and prior to it being sent to a permanent repository. Environmental analysis that accompanies initial license and renewal will still be used to consider the potential environmental impact of fuel storage during operation. We see no need to require additional environmental studies to determine the potential impacts of continued storage when it has already been addressed in the initial licensing during operation. (0152-3 [Pelletier, David A.])

Comment: I've read the revised Waste Confidence Rule and associated Environmental Impact Statement, and I commend the NRC staff on doing such a thorough and thoughtful job. (0163-11-1 [Gutherman, Brian])

Comment: The proposed rulemaking and Environmental Impact Statement are well done, accurate, and address the issues of the court's order. The Rule and EIS should be approved. (0163-11-6 [Gutherman, Brian])

Comment: While nuclear energy is a vital part of our state's electricity portfolio and economy, we [NAYGN] recognize the need to address the transportation, storage, and disposal of used

nuclear fuel. The National Conference of State Legislatures said recently that it supports Federal action to develop facilities for interim storage of high-level radioactive waste until a permanent repository is ready. We strongly urge the Nuclear Regulatory Commission to continue its strong independent oversight of the commercial nuclear energy facilities, operation of existing plants, licensing new reactors, renewing the operating licenses of existing reactors and the management, transportation, and disposal of used nuclear fuel. (0163-17-2 [Schepperly, David])

Comment: The first is that as was true in the several meetings prior to this one, there's been -- there have been questions asked about the NRC's evaluation generically of the period for storage from the time of license expiration until pick up for disposal. Much has been made of this point and the question then is can the NRC and should the NRC treat these issues generically? The answer has been long ago answered -- the question has been long ago answered by the courts, and again, in 2012 it was affirmed by the D.C. Circuit. The NRC may proceed by rulemaking on certain environmental issues and the courts have said particularly this is true on the issue subject of this rulemaking. In the context of the initial lawsuit in 1979 which challenged the NRC's failure to consider the environmental impacts associated with continued storage, the Court of Appeals for the District of Columbia stated succinctly where factual issues do not involve particularized situations, an agency may proceed by comprehensive resolution of the issues rather than re-litigating the question in each proceeding in which it is raised. Parsing the issue even further, the court said "We agree with the Commission's position that it could properly consider the complex issue of nuclear waste disposal in a generic proceeding such as Rulemaking and then apply its determinations in subsequent adjudicatory proceedings. A few years later in 1983 the Supreme Court endorsed the NRC's long-standing approach. Its commentary was as follows: "The generic method chosen by the agency is clearly an appropriate method of conducting the "hard look" required by NEPA." (0163-30-1 [Ginsberg, Ellen])

Comment: [O]ur [NEI] position is that as an independent health and safety regulator, the NRC has asked and answered the appropriate questions regarding repository availability in the Draft GEIS and Proposed Rule. (0163-38-3 [Bonanno, Jerry])

Comment: The NRC and its staff are to be congratulated for addressing these issues in a generic manner. Ever since our country began to deploy nuclear technologies in the late 1940's, the use of a generic approach -- such as has previously been applied on used fuel transportation issues-has served our country well. Further, the generic approach to addressing the Waste Confidence Decision is consistent with the NRC's responsibilities to carry out its mission thoroughly and efficiently. It is also consistent with the NRC Principles of Good Regulation which state: "Where several effective alternatives are available, the option which minimizes the use of resources should be adopted". Given that the issues associated with used fuel storage are subject to generic evaluations, rather than site specific considerations, the approach incorporated in this EIS makes complete sense. In closing, I would like to say three things: First, I believe the basis for the draft Waste Confidence Rule is as valid today as the time when I was a Commissioner and I also believe it is consistent with the draft environmental impact statement. (0180-6 [Merrifield, Jeffrey])

Comment: I work for a nuclear fuel cycle consulting firm, and my job is to follow spent fuel management issues for our clients. I have read parts of the revised waste confidence rule and associated environmental impact statement and I commend the NRC staff on doing such a thorough and thoughtful job. The assumptions the NRC used in the EIS are reasonable and conservative, and I believe the conclusions reached are correct. (0181-1 [Waters, Christine])

Comment: These facts are important because approval of this rulemaking and EIS is essential for the industry to continue with numerous licensing actions that will keep the reliable nuclear electricity we all take for granted flowing without interruption. The NRC will not issue final licenses or renewals until the rulemaking is finalized. Stopping this rulemaking will ultimately cost jobs, harm many local economies, reduce the tax base, and put the reliability of our nationwide electric power system at risk. All for no good reason. In summary, this proposed rulemaking and environmental impact statement are well done, accurate, and address the issues in the court's order. The rule and EIS should be approved. (0181-6 [Waters, Christine])

Comment: As a consultant who works in the nuclear industry, and who specializes in the back-end of the fuel cycle, I appreciate the opportunity to make comments on the proposed waste confidence rulemaking, and the associated generic environmental impact statement (EIS). I am concerned about the environment and about this country's ability to meet our electricity demand for the long-term future. Nuclear safety matters to me and my loved ones just like it does to everyone else in this room. As part of my job, I have read parts of the revised waste confidence rule and the Generic EIS and commend the NRC staff on doing such a thorough and thoughtful job. The assumptions the NRC used in the EIS are reasonable and conservative, and I believe the conclusions reached are correct. (0183-1 [Green, Carlyn])

Comment: These facts are important because approval of this rulemaking and EIS is essential for the industry to continue with numerous licensing actions that will keep the reliable nuclear electricity we all take for granted flowing without interruption. The NRC will not issue final licenses or renewals until the rulemaking is finalized. Stopping this rulemaking will ultimately cost jobs, harm many local economies, reduce the tax base, and put the reliability of our nationwide electric power system at risk. All for no good reason. In summary, this proposed rulemaking and environmental impact statement are well done, accurate, and address the issues in the court's order. The rule and EIS should be approved. (0183-6 [Green, Carlyn])

Comment: I am writing to say that I will be commenting on the topic about the update of the Waste Confidence Generic Environment Statement (Docket ID NRC-2012-0246-0362). I am fully in favor of writing this new EIS in order to make nuclear waste less of a problem. Throughout my comment, you will see I have provided different reasons on why I feel the updated EIS is needed very much. Potential benefits for the community and agencies, and some ethical environmental reasons effectively show my stance on this topic. Thank you for your time, and I hope this provides some useful insight! (0192-1 [Einhorn, Jeremy])

Comment: The NRC's proposal to update the Waste Confidence Generic Environmental Impact Statement is of utmost importance to be done as soon as possible. I say this because of benefits for the community and the agencies, the necessity of this, and how it's basically the NRC's job to do such action in order to do their jobs in the best way possible. In conclusion, I am all for the updating of this EIS, and I hope that everyone else sees just how important this is. (0192-15 [Einhorn, Jeremy])

Comment: It is without say that spent nuclear fuel is a very serious topic as it is incredibly dangerous and its damaging effects have the potential to be devastating. In 2010, the Nuclear Regulatory Commission (NRC) created a generic environmental impact statement (EIS), called the Waste Confidence Generic Environmental Impact Statement, which dealt with the environmental impact of spent nuclear fuel, or nuclear waste. It is now up for comment on the update and revision of this EIS. I am for the renewal of this EIS, as this is something that can come back to haunt American if not dealt with properly. (0192-2 [Einhorn, Jeremy])

Comment: I am very happy the NRC is providing this draft EIS on the proposed schedule. The original legislation to create government storage of spent fuel was passed in 1982 and the US has not picked up the first ounce of spent fuel. In the absence of government regulation, the utility companies would have found a faster, cheaper and more efficient method to store, move & handle spent fuel - but at least the government is moving forward again at this glacial pace. Since the NRC stated in 1977 that it "... would not continue to license reactors if it did not have reasonable confidence that the wastes can and will in due course be disposed of safely" (42 FR 34391). So the NRC vision of due course is greater than 36 years, probably over 80 years. Now a repository is predicted for 2048, so 71 years minimum. And the utilities are required to collect money in every power bill to continue to fund this non progress. Our lovely government is amazingly wasteful in spending the citizens money. (0199-1 [Dailey, Arthur])

Comment: I look forward to the completion of this rulemaking on the announced schedule, and resumption of licensing reactors and spent fuel storage installations. (0201-4 [Fregonese, Vic])

Comment: In closing, I fully support the NRCs analysis and conclusions related to Waste Confidence. (0201-6 [Fregonese, Vic])

Comment: I agree with the NRC's definition of proposed action of promulgating of a rule that generically addresses the environmental impact of used fuel storage, making such considerations largely unnecessary in individual licensing proceedings which then would focus strictly on the individual licensed properties. (0244-1-2 [Tulenko, James])

Comment: The Waste Confidence decision supports the licensing of nuclear plants that provide 63 percent of the nation's carbon-free electricity. And I think a comment was made earlier that, you know, why does the regulator need to be efficient. Well, NRC has been efficient and is continuing to be efficient in this process even while making sure that all comments are heard. Because all forms of energy are regulated. The nuclear regulatory process is one of the toughest ones out there. Coal is regulated; natural gas is regulated; oil, solar, and wind are regulated. If all those regulators don't pay attention to being efficient, the end result is that energy, electricity, becomes very very expensive. A world in which electricity is priced out of reach is perhaps the most dangerous world we could possibly live in. If you don't believe that, have you ever seen the pictures called The World At Night, where it's a composite photo of the globe looking down as if it was night all over the globe? You see where the bright spots are in the world? The developed countries, the countries that have a high standard of living, those bright spots also tend to be clustered around nuclear plants. We are a significant source of baseload electricity around the world, over 400 plants. (0244-11-2 [McCullum, Rod])

Comment: In the meantime the NRC can and should issue its Waste Confidence Rule. (0244-12-7 [Ratchford, James])

Comment: The bottom line is that I do believe that we do have the technical basis for concluding that there is confidence in our ability to store spent nuclear fuel onsite, short term, long term, and indefinitely. I believe that your conclusions in your existing EIS, pursuant to the Federal Register that you have posted out there, the number of which you cited earlier, that they are valid conclusions. Particularly those that, in its draft form, conclude small impact, especially as to the air quality and air impact of the EIS, and I hope that your record reflects that. (0244-9-9 [Paul, Jerry])

Comment: The coalition supports the Proposed Waste Confidence Rule because the facts show that spent fuel can be, and is, safely and securely stored in Illinois. We further urge the

NRC to move forward expeditiously with the construction of a central spent fuel repository which will help us further develop potential nuclear energy and nuclear science across the nation. (0245-16-4 [O'Brien, Doug])

Comment: It is important to continue progress on a permanent solution of the storage of spent fuel. Exelon supports the development of the GEIS as a stepping stone in this process and supports and agrees with the conclusions in this report. The draft report is a rigorous examination of the environmental impact based on 50 years of research and operating experience. The report draws on industry, government, and academic references to compile a complete view of the potential impacts of spent fuel storage. The report appropriately looks at bounding conditions over the time periods in question, and the conclusion forms a sound basis for continued nuclear fuel storage and disposal. (0245-20-2 [Dunlap, Jeff])

Comment: In the meantime, the NRC can and should issue its Waste Confidence Rule. (0245-20-7 [Dunlap, Jeff])

Comment: I fully support the Rule. (0245-23-3 [Korn, Susan])

Comment: I have confidence in the draft GEIS and I would urge the NRC to adopt the Rule. (0245-33-4 [Schussele, Samantha])

Comment: Now, in vacating the 2010 update to the Waste Confidence Rule, the Appellate Court, among other things, directed the Agency to more thoroughly examine the environmental impact of continued spent fuel storage. The Agency's findings of minimal impact are consistent with the excellent safety track record associated with dry storage systems and the broader performance of the U.S. Nuclear Energy industry. (0246-10-2 [Bennett, Nathan])

Comment: I would like to offer my support for the Proposed Rule and thank you for your time this afternoon. (0246-10-7 [Bennett, Nathan])

Comment: There is much more to be said about why it is appropriate for the NRC to have conducted a generic review to meet its NEPA obligation. There is also much more to be said about how the draft GEIS sufficiently responds to the Court's direction to consider spent fuel pool leaks and fires. (0246-14-4 [Ginsberg, Ellen])

Comment: [The United Association of Plumbers and Fitters in North America and Australia] support the NRC findings. (0246-18-7 [Karbowsky, Brad])

Comment: I work as a nuclear safety performance engineer and I work on the safety systems that are currently analyzing the spent fuel pool cooling for Fukushima-type conditions. And I take that responsibility to heart. I know the public and our country trusts engineers like me to provide them with the trust that they need in order to continue nuclear power and the safe storage of spent fuel. And I believe that the Proposed Rule is consistent with that. (0246-21-1 [Garcia, Diego])

Comment: I think the generalized approach is appropriate, as it takes into account bounding conditions, conditions for wet storage that are way beyond what storage is usually used for. It takes into account indefinite and long-term storage and dry casks. And those are applicable across the board. As an engineer, I feel confident in that. (0246-21-2 [Garcia, Diego])

Comment: I support the Rule and I think it does a very good and bounding job in addressing the issue at hand. (0246-21-5 [Garcia, Diego])

Comment: We [Decommissioning Plant Coalition] commend the Commission staff for its work to date and believe that the work firmly and fairly addresses the deficiencies found by the Court. Its analyses of short-term, long-term, and indefinite storage time frames are more than adequate to support the long-held tenant that the U.S. can and will successfully store and dispose of used fuel and reactor-generated greater-than-Class C waste safely and securely. And that would complete our comments on the Draft Final Rule and the Generic Environmental Impact Statement, itself. We do note that there is a need to address some of the written material ancillary to the Rule. We will offer comments that should illuminate the considerations and the publication of the Final Rule in the accompanying GEIS without disturbing the actual Rule and Statement. (0246-4-1 [Callahan, Mike])

Comment: I do, in closing, want to state that we do commend the staff and particularly this Directorate for its hard work and believe that you have firmly and fairly addressed the deficiencies of the Court. (0246-4-4 [Callahan, Mike])

Comment: [T]he draft Generic Environmental Impact Statement is a comprehensive assessment of the impact of the long-term storage of spent nuclear fuel. It's based on reasonable assumptions and it's based on current technology. Finally, the draft Generic Environmental Impact Statement provides a sound basis, both technically and on a regulatory framework, for the conclusion that it's technically feasible to store spent fuel on an indefinite long-term basis, safely and securely. (0250-15-4 [Rodack, Tom])

Comment: I support the conclusion that fuel can be stored without significant environmental impact, and laud the effort of the Commission to complete their analysis to eventually solve these issues, diverse energy solutions for storage and long-term energy planning for nuclear science and technology. (0250-19-3 [Howell, Adam])

Comment: I would like to thank the NRC for providing this time to provide public comments on the Waste Confidence ruling. I would like to state that I fully agree with and support the conclusions that are proposed in the Environmental Statement Impacts, and I fully believe, with all the technical understanding that I have of the nuclear industry, that the Environmental Impacts stated in that ruling are very clear, concise, and we have a very sound understanding of what is going to occur. (0250-24-1 [Rogers, Tim])

Comment: I'd like to extend my personal thanks to the NRC representatives for hosting this meeting. I would also like to compliment you and the staff on the quality of the documents that you have prepared. The documents are very well written, and laid out in very sound, logical fashion. (0250-25-1 [Wellwood, Jay])

Comment: Based off my experience, it is my professional opinion that there is substantial evidence to support the conclusions in the report regarding at and away from reactor storage, as well as the conclusions regarding cumulative impacts of those scenarios when combined with other federal and non-federal actions. (0250-25-3 [Wellwood, Jay])

Comment: I would like to express appreciation to the NRC for having this public meeting tonight. I do greatly support the NRC's efforts in the preparation of the GEIS which will help advance Waste Confidence for our industry[.] (0250-27-1 [Pennington, Charlie])

Comment: The proposed Waste Confidence Rule and Generic Environmental Impact Statement support the efforts of our company to deliver safe, reliable, and emission-free power to our customers, long into the future. It will also support efforts by other utilities that are working

to license new reactors to support their strategic objectives. We support the NRC's efforts this evening, and we support the agency moving forward with the proposed Waste Confidence Rule and Generic Impact Statement. (0250-3-5 [Archie, Jeff])

Comment: We can all be confident that used nuclear fuel is being safely stored, can be safely stored, and will be safely stored. I ask the NRC Commissioners to pass the new Safe Storage rule. (0250-35-7 [Cook, Andrew])

Comment: The court was very specific, the findings were very narrow; NRC has addressed these. A lot of talk about the generic nature and whether that's appropriate. NRC has done it appropriately because they've been bounding a lot of enveloping assumptions in here. Impacts are shown to be small, but in reality they're even smaller. We won't be repackaging every 100 years; we won't be building dry transfer facilities at every site; we won't be waiting 60 years to move fuel out of pools at shutdown plants. The average since dry cask storage was invented is 11 years. So, in closing, there's a lot to be confident. There will be more innovation. (0250-36-3 [McCullum, Rod])

Comment: Developing a final storage rule allowing the outside storage of spent fuel has a negligible environmental impact. (0250-37-4 [Barilla, Frank])

Comment: I'd like to thank the professionals at the NRC for their hard work developing this rule, and I urge the Commission to approve it. (0250-37-6 [Barilla, Frank])

Comment: The NRC and its staff should be congratulated for addressing these issues in a generic manner, rather than using a site-specific methodology. This approach to addressing the Waste Confidence decision is consistent with the NRC's responsibility to carry out its mission thoroughly and efficiently. It is also consistent with the NRC's principles of good regulation, which state "Where several effective alternatives are available, the option which minimizes the use of resources should be adopted." In closing, I'd say three things. First, I believe the basis for the draft Waste Confidence Rule is as valid today as the time when I was a Commissioner, and I also believe is consistent with the draft Environmental Impact Statement of which we discussed tonight. (0250-4-4 [Merrifield, Jeffrey])

Comment: And I implore the NRC to pass the GEIS as proposed. (0250-41-5 [Abendano, Juan])

Comment: I will briefly say that I do endorse the NRC's Environmental Impact Statement, and I worked at a number of nuclear plants now. I've been in the business for five years, and I have complete confidence in the NRC to continue to provide robust, safe, and reliable regulatory oversight and rules for our industry that includes the storage of nuclear fuel waste. (0250-43-1 [Causey, Lee])

Comment: The Nuclear Regulatory Commission's draft Generic Environmental Impact Statement adequately addresses the items identified in the remanding of the 2010 Waste Confidence rulemaking by the United States Court of Appeals for the D.C. Circuit Court. The draft Generic Environmental Impact Statement thoroughly examines across multiple time frames the environmental and societal impacts of storing spent fuel at licensed facilities. The draft Generic EIS considers not only the effects of time but the possibility for such adverse conditions as seismic events, extreme weather, and hostile human action. These studies have been conducted in a conservative and bounding manner to ensure that the generic study is applicable to facilities nationwide. For those of you who actually read it and, well, a side comment, I am wondering how many of you actually did -- it actually lists all the facilities in the country that

have stored spent nuclear fuel and it covers that list. The specific dependencies on spent nuclear fuel leaks and fires mandated by the Court of Appeals ruling enforces the communities' understanding that, even under the worst of conditions, the likelihood of spent fuel stored at commercial facilities contributing adversely to a severe event is extremely small. (0250-56-1 [Murphy, William])

Comment: The conclusions of the draft Environmental Impact Statement most of all, to me, serve to confirm what I have personally observed and contributed to that storage of spent nuclear fuel has been and will be conducted with public health and safety as an overriding objective. (0250-56-3 [Murphy, William])

Comment: I support the NRC's conclusion that used fuel can be stored safely and without significant environmental effects and ask the NRC to complete this rulemaking in a timely fashion. (0250-57-6 [Jones, Lauren])

Comment: Despite our industry's frustrations, we are committed to keeping the lights on. And I am confident in the NRC's ability to objectively evaluate options with respect to used nuclear fuel storage and safety. I look forward to the issuance of the Waste Confidence Rule. (0250-58-7 [Cagnetta, Matt])

Comment: [W]e [Duke Energy] endorse the proposed Waste Confidence Rule. The NRC properly concludes that reactor operators can safely store used fuel after shutting down, until the federal government carries out its responsibility to dispose of the material. (0250-6-2 [Nesbit, Steve])

Comment: I think there are three important things with respect to the rulemaking and the Generic EIS that are very important here. I do endorse the Generic EIS and the treatment of that. I found the EIS to be very thoroughly written in the proposed rulemaking, but I would say three things are really important for the NRC. First is to make sure that we are removing uncertainty that the analysis is thorough, it's well-done, and the analyses and the EIS and the incorporation of comments from members of the public and industry are incorporated into that comment process, which is one of the events that we're doing tonight. (0250-61-3 [Little, Jim])

Comment: First of all, I do support the conclusions from the Nuclear Regulatory Commission as it relates to the Generic EIS. It's a very important issue for our industry to address and for our country to address. It provides needed certainty in an industry that provides a lot of reliable, safe, clean generation. It provides a lot of jobs for our citizens. And it is a vital part of our energy mix in the United States. So I applaud the NRC process. (0250-62-2 [Fregonese, Vic])

Comment: I support the conclusions of the EIS. And I look forward to the NRC bringing this to closure. (0250-62-6 [Fregonese, Vic])

Comment: Our safety record for protecting the public and our proven ability to safely harness nuclear power is why I support the Waste Confidence Rule and have the utmost confidence in this industry's ability to safely store used nuclear fuel in both spent nuclear fuel and dry storage. (0250-67-3 [DeVoe, Joe])

Comment: I support the NRC's decision to generically revise 10 CFR 51.23. It's the most efficient use of government resources, and it does compromise its mission of ensuring safety. The staff is also to be commended for their work on this draft GEIS. It's comprehensive, both in its effects and its three large time frames considered, particularly the inclusion of the indefinite storage period, which is conservative, although obviously not politically desirable. I think that the

assumptions of the GEIS are reasonable. The range of resource areas, in effect, considered, are logically and technically sound. (0250-70-1 [James, Andrew])

Comment: And we support the draft Environmental Impact Statement. (0250-70-6 [James, Andrew])

Comment: The South Carolina Governor's Nuclear Advisory Council (GNAC) was formed by statute to advise the Governor on issues relating to nuclear materials and activities in South Carolina. South Carolina hosts seven power reactors, with used fuel in pools and dry casks, and the Savannah River Site, which stores vitrified defense waste waiting permanent disposal. We provide the following comments on the subject rule and its supporting EIS for your consideration. The GNAC agrees with the conclusions in the Waste Confidence Draft GEIS and with the proposed revisions to the Waste Confidence - Continued Storage of Spent Nuclear Fuel rule. The draft GEIS is a National Environmental Policy Act (NEPA) document and its conclusions support the proposed rulemaking (0262-1 [Patterson, Karen])

Comment: The proposed rule simply clarifies the issues and processes surrounding the safe and secure storage of spent nuclear fuel. It does not authorize individual licenses, as this is only one step in the commission's National Environmental Policy Act (NEPA) review. Enhancing the clarity of this policy will lead to a more efficient licensing process, which will benefit consumers throughout our region. (0273-2 [Kinzinger, Adam])

Comment: I therefore support the pending rulemaking. (0313-3 [Waage, Edward])

Comment: We have reviewed the Waste Confidence Draft Generic Environmental Impact Statement and conclude that the NRC is interpreting well the professional consensus in preparing a more thorough Environmental Impact Statement as requested by the U.S. Court of Appeals for the District of Columbia in order to satisfy the NRC's NEPA obligations. (0325-17-1 [Pearson, Jeremy])

Comment: But I think that we've had confidence, and we have confidence in their Draft EIS for future storage. (0325-18-4 [Lemmon, Tom])

Comment: I think what they've done in terms of putting together a generic program is a good idea. It takes away 80 percent of the issues. So, when we get to San Onofre and what to do with that fuel, then a lot of the other issues have already been solved. And we can look at the specifics of this. We don't have to reinvent the wheel all the time. (0325-32-4 [Lord, Stephen])

Comment: I'm here to support the NRC Waste Confidence Ruling. (0326-18-1 [Schrader, Ken])

Comment: So that being said, I definitely support a spent fuel storage policy, and specifically, long-term storage solutions, and encourage that to move forward. A rulemaking that generically addresses Waste Confidence issues is absolutely a step in the right direction. (0326-41-3 [Zaitz, Kristin])

Comment: The United States Nuclear Regulatory Commission, NRC, has asked for public comment on the Proposed Waste Confidence Rule. The State Building Trades believes it is important that the NRC more efficiently conduct its licensing process by adopting a Waste Confidence Rule which provides a generic analysis of the environmental impact of the continued storage of spent nuclear fuel beyond the licensed life of the operation of the nuclear reactor. The adoption of the Waste Confidence rule, which states that used nuclear fuel can be stored at nuclear power plant sites safely and without significant environmental impact, provides the

nuclear industry with a certainty regarding the management of the spent fuel. Providing this clarity is critical towards ensuring operations and capital investment at these nuclear facilities continue which means jobs for our State Building Trades. (0327-12-1 [Knisley, Mike])

Comment: In summation, the State Building Trades supports adoption of the Waste Confidence Rule which provides the nuclear industry with long-term stability on this issue, and which will likely continue for significant work opportunities for our members. (0327-12-4 [Knisley, Mike])

Comment: I live close to both Fermi and Davis-Besse, and I am in favor of, and have confidence in, these fuel storage options. (0327-17-1 [Padot, Paul])

Comment: I support the adoption of this Proposed Waste Confidence Rule. We need a safe, secure, and commonsense way to store this waste until a permanent facility is available. Many of my members [Plumbers and Steamfitters Local 50] help maintain and service the Davis-Besse powerhouse in Oak Harbor, and I will say it is one of the safest and most secure job sites there is for them to have an opportunity to work at. (0327-19-1 [Szabo, Lou])

Comment: I've reviewed the GEIS and the proposed rulemaking, and I want to voice my support. (0327-28-1 [Greenwood, John])

Comment: In further support of this rulemaking, I believe firmly in the nuclear industry because I see life within infrastructure. And it's key to our infrastructure to maintain integrity of our electrical grid. I've traveled abroad and have seen places without that infrastructure that have desolation and the poor living standards that are there. Our country is rich. We want to maintain this tradition. If we want to support our education, if we want to support the growth of our future, we need to maintain critical infrastructure, which is the electric grid. (0327-28-5 [Greenwood, John])

Comment: The NRC has asked for public comment on the Proposed Waste Confidence Rule. ACT Ohio is in full support of a Waste Confidence Rule which provides a generic analysis of environmental impacts of the continued storage of spent nuclear fuel beyond the life of the license of the operation of the nuclear reactor. The adoption of such a Rule would provide the nuclear industry with a long-term stability and allow it to make capital improvements to its facilities, which helps leads to increased work opportunities for the skilled construction trade industry and the safety of our local communities. (0327-31-1 [Dorans, Rob])

Comment: In summation, ACT Ohio [Affiliated Construction Trades Foundation of Ohio] supports the adoption of the Waste Confidence Rule, which provides the nuclear industry with long-term stability on this issue and will help lead to work opportunities for the skilled construction trades industry. (0327-31-6 [Dorans, Rob])

Comment: I would like to applaud the NRC on completing a Draft Generic Environmental Impact Statement and convey our support for the proposed action of issuing a revised Waste Confidence ruling. As a member of the nuclear industry, I realize the significance and impact that both the Draft GEIS and the revision of the Waste Confidence ruling will have on the growth and sustainability of this industry. As our current nuclear fleet ages and the continued need for carbon-free energy increases, it has never been more imperative that these issues are addressed. (0328-10-2 [Biersdorf, John])

Comment: I support the NRC's findings in both the GEIS and the Nuclear Confidence ruling. These findings will allow the industry the flexibility to deal with its own spent nuclear fuel until a finalized solution can be agreed upon, while also allowing the industry to grow and meet the demand for carbon-free electricity using proven methods for spent fuel storage in the interim. (0328-10-5 [Biersdorf, John])

Comment: The analysis contained in the Draft Waste Confidence Generic Environmental Impact Statement supports what nuclear experts have long contended, used nuclear fuel is, and can continue to be, stored on site at commercial nuclear power plants in a safe, environmentally sound manner for a long time. However, just because it can be done does not mean that it should be done. (0328-5-11 [Pickens, Terry])

Comment: In the meantime, the NRC can, and should, issue its Waste Confidence Rule. (0328-5-14 [Pickens, Terry])

Comment: I am in complete support of what the NRC has promulgated in its Waste Confidence Draft Rule. (0329-2-1 [Mirsky, Steven])

Comment: I am my family are in support of NRC's spent fuel rule- (0374-1 [Landers, Don])

Comment: I and my husband and son support the NRC Spent Fuel Storage Rule. (0383-1 [Mordaunt, Brandon] [Mordaunt, Laura] [Mordaunt, Philip])

Comment: As a 33-year resident of the Central Coast of California, I am writing this letter to convey my support for the NRC's Spent Fuel Storage Rule. (0388-1 [Cox, David])

Comment: It is essential for the Nuclear Regulatory Commission to complete the waste confidence rulemaking and move forward with issuing renewed operating licenses for existing nuclear plants and licenses to build and operate new plants. The proposed rulemaking will enhance efficiency in individual licensing reviews by utilizing the Waste Confidence Generic Environmental Impact Statement to satisfy the requirements of the National Environmental Policy Act with regards to continued storage of spent nuclear fuel, which are the same or largely similar at each nuclear site. Additionally there is strong international scientific consensus that geologic disposal is the best solution to permanently isolate spent nuclear fuel from the public and the environment. Studies by the National Academy of Sciences and the International Atomic Energy Agency have confirmed this conclusion. (0398-1 [Helsel, Adam])

Comment: It is essential for the Nuclear Regulatory Commission to complete the waste confidence rulemaking and move forward with issuing renewed operating licenses for existing nuclear plants and licenses to build and operate new plants. The proposed rulemaking will enhance efficiency in individual licensing reviews by utilizing the Waste Confidence Generic Environmental Impact Statement to satisfy the requirements of the National Environmental Policy Act with regards to continued storage of spent nuclear fuel, which are the same or largely similar at each nuclear site. Additionally there is strong international scientific consensus that geologic disposal is the best solution to permanently isolate spent nuclear fuel from the public and the environment. Studies by the National Academy of Sciences and the International Atomic Energy Agency have confirmed this conclusion. (0399-1 [Sylvester, Richard])

Comment: It is essential for the Nuclear Regulatory Commission to complete the waste confidence rulemaking and move forward with issuing renewed operating licenses for existing nuclear plants ? and licenses to build and operate new plants. The proposed rulemaking will enhance efficiency in individual licensing reviews by utilizing the Waste Confidence Generic Environmental Impact Statement to satisfy the requirements of the National Environmental

Policy Act with regards to continued storage of spent nuclear fuel, which are the same or largely similar at each nuclear site. Additionally there is strong international scientific consensus that geologic disposal is the best solution to permanently isolate spent nuclear fuel from the public and the environment. Studies by the National Academy of Sciences and the International Atomic Energy Agency have confirmed this conclusion. (0400-1 [Blankenmyer, Eric])

Comment: For many reasons, nuclear energy is a vital part of our nation's electricity system. It is essential for the Nuclear Regulatory Commission to complete the waste confidence rulemaking and move forward with issuing renewed operating licenses for existing nuclear plants and licenses to build and operate new plants. (0456-1 [Hoisington, Paula])

Comment: It is essential for the Nuclear Regulatory Commission to complete the waste confidence rulemaking and move forward with issuing renewed operating licenses for existing nuclear plants...and licenses to build and operate new plants. The proposed rulemaking will enhance efficiency in individual licensing reviews by utilizing the Waste Confidence Generic Environmental Impact Statement to satisfy the requirements of the National Environmental Policy Act with regards to continued storage of spent nuclear fuel, which are the same or largely similar at each nuclear site. (0461-1 [Pan, Arthur])

Comment: The proposed rule on storage of spent nuclear fuel seems reasonable (0466-1 [Tanner, John])

Comment: The HPS supports the analysis and conclusions of the Waste Confidence Generic Environmental Impact Statement (GEIS) and Proposed Rule. We are particularly pleased that the staff report supports the conclusion that environmental impacts from all three timeframes are adequately small to support proceeding with the rulemaking. This conclusion is consistent with our HPS Position Statement PS022-1, "Managing Spent Nuclear Fuel," revised June, 2007. (0534-1 [Vetter, Richard])

Comment: We were satisfied that the GEIS addressed the use of high burnup fuel, mixed oxide fuel, stainless steel cladding, small modular reactors and other peripheral issues being raised in objection to the proposed rulemaking. The second issue of concern to members of the public is the potential for fire in a spent fuel pool caused by reduced water inventory. The GEIS has also adequately addressed this very low potential environmental impact. (0534-2 [Vetter, Richard])

Comment: NAYGN supports NRC's on rulemaking. NRC appropriately addresses the spent fuel storage issues in a Generic Environmental Impact Statement and rulemaking. The draft Generic Environmental Impact Statement makes conservative assumptions and reasonably shows that if necessary, used nuclear fuel can continue to be stored in a safe, environmentally sound manner for a long period. (0535-4 [Damratoski, Katie] [Thornton, Adam])

Comment: I strongly support the NRC's efforts to keep our nuclear facilities safe and reliable. As the NRC continues its Waste Confidence rule making, I urge the NRC to proceed efficiently. (0555-1 [Contreras, Raquel])

Comment: We [The Decommissioning Plant Coalition] commend the Commission for its work to date and believe that it firmly and fairly addresses the deficiencies found by the Court and that its analyses of short, intermediate, and long-term storage timeframes are more than adequate to support the long held tenet that the U.S. can and will successfully store and dispose of used fuel and reactor-generated high-level wastes safely and securely. (0637-1 [Norton, Wayne])

Comment: Xcel Energy appreciates the opportunity to address this very important rulemaking action by the Nuclear Regulatory Commission and applaud the Commission's efforts to act in an efficient, transparent and expeditious manner. We support the NRC staffs proposed determinations that it is feasible to safely store spent nuclear fuel beyond the licensed life for operation of a reactor and to have a mined geologic repository within 60 years following the licensed life for operation of a reactor. We believe that the Commission's proposed rule and draft generic environmental impact statement comprehensively addresses the issues raised by the U.S. Court of Appeals for the District of Columbia Circuit in *New York v. NRC*. (0638-1 [Glass, Peter])

Comment: The draft EIS provides a thorough evaluation of the environmental consequences of used fuel storage at reactor sites or at consolidated storage facilities following termination of reactor operations. (0672-3 [Jamil, Dhiaa])

Comment: I am writing to you today to show support for PG&E's successful spent fuel management program and the NRC's Spent Fuel Storage Rule. (0682-1 [Adam, Peter])

Comment: I am writing to you today to show support for PG&E's successful spent fuel management program and the NRC's Spent Fuel Storage Rule. (0683-1 [Nelson, Bob])

Comment: The draft EIS provides a thorough evaluation of the environmental consequences of used fuel storage at reactor sites or at consolidated storage facilities following termination of reactor operations. (0685-4 [Davis, Ed])

Comment: TVA agrees with the Proposed Rule and the conclusions in the DGEIS that it is eminently feasible to safely store spent nuclear fuel beyond the licensed life for operation of a reactor and to have a mined geologic repository within 60 years following the licensed life for operation of a reactor. TVA further agrees with the conclusions in the DGEIS that the environmental impacts of continued at-reactor storage of spent fuel are generally small, including the impacts from spent fuel pool leaks and fires. (0694-1-1 [Shea, Joseph])

Comment: TVA fully agrees with the NRC's and NEI's conclusions that a generic approach is appropriate. TVA's conclusions are supported by the following: •As the NRC correctly notes, the impacts of continued storage of spent fuel can be assessed generically because: (1) continued storage will involve SNF storage facilities for which the environmental impacts of operation are sufficiently understood as a result of lessons learned and knowledge gained from decades of operating experience (including the use of common storage technologies); (2) activities associated with continued storage are expected to be within this well-understood range of operating experience and, thus, environmental impacts can be reasonably predicted; and (3) changes in the environment around SNF storage facilities, including those existing or planned for WBN, are sufficiently gradual and predictable to be addressed generically. •The advantage of a generic rulemaking in these circumstances is clear and well-established, and expressly stated in the Proposed Rule: to enhance efficiency in individual licensing reviews by comprehensively analyzing environmental impacts that are the same or largely similar for each nuclear power reactor or storage site, thereby avoiding the need to "repeat the identical or substantially similar analysis in individual licensing actions." This is consistent with the Commission's longstanding practice to address long-term waste storage issues generically by rulemaking rather than on a case-by-case adjudicatory basis. •Use of a generic rulemaking also has been sanctioned by the federal courts, including the D.C. Circuit in *New York v. NRC*,²⁰ [footnote 20 text: See *New York*, 681 F.3d at 480; see also *Baltimore Gas & Elec. Co. v. Natural Res. Def. Council, Inc.*, 462 U.S. 87, 101 (1983) ("The generic method chosen by the agency is

clearly an appropriate method of conducting the hard look required by NEPA."); *Minnesota v. NRC*, 602 F.2d 412, 416-17 (D.C. Cir. 1979).] and avoids the obvious inefficiencies attendant to case-by-case adjudication of fundamentally generic environmental issues. (0694-1-10 [Shea, Joseph])

Comment: TVA has confirmed that the conclusions in the DGEIS regarding the small environmental impacts of continued storage of SNF apply to TVA's plants, including WBN. Thus, there is no need for or benefit of a site-specific analysis for issuance of an operating license for WBN-2 or other pending or future TVA licensing actions. In summary, the use of a generic rulemaking and a generic EIS is entirely appropriate for the waste confidence issues under consideration in the Proposed Rule and DGEIS, and has been justified by the NRC. (0694-1-11 [Shea, Joseph])

Comment: TVA supports the comments submitted by the Nuclear Energy Institute on behalf of the nuclear power industry. In particular, TVA agrees that the NRC's use of a generic rulemaking to address the waste confidence issues is appropriate and consistent with applicable law, and the NRC has fully addressed the issues identified by the U.S. Court of Appeals for the District of Columbia Circuit in *New York v. NRC*. (0694-1-2 [Shea, Joseph])

Comment: TVA provides comments that confirm that the NRC's general analysis of spent fuel storage impacts is fully applicable to TVA's nuclear plants, including Watts Bar Unit 2. In addition to support for NEI's comments and discussion of the applicability of the DGEIS analysis to TVA's plants, TVA provides comments for changes to the DGEIS, including recommendations for additional detail or topics in places to support the NRC's conclusions that environmental impacts are small and appropriately apply to all U.S. nuclear plants. TVA's comments demonstrate that there is no need for a site-specific Environmental Impact Statement for any TVA plant with a pending license application. (0694-1-3 [Shea, Joseph])

Comment: In summary, the Proposed Rule states that the Commission has determined that it is feasible to safely store SNF following the licensed life for operation of a reactor, either in spent fuel pools ("SFPs") or dry casks, and to have a mined geologic repository within 60 years following the licensed life for operation of a reactor. The Proposed Rule is supported by the conclusions in the DGEIS that most of the environmental impacts of continued at-reactor storage of spent fuel in a SFP or Independent Spent Fuel Storage Installation ("ISFSI") are small. TVA agrees with and fully supports these conclusions and the NRC's supporting explanation. (0694-1-5 [Shea, Joseph])

Comment: NRC's generic analysis of spent fuel storage impacts is fully applicable to TVA's nuclear plants, including WBN-2. This includes consideration of the DGEIS assumptions, such as the reference facility described in Chapter 2; the affected environment in Chapter 3; consideration of the environmental impacts in Chapter 4; consideration of continued safe storage of spent fuel in Appendix B; consideration of SFP leaks in Appendix E; and consideration of SFP fires in Appendix F. (0694-1-9 [Shea, Joseph])

Comment: The Proposed Rule and the supporting DGEIS directly address the three deficiencies identified by the D.C. Circuit in its remand order, ³⁶ [footnote 36 text: *New York*, 681 F.3d at 478-79.] and do so in a manner that thoroughly and reasonably address the environmental impacts of continued storage of SNF for all reactors-including those at TVA's plants. ³⁷ [footnote 37 text: See Proposed Rule, 78 Fed. Reg. at 56,780 ("[T]he Commission instructed NRC staff to proceed with a generic EIS to analyze the environmental impacts of continued storage and address the issues raised in the Court's decision and to update the

Waste Confidence rule in accordance with the analysis in the EIS. The DGEIS and the proposed rule implement the Commission's direction."); *id.* at 56,784 ("The analysis in the GEIS constitutes a regulatory basis for the proposed rule at 10 CFR 51.23, which codifies the NRC's conclusions in the GEIS on the environmental impacts of continued storage, including the Commission's expectations on the availability of a geologic repository.".)] (0694-2-1 [Shea, Joseph])

Comment: TVA agrees with the NRC and NEI that the indefinite storage scenario is not likely to occur. (0694-2-10 [Shea, Joseph])

Comment: Nonetheless, the D.C. Circuit specifically directed the agency to assess the environmental impacts of failing to establish a permanent repository, and TVA agrees with NEI that the NRC's consideration of an indefinite storage timeframe completely addresses the remand on this issue. Furthermore, inclusion of the indefinite storage scenario in the analysis helps the DGEIS to fully cover any possible environmental impacts associated with continued storage of spent fuel. (0694-2-12 [Shea, Joseph])

Comment: NRC's analysis of possible impacts from each storage scenario is applicable to TVA's nuclear plants, including WBN and any incremental impacts associated with issuance of an operating license for WBN-2. (0694-2-14 [Shea, Joseph])

Comment: [T]he NRC's generic analysis of spent fuel storage impacts in the Proposed Rule and DGEIS is fully applicable to TVA's nuclear plants, including WBN-2; any site-specific differences are not expected to have any new or significant environmental impacts. Therefore, the NRC has completed a reasonable and thorough generic evaluation that fully satisfies NEPA and no site-specific evaluation of spent fuel storage impacts is necessary or warranted for any of TVA's plants, including WBN-2. (0694-2-15 [Shea, Joseph])

Comment: This scope encompasses spent fuel storage issues applicable to TVA's nuclear plants. (0694-2-16 [Shea, Joseph])

Comment: DGEIS Chapter 2 discusses "typical facility characteristics and activities" that the NRC used to assess environmental impacts that may occur from continued storage of SNF.⁶⁰ [footnote 60 text: See DGEIS at 2-1.] These characteristics and activities are generally comparable to those for the WBN site. (0694-2-17 [Shea, Joseph])

Comment: Characteristics of WBN-1 and WBN-2, including facility description, reactor core size, fuel design, enrichment, and burnup, are generally comparable to the reactor description assumptions in Section 2.1 of the DGEIS. For example, as discussed below, some of TVA's reactors have or may participate in tritium production for the Department of Energy ("DOE"), but that activity does not significantly alter their characteristics that are relevant to waste confidence considerations and any minor differences do not impact the DGEIS conclusions. (0694-2-18 [Shea, Joseph])

Comment: As stated in the DGEIS, "[f]or most of the resource areas, the impact determinations for all three timeframes are SMALL."⁴² [footnote 42 text: DGEIS at 4-90.] There is nothing unique or different at TVA's plants that calls into question the applicability of these impact determinations. (0694-2-2 [Shea, Joseph])

Comment: Therefore, this SFP design is consistent with, and in fact appears to exceed, the SFP designs considered in the DGEIS. (0694-2-21 [Shea, Joseph])

Comment: Assuming a maximum uranium loading for each fuel assembly, TVA estimates that the WBN's SFP storage capacity is less than the 700 MTU storage capacity discussed in the DGEIS for the "reference spent fuel pool."⁷⁶ [footnote 76 text: DGEIS at 2-11.] (0694-2-22 [Shea, Joseph])

Comment: TVA has not identified any activities that it plans to conduct that would be inconsistent with those discussed in DGEIS Section 2.2. For example, the DGEIS assumes timely decommissioning of reactors in accordance with 10 CFR 50.82 and 52.110(c), and that all spent fuel would be moved from SFPs to dry storage by the end of the short-term timeframe (i.e., within 60 years beyond the licensed life for reactor operations).⁸⁹ [footnote 89 text: Id. at 2-26.] Such assumptions are reasonable and applicable to TVA's nuclear plants, including WBN. (0694-2-27 [Shea, Joseph])

Comment: TVA concludes that DGEIS Chapter 3 provides a reasonable description of the affected environment for consideration of the issues in the DGEIS, and that this description is comparable to TVA's plants for the purposes of the DGEIS. (0694-2-29 [Shea, Joseph])

Comment: Consistent with decades of operating experience and environmental monitoring, including TVA's own operating experience, that analysis concludes that the impacts are SMALL.⁴⁴ [footnote 44 text: See Proposed Rule, 78 Fed. Reg. at 56,797; DGEIS at E-19.] As discussed below, the SMALL finding regarding the potential offsite impacts of SFP leaks applies to potential impacts at TVA's plants. (0694-2-3 [Shea, Joseph])

Comment: [T]he SMALL finding regarding the risk of SFP fires applies to potential impacts at TVA's plants. (0694-2-4 [Shea, Joseph])

Comment: In summary, the NRC has taken reasonable and appropriate actions, in the form of the DGEIS and a proposed generically-applicable rule, to address the deficiencies in 10 CFR 51.23 identified by the D.C. Circuit. (0694-2-5 [Shea, Joseph])

Comment: The Proposed Rule and DGEIS Consider Appropriate Timeframes for Continued SNF Storage[.] (0694-2-6 [Shea, Joseph])

Comment: The assumptions within the short-term timeframe are reasonable for TVA's nuclear plants, including WBN. (0694-2-7 [Shea, Joseph])

Comment: The assumptions within the long-term timeframe are also reasonable or conservative for TVA's nuclear plants, including WBN. (0694-2-8 [Shea, Joseph])

Comment: These assumptions [indefinite timeframe] also are reasonable or conservative for TVA's nuclear plants, including WBN. (0694-2-9 [Shea, Joseph])

Comment: TVA is not aware of any aspects of its plants that would place them outside the generic evaluation of the environmental impacts of continued at-reactor storage of spent fuel that is provided in the DGEIS. (0694-3-10 [Shea, Joseph])

Comment: DGEIS Appendix B addresses the technical feasibility of continued safe storage of spent fuel, including the technical feasibility of wet storage (Section 8.3.1) and the technical feasibility of dry cask storage (Section 8.3.2). TVA has not identified anything in these sections of the DGEIS that is inconsistent with its own substantial spent fuel storage experiences and plans. (0694-3-11 [Shea, Joseph])

Comment: DGEIS Appendix E describes the environmental impacts of SFP leaks that may occur during the short-term storage timeframe, and concludes that the environmental impacts from leaks would be SMALL to groundwater, surface water, soils, and public health.¹¹⁸ [footnote 118 text: *Id.* at E-19.] TVA has confirmed that these conclusions regarding the impacts of SFP leaks apply to its nuclear plants, including WBN. (0694-3-14 [Shea, Joseph])

Comment: It is entirely reasonable for the NRC, like other government agencies in other waste-related contexts, to assume that institutional controls will remain for all reactor sites. There is nothing unique about TVA's plants in this regard. (0694-3-21 [Shea, Joseph])

Comment: Some of the reasons for a SMALL impact for TVA include: TVA already has a large area of previously disturbed land at its sites that would be used for the construction of storage facilities, TVA would mitigate any adverse effects on historic properties, TVA has appropriate management plans and procedures that are protective of historic and cultural resources, and these activities would be subject to further consideration of historic and cultural impacts during future regulatory activities. (0694-3-6 [Shea, Joseph])

Comment: •As described in DGEIS Sections 4.18.1 and 4.18.2, the environmental risks of continued storage of spent fuel associated with postulated accident conditions, such as design basis events for SFPs and dry cask storage systems, including hazards from natural phenomenon, such as earthquakes, floods, and tornadoes, and severe accidents, are SMALL.¹⁰¹ [footnote 101 text: *Id.* at 4-69 to 4-83.] These conclusions apply to TVA's plants, including WBN-2. (0694-3-8 [Shea, Joseph])

Comment: We respectfully submit the attached comments on the Proposed Rule and the DGEIS on behalf of Entergy Nuclear Operations, Inc. ("Entergy"). In summary, Entergy agrees with the Proposed Rule and the conclusions in the DGEIS that it is eminently feasible to safely store spent nuclear fuel beyond the licensed life for operation of a reactor and to have a mined geologic repository within 60 years following the licensed life for operation of a reactor. Entergy further agrees with the conclusions in the DGEIS that the environmental impacts of continued at-reactor storage of spent fuel are generally small, including the impacts from spent fuel pool leaks and fires. (0697-1-1 [Bessette, Paul] [Kuyler, Raphael])

Comment: Therefore, the DGEIS evaluations and conclusions apply fully to Entergy's plants. (0697-1-10 [Bessette, Paul] [Kuyler, Raphael])

Comment: Entergy demonstrates that the DGEIS generic conclusions are applicable to IPEC, such that no additional site-specific analysis is necessary to evaluate the environmental impacts of long-term storage of SNF at IPEC. (0697-1-11 [Bessette, Paul] [Kuyler, Raphael])

Comment: Entergy fully agrees with the NRC's and NEI's conclusions that a generic approach is appropriate and would result in increased efficiency. Entergy's conclusions are supported by the following: •As the NRC correctly notes, the impacts of continued storage can be assessed generically because: (1) continued storage will involve SNF storage facilities for which the environmental impacts of operation are sufficiently understood as a result of lessons learned and knowledge gained from decades of operating experience (including use of common storage technologies); (2) activities associated with continued storage are expected to be within this well-understood range of operating experience and, thus, environmental impacts can be reasonably predicted; and (3) changes in the environment around SNF storage facilities, including those existing or planned for IPEC, are sufficiently gradual and predictable to be addressed generically.¹⁴ [footnote 14 text: Proposed Rule, 78 Fed. Reg. at 56,781.] (0697-1-12 [Bessette, Paul] [Kuyler, Raphael])

Comment: •The advantage of a generic rulemaking in these circumstances is clear and well-established, and expressly stated in the Proposed Rule: to enhance efficiency in individual licensing reviews by comprehensively analyzing environmental impacts that are the same or largely similar for each nuclear power reactor or storage site, thereby avoiding the need to "repeat the identical or substantially similar analysis in individual licensing actions."¹⁵ [footnote 15 text: *Id.* at 56,784.] •This is consistent with the Commission's longstanding practice to address long-term waste storage issues generically by rulemaking rather than on a case-by-case adjudicatory basis.¹⁶ [footnote 16 text: See *Entergy Nuclear Operations, Inc. (Indian Point Nuclear Generating Units 2 & 3)*, CLI-10-19, 72 NRC 98, 99-100 (2010) (citing *Duke Energy Corp. (Oconee Nuclear Station, Units 1, 2, & 3)*, CLI-99-11, 49 NRC 328, 343 (1999); *Kelley v. Selin*, 42 F.3d 1501, 1512-13 (6th Cir. 1995)) (directing denial of the admission of waste confidence contentions that were the subject of general rulemaking).] (0697-1-13 [Bessette, Paul] [Kuyler, Raphael])

Comment: •Use of a generic rulemaking also has been sanctioned by the federal courts, including the D.C. Circuit in *New York v. NRC*,¹⁷ [footnote 17 text: See *New York*, 681 F.3d at 480; see also *Baltimore Gas & Elec. Co. v. Natural Res. Def. Council, Inc.*, 462 U.S. 87, 101 (1983) ("The generic method chosen by the agency is clearly an appropriate method of conducting the hard look required by NEPA."); *Minnesota v. NRC*, 602 F.2d 412, 416-17 (D.C. Cir. 1979).] and avoids the obvious inefficiencies attendant to case-by-case adjudication of fundamentally generic environmental issues. (0697-1-14 [Bessette, Paul] [Kuyler, Raphael])

Comment: [T]he conclusions in the DGEIS regarding the SMALL environmental impacts of continued storage of SNF apply to Entergy's plants, including IPEC. Thus, there is no need for or benefit of a site-specific analysis for issuance of renewed licenses for IP2 and IP3 or other pending or future Entergy licensing actions. In summary, the use of a generic rulemaking and a generic EIS is entirely appropriate for the waste confidence issues under consideration in the Proposed Rule and DGEIS, and has been justified by the NRC. (0697-1-15 [Bessette, Paul] [Kuyler, Raphael])

Comment: The Proposed Rule and the supporting DGEIS directly address the three deficiencies identified by the D.C. Circuit in its remand order,³⁴ [footnote 34 text: *New York*, 681 F.3d at 478-79.] and do so in a manner that thoroughly and reasonably addresses the environmental impacts of continued storage of SNF for all reactors—including those at Entergy's plants.³⁵ [footnote 35 text: See Proposed Rule, 78 Fed. Reg. at 56,780 ("[T]he Commission instructed NRC staff to proceed with a generic EIS to analyze the environmental impacts of continued storage and address the issues raised in the Court's decision and to update the Waste Confidence rule in accordance with the analysis in the EIS. The DGEIS and the proposed rule implement the Commission's direction."); *id.* at 56,784 ("The analysis in the GEIS constitutes a regulatory basis for the proposed rule at 10 CFR 51.23, which codifies the NRC's conclusions in the GEIS on the environmental impacts of continued storage, including the Commission's expectations on the availability of a geologic repository.").] (0697-1-18 [Bessette, Paul] [Kuyler, Raphael])

Comment: As stated in the DGEIS, "[f]or most of the resource areas, the impact determinations for all three timeframes are SMALL."⁴⁰ [footnote 40 text: DGEIS at 4-90.] There is nothing unique or different at Entergy's plants that calls into question the applicability of these impact determinations. (0697-1-19 [Bessette, Paul] [Kuyler, Raphael])

Comment: Entergy fully supports the comments submitted by the Nuclear Energy Institute on behalf of the nuclear power industry. In particular, Entergy agrees that the NRC's use of a

generic rulemaking to address the waste confidence issues is logical and appropriate and consistent with applicable law, and the NRC has fully addressed the issues identified by the U.S. Court of Appeals for the District of Columbia Circuit in *New York v. NRC*. (0697-1-2 [Besette, Paul] [Kuyler, Raphael])

Comment: Consistent with decades of operating experience and environmental monitoring, including Entergy's own operating experience, that analysis concludes that the impacts are SMALL.⁴² [footnote 42 text: See Proposed Rule, 78 Fed. Reg. at 56,797; DGEIS, App. E at E-19.] As discussed below, the SMALL finding regarding the potential offsite impacts of SFP leaks is sound and applies to potential impacts at Entergy's plants. (0697-1-20 [Besette, Paul] [Kuyler, Raphael])

Comment: [T]he SMALL finding regarding the risk of SFP fires applies to potential impacts at Entergy's plants. (0697-1-21 [Besette, Paul] [Kuyler, Raphael])

Comment: In summary, the NRC has taken reasonable and appropriate actions, in the form of the DGEIS and a proposed generically-applicable rule, to address the deficiencies in 10 C.F.R. § 51.23 identified by the D.C. Circuit. (0697-1-22 [Besette, Paul] [Kuyler, Raphael])

Comment: The Proposed Rule and DGEIS Consider Appropriate Timeframes for Continued SNF Storage[.] (0697-1-23 [Besette, Paul] [Kuyler, Raphael])

Comment: The assumptions within the short-term timeframe are reasonable and appropriate for Entergy's nuclear plants, including IPEC.⁴⁶ [footnote 46 text: See Entergy Letter NL-08-144, "Unit 1 & 2 Program for Maintenance of Irradiated Fuel and Preliminary Decommissioning Cost Analysis in accordance with 10 CFR 50.54 (bb) and 10 CFR 50.75(f)(3)," Attach. 1 at 2 (Oct. 23, 2008) ("IP2 IFMP"), *available at* ADAMS Accession No. ML083040378; Entergy Letter NL-10-123, "Unit 3 Program for Maintenance of Irradiated Fuel and Preliminary Decommissioning Cost Analysis in accordance with 10 CFR 50.54 (bb) and 10 CFR 50.75(f)(3)," Attach. 2 at 2 (Dec. 10, 2010) ("IP3 IFMP"), *available at* ADAMS Accession No. ML103540233.] (0697-1-24 [Besette, Paul] [Kuyler, Raphael])

Comment: The assumptions within the long-term timeframe are also reasonable or conservative for Entergy's nuclear plants, including IPEC. (0697-1-25 [Besette, Paul] [Kuyler, Raphael])

Comment: These assumptions [indefinite timeframe] also are reasonable or conservative for Entergy's nuclear plants, including IPEC. (0697-1-26 [Besette, Paul] [Kuyler, Raphael])

Comment: Nonetheless, the D.C. Circuit specifically directed the agency to assess the environmental impacts of failing to establish a permanent repository, and Entergy agrees with NEI that the NRC's consideration of an indefinite storage timeframe appropriately addresses the remand on this issue. Furthermore, inclusion of the indefinite storage scenario in the analysis helps the DGEIS to fully cover any possible environmental impacts associated with continued storage of spent fuel. (0697-1-29 [Besette, Paul] [Kuyler, Raphael])

Comment: NRC's analysis of spent fuel storage impacts is fully applicable to Entergy's nuclear plants, including the Indian Point Energy Center. (0697-1-3 [Besette, Paul] [Kuyler, Raphael])

Comment: As discussed further below, the NRC's analysis of possible impacts from each storage scenario is applicable to Entergy's nuclear plants, including IPEC and any incremental

impacts associated with issuance of renewed operating licenses for IP2 and IP3. (0697-1-31 [Bessette, Paul] [Kuyler, Raphael])

Comment: Entergy's comments demonstrate that there is no need for a site-specific Environmental Impact Statement for Indian Point Energy Center, or any Entergy plant with a pending license application. (0697-1-4 [Bessette, Paul] [Kuyler, Raphael])

Comment: In summary, the Proposed Rule states that the Commission has determined that it is feasible to safely store SNF following the licensed life for operation of a reactor, either in spent fuel pools ("SFPs") or dry casks, and to have a mined geologic repository within 60 years following the licensed life for operation of a reactor. The Proposed Rule is supported by the DGEIS conclusions that the environmental impacts of continued at-reactor storage of spent fuel in a SFP or ISFSI are SMALL.⁶ [footnote 6 text: See DGEIS at 4-90.] Entergy agrees with and fully supports these conclusions and the NRC's supporting explanation. (0697-1-6 [Bessette, Paul] [Kuyler, Raphael])

Comment: [T]he NRC's generic analysis of spent fuel storage impacts is fully applicable to Entergy's plants, including IPEC. This includes consideration of the DGEIS assumptions, such as the reference facility described in Chapter 2, the affected environment in Chapter 3, the environmental impacts in Chapter 4, consideration of continued safe storage of spent fuel in Appendix B, consideration of SFP leaks in Appendix E, and consideration of SFP fires in Appendix F. (0697-1-9 [Bessette, Paul] [Kuyler, Raphael])

Comment: [T]he NRC's generic analysis of spent fuel storage impacts in the Proposed Rule and DGEIS is fully applicable to Entergy's nuclear plants, including IPEC. Any site-specific differences are not expected to have any new or significant environmental impacts. Therefore, the NRC has completed a reasonable and thorough generic evaluation that fully satisfies NEPA and no site-specific evaluation of spent fuel storage impacts is necessary or warranted for any of Entergy's plants, including IPEC. (0697-2-1 [Bessette, Paul] [Kuyler, Raphael])

Comment: •As described in DGEIS Sections 4.18.1 and 4.18.2, the environmental risks of continued storage of spent fuel associated with postulated accident conditions, including design basis events for SFPs and dry cask storage systems, hazards from natural phenomenon such as earthquakes, floods, and tornadoes, and severe accidents, are SMALL. These conclusions apply to Entergy's plants, including IPEC. (0697-2-17 [Bessette, Paul] [Kuyler, Raphael])

Comment: Entergy is not aware of any aspects of its plants that would place them outside the generic evaluation of the environmental impacts of continued at-reactor continued storage of spent fuel that is provided in the DGEIS. (0697-2-19 [Bessette, Paul] [Kuyler, Raphael])

Comment: DGEIS Appendix B addresses the technical feasibility of continued safe storage of spent fuel, including the technical feasibility of wet storage (Section B.3.1) and the technical feasibility of dry cask storage (Section B.3.2). As described further below, Entergy has not identified anything in these sections of the DGEIS that is inconsistent with its own substantial spent fuel storage experiences and plans. (0697-2-20 [Bessette, Paul] [Kuyler, Raphael])

Comment: DGEIS Chapter 2 discusses "typical facility characteristics and activities" that the NRC used to assess environmental impacts that may occur from continued storage of SNF.⁵⁷ [footnote 57 text: See DGEIS at 2-1.] These characteristics and activities are generally comparable to those for the IPEC site. (0697-2-3 [Bessette, Paul] [Kuyler, Raphael])

Comment: The characteristics of IP2 and IP3, including facility description, reactor core size, fuel design, enrichment, and burn-up are generally comparable to the reactor description assumptions in Section 2.1 of the GEIS. (0697-2-4 [Bessette, Paul] [Kuyler, Raphael])

Comment: [T]he IP2 and IP3 SFPs are consistent with the SFP designs discussed in the DGEIS[.] (0697-2-5 [Bessette, Paul] [Kuyler, Raphael])

Comment: Entergy has not identified any activities that it plans to conduct that would be inconsistent with those discussed in DGEIS Section 2.2. For example, the DGEIS assumes timely decommissioning of reactors in accordance with 10 C.F.R. §§ 50.82 and 52.110(c), and that all spent fuel would be moved from SFPs to dry storage by the end of the short-term timeframe (i.e., within 60 years beyond the licensed life for reactor operations).⁷¹ [footnote 71 text: *Id.* at 2-26. An ISFSI facility is relatively simple to construct and would be relatively simple to deconstruct. Replacement of the ISFSI would be a short-term project with little radioactive material requiring disposal. Once all loaded casks are transferred to replacement storage overpacks on a new ISFSI pad, the original ISFSI would be decommissioned in a short time frame. The decommissioning plan would be prepared and approved prior to any decommissioning, and the site of the decommissioned ISFSI would be available for future use as a replacement ISFSI.] (0697-2-7 [Bessette, Paul] [Kuyler, Raphael])

Comment: Entergy concludes that this DGEIS Chapter 3 provides a reasonable description of the affected environment for consideration of the issues in the DGEIS, and that this description is comparable to Entergy's plants, including IPEC, for the purposes of the DGEIS. (0697-2-9 [Bessette, Paul] [Kuyler, Raphael])

Comment: The DGEIS concludes that the impacts on groundwater, surface water, soils, and public health would be SMALL for all plants.⁹⁹ [footnote 99 text: *Id.* at E-19.] Entergy has confirmed that these conclusions regarding the impacts of SFP leaks apply to its nuclear plants, including IPEC. (0697-3-2 [Bessette, Paul] [Kuyler, Raphael])

Comment: [T]he assumption in the DGEIS that all spent fuel has been transferred from the SFP to an ISFSI by the end of the short-term timeframe (i.e., by 60 years after the end of licensed reactor operating life) is reasonable and applies to IPEC. (0697-3-6 [Bessette, Paul] [Kuyler, Raphael])

Comment: [T]he 2013 Proposed Rule and DGEIS fully address New York's previously-stated concerns about the lack of environmental impact findings beyond 60 years after plant shutdown. The DGEIS analyzes, in a bounding fashion, the impacts of three timeframes that represent various scenarios for the length of continued SNF storage that may be required. (0697-3-7 [Bessette, Paul] [Kuyler, Raphael])

Comment: In summary, there is extensive, uncontroverted evidence in the public record to show that the DGEIS's generic conclusions of SMALL environmental impacts from SFP leaks fully apply to the IPEC site. (0697-3-8 [Bessette, Paul] [Kuyler, Raphael])

Comment: In summary, the generic analysis of the environmental impacts of SFP fires in the DGEIS is well-supported, is conservative, satisfies NEPA, and is fully applicable to IPEC. (0697-4-1 [Bessette, Paul] [Kuyler, Raphael])

Comment: With respect to ISFSIs, the DGEIS explains that ISFSIs are inherently robust and highly resistant to damage, and that NRC and licensee experience with ISFSIs and cask certification indicates that spent fuel can be safely and effectively stored using passive dry cask

storage technology.²²⁶ [footnote 226 text: See DGEIS at B-13.] This evaluation applies to Entergy's plants, including IPEC. This issue is further addressed in Section III.D, above. In summary, no site-specific seismic hazards exist at IPEC that would call into question the DGEIS's generic evaluation of seismic hazards for wet and dry storage. (0697-4-2 [Bessette, Paul] [Kuyler, Raphael])

Comment: Nuclear energy is a vital part of our clean energy portfolio in the United States. According to a current public survey conducted by Quest Global Research, a majority of the public favor nuclear power, making the Waste Confidence rulemaking an imperative issue for the nation to address. In addition, the proposed rule and draft GEIS are significant to AREVA and the entire nuclear industry because the NRC's final rule on Waste Confidence supports both the licensing of new builds and renewed licensing of the existing fleet. (0745-2 [Kelley, Devin])

Comment: As a 35-year resident of the city of San Luis Obispo, I support the NRC's Spent Fuel Storage Rule. (0753-1 [Devitt, Andrea])

Comment: I support the Commission's proposed Rule-making on Continued Storage of Spent Nuclear Fuel (Docket ID NRC-2012-0246). As a registered professional engineer (nuclear) in California, it is abundantly clear to me that this is a necessary step in the continued use of nuclear power as a reliable baseload component of the US energy grid. It is further clear to me that safety issues have been and can continue to be addressed so that there are NO public safety dangers. (0802-1 [Moore, Richard])

Comment: Second, NextEra supports the NRC's decision to continue following its historical approach to this industry-wide issue by considering it generically, both through the GEIS and through the proposed rule. The decision to address this generic issue on a generic basis instead of in individual licensing proceedings continues to be the right choice. (0808-2 [Petro, James])

Comment: NextEra concludes that the NRC adequately addressed the areas of concern identified by the Court in *New York v. NRC*. NextEra concurs with NEI that, though the need for indefinite storage is unlikely, the NRC's consideration of the indefinite storage scenario makes for a robust analysis that satisfies the Court's requirements. Similarly, the NRC's discussion of spent fuel pool leaks and fires is adequate to address the Court's stated concerns. (0808-3 [Petro, James])

Comment: The USHCC is a member of the Clean and Safe Energy Coalition's Business, Labor and Minority Steering Committee and strongly believes that nuclear energy is an important part of our national energy portfolio. Not only do we agree with the Nuclear Regulatory Commission's efforts on the Waste Confidence rulemaking, but we also agree that nuclear energy is critical to our nation's energy production and economic output. (0825-1 [Palomarez, Javier])

Comment: In sum, the NRC's responsibility is to identify any insurmountable technical barriers to safe storage of spent nuclear fuel until a repository is developed; and to robustly analyze and consider the environmental impacts of continued storage. To date, the NRC has identified no such barriers; and has found the environmental impacts of continued storage to be small. As explained by the Second Circuit in the *NRDC* decision, the NRC is not, however, responsible for the national energy policy decision to pursue development of commercial nuclear power in parallel with development of a repository. To the contrary, responsibility for that decision lies squarely with Congress and is not the subject of the draft GEIS or proposed rule. (0827-1-12 [Ginsberg, Ellen])

Comment: Ultimately, an EIS must contain "high quality" information and "[a]ccurate scientific analysis."²⁸ [footnote 28 text: *Seattle Audubon Soc. v. Espy*, 998 F.2d 699, 704-05 (9th Cir. 1993).] After all, an EIS's purpose is to avoid speculation and ensure data is gathered and analyzed prior to decision-making.²⁹ [footnote 29 text: *Found. for N. Am. Wild Sheep v. U.S. Dep't of Agric.*, 681 F.2d 1172, 1179 (9th Cir. 1982).] The NRC has done just that with the draft GEIS. (0827-1-6 [Ginsberg, Ellen])

Comment: NEI agrees with the conclusions in the draft GEIS that almost all environmental impacts resulting from the continued storage of spent nuclear fuel at, or away from, reactor sites would be small. In general, the NRC's assessment of environmental impacts from interim spent fuel storage is thorough and well-reasoned. (0827-2-9 [Ginsberg, Ellen])

Comment: The proposed rule appropriately points to the GEIS for an assessment of the environmental impacts of continued spent fuel storage beyond the licensed life of a reactor. However, in lieu of the five prior WCD Findings, the SOC for the proposed rule, Section C ("Decision"), contains "Conclusions" based on the draft GEIS and the assessment of spent fuel storage and disposal practices nationally and internationally. The Conclusions generally address the same issues as the five prior WCD Findings. The Conclusions relate to technical feasibility and availability of a geologic repository (see section III.C.2 of the SOC), and safety and environmental impacts of spent fuel storage during the three timeframes discussed above (see section III.C.3 of the SOC). While the use of "Conclusions" instead of "Findings" represents a departure from the prior WCD, the Conclusions are valid and well-supported based on the record in the GEIS. (0827-5-4 [Ginsberg, Ellen])

Comment: NEI agrees with NRC's determination¹⁰⁴ [footnote 104 text: Proposed 10 C.F.R. § 51.23(2)(i).] that it is "feasible to safely store spent nuclear fuel following the licensed life for operation of a reactor" and to not limit the time to which this determination applies. The NRC has described the role that aging management programs and confirmatory studies play in supporting safe, long-term storage. NRC has commendably built the draft GEIS on the extensive work already done. More than 40 years of experience have produced a mountain of research and data on previous events that supports the conclusions in the draft GEIS. This research and data were produced by a variety of sources, including industry, government, academia, and international organizations. The conclusions that are reached in the draft GEIS are firmly based on the experience of decades of spent fuel storage already behind us. In fact, the probability of future events decreases for future storage systems because of actions and programs created and performed to prevent re-occurrence of the past events, as well as technological advances. (0827-5-5 [Ginsberg, Ellen])

Comment: As a member of the public, I wish to support the NRC's proposed rule revising Part 51 provisions dealing with waste confidence and the supporting generic EIS. (0841-1 [Corrino, G])

Comment: Considering the political polarization connected with the disposition of spent nuclear fuel, it is essential to employ "Planning-in-Depth". The goal of Planning-in-Depth is to guarantee the safety and security of the United States inventory of spent nuclear fuel regardless of any possible political developments, or the lack of political developments. Both the former and updated versions of the Waste Confidence rule successfully employ the principle of Planning-in-Depth. (0863-5 [Brinton, Samuel] [Curtis, Daniel])

Comment: We support the proposed rule update and implementation of the associated Generic Environmental Impact Statement. The proposed NRC updates accurately reflect the current technical consensus. (0863-7 [Brinton, Samuel] [Curtis, Daniel])

Comment: Exelon believes that the NRC has met the requirements specified for development of this generic environmental impact statement, in that: > --The GEIS addresses the environmental impacts of storage of spent nuclear fuel beyond the licensed operating life of a reactor; and > --It is shown to be "feasible" to safely store spent nuclear fuel following the licensed life for operations of a reactor and to have a mined geologic repository within 60 years following the licensed life for operation of a reactor. (0942-10 [Helker, David P.])

Comment: Exelon supports the NRC's generic determination that used fuel can be stored at nuclear power plant sites, safely and without significant environmental impact, between the end of the license term and the time it is shipped offsite. (0942-2 [Helker, David P.])

Comment: NAYGN supports the NRC's efforts on this rulemaking. The NRC appropriately addresses the spent fuel storage issues in a Generic Environmental Impact Statement and rulemaking. The draft Generic Environmental Impact Statement makes conservative assumptions and reasonably shows that if necessary, used nuclear fuel can continue to be stored in a safe, environmentally sound manner for a long period. (0948-4 [Commenters, Multiple])

49. Out-of-Scope Comments – General

Comment: The nuclear industry's over confidence is proving a dangerous and costly risk to the public. (0011-3 [Follett, Carol])

Comment: The horrid mess at Fukushima is good evidence that nuclear power can become very dangerous when something goes wrong. I have NO CONFIDENCE in the ability of corporate nuclear power plant owners to safely store spent nuclear fuel rods even in dry casks. I suggest asking US Navy to choose one of the four commercial nuclear power plants designated for decommissioning as being the safest of the four for them to use as a location where they can use spent fuel rods as high grade ore to make new fuel rods out of. Whether they use the new fuel rods made of material salvaged from old fuel rods in the navy or sell them to remaining commercial nuclear power operators, they will be disposing of those spent fuel rods and avoiding the need to dig up as much more virgin uranium ore as otherwise. They will end up with three products: new fuel rods ready to use, long half-life radio-active material mostly depleted uranium which is toxic but can be used as the counterweight in fork life trucks, and short half-life radio-active material which will need to be stored safely out of harm's way for 300 years after which the remaining hazard will be chemical toxicity rather than radioactivity. That should be less of a problem than storing spent fuel rods safely out of harm's way for 3,000 years waiting for them to decay back down to the same amount of radioactivity as was in all the ore that had to be mined and processed to make the fuel rods. It will mean making whichever nuclear power plant campus the Navy chooses the de facto location for storing spent fuel rods use the have cooled down enough to put in dry casks and ship. I suggest making sure that rail lines between other commercial nuclear power plant campuses and the decommissioned campus chosen by the Navy are as safe as possible. (0013-1 [Adams, Grace])

Comment: Face it, you don't have a real clue what you are doing, besides accomodating the desires of the industry and especially the individuals at the top of that particular industrial food chain and the government "officials" that are in their pay. I haven't the inclination to be more polite to those who are allowing our beautiful planet and the future of life to be collateral damage to sociopathic greed. End this madness now and let us just have to deal with the damage already done. (0014-3 [Bolognini, Franceseca])

Comment: Spent fuel must be RECYCLED as we did in the 1960s. In the 1960s, we recycled spent nuclear fuel. We don't recycle nuclear fuel now for two reasons: 1. It is valuable and people steal it. The place it went that it wasn't supposed to go to was Israel. This happened in a small town near Pittsburgh, PA circa 1970. A company called Numec was in the business of reprocessing nuclear fuel. [I almost took a job there in 1968, designing a nuclear battery for a heart pacemaker.]; 2. Virgin uranium is so cheap that it is cheaper than recycling. This will change eventually, which is why we keep the spent fuel where we can reach it. The US possesses a lot of MOX fuel made from the plutonium removed from bombs. MOX is essentially free fuel since it was paid for by the process of un-making bombs.; Please read this Book: "Plentiful Energy, The Story of the Integral Fast Reactor" by Charles E. Till and Yoon Il Chang, 2011[.] Per Till & Chang: The Integral Fast Reactor [IFR] uses "nuclear waste" as fuel and gets 100 times as much energy out of a pound of uranium as the Generation 2 reactors we are using now. The IFR is safer than the Generation 2 reactors, which are safer by far than coal. The IFR is meltdown-proof. The IFR can be turned up and down quickly and repeatably. The IFR uses metal fuel that is recycled in a system that makes it difficult to get plutonium239 out of the fuel. To make a good plutonium bomb, you must have almost pure plutonium239. 7% plutonium240 and higher isotopes or other actinides will spoil the bomb. IFR Pyro process recycled fuel is useless for bomb making. Elements with more protons than uranium are called trans-uranics alias actinides. Actinides are the part of so-called nuclear "waste" that makes it stay radioactive for a long time. The IFR uses up the actinides as fuel. Actinides include plutonium, neptunium, americium, curium, berkelium, californium, einsteinium, fermium, mendelevium, nobelium and all of the other "synthetic" elements. The IFR is the ideal source of electricity since it does not make CO2. The resultant "waste" is very small, will decay in only 300 years and is useful in medicine. The following countries either already recycle spent fuel or are experimenting with a recycling process or both: France, Japan Russia, China, India, South Korea. The US recycled spent fuel in the 1960s. Purex process: The old one. Separates out plutonium, but does not separate the isotopes of plutonium. Any bomb made with this plutonium from a powerplant reactor would fizzle. You can't make a plutonium bomb with more than 7% Pu240. Pyro process: Leaves plutonium mixed with uranium and trans-uranic elements. [All fissionable elements are kept together with uranium][.] Other processes [wet] are also under development. By recycling nuclear fuel, we have a 30,000 [thirty thousand] year supply. (0016-1 [Greisch, Edward])

Comment: The attached may have something to do with why we stopped recycling spent fuel. My solution would be to reprocess the fuel at a Government Owned Government Operated [GOGO] facility. At a GOGO plant, bureaucracy and the multiplicity of ethnicity and religion would disable the transportation of uranium to Israel or to any unauthorized place. Nothing heavier than a secret would get out. (0017-1 [Greisch, Edward])

Comment: The problem is political: The Republicans think GOGO plants are socialist/communist, which is nonsense. If a COCO [Contractor Owned Contractor Operated] plant is the low bidder, it is inevitably a front for Israel or some other country. We could send our spent fuel to France, Japan or Russia to be recycled. (0017-2 [Greisch, Edward])

Comment: I would like to comment on the proposed NRC Nuclear Waste Confidence draft Generic Environmental Impact Statement. To me it sounds as though the nuclear industry has some improper influence with the NRC. As Senator Markey pointed out, Allison McFarlane, NRC's Chairwoman, co-authored a 2003 study "that strongly warned of the needless risks of fire in densely-packed HLRW storage pools". Why has she changed her mind about the risk? Does she give unqualified support to the Impact Statement? (0021-1 [Biddle, Lynn])

Comment: I find it very difficult to find most of the information when I'm looking for it. So after the earthquake and Fukushima I became very aware. I'm getting ready to turn 50 years old. I have obviously lived through Three Mile Island, Chernobyl, and now Fukushima. And really the media hasn't really covered a lot except for here recently with some leaking tanks. And we're talking about a global issue. (0030-15-4 [Gray, Erica])

Comment: Transparency though on the issue needs to begin at the beginning, and that's with the monies that are given to our elected officials by these very industries that are present here today and many more, the monies given them in order to stack the deck in their favor. And it always the public that's on the short end of it. When they keep talking about cheap, what they're saying is their end of it is cheap. You are asking us, the citizens, the taxpayers, to pay the loan guarantees and the subsidies that even allow these things to be built. And I don't know at this point if we can ever turn around Congress, because if you bother to look up and see what all of our elected officials are on the receiving end of, it's no wonder than when the votes come down, they do as they do. I would want transparency in the BRC, because I didn't see an Arjun Makhijani being named to the BRC. I saw John Rowe, the chair of Exelon, being named to the BRC, which was very self-serving. So in terms of the public, I think the only way we can get a fair shake, if there is one, has to do with the licensing. (0030-22-2 [Headington, Maureen])

Comment: I might remind some of our friends here that actually the industry pays \$0.90 of every dollar in reimbursements to the NRC. Actually only 10 percent of the NRC budget is covered by the taxpayers. And to that end it's always perplexing when the NRC is affected by things like sequestration and Government funding shortfalls. But we've encouraged reform in that area and that simply hasn't happened today. (0030-23-2 [Blee, David])

Comment: And no one has even addressed, at least not addressed adequately, as far as I'm concerned, who bears the risk? What's the insurance? Who pays when this happens? And it inevitably will happen, because we've seen it happen. Who pays? Now, the Government doesn't pay. The Government passed a pathetic anemic compensation bill for the downwind victims of the bomb testing. It was \$50,000 for each person. No medical payments. Who pays for the loss of property when the property disappears or is no longer useable? If it's contaminated like it was in Chernobyl, like it is in Fukushima, who pays? Do I have shoulder that burden? This has to be in your environmental impact statement. All risk. The damages have to be in there. And the Government has no good real record of paying. The token payments that were made for the bomb testing are pathetic. They're minuscule. (0030-24-2 [Nelson, Dennis])

Comment: As I have followed this process, I have been amazed by the Nuclear Regulatory Commission's bias toward continuing to regulate -- to allow radioactive waste to be manufactured by these power plants. And it just points out the fact that the very beginning of -- the Nuclear Regulatory Commission was created because the Atomic Energy Commission was perceived as being unduly favorable to the industry. And I think the NRC is that -- in that same situation now. It is interesting to note that, according to records I have found, NRC has over 4,000 employees, and you do not need people doing this type of thing for solar power, for wind power. We just need to quit making this radioactive waste. (0030-5-4 [Safer, Don])

Comment: I think we should pursue a closed fuel cycle, reuse of the wasted energy, maybe provided as a 10-year program, same as that was used for landing on the moon. What did we get out of space exploration? Everyone in this room is tied at their hip to their cell phone through satellite communication. (0030-9-3 [Guido, Jeffry])

Comment: I am writing you because I am concerned about how we store and transport our most hazardous waste, the radioactive fuel rods from nuclear reactors. What compensation do citizens living near storage sites or near transportation routes receive for becoming victims of accidental radioactive discharges? I have read case histories of people who were living near Three Mile Island at the time of the disaster there. I am well-aware of the scientific weakness of such information. But when number of major medical problems vastly exceeds the occurrence of similar medical problems in areas with no increase in radio- activity, one needs to draw the obvious conclusion. (0042-1 [Hellwig, Louis])

Comment: It's feasible perhaps to handle nuclear waste, but the fact of the matter is that a lot of nuclear waste has been made into depleted uranium shells that have been used by the United States military and have poisoned the land and the air in Southern Iraq and in Serbia battles and has caused all kinds of birth defects and deaths in the process. So it wasn't in fact safely handled, the nuclear waste, that the so-called depleted uranium was allowed to get out. (0045-12-4 [Kinsey, Bob])

Comment: Fortunately, American nuclear providers have successfully demonstrated that they can safely store nuclear waste while we wait for the Federal Government to enact a long-term solution. Federal policymakers must act now to develop consolidated facilities for interim storage, as recommended by the President's Blue Ribbon Commission on America's Nuclear Future, and supported by a bi-partisan group of congressmen. Our nation must also pursue an agreed-upon site for permanent disposal. (0045-4-3 [Martini, Shawn])

Comment: There must be tighter design criteria for "nuke" power plants, constant inspection, and the means to shut them down as soon as they need to be retired. (0057-4 [Lamont, Dana])

Comment: We cannot wait for a Federal solution for all of the 104 US reactors' spent fuel storage. California must come up with its own solution. We must create a place away from populations, away from aquifers, away from earthquake zones to store California nuclear spent fuel from SONGS and DIABLO. The law that would create this solution must include prohibition of any other spent fuel to be stored there and a law against any new reactors ever being built in this earthquake fault state so obviously vulnerable to nuclear accident. We have Fukushima from which to learn. A desert military base away from population centers and earthquake faults in California could be a solution. What must be done to create that solution? Meanwhile we are playing Russian roulette with the future of California by storing our spent fuel with a company that has a dismal safety record and will continue to profit from leaving the spent fuel in the pools where it now is. We need an immediate MRS solution - Monitored Retrievable Storage. Is there any interim step that could get the spent fuel pools moved from the ocean and at least 50 miles away from 8.4 million people, monitored and protected by our US military? Who on the NRC is willing to help create this complex but necessary solution before the third largest economy in the world, the state of California, gets compromised forever? (0063-13 [Magda, Marni])

Comment: I am also aware of substantial upgrades in plant safety and reliability, reactant toxicity, fuel divertability, with remarkable reductions in both overall waste and the waste's half-life, substantially reducing long-term waste safe storage requirements. I refer to designs like G.E.'s PRISM thorium molten-salt reactor. Why are designs that have demonstrated severe catastrophic capability being proposed for new construction? Why aren't safer and less toxic designs considered? (0068-1 [Chrisler, Gary])

Comment: Finally, I am dismayed that significant upgrades to reactor safety and waste reduction have been made, but are not being applied to designs proffered for approval in the

attempted resurgence of conventional nuclear technology. Why are designs such as the thorium molten salt reactor, which runs on a less-toxic, nonexplosive reactant, has "walk-away safe shutdown" operation, that produces 99% less waste, and the waste with a half-life of 300 years vs 168,000, why hasn't there been a serious effort to license and promote such improvements? The single fact of 300-year half-life versus 168,000 is a complete game changer, because a structure or containment lasting the better part of a million years is simply not feasible. It is impossible to ensure reliability over timespans like that. But waste repositories safeguarding waste for 1200 or 1500 years CAN be constructed. We know how to do that, we've built structures that have lasted that long. To want to build more units designed in the era of the Fukushima reactors is demonstrably unwise. Why risk contaminating an entire region for a million years when you don't have to? Pursue better alternatives. (0068-2 [Chrisler, Gary])

Comment: I am writing you because I am concerned about how we store our most hazardous waste, the radioactive fuel rods from nuclear reactors. As a retired scientist (medicine), I would like to know what happened to the then seemingly sound method of storage of at least low level reactor waste via glassification and subsequent burial in salt domes? I discussed with an engineer friend in the early eighties. Is the technology inadequate, or has the political process been typical of the current dysfunction in Washington, namely, stalemate until the situation worsens beyond consideration, in addition to the "Not (thousands of feet under) my back yard? I would love to have a response, even if from one of your lowest aides, who would know much more than me about the subject matter. (0070-1 [Peters, Mark])

Comment: We need much more environmental oversight in the SE TN, N GA areas, in all areas possible. (0074-1 [Rowlett, Kimberly])

Comment: New rules, yes! Take care of and protect our (your, my, our) human habitat/home/ecological niche. (0075-6 [Hill, Barbara])

Comment: This is the future black market for weapons of different kind - there are too few possibilities to secure the waste. Don't let it become a market for criminal terrorist trade. Future generations have a right to safety. (0084-1 [Hennig, Anna Christina])

Comment: The hazard can be at least partially mitigated. US Navy has done some re-manufacturing of nuclear fuel rods from spent fuel rods. So they know how and can do it. Half of the U235 in a new fuel rod is still in a spent fuel rod. So the U235 from two spent fuel rods and enough of the U238 to make up the same total weight as one original fuel rod will go into a re-manufactured fuel rod. Somewhat over 40% of the rest of the material is U238 aka depleted uranium the remaining 5% to 10% is fission products--mostly short half life, average half life about 30 years. By displacing new fuel rods made from virgin uranium ore, the re-manufactured fuel rods will at least partially mitigate the hazard. Spent fuel rods fresh out of the reactor are a million times as radioactive as brand new fuel rods, And 5% is one twentieth as much as 100%. So the short half-life isotopes as concentrated should be 20 million times as radioactive as a spent fuel rod fresh out of the reactor. A million is a thousand times a thousand. So it should take two times ten half lives or two times 300 years or 600 years for the short half life isotopes to decay down to 20 times the radioactivity of a new fuel rod, and one more thirty year half life to decay down to 10 times the radioactivity, or thirty more years total 60 more years to get down to 5 times as radioactive as new fuel rod, total 90 years past the 600 years mark; maybe a total of 180 plus 600 equals 780 years to get to or below the radioactivity of a new fuel rod. I believe another three hundred years for a total of less than 1100 years should get it down to about as hazardous as uranium ore. Still a very long time but still less than half the time it would take an intact spent fuel rod to get there. If the United States lasts as long as Rome through Byzantine

Empire did, the United States would actually still be here to guard the hazardous wastes that long. OSHA permits depleted uranium to be used as a counterweight in a fork lift truck with proper lead shielding. So that part of the problem is minor. You do not have to share nuclear power plants that still have unexpired licenses with US Navy--only turn over to US Navy the nuclear power plants with expired licenses, for US Navy to salvage what it can of spent fuel and decommission the power plants with expired licenses, and allow US Navy to sell re-manufactured fuel rods to still operating nuclear power plants. I feel that hazardous waste is at least as worthy a foe for US Navy to defend us from as any group of humans that might attack us thus declaring themselves our enemies. I would also be glad for US Navy to defend us from toxic chemical wastes and from biologically hazardous wastes. (0097-2 [Adams, Grace])

Comment: Providing "spot energy" for small individual users, as these core units could be thought of as very large water heaters, or heat exchangers.... Another twist to the concept of reusing spent fuel, is that believe it or not, you do not have to use the radioactive material in the old cores to generate electricity, as a reactor does. You can simply place them in a given area to generate heat. (0100-10 [Behling, Steve])

Comment: A nuclear power plant, once you remove all the bells and whistles, is simply a giant water heater. The reason why a reactor has to be refueled, is not because it will no longer boil water, its because it will no longer boil water at the design rate of the reactor. Putting it another way... A reactor may have a 100 megawatt design rating. Over time, the power output will fall below this rating as the fuel decays. At some point after this it must be refueled to stay at the 100 megawatt power level. At this point the spent fuel is removed, and placed in a cooling pond separate from the main reactor. This is why most reactors are located next to a river, large lake, or ocean. There is so much waste heat generated, just from these old cores, that to cool the reactor in an emergency, any municipal water source would be inadequate and overwhelmed. In the old days, the spent rods cooled for a time, in these ponds, and then were shipped to a reprocessing plant. As stated earlier, this proved to be a disaster. As a result, spent cores are now gathering dust, so to speak, at nuclear power plants all over the United States, as there is no longer a place to put them. The same river water that helps cool the reactor, cools these rad waste core ponds. The result of this whole mishmash, is that much useable energy is being wasted heating bodies of water instead of large buildings. This whole situation could be resolved if the spent fuel was containerized and used at factories or large buildings to provide heat. (0100-11 [Behling, Steve])

Comment: As everyone knows, ethanol and bio-fuel plants are springing up all over the United States. These companies use energy to separate alcohol from water to generate motor fuel. The boiling point of alcohol is about 175 degrees Fahrenheit. This is all the heat you need to complete the processing of ethanol. There are over one hundred ethanol plants in the U.S. alone. Currently, most of these ethanol plants use natural gas to provide the heat input. This not only uses valuable natural gas, it also adds to the overall cost of the ethanol. Using the heat from rad-waste however, changes the situation 180 degrees. In other words, motor fuel can be manufactured at a lower cost, using the dry casks of spent fuel that nobody else wants. (0100-12 [Behling, Steve])

Comment: Using the spent fuel dry casks to manufacture fresh water from salt water, in Death Valley. According to all the unsubstantiated gossip I have been hearing over the years, the state of California, as well as most of the southwest, is a drop or two short of fresh water, among other things. Seeing as how Death Valley is 198 feet below sea level, it would be a matter of simple physics to run a pipeline from the Pacific ocean to Death Valley and at least partially fill it with sea water. No pump would be needed, as gravity would provide the siphon action that

would be needed. A solar powered desalinating plant, or many plants, could be built at the site to provide distilled water to the rest of the state, and neighboring states. Also, a turbo generator, or more than one, could be placed in the pipeline to generate electricity as a by-product. It would be a simple matter to use conical mirrors to generate all of the heat that you would want, to boil all of the water that you would want, to obtain all of the distilled water that you would want.... And at night, the spent fuel dry casks would take over in place of the sun. (0100-13 [Behling, Steve])

Comment: The reason why the desalinating plant should be built in Death Valley, as opposed to a plant on the west coast of California, is because it is located in a much safer area than on the coast. You see, there are no hurricanes in this area, as sometimes occur on the coasts. You may remember the oil rigs that were destroyed off the American coast by destructive tidal waves and hurricanes. The Fukushima damage was also caused by a giant tidal wave. I don't think you would have this problem in the valley. Also, the tree-huggers who live on the coast, would have just one more reason to complain about the scenery. Since relatively few people live near, or visit Death Valley anyway, and it is already on government land, and has an Army base close to it, I would say it would be in a safe location to recycle spent nuclear fuel, and build small structures to do so. (0100-14 [Behling, Steve])

Comment: The electrical power system that exists in the United States, is the worlds largest invention. The current costs and payments run into billions of dollars per year. What I am proposing, amounts to cutting costs with no layoffs to power company employees. No new equipment has to be designed, or no different type of metal has to be forged. The nuclear power companies are already encasing the old cores in concrete shells, with no place to store them. Also, the turbo-generators that could be used in the Death Valley pipeline, would be little different then the units that are used in Hoover dam. Another rather large advantage would be small size of such heat generators. Each steam or hot water generator unit would be self contained. It, or they could be placed in remote locations, with little maintenance. Each unit or cluster of units could be used to create live steam or electricity. (0100-15 [Behling, Steve])

Comment: Billions of dollars in savings. First off, let's stop the thirty years of worthless talk of burying the rad waste in the Yucca mountain area. At a cost of ten billion to date. This idea has went nowhere, and probably never will. According to Wall Street Journal articles on the subject, the amount of rad?waste sitting around nuclear plants, already exceed the amount of burial space created in the tunnels. The fact is, that this material generates heat, and it can be used for lower level heat sources. So why not use it! (0100-16 [Behling, Steve])

Comment: Big deal, these casks are still visible from the air. A much more robust solution to the problem of storing the spent nuclear material can be achieved by storing the casks under water. For proof of my claim, simply rent a movie on the war in the pacific during world war two. Every time a Japanese plane was shot down, it either bounced off the water, or went down about five feet before slowly sinking. In other words, water is better than armor from a cost standpoint! Also much less expensive to create and manipulate! (0100-17 [Behling, Steve])

Comment: Another area of cost savings is the elimination of lawsuits, or the near elimination. So far close to one hundred lawsuits have been filed, generally speaking, for breach of contract. To start the budding nuclear industry off, the government promised to dispose of the waste. Well.... this never happened. So the nuclear industry adopted an interim measure of on site storage, and this is why we now have the cask storage problem. As far as I am concerned, this is not a problem, this is the end result. All that needs be done now is to bunch the casks together, and mine the heat. (0100-19 [Behling, Steve])

Comment: As safe or safer than a pebble bed reactor. For those of you people that may have come to the conclusion that this article does not make any sense, what I am proposing is exactly the same thing as the new generation of nuclear reactors, called the pebble bed reactors. In the pebble bed reactor, softball sized uranium pellets are installed in a empty reactor vessel until the proper heat output is obtained. To explain further, in a "standard reactor," uranium fuel rods are installed in the vessel, and the heat output is regulated, by raising or lowering the control rods. When the heat output drops below a certain level, the reactor has to be taken out of service until new fuel rods can be installed. In a pebble bed reactor, the softball sized spheres can be added until the heat output is at the design level of the reactor. As time passes, and the heat level of the spheres decrease, the old spheres can be removed, and new fresh spheres can be added, while the reactor is in operation. The big advantage of a pebble bed reactor, over a "standard" reactor is that the loss of coolant problem is eliminated. In a "standard reactor," a loss of coolant leads to a meltdown, in a pebble bed reactor, a loss of coolant causes no problem, as the spheres do not cause reactor floor melting. (0100-20 [Behling, Steve])

Comment: Employing Death Valley, or any other similar suitable areas, to generate electricity at a profit, as well as rock salt, seafood, distilled water, and an ongoing tax base, as well as creating permanent jobs in the state of California. On a second level, which does not have to be incorporated into the overall concept, a possible solution to the problem of the disposal of spent nuclear fuel. (0100-3 [Behling, Steve])

Comment: Note: Observe the picture below. It would seem that the Atomic Energy Commission, the Nuclear Regulatory Commission, as well as all the nuke haters, and their lawyers, seem to think that the way the casks are constructed, as well as their storage on a concrete slab, are safe enough. Or at least, they cannot drum up enough scientific evidence to prevent the construction of more of them. So lets say that the casks are placed in an uninhabited area, enclosed in a steel container, six casks to a container, and they be allowed to generate steam. This steam after condensing will be distilled water. No energy input is needed. Two problems are solved at once. The casks have a safe storage area, and the entire area has a unlimited supply of fresh water. (0100-30 [Behling, Steve])

Comment: In summation, what I am proposing, is a alternative to the idea of running a pipeline from the great lakes to the southwest. At a lower cost, a pipeline could be run from the Pacific ocean to Death Valley. An area that is currently being mostly unused. A badly needed tax base could be created, by creating a inland lake. Electrical energy could be created, as well as hydrogen gas, rock salt, and a fishing industry. And if anybody is concerned about it, old rad-waste cores could be stored there, at a profit. (0100-31 [Behling, Steve])

Comment: I don't know if you are aware of the so called "Rad-waste-problem" or not. I submit to you that there is no serious problem. A while back I found out that these spent fuel containers or "dry casks," constructed around old reactor cores, have a skin temperature of up to 350 degrees. This is more than enough to boil water. Because of the politics involved, which I will not go into in this paper, the reactor owners are not allowed to ship the old cores to the Yucca flats burial area. Currently, the result is that the plant operators are encasing the old cores in concrete shells, and storing them out of sight behind the plants, so to speak. It seems plausible to me that boilers, or steam generators could be constructed using these old cores, and put them to good use, generating cash rather than trying to dispose of them. (0100-5 [Behling, Steve])

Comment: These dry casks that are piling up all over the United States, and the rest of the world for that matter, which at the moment, nobody wants, could be configured into a low cost giant electrical power plant, or used to heat large buildings directly. (0100-6 [Behling, Steve])

Comment: At any rate, if the cores are allowed to "cool off" for ten years or so, most of the hard radiation will be greatly reduced. I submit that by creating a "middle step" of harvesting heat from these cores, instead of burying them, will drastically reduce the cost of reprocessing spent cores. (0100-7 [Behling, Steve])

Comment: Another item that is not widely known, is that between ninety five to ninety seven percent of the energy of the original core is retained in the spent cores. This is what produces the latent heat output. With the price of nuclear fuel rising, it would make a substantial cost savings to reuse old cores. Dr. Terry Michalske is the head of the Savannah River Site's research body. He claims that Helium-3 and Americium 241 among the recoverable assets that are mixed with the spent fuel. (0100-8 [Behling, Steve])

Comment: Solving the spent fuel burial problems. As far as I know, not one single cask of spent nuclear fuel has been safely "buried" anywhere in the United States, or anywhere else in the world for that matter. Over a billion dollars has been spent on the Yucca mountains burial project, and has went nowhere. Also, the amount of spent fuel that has been created up to this point would more than exceed the tunnel space that has been excavated so far. By the way, have fun trying to convince all the people in the area, that it's a good idea to live down the street from a high level spent fuel dump. Reusing high level spent fuel would go a long way to solve this problem. The Yucca mountains people, might not have an objection to having "low level" waste being put into tunnels. Low level waste being, boots, gloves, clothing, respirator masks, and small quantities of short lived rad-waste products, such as hospital rad-waste discards. (0100-9 [Behling, Steve])

Comment: Why not use the storage facility at Carlsbad that was originally intended for weapons waste? (0101-1 [Streeter, Richard])

Comment: I know this evening is focussing on waste confidence, but we can't do that without talking about confidence in the NRC - and in most of our elected officials. On-site waste storage at nuclear plants is literally a very "hot" topic for the people who live and work in the vicinity, but you would never know it from the inexcusable silence on the part of most of our elected officials. And by "local" I mean from Congresspersons on down. We keep putting these people back in office because we think the other candidates would speak even less to our interests, but people like Senators Schumer and Gillibrand aren't doing us any favors on this issue. I'm too old to learn how to Tweet, but I do know how to Google, and this afternoon I Googled both of these senators and a number of other electeds that should be out there fighting for the safety of their constituents in the region. Schumer seemed to have gingerly stepped up to the plate 13 years ago, just after Con Ed re-opened IP 2 in 2001. The Times reported that he faulted Con Ed and the NRC for not providing a "full, timely accounting of the new leaks" and said that "until the N.R.C. verifies that Indian Point is in good working condition and will not leak, the doors of this nuclear power plant cannot in good conscience be reopened." He also said that "the utility must confront a perception that it cannot be trusted in light of past accidents at the plant" <http://www.nytimes.com/2001/01/05/nyregion/public-officials-urge-regulators-to-close-indian-point-2-again.html>. This part was not read aloud for time constraints. The Google search also produced a statement from Schumer six years later, in March of 2007, when he called for an Independent Safety Assessment after the same reactor was shut down because the water level being used to cool the core got too low. He said at that time that "When it comes to nuclear

safety and security, we expect the highest standards. Safety must be the number one priority. There must be an independent vigorous investigation so that we can get to the bottom of what is going on at Indian Point - and fix it."

http://www.schumer.senate.gov/Newsroom/record_print.cfm?id=270480 Seven years ago, and nothing since --at least according to Google. (0102-1 [Woodward, Julie])

Comment: Sen. Gillibrand seemed even less concerned: LoHud reported almost two years ago that she actually supported building new reactors in communities that want them: QUOTE: "There's lots of places in the state that would certainly welcome a nuclear facility."

<http://www.lohud.com/article/20110320/OPINION/103200341/>. Really? I guess so, if Entergy and their lobbyists keep persuading people that it's completely safe to live next to more than 2,000 tons of spent fuel, in fact, all the rods the reactors have ever used since the first one went online in 1962. What can you expect from an elected who received a lot of cash from Entergy. Everyone knows about the Common Cause report on lobbying and campaign spending, which said that -At the state and local level: \$4.8 million between 2005 and 2012 went to electeds in NY. On top of that \$4.8 million, is the QUOTE: "massive advertising and public relations campaigns they have mounted to sway public opinion. ... 28% was spent by ... groups masquerading as independent organizations but actually under the control of Entergy."; -And at the federal level: \$31.1 million using 18 firms to lobby the federal government, and \$4 million to candidates, PACs and committees. - Included in these recipients are our silent, ostensibly position-less electeds: Senators Schumer, Gillibrand, and Clinton before them. Common Cause adds that "Spending has intensified in recent years."; <http://www.riverkeeper.org/news-events/news/stop-polluters/power-plant-cases/indian-point/report-documents-how-entergy-spends-millionsto?influence-indian-point-relicensing/>; (0102-2 [Woodward, Julie])

Comment: These people need to break the ties they have with Big Money and start thinking reality: Nuclear waste does not go away. Right here in Buchanan this stuff is not on our doorstep, but inside our house. We need whomever we put into office to start feeling very uncomfortable about the money they accept from a corporation like Entergy - a whole industry, in fact - that puts profit over limited, half-baked solutions and potential long-term devastation. (0102-3 [Woodward, Julie])

Comment: Too many Americans live surrounded by toxic pollution from factories like coal plants, refineries, cement kilns, chemical plants, and incinerators, plus highways, truck routes, and hazardous waste sites. When children go out to play, they wheeze, cough, gasp for air, and face asthma attacks, burning eyes, and long-term health harm. Our most vulnerable communities often have less access to quality, affordable health care, which only exacerbates the impacts of environmental hazards. All of our communities need strong, scientific protection now from air, water, pesticides, and radioactive waste to ensure a happy and healthy future for the people who live there, especially children. (0105-1 [Armerding, Christopher])

Comment: I am writing you because I am convinced that nuclear energy is NOT CLEAN energy and about how and where nuclear is stored. Americans have been told our nuclear waste must go somewhere & spent reactor fuel needs to be stored inside a mountain in the desert, where it will sit as a threat and menace to the world for millions of years. We're told there's nothing we can do about it. What if that "spent fuel" was not spent at all? What if a technology existed which allowed the same fuel to be used over and over, twenty times in fact, and safe enough to handle directly out of the reactor? Think any "spent fuel pools" would be full? What if foreign nations, (France was one) offered to buy this fuel from America for billions of dollars only to have the American Government refuse the offer for no reason at all? Certainly allowing France to have it would solve the problem of getting rid of it right? One final question,

WHY would the American Government want so much nuclear material sitting around the country - enough to make countless atomic bombs - only to have it become a threat to America's national security that the govt adamantly states they must protect? Perhaps after reading this report, you will have a change of heart. <http://www.jimstonefreelance.com/busted.html> (0108-1 [G, Ambriel])

Comment: I am always disappointed when the long term public health, environmental and public clean up costs are discounted or not considered when governmental agencies make critical decisions. I understand that we need successful businesses to have a successful economy. But, these things must not be mutually exclusive and business success/profits should not be the guiding principal. (0111-1 [Fox, Patsy])

Comment: Lest you think I have nothing good to say about your regulatory agency, you may be glad to hear that I give the NRC very high marks, but only for hubris and audacity. I wish to make it very clear how much contempt I have for your hubris and audacity. But I recognize that although you are insensitive to the cancers and birth defects of many thousand generations to come, your staff are sensitive beings. (0112-11-3 [Agnew, David])

Comment: There's another aspect to this about oversight. And, you know, the whole thing about, you know, Federal oversight versus municipal oversight. Everybody's afraid of the NRC. They're big dogs. And not too many people went against you. And these little host towns know that they can't afford a fight with you. And so in talking to William Dean I learned that Entergy and any of these host communities do not have to file plans with the NRC prior to building a nuclear waste dump site at an existing reactor. What happens is the NRC goes out, takes a look at the construction after it's built, and issues a certificate of compliance. So there's no preliminary review. Nobody reviewed the siting of the pad, you know. This is incredible. This is not oversight. (0112-23-2 [Maurer, Bill])

Comment: I've been to NRC hearings before, I've read all kinds of things and I've studied the issues. I've never heard anything from the NRC that has made me feel safe. And, in fact, I am more afraid listening to the NRC because I can see that you are colluding with the industry that you are supposed to regulate. You may know more about nuclear engineering than I do, but I knew -- know that you are not keeping me safe. (0112-24-3 [Darling, Ann])

Comment: And in parting, as a veterinarian, 46 percent of dogs are getting cancer. 39 percent of cats are getting cancer. They are canaries in our coal mine. Let's look at that picture, guys, and look at what's happening with these animals. They are telling us what's wrong with us. (0112-29-4 [Roman, Margo])

Comment: And when I was reading one of those endless reports I came across a statement that said the owners of the nuclear power plants are suing the government, that means us, our money, for \$21 billion because the government hasn't made good yet on how to -- what to do with this nuclear power waste, the spent fuel. \$21 billion! (0112-30-3 [Parks, Sheila])

Comment: So my solution is because nobody wants these spent fuel rods or this nuclear power waste any place, but I want it at the White House buried there. I want it buried in the homes of every Congress person who doesn't stand up and say no more nuclear power plants. I want it in the backyards of every single person on the Nuclear Regulatory Commission. And I want every one of the people that I've just named to face a Nuremberg-like trial because that's what you are doing. You are murdering many more people than the Nazis ever did. (0112-30-6 [Parks, Sheila])

Comment: And let me address the legal counsel and the Supreme Court. The Supreme Court of the United States also said that slavery was legal lest you forget and every single solitary thing that the Nazi's did in Germany was legal. And that's what this United States government is doing now, killing all of us with these legal weapons of mass destruction. (0112-30-7 [Parks, Sheila])

Comment: So I hope that all of you on the Nuclear Regulatory Commission take what I'm saying very personally because I mean it personally. Because you can resign. You can get a better job. You can be a whistleblower. You can be on the side of the angels and you can look in the mirror again. What do you tell your children and what do you tell your grandchildren? You know, this planet isn't going to be safe for hundreds of thousands of years. (0112-30-8 [Parks, Sheila])

Comment: Some of the terms that I've come across in what I was reading tonight because I didn't have time to go over the 575 pages, although I fully intended to and will. These ideas of generic and efficiency are their [the NRC's] ways to find words to describe a process that has basically become unmanageable. You are in charge of regulating a fleet of aging reactors that is crumbling as we speak and it's exposed to a multitude of threats from weather and accidents, power outages, terrorism, and just old age, decay, bad design. So, the process is unmanageable. And I think the NRC's job has become unmanageable. So it's not -- I don't, you know, so much have criticisms of individual there unless they're so on the side of industry that they can't make a rational decision on behalf of public safety, but you are as much trapped in the bureaucracy as anyone else. This started mostly before you were born. (0112-31-4 [Johanson, Birgit])

Comment: But in my experience on the board [Groton Board of Health], for example, a neighbor down the street from me had an unfortunate accident. He had -- he was running his truck on vegetable oil and he had a fire and a lot of the vegetable oil spilled. And we made him clean it up. Not just clean up the vegetable oil, but remove the soil. Vegetable oil. In other words, we considered the protection of clean water so important that vegetable oil was considered a threat, because it is if it gets into the aquifer. I don't see that same level of concern about the essentials of life in our nuclear regulation. And I think regulation is very important. And I don't see regulation, for example, as antithetical or the enemy of market forces. And, in fact, you need good regulations. Regulations that state what you insist must happen for market forces to then work. In other words, if you simply regulate to the level of safety that the industry is willing to offer you, then market forces aren't working in that area. They're not working to find a safe solution. You're simply going to get what they offer. Now, if you really rely on market forces after -- and you really regulate for real safety, the safety you want, the protection of the environment that you want, you might find that the market forces do more than you expect. They might push you to a new technology. They might tell you one industry goes down. One thing I don't understand is why this entire industry which was predicated on finding permanent storage, safe, permanent storage wasn't shut down when that didn't happen. And I see that as a fundamental failure of regulation. And a failure that allowed market forces to just produce poison and it really worries me. (0112-32-1 [Fleischer, Robert])

Comment: This nuclear mafia that has been running the nuclear bomb industry around the country, around the world operates outside of the democratic process and the people want that to stop. This nuclear waste has been called a resource by people in my hometown who build nuclear submarines where the nuclear waste is being stored and building up at the military installations across this country as well. And they want to call it a -- it's a resource that can be somebody wants to buy that stuff. Well, good luck. But everybody knows that if you have a

fancy coat and you shake enough hands, you can sell anything, even nuclear waste. (0112-34-3 [Chichester, Ben])

Comment: We're tired of the systematic arrogance of the nuclear industry and the regulatory system. We're glad the judicial process is finally calling you out on this charade. (0112-5-9 [Bogen, Doug])

Comment: Oh, the NRC, it's my belief that if the NRC is not able to stop what occurs right now in Fukushima or if they're not able to stop the degradation of San Onofre's reactor of their steam generators, that it shouldn't be in the business of regulating nuclear power. If you can't stop criticality, how can you regulate it? If you can't find the cause at Fukushima, how can you call yourselves a regulator? (0112-8-1 [Sachs, Gary])

Comment: I did hear the NRC say this year they don't think they should be under the control of the Federal justice system. Who do you want to be under the control of, Congress? Markey's now a senator. He might be able to do something to have better effect with you. (0112-8-5 [Sachs, Gary])

Comment: 14. The Uranium that was in the reactors at Fukushima Daiichi originated from Aboriginal Lands in Australia, where the traditional people opposed the uranium ever being removed from the ground. It is time for the decision structure of our United Nations to honor and include the wisdom of those who truly, if heard, could have prevented this disaster. (0113-10 [Caldicott, Helen] [Ehrle, Lynn Howard] [Freeman, S. David] [Grodzinsky, D.M.] [Gunderson, Arnie] [Koehnlein, Wolfgang] [Koerblein, Alfred] [Meyer, Alfred C.] [Mironova, Dr. Natalia] [Patterson, Jeffrey J.] [Pflugbeil, Sebastian] [Preobrazhenskaya, Natalia] [Scherbak, Yuri] [Sovacool, Benjamin K.] [Starr, Steven] [Wing, Steve] [Yablokov, Alexey])

Comment: 15. The Memorandum of Understanding between the World Health Organization and International Atomic Energy Agency should be dissolved permanently. The charge of the IAEA is to spread "peaceful" uses of nuclear technology. This official mandate prevents IAEA from being independent assessors of health impacts of the same technology. (0113-11 [Caldicott, Helen] [Ehrle, Lynn Howard] [Freeman, S. David] [Grodzinsky, D.M.] [Gunderson, Arnie] [Koehnlein, Wolfgang] [Koerblein, Alfred] [Meyer, Alfred C.] [Mironova, Dr. Natalia] [Patterson, Jeffrey J.] [Pflugbeil, Sebastian] [Preobrazhenskaya, Natalia] [Scherbak, Yuri] [Sovacool, Benjamin K.] [Starr, Steven] [Wing, Steve] [Yablokov, Alexey])

Comment: In addition to the action plan outlined above, we have broader concerns about radiological accounting and regulation that United Nations agencies such as the World Health Organization (WHO), International Atomic Energy Agency (IAEA) and United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) have already engaged in. With regard to the Fukushima nuclear disaster other UN Agencies, like the High Commission on Human Rights, have recognized how this accounting is not serving humanity. (0113-2 [Caldicott, Helen] [Ehrle, Lynn Howard] [Freeman, S. David] [Grodzinsky, D.M.] [Gunderson, Arnie] [Koehnlein, Wolfgang] [Koerblein, Alfred] [Meyer, Alfred C.] [Mironova, Dr. Natalia] [Patterson, Jeffrey J.] [Pflugbeil, Sebastian] [Preobrazhenskaya, Natalia] [Scherbak, Yuri] [Sovacool, Benjamin K.] [Starr, Steven] [Wing, Steve] [Yablokov, Alexey])

Comment: 8. A new formulation of the radiological risk coefficient assigned to radiation exposure is needed, as well as a rigorous discussion of the option for more than one such coefficient. Unfortunately, outdated assumptions are still being applied to what is happening to the people of Japan, and others being exposed to radioactivity from Fukushima (and elsewhere). More accurate understanding of the impact of ionizing radiation from both

internalized radionuclides, and also across the life-cycle, has not yet been incorporated into risk estimates. "Old" (inaccurate) assumptions do not account for disproportionate harm to females in general, and young children in particular (National Academy of Sciences, BEIR VII page 311, Tables 120-1 and 120-2 Lifetime Attributable Risk of Cancer Incidence and Mortality). Official estimates are beginning to acknowledge this reality [World Health Organization, 2013, Health risk assessment from the nuclear accident after the Great East Japan Earthquake ... see page 54 section 5.2.2 Results of lifetime risk calculations. http://www.who.int/ionizing_radiation/pub_meet/fukushima_risk_assessment_2013/en/index.html ; UNSCEAR press release (http://www.unis.unvienna.org/unis/en/pressrels/2013/unisinf4_75.html) and video (<http://www.youtube.com/watch?v=gyLDNg3VBMU&feature=youtu.be>)] however, this impact is not yet incorporated in the regulation of radiation exposure worldwide. In addition, it is no longer valid to omit the impact of internal exposure; risk estimates can no longer assume different types of radiation outside the body have equivalent health impact once inside the body. (See: Yablokov, 2013, "A Review and Critical Analysis of the "Effective Dose of Radiation" Concept" Journal of Health & Pollution Vol. 3, No. 5-pg 13--28.) Finally, it is not clear that exposures in utero, during the initial phases, or over time will be included in the estimate of health risk or consequences from Fukushima. (0113-4 [Caldicott, Helen] [Ehrle, Lynn Howard] [Freeman, S. David] [Grodzinsky, D.M.] [Gunderson, Arnie] [Koehnlein, Wolfgang] [Koerblein, Alfred] [Meyer, Alfred C.] [Mironova, Dr. Natalia] [Patterson, Jeffrey J.] [Pflugbeil, Sebastian] [Preobrazhenskaya, Natalia] [Scherbak, Yuri] [Sovacool, Benjamin K.] [Starr, Steven] [Wing, Steve] [Yablokov, Alexey])

Comment: 9. The global organizations charged with radiological analysis and regulation should be generating a real base of monitoring data from Fukushima. Contamination levels in both humans and the environment need to be woven into any health assessments. Reliance on dose reconstruction alone is insufficient and collection of biological data will help researchers observe, not just predict, health outcomes. It is incumbent upon these global organizations, given the amount of information now known about disproportionate impacts from internal exposure; and the disproportionate harm across the lifecycle (human and otherwise) to collect data and calculate exposures directly; not from extrapolations mired in outdated and incorrect assumptions. The UN Special Rapporteur supports collection of biological data to assess internal exposure: "Refrain from restricting examination for internal exposure to whole-body counters and provide it to all affected population [sic], including residents, evacuees, and to persons outside Fukushima prefecture;" (Grover 2013, p 23) (0113-5 [Caldicott, Helen] [Ehrle, Lynn Howard] [Freeman, S. David] [Grodzinsky, D.M.] [Gunderson, Arnie] [Koehnlein, Wolfgang] [Koerblein, Alfred] [Meyer, Alfred C.] [Mironova, Dr. Natalia] [Patterson, Jeffrey J.] [Pflugbeil, Sebastian] [Preobrazhenskaya, Natalia] [Scherbak, Yuri] [Sovacool, Benjamin K.] [Starr, Steven] [Wing, Steve] [Yablokov, Alexey])

Comment: 10. In general, public health concerns need to drive public spending and health assessments; principles of biology need to drive health research not scientific investigation for science's sake. People need proper medical treatment, not data-mining. Japanese People, especially parents, should be told the truth about the medical effects of radiation exposure and have full and open access to the tests that are being performed on them to detect health abnormalities, such as thyroid cancer. All investigations into health abnormalities should include all cancers and other diseases related to radiation exposure. The world must not re-commit the post-war crimes of Hiroshima and Nagasaki, where the radiation victims known as Hibakusha, were only studied by the West rather than helped to heal. (0113-6 [Caldicott, Helen] [Ehrle, Lynn Howard] [Freeman, S. David] [Grodzinsky, D.M.] [Gunderson, Arnie] [Koehnlein, Wolfgang] [Koerblein, Alfred] [Meyer, Alfred C.] [Mironova, Dr. Natalia] [Patterson, Jeffrey J.] [Pflugbeil, Sebastian] [Preobrazhenskaya, Natalia] [Scherbak, Yuri] [Sovacool, Benjamin K.] [Starr, Steven] [Wing, Steve] [Yablokov, Alexey])

Comment: 11. Where biological mechanisms or results are unclear, precaution should be used and not be superseded by principles of physics alone because physics is only one of the forces acting to impact health. Research finding negative health impacts of low doses should be accounted for, not disregarded. The UN Special Rapporteur, after reviewing such research, recognizes this: "...disregarding these findings diminishes the understanding of and increases vulnerability to health effects of long-term exposure to low-dose radiation." (Grover 2013, p 6) Unfortunately these concerns extend far beyond Japan today, and per new projections (shown graphically here), impacts are still expanding: <http://liopscience.iop.org/1748-326/7/3/034004/article?vshowaffiliations=yes> (0113-7 [Caldicott, Helen] [Ehrle, Lynn Howard] [Freeman, S. David] [Grodzinsky, D.M.] [Gunderson, Arnie] [Koehnlein, Wolfgang] [Koerblein, Alfred] [Meyer, Alfred C.] [Mironova, Dr. Natalia] [Patterson, Jeffrey J.] [Pflugbeil, Sebastian] [Preobrazhenskaya, Natalia] [Scherbak, Yuri] [Sovacool, Benjamin K.] [Starr, Steven] [Wing, Steve] [Yablokov, Alexey])

Comment: 12. Those who are displaced from their homes due to radioactivity need to have good options regarding how and where to live that are respectful of their culture and traditions. Consequently, the Special Rapporteur's report says any relief package should "(i)include cost of reconstruction and restoration of lives" (Grover 2013 p 24) This starts by providing them information about radiation in the context of other determinants to health, and this information should not be in the control of parties with financial interests in the nuclear industry. (0113-8 [Caldicott, Helen] [Ehrle, Lynn Howard] [Freeman, S. David] [Grodzinsky, D.M.] [Gunderson, Arnie] [Koehnlein, Wolfgang] [Koerblein, Alfred] [Meyer, Alfred C.] [Mironova, Dr. Natalia] [Patterson, Jeffrey J.] [Pflugbeil, Sebastian] [Preobrazhenskaya, Natalia] [Scherbak, Yuri] [Sovacool, Benjamin K.] [Starr, Steven] [Wing, Steve] [Yablokov, Alexey])

Comment: I am waiting for the individuals on the Commission to behave as individuals who must be accountable to your families and communities. Because now families and communities are not only watching, they are measuring. They are measuring the radiation in the atmosphere. The Gamma radiation from Cesium 137. The data will do the talking. The presence of Cesium 137 will not be a secret and silenced. (0120-7 [Seeman, Laurie])

Comment: It seems to me that the threat "Your money or your life!" has never been more accurate. I feel that the NRC has a moral obligation to put all other concerns aside & show global responsibility & leadership, based on what I hope their mission is: to regulate the use of nuclear power in order to require that the safest methods are used in all aspects of the technology - period. I hope their mission is not to do this by the cheapest means possible. (0126-3 [Houston, Ann E.]

Comment: With all due respect, the policies perpetrated by this agency put the interests of the nuclear power operators far above the welfare of populations in reactor communities. (0136-12 [Shaw, Gary])

Comment: One might ask what type of oversight the NRC provides if it could not see that the operator was incapable of maintaining safe operations? Over the last 13 years of observing this agency, my conclusion is that the agency is not so good at preemption, but works hard to find root causes after damage has been done. (0136-2 [Shaw, Gary])

Comment: I am saddened and dismayed that there is so much controversy surrounding nuclear plants, nuclear waste storage and leakage of contamination into the groundwater. The NRC must adopt very strict standards and regulations for existing and future nuclear plants. The damage and ensuing threat of a nuclear meltdown at Fukushima should be example enough that our nuclear plants must adhere to the strictest of standards. (0158-1 [Payne, Joanne])

Comment: There was a project at UNLV to recycle nuclear waste. I'm not sure of the outcome of this particular project, but I'm sure scientists would be happy to work on this project with some support from the government. (0162-1 [Ramsey, Betty])

Comment: Before closing I would like to note that 20 months ago the Disposal Subcommittee of the Blue Ribbon Commission of America's Nuclear Future presented its upgraded report and there's a roadmap there and certainly the NRC should follow that. However, in the interim, it's incumbent upon you to promulgate rules and enforce them so that we will have the maximum protection to the public and the surrounding from the potential ill effects of an adverse incident which causes the release of nuclear waste. (0163-16-8 [Wolf, Peter])

Comment: One last point. Indian Point has become a defacto toxic waste dump on the banks of the Hudson River 34 miles from mid-town Manhattan. That's the reality. It wasn't -- didn't start out that way, but that's the situation we're dealing with now. And we deserve better than -- what we deserve from the NRC is a thorough and honest assessment of the risks and the impacts and a plan to deal with this waste safely instead of what we got, which was business as usual from the NRC on Indian Point. (0163-2-7 [Musegaas, Philip])

Comment: I live five-and-a-half miles from Indian Point. I was going to start off talking about what a poor job I have observed the NRC doing in terms of preemption of problems. They didn't prevent Con Ed from having a steam pipe eruption that released radioactive steam into the atmosphere and irradiated water right into the Hudson. They weren't -- they couldn't prevent more ruptures and leaks in underground piping. They had no idea that their spent fuel pools were leaking until, as somebody else mentioned, a contractor started doing excavation and said "Oh, it's wet outside the spent fuel pool." So the NRC is not very good at preemption, but they're pretty good at going "Uh-oh, what do I do now that there's a problem?" So the idea that they now have a plan to take care of nuclear waste into millennia, it would be hilarious if it wasn't so scary. (0163-22-1 [Shaw, Gary])

Comment: With all due respect, the policies perpetrated by this agency put the interests of the nuclear power operators far above the welfare of populations in reactor communities. (0163-22-10 [Shaw, Gary])

Comment: The idea that, you know, when we had public meetings with the NRC and asked how many exemptions has Indian Point received and they didn't -- they had no idea how many exemptions they've given or how they interacted. So I have very little, very little, confidence in this so-called regulator whose primary objective by law is supposed to be protection of public health and safety. They're obviously much more interested in the financials of the operator. That came out in an Inspector General's report when they almost let Davis Bessie reactor in -- outside of Toledo, Ohio, have a breach of containment because they were concerned about the financial impact of shutting the plant down to find out what the problem was. (0163-22-2 [Shaw, Gary])

Comment: I can't think. And it just occurs to me that there is so much arrogance going on at the NRC and has been for decades, because I've been coming to these meetings for over 30 years, ever since I moved to my home which is 14 miles from Indian Point. And I'm furious, and I know that there are a lot of other people who are being more polite than I am who are equally furious that you think that you can con us into thinking that there is any solution for this. (0163-24-3 [Allen, Judy])

Comment: I want you to know that there is a disconnect between what the NRC says and what the public perceives. There is lip service. Only lip service paid to the public health and safety. We all know that you are beholden to the nuclear industry. We all know that organizations like SHARE and New York AREA have been created by Entergy with Entergy's money. (0163-24-4 [Allen, Judy])

Comment: First of all, on behalf of people who are not here, I want to say, like a lot of people, just everyday people like myself, they're already catching up with all the deceptions of nuclear energy and it's amazing to see NRC people whose doing amazing job in keeping status quo even after the post-Fukushima wall. We are in an incredible situation, an extreme situation, and people in suits today from the industry and from Regulatory Commission might be just doing their job to keep their, you know, career and all that. And it's just obvious that people like us and people from Japan need to be heard. (0163-31-1 [Tonohira, Yuko])

Comment: Onsite waste storage at nuclear plants is literally a very hot topic for the people who live and work in the vicinity, but you would never know it from the inexcusable silence on the part of most of our elected officials. And by local, I mean from congress-people down. We keep putting these people back in office because we think the alternative candidates would speak even less to our interests. But people like Schumer, Gillibrand, aren't doing us any favors on this issue. I'm too old to learn how to tweet, but I do know how to Google, and this afternoon I Googled both of these senators and a number of other elected that should be out there fighting for our safety or the -- and their constituents in this region. Schumer seemed to have gingerly stepped up to the plate 13 years ago after Con Ed reopened Indian Point Number 2 in 2001. The Times reported that he faulted Con Ed and the NRC for not providing a full, timely accounting of the new leaks and said that until NRC verifies that Indian Point is in good working condition and will not leak, the doors of this nuclear power plant cannot in good conscious be reopened. I'll shorten my remarks, but the next time he spoke on the issue of Indian Point was in 2007. That's six years later. The most recent comments he made were about barbeque grills at a time when we expected him to be talking about Indian Point. (0163-37-1 [Woodward, Julie])

Comment: These people need to break the ties they have with big money and start to think reality. Nuclear waste does not go away. Right here in Buchanan this stuff is not on our doorstep but inside our house. We need whomever we put into office to start feeling very uncomfortable about the money they accept from a corporation like Entergy, the whole industry in fact -- that puts profit over limited half-baked solutions and potential long-term devastation. (0163-37-3 [Woodward, Julie])

Comment: I have confidence that the sun will rise in the east and basically, death and taxes. But I don't have confidence that any agency could actually take responsibility and carry out a responsibility to deal with this huge, huge issue. When I hear news or information presented as fact, I ask myself what's the source of the information and what does that source have to gain by their so-called facts? Follow the money is my motto, and I respect everyone here who has spoken and who has spoken on both sides of -- on whatever side of this issue. However, it cannot be said that somebody who works for the nuclear industry is disinterested, is a disinterested party. (0163-39-2 [Sack, Emily])

Comment: The other thing I would like to point out and emphasize again, is of course, how shall I put this? Well, I will put it this way. In a functional society the decision-making on any issue would not be open to anyone who has a vested interest in the outcome of that decision, right. Meaning -- meaning of course that the honorable thing is that if you're making money off of, say, Indian Point, you recuse yourself from decision-making about waste storage and

whether it should be open because even if you try to be devoid of the conflict of interest, it's going to be there and present, you know, your livelihood depends on it. And for those people who are making a living by, you know being engineers or management people or secretaries at Indian Point, yes, I have sympathy for your predicament, but it's kind of like, you know, you're making money off something that's very dangerous. The witch burnings in Europe went on for 300 years because the interrogators of witches and the people who made instruments of torture for the interrogation, it was a big money-maker in Europe, you know. We got to put money behind good stuff that we need and take it away from poisoning the water, poisoning the air, poisoning the earth, poisoning ourselves, et cetera. (0163-41-4 [Kidney, Barbara A.])

Comment: I really respect everyone that has spoken tonight. But all I can think of, and I know this is going to be very crude and rude, all I can think of is my father, who really would have just been aghast at what is going on. And all I can think of is the expression he told me once. All you can do is put your head between your knees and kiss your ass goodbye. That's all. (0163-50-1 [DeCrescenzo, Jackie])

Comment: It occurs to me, everyone who has spoken in favor of nuclear energy, its safe storage and generic rules for waste has a JOB that depends on nuclear energy! (0175-4 [Arnason, Deb])

Comment: Given the complexity and seriousness of this issue and given that we are currently witnessing movement of spent fuel rods at Fukushima and some of us are holding our breath in anticipation of more serious consequences I ask that all interested parties enter into a serious and respectful discussion. Individual citizens, policy advocates from ngos, volunteers from various groups have no vested interest in this other than their concern for human survival and the health and well-being of all and our planet. They are not a lobbying group, they stand to gain nothing on the material level. start listening to them and engaging them in real conversation. Stop being a front for the industry and do your duty to humanity. (0177-6 [Craig, Anne])

Comment: GmP's mission is the deployment of small modular reactors. We believe that SMRs provide a near-term option to address multiple needs: diversity of fuel supply, replacement of aging fossil fleets with a carbon-free option, the ability to stabilize small and segmented grids, addressing post-Fukushima safety requirements with significant improvements in safety margins, and providing access to safe, carbon-free generation options at sites never before envisioned, all with reasonable investment and project risks. We also provide electric generation and process heat options not available previously in emerging markets, and are working to provide options worldwide for near-term, low-risk, carbon-free power. This mission is in support of a strategic need, both here in the US and abroad, to transition electricity generation to cleaner, long-term power. Approval of our design by the NRC is considered by many to be a prerequisite to deployment in other countries. And a very important aspect of moving forward in any area of nuclear licensing is regulatory stability; the deployment of SMRs in the US is no exception. (0182-2 [Vytlačil, Gordon])

Comment: The philosopher, Georges Santayana, said that those who ignore the failures of the past are doomed to repeat them. Within his first 100 days, Jimmy Carter issued an Executive Order on April 7, 1977 to defer indefinitely the reprocessing of used nuclear reactor fuel. He said it was necessary to prevent proliferation, and that nuclear power could go ahead just fine. He was wrong on both counts. His order was a Major Federal Action. Did he prepare an EIS (Environmental Impact Statement)? No! He made his decision in secret, listening only to those who he knew would agree with him. Kept tightly classified, there were no White House leaks. Carter ignored four decades of planning, study and Congressional funding on waste disposal,

and never reviewed the lengthy hearings in the Senate or the House on the economics, proliferation or the Waste Confidence Rule. The Vietnam War had brought changes to American policymaking. Activists challenged governments from Federal down to county levels. "Public participation in decision making" was Ralph Nader's banner and was demanded by activist groups. In 1975, activists won a court decision that forced an EIS on the entire planning for reprocessing and recycling of used nuclear fuel. The GESMO (Generic Environmental Statement on Mixed Oxide Fuels) meant months of preparation, and a series of public meetings had already been announced when Carter was elected. Carter's new nuclear policy stopped the GESMO. It achieved victories for NRDC, UCS, EDF and Common Cause. GESMO's demise showed that a small group of dedicated organizations could use NEPA (National Environmental Policy Act) and the EIS to try to stop a big program of a major industry. While not offering viable alternatives or even documented facts, and maybe not being able to totally stop it, they were able to delay it while raising costs, feeding public doubts and fears, and fueling more distrust of government. Carter read voraciously, but skipped or ignored experts who knew enough to point out weaknesses and fundamental errors in his scheme, including its impact on the national program for nuclear waste management. Even after his election, President Carter never consulted the directors of our weapons laboratories about plutonium. He feared that if his policy were leaked, the nuclear industry would use its vast financial resources to undermine his plans. Carter just believed that if the US took the lead by stopping our reprocessing, separating and recycling plutonium and the breeder reactor, the other nations would follow our lead and that would prevent proliferation. They did not, and the U.S. lost its leadership in the nuclear power world. Our friends and partners were appalled and furious. They realized that the U.S. had just given activist groups a powerful political gimmick they could use to stop nuclear power. And they tried! (0191-1 [Rossin, A. David])

Comment: Alongside these harmful effects comes the retaliation of the victims; in other words, lawsuits can easily arise when it comes to nuclear waste and its harmful effects. Although a possible lawsuit usually is between a community of people, whether it be a lot of people or a small amount, and a company that deals with nuclear waste directly, the whole ordeal can come full circle and end up putting a negative pressure on the NRC. (0192-6 [Einhorn, Jeremy])

Comment: The reactor licensing must be made permanent and inspectors on the current active power plants are needed to assure our safety. Many are old and need repair. (0193-2 [Doyle, Rosemary])

Comment: Continuing on, I OPPOSE "CENTRALIZED INTERIM STORAGE" (CIS), which has been proposed by the nuclear industry. Illinois should NOT be considered to be a DE FACTO HIGH-LEVEL RADIOACTIVE WASTE DUMPSITE! (0196-4 [Nelson, Dennis R])

Comment: We need to deal with nuclear waste once and for all! (0197-1 [Webb, David])

Comment: I know nuclear energy is a strong player in the energy bussiness and helps meet our needs on the home front. But just like oil and natural gas it depends on a resource that will run out. I think that if the way of the future is renewables, technologies that depend on wind, sun, things that we will never run out of, why are we investing in things that we know for certain we will run out of. If we start investing in renewable energy then we skip a step, building up a technology that will eventually be useless, and have a head start on what were going to have to do anyway. (0200-4 [Individual, Anonymous])

Comment: Companies that use nuclear fuel to produce electricity for profit should maintain strict chain of custody for the duration of its possession until permanent storage is established and carry liability for environmental and/or human issues that may evolve from future events. (0202-2 [Hill, Jack])

Comment: Another option would be alternative designs for nuclear plants. A South African company called PBMR Ltd. began developing a new type of reactor called the pebble bed modular reactor in the 1990s. This design would improve the efficiency of the process, reduce overall quantities of waste, and reduce dangerous conditions (Adams, 2001). Improving the design of the plants would help with the long-term waste storage problem because it would allow plants to generate less waste. Not only will pebble bed modular reactor plants generate less waste, but they will also be designed with a system to make the waste they do generate safer. PBMR proposes to coat the waste with a layer of fuel that will keep it separate from the environment and allow it to safely degrade into a stable substance (Adams, 2001). Furthermore, this design will include specifically engineered areas within the facilities themselves large enough to store the by-products that the plants generate (Adams, 2001). This would make the plants almost self-sufficient and greatly reduce, if not eliminate, the need for substantial off-site storage. Now other countries, like China, have also begun developing the pebble bed reactors. It may prove beneficial for the United States to look into this technology as well. (0205-14 [Lyons, Laura])

Comment: To put things on a more positive note, I think there is a good chance we will eventually learn how to safely recycle high-level nuclear waste. For example, there is this proposal: ACCELERATOR DRIVEN SYSTEMS; D. Vandeplassche and L. Medeiros Romao, SCKCEN, Mol, Belgium; <http://accelconf.web.cern.ch/accelconf/IPAC2012/papers/moyap01.pdf>; From the Proceedings of IPAC2012, New Orleans, Louisiana, USA. I have seen other proposals in the popular media that use fusion as the neutron source to accomplish this. These ideas do look promising, but they currently aren't viable solutions. Also, the time frame for recycling is still going to be on the order of a thousand years, because any real recycling process has to release the remaining energy stored in the high-level waste and it will take that long to use the energy! So, the best advice I could give at this time would be to plan for 1000 years of interim storage. (0208-8 [Robinson, Herb])

Comment: The NRC licenses and regulates the nation's civilian use of radioactive materials to protect public health and defense and security and protect the environment. I state that most important in the NRC's mission is the protection of public health and the protection of the environment. (0219-14 [Olmstead, Stan])

Comment: Further, the NRC's lack of basis for a finding of confidence in the technical feasibility of a repository fatally undermines Table S-3 of the NRC's Uranium Fuel Cycle Rule, which depends on the assumption that radioactive releases from a repository will be zero. (0222-12 [Zeller, Lou])

Comment: Prohibit reprocessing: The reprocessing of irradiated fuel has not solved the nuclear waste problem in any country, and actually exacerbates it by creating numerous additional waste streams that must be managed. In addition to being expensive and polluting, reprocessing also increases nuclear weapons proliferation threats. (0222-20 [Zeller, Lou])

Comment: DISPOSE OF THE WASTE IN THE NEW MEXICO SALT FLATS ALREADY -- THE SOLUTION IS OBVIOUS! (0225-1 [Ludwig, Andy])

Comment: Now you, the NRC, want comments on our plan to store radioactive waste on our seismically active coastline for 300 years. What do I think? I hope a negative answer is as obvious to you as to everyone else. My question to you is, "Who owns you?" It certainly is not the public you are supposed to serve, the 99%. Big money owns our country today. Reason has been discarded. Example: San Onofre closed because repair was too costly -- not because of safety. Must we find a money answer for you and PG & E? Or are you providing it? (a) store spent waste; (b) continue Seismic Studies; (c) wait for an earthquake (0234-1 [McNeil, Dorothy F.])

Comment: The forum was very informative. Both sides presented their arguments on how they feel about coal. I listened to both sides of the equation and I really do not have a stance either way. I did learn some information that I did not previously know so I was happy to be able to attend. I believe nuclear energy is a good alternative to coal but is not the total answer to the question that really needs to be asked. I believe renewable energy is the way to go and I also understand that is not the total answer as well. We have to use all technologies that we have at our disposal as well as what is to come in the future but we should rely on renewable energy as much as possible. In the end nobody on either side of the coin wins on the issue of nuclear. (0235-1 [Ford, Jay])

Comment: In December of 2011, I attended the PowerGen conference in Las Vegas Nevada and delivered hard copy evidence to Clayton Smith, Technical Services Director of Fluor Corporation that a test was done under NRC supervision at Rocky Flats Colorado in the mid 90's that showed conclusively that Plutonium 239 could be safely neutralized. Since hand delivering that information to Mr. Smith, he will not return letters, email or telephone calls. It became apparent to me that NRC officials came down on him with a lead hammer to suppress that information. NRC appears to have one prime directive: that of providing weapon grade materials to the Defense industry, regardless of which administrative shell they hide under. This is not acceptable to a civilized country. I demand this information not only be released, but immediate implementation of the process be used to begin neutralizing ALL of America's radioactive waste AT THE FACILITY. The equipment to accomplish this is small, portable and can be used at each facility. This negates the need for dangerous transportation of any waste. The crisis in Fukushima should make this the top priority in the nuclear power industry. No exceptions. For anyone who honestly is not aware of this process, I can easily provide contact information of the physicist who accomplished the feat at Rocky Flats Colorado in 1994. No nuclear facility should be approved for further operation until this process, or anything proven better, is implemented. (0239-3 [Rasmussen, Kenneth])

Comment: If America wants to be seen as exceptional, we should be setting an example of reason and responsibility. We can set an example by reprocessing spent fuel to reuse it as France has done. That effort cannot possibly cost more than our frantic cleanup efforts cost us. Our 'exceptional' reputation is based too much on keeping our investors happy rather than keeping our environment safe. (0242-1 [Labiosa, Eleanor])

Comment: I trust you to keep the welfare of your own country as your first concern. As a trusted representative of our great Country you cannot possibly not know the dangers inherent in storing nuclear waste. Thank you for putting our health ahead of company wealth. (0242-2 [Labiosa, Eleanor])

Comment: Another thing that I've seen in this EIS is the -- or I've seen in these meetings is people think that NRC might be, what they call a "captured regulator," where NRC is on our side. And if you've been to a lot of the meetings I've been to where we're discussing the details of this process, nothing could be further from the truth. It's a very adversarial process. If you

don't believe that look at the record of public meetings recently between industry and NRC. You know, we both agree that we should be focusing our resources on the things most important to safety, and as we see regulatory costs increasing across our industry we don't always agree about what those things are. Look at the correspondence that's gone back and forth between NRC in industry. If you look at the facts, there's a very strong record to suggest that -- not just to suggest but to prove that this is a very tough adversarial regulator. Those of you concerned about nuclear safety probably say, "Darned good thing." And, you know, we do too. And we don't say, "Oh, phew, we met the regulations let's go home." Our safety culture, where regulatory compliance is a minimum standard of performance. We don't just meet regulations, we exceed them. (0244-11-9 [McCullum, Rod])

Comment: A philosopher, George Santayana, said that those who ignore the failures of the past are doomed to repeat them. Within his first 100 days in office, Jimmy Carter issued an Executive Order on April 7th, 1977 to defer indefinitely the reprocessing of used nuclear reactor fuel. He said it was necessary to prevent proliferation and that nuclear power could go ahead just fine. He was wrong on both counts. His Order was a major Federal action. Executive Orders by the President have the force of law. Did he prepare an Environmental Impact Statement? No. He made his decision in secret, listening only to those who he knew would agree with him. Kept tightly classified, there were no White House leaks and his statement caught the American nuclear industry off-guard, they didn't know it was coming. Carter ignored four decades of planning, study, Congressional funding on waste disposal, and never reviewed the lengthy hearings in the Senate or the House on the economics, proliferation, or the Waste Confidence Rule. The Vietnam War had brought changes to American policymaking, and these changes were very evident by the mid-70s before Carter was elected President. Activists challenged government from Federal level on down to county levels. "Public participation in decision-making" was Ralph Nader's banner, and it was demanded by activist groups one after the other on one issue or another. In 1975 a group of activists won a court decision that forced the Environmental Impact Statement -- forced an environmental statement on the entire planning for reprocessing and recycling of used nuclear fuel. It had the funny acronym, GESMO, G-E-S-M-O, the Generic Environmental Impact Statement on Mixed-Oxide Fuels. And this meant months and months of preparation and a series of public meetings had already been announced and the locations had already been set when Jimmy Carter was elected. (0244-4-1 [Rossin, A. David])

Comment: Anyway, back to Jimmy Carter's new policy. It stopped the GESMO. It achieved victories for NRDC, Union Concerned Scientists, Environmental Defense Fund, and Common cause. GESMO's demise showed that a small group of dedicated organizations could use the National Environmental Policy Act and the Environmental Impact Statement to try to stop a big program of a major industry while not offering viable alternatives or even documented facts, and maybe not even being able to totally stop it, they were able to delay a project while raising costs, feeding public doubts and fears, and fueling more distrust of government. And these were impacts. Jimmy Carter read voraciously, but he skipped or ignored experts who knew enough to point out the weaknesses and fundamental errors in his scheme, including its impact on the National Program for Nuclear Waste Management. Even after his election President Carter never consulted the directors of our weapons laboratories about plutonium. He feared that if his policy were leaked, the nuclear industry would use its vast financial resources to undermine the plan. Carter just believed that if the United States took the lead by stopping our reprocessing, separating, and recycling of plutonium and the breeder reactor, other nations would follow our lead and that would prevent proliferation. They did not follow our lead and the United States lost its leadership in the nuclear power world. You can look at the difference between 1976 and 1978, the United States was no longer a big player. Our friends and partners were appalled and furious at this policy. They realized that the United States had just given activist groups a

powerful political gimmick that they could use to stop nuclear power, and they tried. I want to take a few seconds just to tell one story. I said the U.S. nuclear industry didn't know about Jimmy Carter's policy, neither did anybody else. A day before his press conference he made personal phone calls to the Prime Ministers of the United Kingdom, Germany, and France. The United Kingdom told the President of the United States politely to mind his own business. Carter had asked them to shut down the reprocessing plant that the UK was building. Helmut Schmidt in Germany hung up on Jimmy Carter; he said, "You're crazy." The Prime Minister of France, whose name was Couve de Murville, took Jimmy Carter's call, thanked him for calling, picked up his other phone and called the project manager at the reprocessing plant that the French were building. He said, "Monsieur, I have just received a call from Jimmy Carter. The United States is going to stop its reprocessing program and they want us to do the same." "Thank you Mr. President," said the chief engineer, and he picked up the other phone and called his construction design manager and in effect said, "Stop the presses, triple the size of our reprocessing facility," and they did. (0244-4-3 [Rossin, A. David])

Comment: I just had a conversation with a friend of mine and he said, "Well, you know what I think, these people they just really aren't worried. They think Jesus is coming. It's the apocalypse, they don't have to worry, it's all going to be over." So like when I was up there at that PSC hearing just recently, they're jacking the rates because of their fiasco. You know, and I say, do you feel lucky, do you feel lucky? Oh yeah baby, roll those dice (indicating). That's what you're doing. You don't know what's coming. This is just a big big guess. You don't have any proof. You're all a bunch of jokers. You're rolling the dice. That's all it is, it's a big craps game here. And all these people are saying, "Oh, we know what this is, we know the science, we can tell you with confidence." And, you can't even get a line right. I was supposed to be speaking number four. Clown. (0244-5-6 [Klutho, Mark])

Comment: There have been proposals to incorporate their radioactive effluent in consumer products. That may not be the exact point of this hearing, but that may be the most insane proposal of all. What a great idea, let's expose everyone, including babies and children, to products known to cause horrible illnesses and death. (0244-6-6 [Steorts, Tim])

Comment: My purpose for pointing that out is only this: I've been involved with energy policy, energy planning, and nuclear energy in the state of Florida for over two decades. And I will tell you that the issue that you're dealing with right now is probably the most important one for Florida's clean energy plan in the future. Certainly Florida has made some modest attempts to develop more solar energy, some of which have been successful, some of which have not. (0244-9-5 [Paul, Jerry])

Comment: So, I hope one day we can actually get one better and reprocess the fuel and minimize the amount of waste actually produced. (0245-12-6 [de Graaf, Brandon])

Comment: It's important to get this right because the nuclear industry wants thousands of small modular reactors around the world, which means at least hundreds if they get their way around the country. And this will be the guidance for hundreds of small modular reactors. (0245-19-10 [Smith, Ed])

Comment: It's clear that for our overall quality of life as well as our overall economic well-being that we need a reliable, cost-competitive, diverse, and stable supply of energy. In the past few months, I've been to public hearings on license extensions for nuclear power plants, USEPA regulation on emissions for coal plants, regulations on fracking in Illinois, and permitting for efficient lines that would bring more green energy in Illinois. Every single energy project that I

was at had its detractors at these meetings. Yet no one has come to any of the hearings with the perfect solution, just reasons why the current system isn't perfect. Well, of course it's not perfect. Everyone in this room knows that there is no perfect form of energy. If there was one, believe me, we'd be using it. So, we're stuck with an abundance of imperfect choices. (0245-2-1 [Wolf, Tom])

Comment: I think you should think twice about whether the food you put on your table because of the industry you work for is worth the future that you threaten without the industry. I mean no disrespect for people who work for nuclear industry. It's not a personal issue. It's a systemic issue and the fact that this country has been overwhelmed by corporations and businesses whose first concern is profit over safety. (0245-25-4 [Lehman, Dale])

Comment: In the movie Pandora's Promise, what I believe to be the most important statement in the movie is made by pro-nuclear Mark Lynas, while turning to the nuclear disaster in the area of Fukushima, Japan, he says, "this was not supposed to happen to a reactor." All the things that are not supposed to happen are exactly the problems with storing nuclear waste. In fact, this is something that nuclear industry operators, investors, governments, and their agencies that facilitate nuclear energy as well as companies that build nuclear reactors are concerned about. They know things that aren't supposed to happen do happen. They also know this risk creates a great liability. So, just like stockpiling the nuclear energy waste so quietly, stockpiling risk and liability has happened equally as quietly, and has put upon the public unbeknownst to them a burden. The public is carrying a portion of the liability and risk for the nuclear industry. This is happening on a global scale. Last week, the U.S. Department of Energy Secretary Munoz went to Japan to offer to Fukushima - - as long as Japan signs on to the convention of supplementary compensation for nuclear energy - - removing the liability for nuclear construction companies and other nuclear vendors from nuclear accidents. If you think the same will not apply here in the U.S., think again. (0245-30-2 [Snyder, Gail])

Comment: We know that you represent the industry and not the consumer or the people of the Earth. We feel -- don't need or want to be at great risk due to the ways of the Nuclear Regulatory Commission. Please change your ways. (0245-35-1 [Seastrom, Tina])

Comment: I'm realizing that really the issue here is that what we're looking at is confidence in the NRC. And regardless of that, I am so happy to hear about the culture of safety that is in place in the existing plants, but regardless of what efforts are being made within the plants by all you people who are working there and doing such a fine job, and I trust that you are all very capable, if the structural integrity of the plant is not sound and the only ones that can solve that are NRC. They are the agency that is responsible for addressing safety problems. So, global and safety -- identify problems, but the NRC is basically designated by the Federal government as the responsible agent for correcting the problems or seeing the problems are corrected. And there has been some history that they have always done that. Several decades ago, the government determined that nuclear plants in seismic zones presented specific increased risks. So, in 1996, the NRC required that new reactors built in seismic areas be designed with protections against earthquakes. It took almost nine years, however, for the NRC to begin assessing the potential risk and existing reactors that were already operating in seismic areas. In 2005, NRC identified its 27 most vulnerable reactors, two of these are in Illinois, the two Dresden units, and eight years later there still has not been any corrective action on those. You know, in this world where, you know what, and I don't think anybody in the world disagrees that there is a high risk of nuclear fission. It's like every conceivable effort has to be made to ensure that absolutely nothing goes wrong. The Feds have designated the authority for the safety of our nation's nuclear plants exclusively to the NRC. There are some questions about their track

record with that. So, regardless of how hard you're working in these plants, there's questions, there are serious questions. (0245-41-1 [Cella, Dr. Francine])

Comment: Can the NRC morally defend its position of bequeathing the problem of radioactive waste for thousands of years? The hubris we have as humans, to leave this legacy of waste for 6,000 human generations for a single generation's comfort, it is immoral and arrogant. And I have no confidence that the NRC represents the interests of the future and life on this planet. (0245-43-5 [Michaud, Debra])

Comment: And I want to quote, although there is a lot that could be said, a lot of it has already been said, what it needs to be is taken to heart. And I urge those members of the NRC to remind themselves that they also are people and that their mission is to serve the people of this country and beyond that of the planet and not the business. Let's repeat that, they are there to serve the people. Let us remind them of that. And if they do not serve the people, they are betraying their job, they are betraying their country, and they are betraying their planet. (0245-48-2 [Walter, Beverly])

Comment: The APY recently, I discovered the State of Illinois reactors racked up 1,120 safety violations. In fact, that was from the period 2000 to 2012, and yet the NRC has never met a license renewal it has not liked and licenses routinely are renewed. (0245-6-2 [Headington, Maureen])

Comment: I also have no confidence when the President's Blue Ribbon Commission is made up of industry promoters like John Rowe, former Chairman of Exelon, and others for whom there is a clear conflict of interest in any decision-making capacity. The BRC's recommendation for CIS, centralized interim storage, is no solution, it just puts lethal materials onto our streets and expressways and opens it to traffic accidents and terrorist attacks. Just because, to the statement I heard, just because we haven't had an accident yet means that it's safe is shortsighted and unrealistic. (0245-6-4 [Headington, Maureen])

Comment: Be mindful when you listen to the accolades of industry or politicians who have been the recipients of campaign dollars in terms of listening to them. These reactors are unsafe and unreliable, they are not clean, they are not green. I have no confidence in the -- Anderson Act because it's being reauthorized in 2017. It limits the nuclear power industry's liability and it's a pittance compared to what the people in Japan are facing in trillions of dollars. Our accidents will be paid for by our own tax dollars just like the loan guarantees and subsidies that are building these atrocities in the first place. (0245-6-7 [Headington, Maureen])

Comment: We need the NRC to shepherd us out of this nuclear waste mess as responsibly and quickly as possible. (0246-11-5 [Dubois, Gwen L])

Comment: We should be looking at -- more at allowing the industry to reuse and recycle the fuel rods[.] (0246-18-5 [Karbowsky, Brad])

Comment: I think we are in a situation right now that actually reflects reality. Since I have been tracking the nuclear waste issue in the last '70s, this is the first time that we have had an acknowledgment that there really is no real confidence, that there is no real justification for the creation of high-level radioactive waste. Irradiated fuel is one of the most dangerous, potentially the most dangerous, material that humans have created. And to completely rubber stamp and ignore impacts, which is what the NRC has done in the past and is doing, is unacceptable and it is allowing continued poisoning of our planet. (0246-2-2 [D'Arrigo, Diane])

Comment: But the purpose of my call today is that we have three major, separate regulatory processes going on, Waste Confidence, the Senate Bill S.1240, and foreign ownership of reactors, each with an overarching implicit angle of infusing money into the private treasuries of energy companies, deliberately isolating our comments and questions and objections within each, so as not to apply what would be taken in total for the overall issue of whether we should be even considering continuing with this technology. I have brought up in prior hearings that this industry seems to be out of money. If you approve Waste Confidence, then potentially S.1240 will open up the quasi-government corporate use of the waste funds, giving it back to the companies to handle the waste and decommissioning. And then that won't be enough so we will need foreign investment in these reactors. (0246-24-2 [McCune, Chuck])

Comment: If San Onofre, and now Vermont Yankee, doesn't tell us that this industry is short on money, they are ten percent or more short on the decommissioning of SONGS, then I am asking formally now in this hearing that the NRC, as provided in Section 10 CFR 50.33(f)(4) that the NRC seek additional information on licensees' financial qualifications if the Agency considers such information appropriate. We think at the present time that this information is appropriate. If I were going to go to my bank as a business man and say to them "loan me some money, give me some money, invest in me, and by the way, here is my 20-year-old or 30-year-old financials for you to analyze," I wouldn't get a cent. This industry doesn't need to get a cent either because they can't prove they are even financially viable. (0246-24-3 [McCune, Chuck])

Comment: I am also formally entering my objection to these three separate regulatory processes going on, Waste Confidence, S.1240 with the Nuclear Waste Administration being created, and foreign ownership of reactors. (0246-24-5 [McCune, Chuck])

Comment: For decades, the NRC has licensed and relicensed reactors, not knowing what to do with the highly radioactive spent fuel. You all have kicked the can around for decades. NRC has been complacent, submissive, and accommodating to the nuclear energy industry. The NRC needs to put people and the environment first. We need real-time monitoring. (0246-3-3 [Gray, Erica])

Comment: So, if we can't trust the Nuclear Regulatory Commission to act on its own staff recommendations, how can we have confidence in the NRC acting responsibly in the future? (0246-9-4 [Lewison, Linda])

Comment: But what about Thorium? It is a much safer nuclear fuel, its waste has a much, much shorter half-life, and it cannot be weaponized. As a physicist and engineer, I don't see why a commercial prototype thorium reactor can't be built and tested before 2020. Also, I can't see why existing nuclear power plant designs can't be easily simplified and adapted for thorium fuel. Thorium is a no brainer. Build uranium plants now, but build thorium plants with them. The US could lead the world in thorium power plants in a short period of time. Let's do it. (0248-1 [Snyder, Mark])

Comment: Stop putting the industry's profit and convenience over the safety of the people and the environment. I'm angry about this, but I still pray for you, and I pray that you will do the right thing. (0250-11-6 [Kerr, Julius])

Comment: Again, I would support or would encourage the NRC to move towards reprocessing, and in the interim, a long-term storage facility is certainly an advantage to the nation for today and for the future. (0250-14-8 [Brookhart, Ryan])

Comment: We can use our spent fuel to generate more energy, and in the process reduce the amount of waste as in the volume, and also the longevity of that waste. (0250-18-3 [Lang, Amanda])

Comment: We were once leaders of nuclear science. I would like my generation to reclaim that title, risk-informed, performance-based rulemaking, not rulemaking based on irrationality, misunderstanding, and political grandstanding. (0250-19-4 [Howell, Adam])

Comment: I personally feel that the media and NRC and energy plants are keeping the public in the dark. We hardly hear anything about it. You have to do all the research on your own. The ocean is being contaminated with radiation, and the air is coming through here and also into the currents so the fish you eat from California and Oregon and all over from Japan is going to be contaminated, too. So no matter what you think, what you eat might make a difference in your life. (0250-22-4 [Hands, Tara])

Comment: Many of us in the room know that the NRC is a captured agency, and its inability to adequately regulate the nuclear industry and protect the public has never been more evident than it is today, but yet we are still hopeful this can change, and we will continue to fight. As was mentioned in the presentation today, the NRC is charged with protecting the public's health and safety[.] (0250-28-3 [Embrey, Monica])

Comment: Today hundreds of unpaid concerned citizens are here tonight to ask you to stop protecting the corporations like Duke Energy, headquartered here in Charlotte, and instead defend the people of the United States. Recently, Duke Energy CEO Lynn Good had expressed her intention to continue Duke's nuclear fleet. (0250-28-5 [Embrey, Monica])

Comment: Now we're [Physicians for Social Responsibility] much more -- we've come to recognize the close tie between nuclear weapons and nuclear -- commercial nuclear power. As was mentioned a number of times, it can be reprocessed but one of the products of reprocessing can be plutonium; thus, that's why we're so concerned about Iran and other countries having commercial power capabilities. (0250-31-1 [Clark, Terry])

Comment: I want to get at one of the most important issues, and that is the structural problems with the Nuclear Regulatory Commission, the revolving door. I went to the section on Ethics in the NRC website, and it looked thorough, and I was pleased to see they gave some examples of how someone, if they're a professor, could go give a lecture and not get extra money. What I didn't find was the example of how someone can make a favorable ruling regarding a corporation and then have a job with them in three months. That's not addressed in the Ethics. I don't know that -- (0250-31-4 [Clark, Terry])

Comment: The Japan parliament commissioned an independent study, and what they got back was the number one concern was the structural problems in Japan of the close tie to industry and the regulators, and they place major blame on that. Thus, that is a recommendation that affects the environment, affects all of this. We've heard this stuff, you know, lasts for thousands and thousands and thousands of years, and we don't have plans. (0250-31-5 [Clark, Terry])

Comment: I'm concerned about the environmental impact of the many other energy sources that you and I are breathing the waste of, the gasoline you used to drive here today. (0250-35-6 [Cook, Andrew])

Comment: I'm one of the common people in that area. I was born and raised in that area. And with our politicians and our government, to me it seems though they are accepting bribes instead of looking out for the common people, for the people that God put here on this earth for us to protect each other, but through that circumstance, to me it seems it's all about greed. What can I get for myself? When you stand up there and make those decisions, are you making decisions for yourself, for your personal gain, or are you making decision for the people? You should be for the people because that's what this country was built on. We are the people of the United States of America. When you harm me, you harm the whole nation because are individual, but yet we are collective, and we're all God's children. And when you start making decisions for your personal gain and your greed within your heart, may God have mercy on your soul. (0250-38-2 [Howard, Claude])

Comment: [I]t occurs to me that everyone in favor of nuclear energy and these Generic Waste rules has a job in the industry. (0250-42-1 [Arnason, Deb])

Comment: This is a room full of high-paid, career, corporate true believers in an industry subsidized by corporate welfare. And to you workers there all in your red t-shirts and other uniforms, you know the EPA has drastically reduced standards for radiation protection. So beware. What they tell you is safe is not necessarily safe. (0250-48-3 [Hanrahan, Carol])

Comment: And so one of the things I find fascinating is when I people rationalizing and minimalizing. And that is exactly what I heard when I heard the comment that waste management is only a small part of what you guys deal with. It is a pretty big part of it. There are many voices talking about reasons for concern about nuclear waste. They are good reasons. (0250-52-1 [Amos, T.J.])

Comment: I am standing here today to remind the NRC commissioners of their role to be independent regulators of the nuclear power industry. There is a concern that the NRC commissioners come to the NRC with close ties to the industry. And I would like to ask the commissioners to keep in mind the problem of a confirmation bias. We all tend to value, perhaps overvalue, data that confirms our particular point of view and to give less weight to other positions that would oppose our point of view. That's understandable. I do it, too. We all do. But the NRC commissioners have a grave responsibility to have an evenhanded approach and to take that very seriously. They must have the courage to fulfill that role. They have been entrusted by the nation to regulate the nuclear power industry in an independent and fair-minded manner. They must take confirmation bias into consideration. I know this is very hard, but I implore the commissioners to look anew at the challenging issue of nuclear waste. There are no good solutions. But please try to look at the issue with clear eyes. (0250-53-1 [Larsen Clark, Brita])

Comment: And every dollar spent is again a dollar not spent on renewable energy that will save our planet and ourselves. There is a great big ball of fire out there. Why don't we try to harness it? Why don't we put that effort and that brilliance and that education and that training into saving this world because nuclear and natural gas, these are not a bridge to the future? They are a gangplank. And I will close by saying this. I remember growing up the story of Br'er Rabbit. And when I hear an industry saying, "Please regulate us. This will take care of it," I get a little suspicious. So I say, in closing, look out for us, not the corporations. We know you work hard. We know folks care. But look out for us because this is our future. This is our children's future. This is our inheritance. And we need not spoil it for future generations. (0250-55-2 [Wood, Nick])

Comment: A poem, "Nuclear waste, acid rain, chemical waste, it's in our brains. It's in our cities. It's in our streams. It's in our futures. It's in our dreams. Three Mile Island, Chernobyl, and Fukushima held well-attended safety meetings the day each of them blew. Doctors, engineers, physicists, the whole crew. So what does this mean to the safety of me and you? Carbon impacts all industries, and nuke is not exempt. Kind of makes me wonder if this rule might have been written in a state with legalized hemp. Nuclear waste, acid rain, chemical waste. It's in our brains. Only you and you and you, only we, the people, can effect change. Ecclesiastes 3:1 tells us to everything, there is a season." (0250-63-6 [Kasher, Brian])

Comment: GmP's mission is the deployment of small modular reactors. We believe that SMRs provide a near-term option to address multiple needs, diversity of fuel supply, replacement of aging fossil fleets with a carbon-free option, and the ability to stabilize small and segmented grids addressing post-Fukushima safety requirements with significant improvements in safety margins and providing access to safe, carbon-free generation options at sites never before envisioned, all with reasonable investment and project risks. We also provide electric generation and process heat options not available previously in emerging markets and are working to provide options worldwide for near-term, low-risk carbon-free power. This mission is in support of a strategic need, both here in the U.S. and abroad, to transition electricity generation to cleaner, long-term power. Approval of our design by the NRC is considered by many to be prerequisite to deployment in other countries. And a very important aspect of moving forward in any area of nuclear licensing is regulatory stability. The deployment of SMRs in the U.S. is no exception. (0250-65-2 [Vytlačil, Gordon])

Comment: But what it [science] has succeeded in doing is finding a way to meet all of our energy needs, carbon-free and nuclear-free, without anyone living in a cave or giving up their iPhone, without polluting our communities, and without leaving future generations a huge burden of nuclear waste. (0250-66-6 [Hanson, Courtney])

Comment: If the NRC were running the TSA, I am afraid that we would not have machines. We would not have X-ray machines because the risk of any single person being a terrorist is very small. Therefore, let's not check them. Let's not test them. So I am afraid that the NRC is really not stepping up to its responsibilities with respect to these issues. (0250-68-2 [Robinson, David])

Comment: I urge the Nuclear Regulatory Commission to continue its strong, independent oversight of commercial nuclear energy facilities. (0253-6 [Avilla, Karen])

Comment: My list of radioactive waste neutralization methods includes the electrino fusion power reactor, Hawkings' generator of cold electricity, collective ion accelerator, dematerialization using highest powered positive ions ever, photo-deactivation using gamma rays, implosion machine which duplicates ball lightning, Radha Roy's transmutation process, Barker's method, Gillembarado's method, Keller catalytic process, transmutation of low-level nuclear waste into glassy substance with super high voltage, Brown's gas, combining Brown's gas with bucking magnetic fields inside a plasma ball, Bearden's method, Russian process using liquid lead bismuth to trigger transforming in the form of neutrons, accelerator-driven transmutation of waste, Brown's gas-metal matrix process, photoremediation, ZIPP fusion process, RIPPLE fission process, low-energy nuclear transmutation electrolytic cells, plasma induced/injected transmutation, Kervran reactions, Monti process, higher group symmetry electrodynamics, plasma gasification melting, low-energy nuclear remediation with ultra-low momentum neutron generator, flame-free incineration in a catalyzer, John Hutchison's raygun, and fusion-fission hybrid reactor. More information on many of these methods is available at www.padrak.com/vesperman. (0260-1 [Williams, David])

Comment: The Department Of Energy refuses to neutralize radioactive waste because of its insane policy of preserving its supply of bomb-grade uranium and plutonium for manufacturing nuclear weapons. The Nuclear Regulatory Commission would better serve the nuclear power industry by vigorously developing methods of neutralizing radioactive waste. Free Energy by popular demand helps address Fukushima issues to US Department of Energy with "Three Rhetorical Questions" So Please Like DCW Facebook Comment on Tesla Energy Technologies For Public Meeting 21Nov13 DoE Google Hangout "free energy by popular demand" (0260-2 [Williams, David])

Comment: The nuclear waste already on hand is both a ticking time bomb & a wasted resource. Find ways to reuse/recycle it, instead of just letting it sit there for millennia. (0266-2 [Kutcher, Celia])

Comment: It's clear that for our overall quality of life-as well as our overall economic well-being-that we need a reliable, cost-competitive, diverse and SAFE supply of energy. In the past few months, I've been to public hearings on license extensions for nuclear power plants, USEPA regulations on emissions from coal plants, regulations on hydraulic fracturing in Illinois and permitting for new transmission lines that would bring more wind energy to Illinois. Every single energy project had its detractors at these meetings. Yet no one has come to any of the hearings with the perfect solution. Just reasons why the current system isn't perfect. Of course it's not perfect! Adults in this room know that there is no perfect form of energy. If there was one, we'd be using it! So we're stuck with an abundance of imperfect choices. But we've done pretty well with these[.] (0275-1 [Wolf, Tom])

Comment: If you do not begin to make responsible decisions regarding the protection of this planet and its humanity, then you need to remove your NRC motto "Protecting People and the Environment" because your "adequate" effort will have failed and all will be harmed as a result. (0277-11 [Pierman, Bette])

Comment: Require that any new nuclear reactor designs be able to endure impacts from a large aircraft. Current designs of Westinghouse's AP1000 have the spent fuel pool on an exterior wall of an ancillary building that is 3 stories above the ground. Are you kidding me, this design makes it even easier for a novice pilot to strike the spent fuel pool. I'd like to leave you with one light-hearted antidote to the current situation ...Its all fun and games until someone gets hurt. (0279-3 [Morgal, Richard])

Comment: We cannot wait for a Federal solution for all of the 104 US reactors' spent fuel storage. California must come up with its own solution. We must create a place away from populations, away from aquifers, away from earthquake zones to store California nuclear spent fuel from SONGS and DIABLO. The law that would create this solution must include prohibition of any other spent fuel to be stored there and a law against any new reactors ever being built in this earthquake fault state so obviously vulnerable to nuclear accident. We have Fukushima from which to learn. A desert military base away from population centers and earthquake faults in California could be a solution. What must be done to create that solution? Meanwhile we are playing Russian roulette with the future of California by storing our spent fuel with a company that has a dismal safety record and will continue to profit from leaving the spent fuel in the pools where it now is. We need an immediate MRS solution-Monitored Retrievable Storage. Is there any interim step that could get the spent fuel pools moved from the ocean and at least 50 miles away from 8.4 million people, monitored and protected by our US military? Who on the NRC is willing to help create this complex but necessary solution before the third largest economy in the world, the state of California, gets compromised forever? (0280-13 [Magda, Marni])

Comment: Regarding the disposition of waste and the classification of waste streams: More emphasis must be placed on how actively radioactive material is and less on where it came from. (The DOE is worse than the NRC on this Score.) (0282-2 [Haber, Jim])

Comment: The NRC is responsible for the health and safety of future generations. It is not responsible for the corporate profits of the nuclear industry. (0287-8 [Swanson, Jane])

Comment: The Hudson River is a gift beyond our comprehension. All of us understand the necessities of daily living and the difficulty we have in managing them properly at times. Perhaps Nuclear power usage in limited capacity is necessary for a time. But we must do everything in our power to make sure that this does not jeopardize the greatest natural resource in our community. Toxic waste and its proper disposal must be a priority of our government, for it has been more than evident over the centuries that the business community is unable to do this properly without strict oversight. Thank you for all you do to keep our community & the United States a pristine setting of wondrous bounty. We must never take this for granted. (0294-1 [Goley, Timothy])

Comment: [I]nspections on the current active power plants are needed to assure safety of human kind. (0304-2 [Young, Roberta])

Comment: [I]nspectors on the current active power plants are needed to assure safety of human kind. (0305-3 [Norman, M. Jean])

Comment: Russia and China are building new nuclear. Russia is build 2 fast reactors. In the EU, France has the lowest power cost. NRDC was completely wrong to be against nuclear. Using fast reactors we can use our existing nuclear waste (except fission products) for fuel. (0306-1 [Kirsch, Steve])

Comment: The NRC must move faster even at the expense of political correctness. Let engineers make the decisions instead of polititions and activists. (0312-4 [Meyer, Charles])

Comment: The fears about nuclear energy are based on irrational associations of physics applied to the benefit of mankind with armaments applied to its destruction. There is NOTHING on the table right now that can approach the energy needs of mankind other than fossil fuels, which will surely destroy us, and nuclear energy which we need to learn to use better. The NRC needs to show some courage, and to promote the deployment of safe and sane nuclear energy. That includes fast neutron breeder reactors of the IFR type, that de facto increase the available energy resources by almost two orders of magnitude. The time for dilly-dallying is over. It is time to pursue the one solution we know of, as aggressively as we can. (0317-1 [Minster, Bernard])

Comment: I am a proponent of destroying the nuclear waste by heating it to a high temperature, which at the same time can produce electricity for the grid. I am asking the NRC to team up with the DOE, and Congress to pass legislation that would require all nuclear electric utilities in the Country to start destroying their waste within 5 years, and to have the fuel pools empty of all waste within 10 years. How do you destroy the waste? One proposal calls for moving the fuel rod bundles into onsite Storage Casks (SC) after five years of cooling in the pool. Then, the SC would be moved to a processing room where the Uranium fuel pellets are removed from the zirconium storage tubes. The pellets are fed through a grinder and turned to a powder. The powder is mixed with a Lithium fluoride salt mixture (LF) The LF is then pumped into a Thorium Molten Salt Power Cell, known in the industry as a Liquid Fluoride Thorium Reactor (LFTR) (0321-2 [Bagwell, Charles])

Comment: I propose that Fermi 1, located in Monroe, Michigan, be used as a test site to destroy all the waste stored at the Fermi 2 Power Plant, right next door. I've had a brief discussion with DTE Energy representatives concerning this proposal. They thought it was feasible but they could not act because NRC regulations was a road block to even studying the matter. I am asking the NRC to reform regulations and to become a proponent to recycling our nuclear waste from long term to short term half-life's. (<800 years) (0321-3 [Bagwell, Charles])

Comment: They're very concerned about food safety, and they've been asking -- three people separately have asked me-- if I know where they could find a calibrated Geiger counter that they could take to a supermarket or grain purchase or fish to the center. Some of them with a Geiger counter, and they've got some idea of how hot their tuna or salmon is. So, that is one thing that I would like to add. If you're talking about how confident you can be, maybe we should include something about just making the local public feel safer in the future when more and more of these nuclear plants are shut down. (0325-10-1 [Chambers, Fred])

Comment: According to the Blue Ribbon report of the President in 2012, the U.S. Navy has final geologic disposal casks that it is using right now, 50 of them have already been used because -- and they're transportable because they have to have all of the nuclear waste out of Idaho by 2035. It will have 350 more by that date. We need those casks. I don't know what they cost. I don't care what they cost. They have to be final deposit. (0325-12-4 [Magda, Marni])

Comment: I urge the Nuclear Regulatory Commission to continue their strong independent oversight of commercial nuclear energy facilities, the operation of existing plants, licensing of new reactors, renewing the licensing of existing reactors, and the management, transportation, and disposal of our used nuclear fuel. (0325-13-6 [Wicks, Tonja])

Comment: I believe the best solution to the problems posed by the 1,600 metric tons of spent fuel in San Onofre resides in the MSR, Molten Salt Reactor technology. This technology is safe, it's proven, and cost-effective means of reducing the volume in radioactive waste by 99 percent, and a half-life from 10,000 years to a manageable 100 years while generating affordable electricity. Moreover, this non-pressurized Molten Salt Reactor has the capability to mitigate the San Onofre pressurized water reactor-style risks of high-pressure radioactive release and core meltdown. The MSR can be fueled by spent uranium or by thorium. Thorium is an element that has 500 times the abundance of uranium-235. A gram of thorium has as much energy potential as 7,500 barrels of oil with no fracking or CO2 emissions. Energy from thorium in the MSR at 3 cents a kilowatt is cheaper than coal, at 5 cents a kilowatt. This Molten Salt Reactor technology was recommended by the superstars responsible for the birth of the nuclear age. These were Glen Seaborg, the President of the Atomic Energy Commission and Nobel Prize winner who discovered ten of the elements and held over 50 honorary degrees. Alvin Weinberg, Manhattan Project. He actually owns the patent on the pressurized water reactor up here at San Onofre. And he ran Oak Ridge National Labs where he developed the Molten Salt Reactor technology. And Eugene Wigner, who was the founder of the Atomic Theory and also a Nobel Prize winner. The Civilian Nuclear Power Report was submitted to President John F. Kennedy in 1962. This report contained the vision of these superstars of safety, inexpensive, nearly limitless civilian power by transitioning to Molten Salt Reactors with energy from thorium. Unfortunately, John F. Kennedy was killed 50 years ago on the 22nd of this month. His vision was never brought to -- was never implemented. So, I think following the advice of the most inspired and brilliant nuclear experts, the Nuclear Regulatory Commission should immediately begin to advocate and lobby for MSR development. The response will probably be that R&D of new reactors is not their job, but their charter in the NRC was charged with overseeing the reactor safety and spent fuel management. The Union of Concerned Scientists has accused the NRC of doing an inadequate

job. This is, obviously, a demanding and funding -- there is obviously a demand for funding for spent fuel abatement as evidenced by the \$18 billion spent preparing Yucca Mountain to be a waste repository before the program was cancelled. (0325-15-1 [Robinson, Eric])

Comment: The NRC needs to be re-tasked with a mission that's worthy of its charter. They have an annual budget over \$1 billion and a staff of 3,800. They need to initiate a creative entrepreneurial research incubator that incentivizes the rapid prototyping and development of Molten Salt Reactors to solve the domestic and global energy crisis for the next 1,000 years. In the semiconductor industry there is something called Moore's Law. Every 18 months a new generation of faster, smaller, less expensive processors are developed. If the NRC can establish a new Moore's Law paradigm for the development of continuous dense power production systems we can get down to realistically solving the global problems of pollution, poverty, and population. What really ended slavery was not the Civil War, but the invention of the internal combustion engine. It made human labor obsolete. This technology allows the increased freedom and the largest growth of the standard of living in history. Engines run by petroleum products have run their course. Molten Salt Reactors are a source of clean, green, continuous dense power that can take us to a new level of humanity by producing a millionth the pollution of energy powered by fossil fuels. Instead of endless resource wars, the U.S. can finally solve the global problems of poverty, pollution, and population. And if you want to join me, I've got a lot of information here that shows how this reactor works, and we also have a bill going through Congress that needs attention right now, so if you can swing by I'll give you a sheet who to call. There's important legislation going on right now (0325-15-3 [Robinson, Eric])

Comment: I would like to say I don't think we have an energy policy. If we had a true energy policy, we would be looking at local solar, we be looking at where our money is going and where we might do best with it. We certainly have heard about retrofit, which helps in every way to save energy, so that probably won't get in this EIR, but I think it's important. Have you read any James Thurber? You remember he had an aunt that said she would go around and put tape over the electric plugs because energy leaks, and she was afraid it would get her. Well, it does leak. You lose about 40 percent of your energy on transmission lines depending how far they go. So, if you have a huge plant here that sends electricity to San Francisco, and LA, and who knows where else, it just leaks. We really need a good energy policy that takes some of these things into consideration. Thank you for listening. (0325-25-2 [Welty, Delores])

Comment: I would like to propose an out-of-the-box solution for dealing with the waste that we have to deal with. And I firmly believe we really do need to get rid of the stuff. Off the California coast and other places around the world there is a subduction zone where the Pacific plate is moving under the continent. I'm proposing that we sink wells into that trench, put the stuff in there, cover it up. What will happen over thousands and tens of thousands of years is the stuff will be carried back into the earth where it came from in the first place. So, I would urge that we take a serious look at this approach because, again, we really need to get rid of this stuff. (0325-30-1 [Cleveland, Charles])

Comment: One thing we've learned from Fukushima, Chernobyl, and the other disasters is that the people in the nuclear industry and the NRC are professional risk takers. The fact that they switched to high-burnup fuel, that was a big risky venture. We're hearing risk taking all the time. It's run by bankers. Bankers are risk takers. (0325-31-7 [Johnson, Roger])

Comment: It all started with the Manhattan Project. We had a lot of money to develop this kind of technology, and the Japanese got an experience of what it was like. And then we started developing hydrogen bombs and we had all this radiation floating around because we did it all

above ground, and we showed off all these mushrooms. And all the radiation went around, and people started having cancer. And we started to learn that from Hiroshima, and we learned from the radioactive fallout that it's not a healthy thing, radioactive materials. (0325-33-1 [Zigler, Randy])

Comment: When we were doing the aboveground testing we knew it was bad, and they found it necessary to put it under the ground and not have it spread around. (0325-33-3 [Zigler, Randy])

Comment: My question for the Nuclear Regulatory Commission is when will it be necessary for the Nuclear Regulatory Commission to act with authority and provide adequate force towards a serious decommissioning of San Onofre? That's my first question. When will it be necessary for them to act seriously and not just come up with words and paper, on paper that's highly questionable? (0325-33-4 [Zigler, Randy])

Comment: My second question is, is there any possibility whatsoever of making harmless the radioactive waste that we have produced in such massive quantity? Is there any possibility at all for making this waste harmless? Is it possible? (0325-33-5 [Zigler, Randy])

Comment: We heard from a number of pro-nuclear people here today. I didn't hear them discussing solutions to the waste problem. I heard them trying to discuss, for example, solutions to the climate change problem which, of course, is wind, and wave, and solar, and things like that; offshore, space-based solar power with large mirrors. These things exist. They can be built. There's no problem with it, thin film technology, et cetera, et cetera; lots of fancy words that will describe things that are effective now. (0325-7-2 [Hoffman, Ace])

Comment: Why aren't we recycling and reusing fuel as they are doing in France, Russia, and the United Kingdom? So far, almost 90,000 tons of used fuel from commercial power reactors has been reprocessed. Why aren't we doing that in the U.S.? This isn't anything new. In fact, according to the World Nuclear Association, over the last 50 years the principle reason for reprocessing used fuel has been to recover unused uranium and plutonium, gaining up to 30 percent more energy, but the secondary reason is because it reduces the volume of material to be disposed of to about 1/5, and the level of radioactivity in the waste from reprocessing is much smaller, and falls much more rapidly than in used fuel itself. (0326-11-2 [Bean, Judith])

Comment: I want to be sure and get in, there's new nuclear technologies that are much safer, and I know you're skeptical, but keep an open mind and do some reading. Thorium, look up thorium nuclear power, it's a new kind of reactor, and there's a lot of excitement about it. It's unpressurized; the vessel is unpressurized. The operators have to work to keep it going as opposed to our current nuclear technology, where they have to be there to make sure it doesn't go out of control. With thorium, they're there to keep it going, so look up thorium nuclear power. (0326-24-3 [Gloge, William])

Comment: I love solar cells. I've lived on them on my sailboat for the last 18 years. They're just not enough to power our world today. So keep an open mind, read all you can, read the other side, what they have to say, and make sure you read stuff that is peer-reviewed good scientific stuff. (0326-24-4 [Gloge, William])

Comment: So I'm in the cost tradeoff analysis, and what that really means is, okay, how much does it cost to do this versus that? What I'm interested in is, what would it take to decommission Diablo and offset that power in another way? If we did 50 percent reduction, I'm a PG&E authorized energy upgrade contractor, I'm a general contractor, so I'm all for some of the things that PG&E does, if they focused the \$2 billion of upgrades that this plant actually needs on

offering expanded energy upgrade grants to retrofit, increase the energy efficiency of existing homes, 2.2 million homes would eliminate the power that's, you know, consumed by this power plant. So why aren't we spending the money on an alternative that makes sense? We don't have to put up windmills, we don't have to put solar panels, this is the cheapest way for us to move into the future without energy, and it happens to also create 200,000 jobs in the State of California. If you retrofit these homes, the return on investment to the consumer is seven to ten years. So after seven to ten years, the energy savings alone have paid for the retrofits, and they continue to pay for themselves for the next 100 years, at a time when energy rates are continuing to climb. There's nothing that makes more sense than this. It makes more sense than even solar power. I greatly am a proponent of taking the Diablo facility, only if the Native Americans present agree, and taking that land, and making it a symbol of what wind power, wave generation, and solar power could do in this country. (0326-26-2 [Severance, Bruce])

Comment: It's good to be here tonight. I date back on this particular issue a long time and I think it would be worthwhile to revisit history, probably more than anybody in the room here. In '75 to '79, I was, first, with the Senate, and then the State Department, and it was right after the Indian bomb of 1974, and at that point there were about six nations that were going to be building reprocessing plants, et cetera, and we were heading to build the breeder, and do reprocessing, and have a plutonium economy. And the end result is, the six reprocessing plants did get shutdown[.] (0326-30-1 [Hafemeister, David])

Comment: Lastly, I want to end with a little lecture for the group, and I won't be popular for this, but I don't care. I have more of an international focus. I worked for the Senate Foreign Relations Committee, the State Department, the Arms Control Agency, et cetera, and I've been to a lot of embassies and so forth. And I see California is the state we import about a quarter or so of our electricity. The County of San Luis said no to natural gas at Morro Bay, even the Sierra Club opposed topaz, coal is out of there, everybody knows that, it's going to be replaced by fracking. So in other words, somebody has to have some kind of big think going on, and it's very easy to be against something, but then finally, what are you really for other than just saying solar? And I have a Leaf car. I have PBs on my roof. I love it. I love it. But, you know, the American Physical Society says, until you get energy storage cracking, you know, it's not going to go beyond 20 percent. So I think you have to have some broader view than just saving my life. You have to look at, well, what about the other people? (0326-30-3 [Hafemeister, David])

Comment: [A]nd why haven't our entrepreneurs, who want to go out into space, put some money where their mouths are and turn that PG&E rocket fuel from our nuclear poop? (0326-36-3 [Vandel, Nikohl])

Comment: Somebody had mentioned nuclear regeneration. I did read, at one point, that President Putin from Russia, had made an offer to this country to purchase any kind of nuclear waste for regeneration, that they would take any that we would give them, so that does exist. Also, for nuclear waste, there is the, what some call, isotope economy that these nuclear wastes can be used for medical purposes, et cetera. There is a technology that exists for nuclear remediation. It's called Brown's gas. It was developed by a Dr. Yule Brown, who was on the, what was it?-- Tesla Board, and also was a speaker for the Tesla Convention until he died in the late-1990s, but he does have a technology called Brown's gas for remediation of nuclear waste, that I understand is totally effective. The other thing that I have been pushing recently that is kind of -- oh, and also, I wrote down a website. That one's called -- that's associated with Dr. Brown's work. It's called zapnuclearwaste.com. So if anybody's interested in Dr. Brown's work, or the possibility there. I also see that, in this country right now, we're in kind of a production collapse, and really, to restore the high-productive forces in our country, we are going to need

energy that is high-flux density per capita and per square area. And there is a technology called ICF fusion. It actually can use the nuclear wastes that are available now to produce fusion energy. It can actually use those to eliminate them as a transition into full nuclear fusion and no nuclear waste. (0326-42-1 [Hollingsworth, Timothy])

Comment: I stand here today as an act of resistance. I will not allow other young people who work for Clean and Safe Energy Coalition and are funded by the nuclear industry to speak for my generation. I especially won't let them speak for me because these people were so shameless that they failed to disclose that they are funded by the nuclear industry and live nowhere near a nuclear power plant or disposal site. (0326-51-1 [Gutierrez, Ingrid])

Comment: I lived in Nevada a lot and I'm not an authority on storing this material there. But when the man spoke of removing it and dealing with it later, after storing it in Nevada, perhaps that's best. (0326-52-2 [Fosmo, Vaughn])

Comment: While this is in operation it would be of great benefit to PG&E and its customers to design benign and sustainable energy alternatives suited for its surrounding campus for a steady replacement of new energy. Yours and PG&E's reputation will change. You can become a graceful good neighbor. Thank you. I'm a parent and proponent of conservation. If we put conservation to work we could save 45 percent of our energy. Solar, wind, and tidal energy is within grasp. (0326-58-5 [Davis, Adrienne])

Comment: I do support San Luis Obispo City upgrading their street lights to LED. I urge everyone here to switch out their light bulbs to LED light bulbs, conserve as much power as you can. And we should be transitioning to renewable energy. (0326-59-1 [Cordes, Reo])

Comment: I suggest the NRC create a rule to require nuclear power plants in coastal zones such as Diablo Canyon power plant to provide a secondary, beyond what it is already doing, a secondary backup power source, provided by a renewable energy onsite, such as solar power at the surrounding hills of Diablo Canyon. We have some beautiful south-facing hills there which could be providing electricity from the sun. (0326-59-4 [Cordes, Reo])

Comment: And I'm going to wrap this up here but I wanted to, I need to dispel the big lie. We do have choices. We do have options. But the idea that our choice is between climate change, global warming, or nuclear power, that's the big lie. We have had no Federal program for alternative energy and for renewables. And our own renewable energy lab states that, this is our government, our research This is my last thing here. Renewable electricity generation from technologies that are commercially available today, in combination with more flexible electric system, is more than adequate to supply 80 percent of total U.S. electricity generation by 2050. While meeting electricity demand on an hourly basis in every region in the country. That's 34 years from now. (0326-61-5 [Henry, Anita])

Comment: This is insane, that's all it is. It's money-driven insanity and the Indians used to say that if you take more or you destroy your environment that you're insane. And they used to deal with people. We don't deal with them. We're making them heroes. We're giving them big paychecks. They get paychecks of \$100,000 and over because, let's see, oh, I know, because our government gives PG&E a bonus to manage all of this for us. They're doing us a big favor. Well, the favor, the rule that I'd also like to see is that they have to carry an insurance policy so that everything I've worked for over in Morro Bay, when you screw up this place, somebody compensates me for it, because they're not going to. We know that. I mean, look at Fukushima. They're giving people \$20,000 for the land that they've been on for nine and ten generations.

This is a sick thing that we're doing here. And I believe in Karma, and we'll leave Karma to Karma. And we will all pay for your indiscretions. You can push me, but I've been here six hours and I wait longer anyway. (0326-64-5 [Nelson, David])

Comment: Lessons, the NRC is responsible for the health and safety of future generations; it is not responsible for the profit margin of Pacific Gas & Electric Company. Do the right thing. (0326-8-8 [Swanson, Jane])

Comment: And he said, "You're an electrical engineer. What do you know about power?" And I said, "Well, I'm digital but I've been involved with power." He said, "Well, can you tell me where we're going to get power over the next 10 to 20 years?" And I said, "What do you mean?" He says, "We're running out of power here." I said, "Well, I recommend nuclear." And he laughed. He said, "We tried that and we built one plant, had some problems with it, just shut it down, turned off the lights, and locked the door." He said, "What do you think of wind power?" Well, I live in Bowling Green and I can tell you that wind turbines have their own set of problems. One of them is very simple, once you get over about 20 percent of your power coming from wind turbines, the days that the wind doesn't blow is a real problem. You're killing birds, there's all sorts of problems with wind turbines. Then he said, "How about solar cells?" I said, "Yes, maybe in 50 years there'll be affordable." I said, "How about coal, they say with scrubbers." And he just laughed, he said, "No, they won't do that." He says, "They want to tear down Grand Coulee Dam and Bonneville Dam." Where are we going to get power? (0327-16-1 [Border, Gary])

Comment: This is not just a matter of trust, or lack of public trust, lack of confidence. This is a criminal enterprise being perpetrated on the public by the nuclear power industry and the captured regulator. This meeting is a fraud, this process is a fraud. I believe this to be criminality. There are five Nuremberg principles. I don't have them with me today, but I will be submitting them in writing because it does not get one off the hook just because they're following directions of the government, following orders. I was just following orders. Everyone in this room has been pleasant on the phone setting up the meeting, so on and so forth. I thank you for that. I have nothing against any one of you, but you are engaged in a criminal enterprise and you need to recognize that, and cease and desist. (0327-2-6 [Keegan, Michael])

Comment: What about depleted uranium? Does anybody know about depleted uranium? Our soldiers are being irradiated, just getting blasted with this stuff, and we're spreading it all over the planet. All over. And in Iraq, babies are being born with two heads and eyes in the center of their forehead. It's a nightmare. (0327-22-5 [Muser, Mary Jo])

Comment: I find it really ironic that you've changed your name to the Waste Confidence Directorate. It rings a little too true to the Clean Air Initiative. With a dwindling EPA, corporate greed seems to always win. You guys, your industry, can't win this one. We have to. (0327-23-1 [Tolls, Leatrice])

Comment: I find it ironic that now to save the water I have to get arrested. I find it ironic and disgusting that the NRC can, in the face of what I've lived through, Three Mile Island -- my father worked for General Electric. The year we moved to Ohio, the Perry spent rods were a problem. My dad and mine's relationship ended when I was 13 and I was protesting at the Perry plant against General Electric. I find it ironic and disgusting that we have an entire ocean right now in trouble. We have children on the West Coast of California that are at major risk for thyroid issues, and they're testing positive in the milk for nuclear radiation. And the tuna that we all like and the sushi we all like really shouldn't be eaten ever again. I find it really ironic and disgusting that we have to, as citizens, come before you again and again and again and again. Our water

is our lives, okay? Water is life. Your bodies are made out of it. The planet depends upon it and, yet, we are having these conversations over, and over, and over. (0327-23-2 [Tolls, Leatrice])

Comment: I don't know how we can continue to leave in the hands of people, who do not have humanity's best interests always at heart, the future of our species. (0327-24-3 [Rivers, Alicia])

Comment: I've heard some people talking about the need for more power, but I have yet to hear one person talk about conservation. (0327-25-2 [Crow, Valerie])

Comment: The only thing we can do at this point is to re-purpose the NRC. I heard at the beginning Keith said that this is only a small part of the relicensing and the regulatory proceedings at the NRC. This should be the main purpose of the NRC: protecting us from this radioactive waste and protecting our future generations. And, please, re-purpose yourselves. It would be a boon to mankind if that became the main mission of the NRC. (0327-29-5 [DeMare, Joseph])

Comment: This organization who I represent [Radioactive Waste Alert] is now in an effort to stop what is considered to be low level of radioactive waste to be ignored through recent regulation in Ohio that has deregulated shale waste streams from t-norm to norm, invisible basically, and is all going to be dumped in open landfills in the state of Ohio. This issue is dwarfed by the issue we're here for tonight. (0327-32-3 [Pace, Greg])

Comment: Radioactivity, fracking, water. It's in gasoline. Anything from below 2,000 feet is radioactive. Has anybody checked the Philippine flood to see what the radioactivity that those people are facing as a result of Fukushima? (0327-33-2 [Carey, Corinne])

Comment: I remember pulling out an encyclopedia and finding a statement on atomic power, "Wow, this is pretty cool. I've heard of atomic bombs." Okay. Reactors, a statement in, I think it was the World Book said nuclear power will be so cheap that we will not use the fuels, like coal and oil, to generate electricity anymore. This was a kids' encyclopedia. I don't know what it was. And I'm thinking, well, that didn't work out. The nuclear fuel cycle we are stuck with flat out is aimed at weapons. That's all it's aimed at. We are using it because it was convenient to develop it for that use, in addition to getting weapon-grade materials out of it. Depleted uranium is not a big deal unless you are an airman loading the rounds into the 30 millimeter canon that fires it. Think about that. I wonder what the outcome has been for those soldiers. Oh, well. I'm sure they're doing as good as they can do. The bad choices have resulted in waste products that are just too devilish to discuss any further. What are other advanced countries doing? The most advanced country, other than the United States, Germany, has quit. Good for them. The weapons-grade fuel cycle is still going to get distributed. We've heard that in the news. Iraq is still going to be able to develop nuclear power. (0327-34-1 [McCrane, Richard])

Comment: Higher tech fuel cycles are out there. The waste products are the problem. What are we going to do? We can go back to day one, quit doing anything else, start the new fuel cycle, and maybe also lobby our government for representation of citizens in the government. (0327-34-2 [McCrane, Richard])

Comment: Another thing that makes me lose confidence in the NRC is the lack of performance or reaction at Davis-Besse and the significant corrosion of that reactor. Some lazy NRC guy dry labbed the results of his inspection. He didn't want to go out in the contaminated area. He didn't want to go out in the high radiation area and see for himself. And he took the words, the report of a person who had a vested interest, namely the operator, and said all is well. He should have

had his head chopped off for that, but he didn't. And his supervisor should have had the same thing. So there's my problem with confidence. (0327-36-3 [Lamberger, Paul])

Comment: I just want to address the elephant in the room, and the issue is that everyone should be asking, and I don't have an answer to this question, but it's a question we should all be asking: is this agency really an independent agency? Is there anything that citizens could say here that will be taken seriously if it contradicts or runs against the interests of the industry that it is supposedly regulating? That is the question that we need to be talking about and not trying to convince people who cannot institutionally be convinced of things, no matter how much scientific, historical, sociological, etcetera, evidence we marshal. Now, this agency is not unusual because almost all of our agencies in Washington, D.C. are now essentially captive agencies. This is the question we should all be putting our efforts to, and then all these disparate issues that are consuming us, we don't know what to work on first. Should it be the food stamps, the fact that people are hungry? Should it be global warming? Should it be the nuclear -- what do we work on first? (0327-37-1 [Leontis, Neocles])

Comment: Well, you know, it might be that if we could get at the root issue, if we could elect people that address the root issue and get at this, we might be able to start solving all of these problems because, fundamentally, we no longer have control of our government. It is governed by corporations, corporatocracies, by special interests. And guess what? The people in those special interests, they may be able to control their little agency, but they're just as at the mercy of what other agencies are doing. They have to eat the same food that we all have to eat. You know, they may be getting special interest from, special treatment from, their little agency, but they're subject to the same problems the rest of us are. So, in fact, this could be good for everybody. And I want to leave you all with this idea. All this energy in this room, can we get together in the next six months in Michigan, in Ohio, and start thinking about a constitutional amendment to turn back Citizens United? (0327-37-2 [Leontis, Neocles])

Comment: We are making a plea to the NRC to step back from their political positions today and look to the future. We are in the midst of a major geological extinction. The world's major fisheries have collapsed, honeybees that pollinate one-third of the world's food crops are declining even more rapidly this year. Rising sea levels are killing the world's corals and threatening low-lying coasts. The intensity of storms and floods, droughts and fires is increasing. Ash trees are gone, and oak and pine are succumbing to imported diseases. The very fabric of our society is threatened from communities, to government, to banking systems, to civilization itself. (0327-4-1 [Marida, Patricia])

Comment: We [The Energy From Thorium Foundation] are an education and advocacy group. We're basically advocating for the development and licensure of advanced nuclear reactor designs, generation four designs, specifically molten salt reactor designs that have enormous promise to deal with our energy issues in this country and to deal with even the spent fuel that we have today. Variations on the class of reactor designs referred to as molten salt reactors can consume, as fuel, the spent fuel of today's reactors, thus eliminating the 300,000-year lifetime into something far, far shorter. These reactors produce a tiny fraction of the waste that we have today, and it is radiotoxic for far less time. One percent of the waste, 0.1 percent of the duration. These reactors are far safer. They cannot melt down. They are, in fact, already molten so they cannot undergo that phase change. And they are very promising. A great deal of work was done on these reactor designs back in the 1960s at Oak Ridge National Labs. These reactor designs, for political reasons, the research and development into that line of design stopped. It has not been picked up since. We'd like to see that happen. We are advocating for the advanced research and development of molten salt reactors. We see them as a way to use not uranium

but thorium as a fuel source that can last literally billions of years as an energy source for the country and the world and raise up all seven billion people on planet Earth to a Western-style standard of living and increase that standard of living. That is the positive side that nuclear energy has to offer that I think needs to be considered, and we also have to weigh it against the negative. Let's address the negative. The ability to address our problems is part of the American tradition. If we looked at the electronics industry over 40 years ago, it would be unrecognizable relative to today. If you look at the nuclear industry, it is stagnated relative to today. There's technology out there that can be developed that can address all these problems. Let's look at this as a scientific project, let's undertake it, and let's change the world for the better. I ask you to inform yourself. You can learn more at energyfromthorium.com. (0327-41-1 [Thesling, William])

Comment: And regarding to alternatives, which is another major area that needs to be developed, as everyone here knows, the major corporations have squelched alternatives and there are alternatives besides wind. Solar. Germany is really powerful in solar and, hopefully, that really will grow. That's a wonderful, passive, peaceful way to generate electricity, but it depends on sunlight. Tesla drove across the U.S. about 70 miles an hour, only had to stop every 500 miles to change - - well, it was like a piece of zinc to put in a battery generation unit, in the electric motor sitting up in front. Now, it appears to be a reliable report. But between Tesla and Schauburger, Victor Schauburger, I believe it's S-C-H-O-E-B-E-R-G-E-R, but there's somebody in northern Michigan who developed a turbine, it's a turbine system, and it is wonderful. Once you get it moving, it self-propels itself. And that's usable in transportation, but that's not his interest. He designed a unit to replace a coal-generated electricity plant. And those plants, I tried to find it in the internet. This was ten years ago when I was really into this stuff, and then I kind of got whacked to radionics. I'm starting to come out of it. Okay. There is advanced technology on more than one level. But, in any case, the Schauburger turbines with Tesla does replace the coal power plants. (0327-45-1 [Guindon, Ernest])

Comment: I think over here there's a small group of young indoctrinated nuclear -- future nuclear industry practitioners. I see you, how are you doing? I can spot you every time. You all look similar and dress similar, and have the same smiley little faces, and nodding your heads nervously when we address the issues that you seem so gullibly in tune, paid for by the Nuclear Energy Institute to indoctrinate a future generation of automatons to march forward. Nuclear power is the solution to global warming, and all this other BS put forward, so we have this ménage à trois, I like to call it, between the nuclear industry, the Nuclear Regulatory community, and our sad and pathetic politicians. (0327-6-3 [Leonardi, Michael])

Comment: Our tribal council chamber overlooks the nuclear plant. One afternoon, someone in a meeting would look at me and say, "Ron, why do you always sit on the opposite side looking out the windows here?" And, you know, I had to think about it for a minute, and it kind of occurred to me I always watch the plant. And I'm not looking for scenery or anything, but I do, I keep an eye on the plant, and that's what I do. And that's part of my position that I do, you know. And it's not the, you know -- to make sure that things are okay and everything for the safety of the community. But then out of concern for the family and the community here, that's why I encourage the people of Minnesota and beyond that that I'm compelled to be here. So, you know, it's part of what we do. (0328-1-2 [Johnson, Ron])

Comment: Or something even simpler, when Monticello's rotor was going down the railroad, going back to somewhere in Illinois, probably where it was made, they low bridged it in downtown Minneapolis. Did you even hear about it? This is about 1997. I mean, something that simple. I'm sorry, you know, I don't have confidence in this industry. (0328-14-6 [Overland, Carol])

Comment: I have to consider the effects of nuclear power and fossil fuels on our governance, the governance where the people get to choose. Here I see the NRC, I'm not just addressing you, NRC. I'm addressing the President, I'm addressing the Senate, and I'm addressing the whole Congress. I'd like to support the move to amend that gives the right of corporations the rights of individuals. That's why we're here today. 1876, that's when the government of the people, by the people, for the people was destroyed. There is no conscience in these industries. These industries are going to have to be forfeited by the greedy ones who have encouraged this and allowed this to occur to all life, allowed this to occur to our water. That's the greatest thing they've done. The greatest thing they've done is they forget where everything they ever had, have, or will have comes from, and they're destroying it. The pipelines, the fracking. Right now there's two leaks, oil leaks that they can't -- scientists can't turn off. (0328-16-1 [Bonniwell, Colleen])

Comment: And my suggestion would be to focus on an economy that is sustainable, with sustainable agriculture, with sustainable health care, and that would work. That would work. All this time we could have had vegetable cellulose. We didn't need petrol, but they cut it off. They cut it off. Ford tried in the automobile, they cut him off. The fossil fuel industry, the nuclear power industry, those industries move to amend, take their right to do this to the people away from them and give the people the confidence they need to deal with their future in a compassionate, kind, responsible way. (0328-16-10 [Bonniwell, Colleen])

Comment: Karen Silkwood. Karen Silkwood knew just exactly how evil, and corrupt, and gangster-like is the nuclear power industry. The environmental movement knows exactly how evil, and corrupt, and gangster-like is the nuclear power industry. And we now have the United States Nuclear Regulation Commission working with the nuclear power industry. Somebody killed Karen Silkwood. A lot of us environmentalists in this room know exactly who that was. We know which power brokers and which power industries killed Karen Silkwood. (0328-17-1 [Cavlan, Michael])

Comment: I have been watching, and watching with dismay, the actions of the Nuclear Regulatory Commission for a number of years, and I'm just going to keep it, keep it very simple. This is about confidence, and I have no confidence in the Nuclear Regulatory Commission, especially when it comes to simple facts, simple facts such as, you know, this radioactive and dangerous material is seeping into our water supply. That's a fact. That's a fact that's proven by the tritium leak at the North Anna Nuclear Power Plant that hasn't really been addressed by the NRC, who seems to be covering this up. (0329-1-1 [Dorsey, Chris])

Comment: A couple of concerned citizens on this call have spoken about reprocessing as a possible alternative. I think one of them called it recycling. And I would urge them and every one on this call to look more deeply into this issue. Reprocessing is probably the worst single thing you can do with high-level radioactive waste that already exists. It's a nuclear weapons proliferation risk. It's astronomically expensive. It causes an environmental disaster wherever it's carried out. Mahogan Tramps is one example. (0329-11-4 [Kamps, Kevin])

Comment: I think the work that needs to be done is to figure out what can be done with our current level of waste and to begin to transition out of nuclear into replacement energy, which is beginning to happen. (0329-14-5 [Sondheim, Steven])

Comment: Yellow caution strips remind us that as pedestrians on this planet, we are guests. And each choice we make, each step we take brings us one step closer, together or apart, based on the choices we make. And the leadership and the lack thereof at making just simple

decisions , like how did we come up with this NUREG, where we have half-*priced human being value? (0329-19-2 [Vandel, Niki])

Comment: I was mortified to learn that while I was on mother leave and focusing on that, that nobody paid attention to that well enough to bring it to at least the Bill Moyers' level. And the lack of the voice of the intelligencia on this issue [what to do with the waste] in the mainstream is really disturbing. (0329-19-3 [Vandel, Niki])

Comment: So I and many others relate the situation in Japan to be very, very similar to the situation in the United States. Having industry capture regulation of the nuclear power industry is very dangerous. And I'm confident that we have that. (0329-31-3 [Carberry, Mike])

Comment: There seems to be just an unbelievable amount of collusion between the agency that is supposed to be regulating nuclear power and protecting the public and those people who are producing nuclear power for profit[.] (0329-32-4 [Seeley, Linda])

Comment: And PG&E, at the San Luis Obispo hearing, who couldn't get excited when she was talking about the recycling of our nuclear waste. As powerful as it is, of course it's going to create more energy in a different form. Let's get on it. We can't transport it. Let's do it where it is, but we've got to do it right. We have to have citizen oversight for the area. We have to have the original people involved. They're the only ones that understand Mother Earth at the innate level, and that's who we need to be listening to. We can't mine anymore. (0329-6-5 [Vandel, Niki])

Comment: But you guys are doing a great job. Do I have confidence in the NRC? Yes, I do if you guys make some serious hardcore decisions, put into place something that we can be confident in, that we've got a team that can go in in the situation like Fukushima and they're just handling it. We don't have that, not in the industry, which I don't understand just on that level. (0329-6-6 [Vandel, Niki])

Comment: I am a resident of Ann Arbor, Michigan, home of the University of Michigan Department of Nuclear Energy, which desperately needs a fundamental shift in consciousness and an existential redefinition of purpose and mission, as does the NRC. (0329-7-1 [Schonberger, David])

Comment: Listening to the comments of people, I've not heard of any studies of making the waste inert, or making it inert. That should be looked into. (0329-9-1 [Martin, David])

Comment: I testified multiple times in the early 1980's to your body, and have found that even though the waste was a huge problem then, and still remain's an unresolved problem today that the NRC's actions in the end always supports the Nuclear industry's existence. I guess job security warrants that to be so. (0330-2 [Beccia, John])

Comment: Shame on you. This community deserves better. (0330-4 [Beccia, John])

Comment: Recent experience shows that the organizations that manage energy are not competent to handle high-risk systems; they are too focused on maintaining profits, rather than on protecting their customers and the general public. I fear that this focus will lead to reducing estimates of the probability of systemic failure and of the costs of such failure. (0333-2 [Balke, Karl])

Comment: The taxpayers of this nation have been forced to assume costs and liability for this waste that runs in the hundreds of billions. The safety, security, health and environmental

dangers involved in nuclear power are of such potential magnitude, that neither the commercial nuclear industry, nor the insurance industry, will accept more than a fraction of the potential liability. And thus through laws like the Price-Anderson Act of 1957 and the Nuclear Waste Policy Act of 1982, most of the risk burden has been placed on the American public. The NRC itself has taken the position that it cannot be held responsible for cleanup in the event of a major accident. The NRC has allowed nuclear power plants to be owned and run by LLCs, limited liability corporations and other legal constructs which would allow the multi-billion parent corporations to walk away from a major liability, not just in the future, but today. (0341-1-9 [Mermelstein, Richard])

Comment: Water is essential to life. In the Midwest portion of the United States we are gifted with a surplus of potable water. Without a doubt other parts of the United States and world will not be able to sustain current consumption rates based on their current supply of potable water. Please consider the comparative advantage potable water offers regarding health and economic growth. By not requiring commerce to disclose the waste it is moving through public waterways it endangers the local supply of water along the entire Ohio river. There is no way for first responders to effectively respond to a spill or disaster. Also, by allowing another source of waste to be transported along our rivers it increases the risk of a spill. The ramifications of not requiring commerce to disclose the contents and ingredients of their waste could be enormous. Please consider how precious potable water is and our need to protect it effectively as possible. (0346-1 [Boyda, Jonathan])

Comment: I believe there is so much dis-information circulating that the public cannot possibly make a good decision and Nuclear Energy and nuclear waste and Nuclear Waste storage decisions should be made through the unbiased and apolitical eye of science, that is an open process for all to see, and is subject to independent audit of watchdog groups. While I have great confidence the NRC is doing a great job in keeping the public safe. I would have even more confidence in the NRC if they would accelerated licensing private research and development of technologies (such as MSRs Molten Salt Reactors) that would radically reduce our nuclear waste stockpiles with affordable small modular reactors that could be shipped to onsite storage sites, hooked to the electrical power grid, and consume 99% of our radioactive waste, and make the small amount of resulting waste radioactive for only hundreds of years in stead of hundreds of thousands of years. By privatizing nuclear waste not only could we save \$billions in taxpayer and ratepayer dollars, we could help spark an economic recovery, and not pass nuclear waste hundreds of thousands of years into the future[.] Currently, the US Government by law, owns all nuclear waste. The federal government has wrestled with this problem (of nuclear waste storage) for decades and has not presented a viable solution for reducing our nuclear waste instead of just storing it. If industry had a profit motive through ownership of the waste, then more than likely self serving profit driven companies (under the watchful eye of the NRC) would come up with a solution such as a MSR actinide burner that would allow for the safe and very economical onsite destruction of nuclear waste (conversion into energy cheaper than coal). This would greatly lessen the cost of nuclear power, benefit the environment, minimize the potential for accidents, and create many jobs. Jobs that America needs! (0347-12 [Morrow, Jon Paul])

Comment: There are many that will say the NRC is owned by the corporations that are behind nuclear energy and anyone that believes otherwise is just a dupe! There are many that will say that the NRC is in bed with the corporations that run Nuclear Power Plants and we (the public) are playing with a ticking time bomb that will kill us all because these corporations would throw caution into the wind and sacrifice safety to the expense of all of us. Logical conclusion number 1: Nuclear power companies like to build nuclear power plants because it helps them to make a

profit. It does not make any logical sense that if they (nuclear power companies) own the NRC under some illogical conspiratorial grand design that they have not built any new nuclear power plants within the last 30 years. On the contrary, that would point to Wind and Solar lobbies running the government and paying off NRC officials to eliminate the competition (another far flung conspiracy). Logic would dictate these claims are without merit and that the NRC, if anything is overprotective of the public's safety. (0347-5 [Morrow, Jon Paul])

Comment: Thus, in accord with *In re: Aiken County*, a portion of the federal government's delay in curing the breach of the NWPA-prescribed "standard contracts," and therefore a portion of the damages, is attributable to the NRC. Based on the \$1.6 billion figure in GAO-12-797 and the time duration between January 31, 1998 (breach start date), and August 15, 2012 (GAO report date), which is about 174 months (i.e., 11 mos. for 1998; 12 mos. each for 1999 through and including 2011, or $12 \times 13 = 156$ mos.; and 7 mos. for 2012), the breach has been costing the Judgment Fund, on average, about \$9.2 million per month ($\$1.6b / 174\text{mos.} = \9.195m per month). NRC's NUREG-1100, Vol. 26, documented NRC's decision to commence "an orderly closure of the agency's Yucca Mountain licensing support activities." *In re: Aiken County* ruled that closure decision was not lawful. Therefore, the NRC's share of the government's delay in curing the breach can reasonably be measured from February 2010, when NUREG-1100, Vol. 26, was issued, to August 13, 2013, when *In re: Aiken County* was issued. That's about 41 months (i.e., 10 mos. in 2010, 12 mos. each in 2011 and 2012, and 7 mos. in 2013). Thus, at \$9.195m per month for 41 months, the NRC's share of the federal government's delay in implementing the Nuclear Waste Policy Act of 1982, as amended (NWPA), has cost the Judgment Fund at least \$377 million. Significantly, that money comes from the U.S. taxpayers and not from the utility-supplied Nuclear Waste Fund. Based on the \$2.6 billion figure in the House Energy and Commerce (E&C) Committee memorandum, NRC's share works out to be larger: at least \$570 million ($\$2.6b / 187 \text{ mos.} = \$13.9037\text{m per month}$; which, over 41 months, comes to \$570m). (0355-2 [Skov, Jeff])

Comment: In sum, NRC needs to conduct a thorough root cause analysis, to include an "extent of condition" evaluation, and implement sound corrective actions to prevent recurrence. To do so would be consistent with commonsensical management principles; the expectation expressed in the concurring opinion in *In re: Aiken County* that "[t]oday's judgment should ensure that the Commission's next chapter begins with adherence to the law"; the approach embodied in the agency's regulations at 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," which the agency applies to its licensees; and the traits of a healthy safety culture (see the NRC's "Final Safety Culture Policy Statement," 76 FR 34773, 34777-34778, dated June 14, 2011), including, in particular:

- Leadership Safety Values and Actions-Leaders demonstrate a commitment to safety in their decisions and behaviors.
- Problem Identification and Resolution-Issues potentially impacting safety are promptly identified, fully evaluated, and promptly addressed and corrected commensurate with their significance.
- Continuous Learning-Opportunities to learn about ways to ensure safety are sought out and implemented.
- Questioning Attitude-Individuals avoid complacency and continuously challenge existing conditions and activities in order to identify discrepancies that might result in error or inappropriate action.

On a brighter note, I did receive the Statements of Consideration supporting the 10 CFR 50.9 rule. (0355-9 [Skov, Jeff])

Comment: The human race may not explode itself with a man-made bomb (as we worried about when I was a kid in the 50's) but instead, we are likely setting ourselves up for a slow & steady death by escaped radiation. We, the people of the entire planet, are COUNTING ON YOU TO KEEP US SAFE; there is no one else who has as much authority to do so as you do. Thanking you in the hopes that you will heed my plea for CAUTION & SAFETY! (0361-5 [Greenfield, Jan])

Comment: We endorse Principles for Safeguarding Nuclear Waste at Reactors from the Institute for Energy and Environmental Research. (0373-13 [O'Malley, Brian])

Comment: While I am talking to the issue of reports that will be delayed, I point out the issue of NTTF Recommendation 1, Enhanced Regulatory Framework. My take on the NRC's enhancement is a means to accept that which the licensees and their engineers provide with minimum friction and delay. The NRC approach to 'enhancement' does not provide more safety to the public, but minimizes safety to the public to provide benefits to the nuclear industry. The staff and Commissioners state that the safety of the public is paramount, but are clear they really mean that following the rules is paramount. I quote from an email sent to me from a staffer, 'Having worked here for 19 years I have never met anyone that is not dedicated to safety... we don't care if the plant runs or not, but it is permitted to run, if it meets our regulations... that is not our choice, it is the law of the land. We make the regulations which we believe to provide safety...' This quote shows that the regulations are believed to provide safety, and that the plants are allowed to run when they meet regulation (0376-2 [Lewis, Marvin])

Comment: Recommend legislation to hold nuclear owners accountable in perpetuity for all costs associated with radioactive wastes left on site after closure. (0377-1-10 [Cuthbert, Lewis])

Comment: Reprocessing is not a solution. It has been an abysmal costly failure, creating larger radioactive waste streams and pollution. -Reprocessing is extremely polluting, risky, and costly to taxpayers; -Increases Volume of Radioactive Waste; -Expensive for Taxpayers/Ratepayers (0377-6-6 [Cuthbert, Lewis])

Comment: Unfortunately, the NRC has a lousy record of enforcement, and can be counted on to continue its practice of granting relief from its requirements. So, we can expect it will allow Pilgrim's owners (and all other nuclear plant owners) extensions of time and "mitigation" measures without license suspensions or even fines for noncompliance. The agency will always protect the interests of the nuclear industry over the safety of the public. (0380-3 [Holt, Joan])

Comment: After attending this meeting and reading the GEIS I am horrified by the lack of conscience of those who represented and defended the NRC, the GEIS, and the nuclear power industry. (0381-1 [Fasten, Susan])

Comment: We rely on the NRC to regulate this most dangerous, toxic, contaminating, uncontrollable, uncontainable substance ever created. We rely on the NRC to protect our air, water, earth, all living things from any more radioactive mishaps and contamination - now and thousands of years into the future. We rely on the NRC to prevent any more 3 Mile Islands, careless handling and storage, leaks, careless dismantlings and disposals, and careless transportings and incinerations. We rely on the NRC to make sure that we do not ever experience a Fukushima or a Chernobyl or a Chelyabinsk. The stakes are too high. If you must err, err on the side of the precautionary principle. It is your job to protect my children and grandchildren. I hold you to it! (0381-10 [Fasten, Susan])

Comment: Recycling radioactive contaminated material into the commercial metal stream is also an incredibly unreasonable option. Do you really want radioactive waste in your kid's braces, toys, high chairs, romper snaps; in your pants zippers, eyeglass frames, eating utensils, heating ducts, water pipes, appliances, and virtually everything you live with? Do you really want to subject virtually every person on earth to yet more radioactive contamination in their daily life? Is there not enough cancer already? Where is the conscience and consciousness in this proposed action? (0381-9 [Fasten, Susan])

Comment: The issue at hand is storage of nuclear waste. Two possible solutions exist. Breeder reactors use up and make harmless most of the current nuclear waste that nuclear power plants now have to store. Congress and the Carter administration banned breeder reactors. France allows breeder reactors which are currently operating safely and efficiently there. Please encourage Congress to repeal the ban on breeder reactors. (0390-2 [Kirkland, Gary L.])

Comment: The NRC's continuing lax approach to regulation endangers American citizens and the myriad commercial, industrial and agricultural activities that they engage in as they live and work near Diablo and other nuclear plants. This casualness, for the sake of the single industry that benefits from such lax regulation, is, in our opinion, indefensible. We are merely two citizens. But we believe you work for the citizens of this country, not for the nuclear industry. Are we wrong? Please demonstrate the courage to look at nuclear storage and safety issues in the way that you must---namely, as if everyone's lives depended on it. (0409-2 [Hanson, Lauren] [Jones, Mary])

Comment: In the USA, per capita expenditures for medical "care" are more than twice as high as the next highest developed country. Total radiation exposure due to medical procedures is also much higher in the USA than in other countries. Unfortunately this excess expenditure for health care and the excess radiation exposure from medical treatment does not translate into better health. The USA ranks low compared to other countries in such objective measures of health as life expectancy. Prior to the nuclear age an estimated one person in ten died of cancer, now it is about one in four. Clearly environmental contamination with radionuclides and chemical toxins has effectively quadrupled the overall cancer rate between 1940 and 1980. The NRC "permissible" dose from man-made radiation (500 mR/yr) is about four to five times higher than the true level of external NBR. This would suggest that the cancer rate in people subjected to the NRC allowed exposure level to man-made radiation might be four to five times higher than the natural rate. Although the average exposure to man-made radiation during those same years probably did not reach the maximum level, it is still possible that the roughly four-fold increase in cancer rate during this period might be explained by the significant radioactive contamination of the environment due to nuclear bomb testing and radioactive emissions from power plants and the rest of the nuclear complex. The overall cancer rate post 1980 appeared to be leveling or decreasing slightly as the radioactive contamination of the environment, (after the cessation of atmospheric nuclear bomb tests) was slowly cleared and the latency period for radiogenic cancers had run its course. Unfortunately, the reactor accidents at Chernobyl and Fukushima, once again added a considerable new radioactive burden to the planet so I expect that cancer rates will hold steady or increase again in the near future. One event which happened in 1953 is illustrative of the danger posed by radioactive contamination of the environment. Earlier in that year several above-ground nuclear bomb tests had been conducted at the Nevada Test Site, which dropped significant fallout on the downwind areas. Later in the year Hollywood filmed a movie called "The Conqueror," starring John Wayne, in Snow Canyon, Utah, about 120 miles downrange from the test site. The particulate radioactive fallout from the earlier tests had mixed in with the soil in the canyon and the horses and wind machines stirred

up large amounts of dust, together with fallout, during the filming of the movie. Years later it was observed that of the approximately 220 cast and crew members on the movie set more than 90 including John Wayne himself had contracted cancer. This is a cancer rate of nearly one person in two, a rate so far above the national average that it is statistically impossible to explain by chance. (0410-17 [Nelson, Dennis])

Comment: As a whole, the analyses appear to show a strong NRC bias in favor of the nuclear power industry. That bias is not surprising given that 90% of the NRC operating budget is provided by the same industry it purports to regulate. Although the NRC is supposed to be an agency of government (which is assumed by most to have as its principal role the protection of the public health), this does not, in fact, seem to be the case. Rather, the NRC seems to be a promoter of nuclear power and a cheerleader for the nuclear industry. The clear preference of the NRC for the "rule making" option in the GEIS, even though it will have the effect of excluding the public from many future licensing decisions, shows that it does not have the genuine interests of the public at heart. This position is in direct contravention of the intent of Congress when it divided the AEC into two parts: the DoE with a mission to promote all things nuclear, including nuclear weapons and reactors; and the NRC whose mission was to act as a brake on the uncontrolled exuberance of the nuclear physicists and to ensure that the public health was not threatened by excesses in that industry, as it had been in the past. (0410-2 [Nelson, Dennis])

Comment: Although the nuclear enterprise is only about 70 years old and the commercial nuclear power industry is only about 60 years old, there is quite an abundant history from which to draw observations and conclusions as to the risk and safety of the enterprise. We are informed by catastrophic nuclear "accidents/events," both intended and unintended, with widespread radiological contamination of the environment, which have impacted the health, homes, property, livestock, livelihoods, and the pursuit of happiness of millions of people in scores of countries. Most of those losses were incurred by ordinary people, who happened to be in the way, and occurred almost entirely without compensation. These past actions have not shown responsibility on the part of either the nuclear industry or their governments in the conduct of this enterprise. Instead, they demonstrate a reckless disregard for ordinary citizens. To be fair, some government "compensation" programs have been created many years after the events; but they were generally too little, too late. Some examples are: Radiation Exposure Compensation Act (RECA) administered by the Department of Justice which provides limited "compensation" payments to Downwinders, uranium miners and millers, and on-site participants at the nation's nuclear tests; Energy Employees Occupational Illness Compensation Program (EEOICP) administered by the Department of Labor which provides payments to ill workers in the nation's nuclear complex; and the Department of Veterans Affairs which provides some payments to atomic veterans. The US Government has also negotiated a Compact of Free Association with the government of the Marshall Islands which includes some limited payments to residents of certain islands who were displaced or injured when the US Pacific nuclear tests were conducted. All these payments total in the billions of dollars but still represent only a small fraction of the total damages incurred by the victims. Private insurance policies also exclude damages from radiological and nuclear events, so there does not appear to be any compensation program in place in this country to reimburse the victims of a potential nuclear accident at a nuclear power plant or fuel storage facility for their losses. This has certainly been the case for the more than one hundred thousand people in Japan displaced by the Fukushima disaster. In the USA there is not even a true national health care system to take care of people injured by radioactive contamination. This amounts to a transfer of costs in the event of an accident from the nuclear operators to the victims, since they must pay for their own medical care. (0410-3 [Nelson, Dennis])

Comment: Downwinders, against the Federal Government and after more than forty years of Government denials and stalling; that the Congress finally passed a compensation act which gave a modicum of relief to the victims of US nuclear bomb testing. Acts such as increasing the allowable radiation dose limits in the aftermath of Fukushima, not based on health science but rather on politics and the level of contamination on the ground, only add to this distrust. This was done by the Japanese government in the regions around Fukushima, with the advice of the US Department of Energy, and makes one begin to question whether the same thing might happen here in this country in the event of a serious radiological accident. Even now people in Japan are being told to return to their homes in the still contaminated zones, against their better judgment and at peril to their health, because they are given nowhere else to go. (0410-31 [Nelson, Dennis])

Comment: Structural/system issues can have an adverse effect on sound management of nuclear waste. This includes for example, officials securing employment in nuclear related industries following their work with The NRC. This risks placing personal gain over the mission of The NRC. Such structural/system must be addressed as potentially harmful to health and the environment. (0417-5 [Clark, Terrence])

Comment: It is my desire to see nuclear plants built that can burn the SNF ridding ourselves of a burden AND producing electricity at the same time. It is time for a reassessment of the prohibition on reprocessing; I do not share the fear of proliferation that President Carter had. (0418-1 [Davison, David])

Comment: Lest you think I have nothing good to say about your "regulatory" agency, you may be glad to hear that I give the NRC very high marks? but only for hubris and audacity. I wish to make it very clear how much contempt I have for your hubris and audacity, but I recognize that although you are insensitive to the cancers and birth defects of many thousand generations to come, your staff are sensitive beings. (0419-3 [Agnew, David])

Comment: In response to the court's decision, the NRC must look to other methods of waste disposal. With sufficient energy input, waste can be transmuted to isotopes that will quickly stabilize. Using particle accelerators where the waste is presently stored would avoid the inevitable accidents related to transporting waste to a centralized facility. This should be the technology upon which confidence statements are based rather than geological storage. License renewals should be contingent on paying in advance for adequate clean energy resources and local accelerator capacity to transmute the waste within 60 years of its being produced. (0422-3 [Dudley, Chris])

Comment: US Navy has re-manufactured spent fuel rods to make new fuel rods meeting same specs as original equipment fuel rods, spent uranium which has cooled enough that it can be used as the counter weight in a fork life truck with suitable lead shielding to protect the operator and is probably about as radioactive as some of the more radio-active types of granite, and short-lived radio-active isotopes (average half-life about 30 years) that will take about 1100 to 1200 years to cool down to the same amount of radioactivity as virgin uranium ore, compared to the 3,000 years it would take for not reprocessed spent fuel rods to reach that state. I know you are ferociously jealous of US Navy. However, it would suit the owners of the reactors with expired licenses, the public, and US Navy just fine if you could turn over those expired license reactors and the spent fuel rods to US Navy and buy back the fuel rods meeting original equipment specs made from the material in spent fuel rods from US Navy to avoid the need to buy fuel rods made from virgin uranium ore. I have a LOT MORE CONFIDENCE in US Navy with its great track record on nuclear power plant safety than I do in either any for profit

corporation or any civilian regulatory agency that has been regulating its same industry for more than ten years. So, please turn over reactors with expired licenses and spent fuel rods to US Navy to deal with as it sees fit. (0439-2 [Adams, Grace])

Comment: Letting US Navy reprocess spent fuel rods to make new rods from material in old rods will help some. (0439-3 [Adams, Grace])

Comment: Why don't you make all LWRs obsolete and go with LFTRs-Liquid Fluoride Thorium Reactors? They can burn up these leftovers and are cheaper than coal. (0440-2 [Pieart, Richard])

Comment: Furthermore, it has been demonstrated that Brown's gas can neutralize some to most of the radio-activity in these dangerous substances. Qualified observers and government agencies have witnessed the demonstrations. It is not enough to store rad-waste and I certainly do not want it in my fertilizer or food. (0441-2 [Baker, Helen])

Comment: WE NEED SCIENTISTS AS A PART OF ANY AGREEMENT THAT HITS A TABLE WHERE IT COMES TO THE NATION'S HEALTH. NO JUNK SCIENTISTS PAID FOR BY THE KOCH BROTHERS OR SOME REPUBLICAN FLUNKY LIKE DARYL ISSA. THE PUBLIC HAS A RIGHT TO THE BEST INFORMATION IT CAN GET AND IT'S OBVIOUS THAT FEW IF ANY MEDIA OUTLETS ARE CAPABLE OF FOLLOWING ANYTHING THIS IMPORTANT. SO IT IS UP TO OUR GOVERNMENT TO SEE TO IT THAT ALL INCIDENTS ARE LOOKED AT WITH A LEVEL HEAD AND A SCIENTIFIC EYE. THAT THERE BE TOUGH REGULATIONS ON ANY TYPE OF ENERGY AND THAT A YEARLY FOLLOW UP ON SUCH ENERGY PROJECTS AND ALL NEW ONES BE DONE AND THEN HIGHLY PUBLICIZED. THAT IS SIMPLY NOT TOO MUCH TO ASK. (0442-2 [Butler, Dee])

Comment: While I support nuclear energy in general, I believe a nuclear technology exists that is superior in many ways to the solid-fuel, high-pressure, light water-cooled reactor (LWR) technology in current use. I refer to the molten salt reactor (MSR) operating in the thorium fuel cycle, designed and successfully prototyped at Oak Ridge National Laboratory in the 1960s. A problem with the LWR is that fuel rods have to be removed from the reactor core after only about 3% of the fissile material is fissioned, leaving 97% of the valuable fissile material in the spent fuel rod, which is regarded to be radioactive "waste" to be disposed of. Not only is that a terrible waste of valuable fissile material, the amount of waste that has to be disposed of is far greater than it needs to be. The MSR does not create that problem, as it fissions 100% of its fuel, leaving only fission products whose total mass is always less than that of the fuel consumed, and a small fraction of the mass of spent fuel rods from a LWR. Besides creating dramatically less waste, the MSR has many advantages over the LWR that make it a logical choice for nuclear energy production. The core consists of molten fluoride salt in which the fuel is dissolved and which serves as the coolant and heat transfer medium for power generation. It is not pressurized but operates at atmospheric pressure, so there is no danger of explosion, as there is with a LWR in the event of the loss of active cooling, as happened at Fukushima. In that scenario, the total loss of active cooling, the core of a MSR simply melts a freeze plug and flows into a drain tank whose geometry prevents criticality and dissipates decay heat. It shuts itself down into a safe configuration without human intervention. There are many other compelling reasons to replace conventional LWR with MSR technology, which the Nuclear Regulatory Commission needs to consider, so as to allow that technology to be implemented on a scale what will provide low-cost energy to enable domestic manufacturing to be globally competitive, creating millions of jobs in the domestic economy. Energy from the MSR fueled by thorium can also be used to synthesize fuels for transportation, ending our reliance of imported oil. So as we consider how best to deal with nuclear waste, it behooves us to consider an alternative nuclear

technology that minimizes the amount of radioactive waste, enables far more efficient utilization of valuable fuel, and ensures dramatically safer operation. More information about MSR technology is available at energyfromthorium.org, and thoriumenergyalliance.org. (0444-1 [Brown, Steve])

Comment: Finally, with full integrity NRC must inform Congress of the untenable hazards of the nuclear industry and advise Congress to authorize prompt cancelling all current nuclear power plant licenses and to accelerate the political and regulatory processes to as quickly as technically possible place all spent fuel and high level radioactive wastes in deep geologic repositories. (0447-2-16 [Andrews, Richard])

Comment: I personally call upon the Nuclear Regulatory Commission and NRC staff to restore the agency to its proper role as regulator of the nuclear industry, not promoter and protector; and to restore its proper role of protecting public health and safety. The AEC was intentionally split up decades ago, to avoid the conflict of being both protector-promoter and regulator of atomic energy and weapons. NRC's solitary role is serving the public interest, ensuring its security, health and safety. NRC is not the steward of nuclear power. (0447-2-19 [Andrews, Richard])

Comment: This posture of the Blue Ribbon Commission, and then repeated by NRC, instills no waste confidence, nor confidence in the NRC as a protector of the public interests, health and safety. The NRC needs to confront this absurdity of the Blue Ribbon Commission and provide valuable and much needed advice to the administration and to Congress to chart a more aggressive path to properly handling and disposing of spent nuclear fuel and other radioactive wastes. To do anything else is putting at extreme risk millions of people of the USA, as well as our lands and economic systems. A single catastrophic SNF fire or major release event would be devastating. (0447-2-21 [Andrews, Richard])

Comment: The interests of the NRC and the operators of Nuclear Reactors are not the same as the Public's interest. Protecting the Public from the health consequences of radiological releases should be the abiding and primary function of the NRC. Sadly, it seems that protecting the Nuclear Operators from the necessity of spending the necessary funds to insure public safety is instead the primary function of the NRC. (0454-13 [Waldstein, Joe])

Comment: An immediate example is EPA's highest paid employee admits to a decade of deceit. How can the public have any confidence in government employees where the highest paid employee in an agency gets away with deceit for a decade without repercussions? (0455-1 [Lewis, Marvin])

Comment: We need to delineate between what's reusable (for other reactors or medicine) and what's truly waste. The sophomoric language of mainstream media reinforces apathy when faced with a demand for greater education on nuclear processes and materials. (0458-1 [Solinsky, Joseph])

Comment: I have no doubt that the Nuclear Regulatory Commission will continue its strong, independent oversight of commercial nuclear energy facilities-the operation of existing plants, licensing new reactors, renewing the operating licenses of existing reactors, and the management, transportation and disposal of used nuclear fuel. I believe it is important for the NRC to continue its transparent and efficient efforts to issue the current waste confidence proceedings so that progress on both plant licensing and used fuel management can continue. (0461-3 [Pan, Arthur])

Comment: The Consequence Study was not conducted pursuant to the requirements of NEPA and thus did not include a hard look at alternatives to continued storage of spent fuel in spent fuel pools nor did it apply NEPA standards to determining whether alternatives to pool storage would be environmentally preferable. Most importantly, it did not apply NRC's requirement that NRC "has taken all practicable measures within its jurisdiction to avoid or minimize environmental harm from the alternative selected, and if not, to explain why those measures were not adopted." 10 C.F.R. § 51.103(a)(4). (0473-8-1 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: Like the Consequence Study upon which it was primarily based, COMSECY- 13-0300 did not address the requirements of NEPA. Rather, it conducted an evaluation of the costs and benefits of expedited spent fuel transfer to dry cask storage using only the restrictive standards imposed under the backfit provision of 10 C.F.R. § 50.109. Using those restrictive standards, COMSECY-13-0300 found *that the expedited transfer of spent fuel to dry cask storage would provide only a minor or limited safety benefit (i.e., less than safety goal screening criteria), and that its expected implementation costs would not be warranted." Id. at 1-2. That conclusion is reached although Staff also found that at least in some evaluations using reasonable conservative assumptions the cost advantage of expedited transfer of spent fuel to dry cask storage could be hundreds of millions of dollars per reactor.¹⁵ [footnote 15 text: Notably, COMSECY-13-0300 includes a detailed non-concurrence of its analysis and conclusions that expedited spent fuel transfer is not warranted, a critique which is not fully rebutted. The DGEIS ignores all of the critiques contained in that rebuttal. COMSECY-13-0300 at Enclosure 2.] (0473-8-2 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: [B]ut let's face the facts Southern California Edison fired Gregory Jaczko for telling the truth. He stated that to build a 25 billion dollar nuclear power station, does protect a 300 billion accident. It's obvious the nuclear industry protects the nuclear industry and can give a shit about human safety. (0478-4 [Higgins, Kevin])

Comment: Invest in Thorium reactors and eliminate the current process and materials used in nuclear power generation. (0480-3 [Arnold, James])

Comment: Protect Our lands, waters, wildlife, health & future! You work for citizens, Not industry! (0483-3 [Garvey, Lydia])

Comment: I am concerned that environmental groups and the public are fixated on SOLAR as the power of the future. This is unrealistic, it should be a priority to educate the public on baseload and peak power. Calif. and Ontario both publish on-line their 24 hour electric power graph/curve. It is very useful to demonstrate that renewables have an insignificant effect on baseload. I would encourage NC to do the same. (0489-2 [Padden, Jim])

Comment: The NRC Commission, and its past and present Division of License Renewal (DLR) management have perpetuated an indefensible scientific fraud upon the American public, in particular, the stakeholders who will have to pay the burden for a future nuclear calamity. (0496-1 [Batobato, Alicia])

Comment: From the beginning of the atomic age in 1945, EVERYONE eats, drinks and breathes invisible, deadly radioactive fallout. Most disease rates then increased. All we can do now is minimize exposure to radiation. Conduct a proper test to find the most cost effective method. It was clear to me that the late Dr. Radha Roy, professor of physics emeritus, invented

the best method that will eliminate....(not reprocess or bury nuclear waste which does not eliminate the radiation health threat). THE ROY PROCESS FOR THE TRANSMUTATION AND NEUTRALIZATION OF RADIO ACTIVE WASTE Please join this campaign:

http://www.change.org/petitions/united-states-senator-harryreid-amend-the-nuclear-waste-policyact?hare_id=OQwAwNKSwf&utm_campaign=mailto_link&utm_medium=email&utm_source=share_petition; There is a viable, cost effective alternative to the federal policy of burying nuclear waste. First, there must be a Congressional Bill passed to allow transmutation, or backwards engineering nuclear waste to a non-radioactive element. In addition to eliminating nuclear waste, the decay heat can turn the steam electric generators at each nuclear power plant to produce electricity. (0497-1 [Nester, Dennis F.]

Comment: If you take the time to read and understand what is REALLY going on as opposed to the spin (or the complete silence) put out by mass media owning companies like GE, which also manufactures and sells nuclear power plants, then you will also understand why even survivalists and preppers will not make it through 20 years of staying underground, much less 25,000 years of staying underground, once the Carrington Effect hits Earth. They are all living in a fantasy land. 11 What are they going to eat down there; dirt? Where will they get radiation free water, and more uncontaminated food, when what they stocked up, runs out? You can only store so much food and pure water, and then you have to come up on the surface and grow more. But those people will be coming up into a world that is very high radioactively contaminated environment. Or, it may be possible that survivors could start eating their comrades, but cannibalism has its own consequences. (0498-16 [AGreen Road Project, Anonymous])

Comment: Please keep Fukushima in mind because it is from the same design batch as Oyster Creek. We cannot risk the Atlantic Ocean and I am begging you to stop worrying so much about the companies involved and address instead Life - all forms of it. (0510-3 [Holmes, Helen])

Comment: Whenever there is a profit to be made, experience shows that operators will place profits over safety. The Navy developed nuclear - powered ships for defense. The Navy could spend money on safety. Private companies have a duty to shareholders to make profits. (0512-2 [Bibb, William])

Comment: Nuclear energy is unsafe because an absolute degree of care is required. No regulator can force middle management types to follow rules. In the Navy you have courts martial. Who has ever been sued or gone to jail in the nuclear industry. I have NO confidence in your system of regulation for the above reasons. Trial lawyers are looking for the first big win as we did with tobacco and asbestos. The laws must be changed. No industry has ever been effectively regulated without unlimited legal liability. (0512-6 [Bibb, William])

Comment: My utility was fined last year for not having the proper neutron absorbing chemicals on site. This should have resulted in a loss of license, not a slap on the hand fine. The NRC mission is incompatible with protecting public safety and this is dangerous for all humanity. (0514-4 [Fahey, John])

Comment: Nuclear power only made economic sense because you allowed incompetence and endangerment of humanity. You are criminally responsible for public endangerment. What the rest of you did to G. Jasko is professional bullying and should be subject to public scorn. I am thankful that your criminality has not turned our country into the nuclear wasteland that Japan is

now (only parts of it). I pray that you will learn the lessons of Fukushima and discontinue such dangerous practices. (0514-7 [Fahey, John])

Comment: 4. Stop allowing shipment of spent fuel to the U.S. from other nations for reprocessing or disposal; 5. Do not allow the disposal of fracking waste and radioactive waste in salt caverns, as this destabilizes the ground in surrounding areas (think Bayou Corne). (0515-10 [Stennes, Nancy])

Comment: Do not allow reactors to operate beyond their design lifespans; (0515-7 [Stennes, Nancy])

Comment: Do not allow fuel reprocessing. There is more than enough nuclear material already in existence to destroy all life on earth; (0515-9 [Stennes, Nancy])

Comment: There's is no mercy to be held for any one in the nuke industry, you're all a bunch of the most foulest criminals that ever walked the Earth. I look forward to the downfall of the industry and the selfish fruitcakes within it. (0523-2 [Hamilton, Richard])

Comment: The Dept. of Justice needs to examine illegal nuclear waste handling over the decades and prosecute regulators who were negligent. The US needs to really ban burning nuclear waste instead of just pretending to. (0527-2 [Titus, Mary])

Comment: Stop, immediately, manufacturing toxic D.U. Label all consumer and industrial products containing D.U. and do a recall on all of them. (0527-3 [Titus, Mary])

Comment: The NRC needs to stop telling the public runaway nuclear plant melt-down pollution is harmless. It is a bold faced lie. (0527-4 [Titus, Mary])

Comment: Wind and solar power, not to mention fuel cells, are sufficient for all our present and future needs. (0530-2 [Proeller, John])

Comment: The Commission Should Acknowledge an Absence of Waste Confidence and Propose that the NWPA be Amended or Replaced (0532-17 [Kotra, Janet])

Comment: Views expressed by the extreme end members of this irresponsible continuum distract the Commission from its foremost responsibility - namely protector of the public health and safety and provider of the common defense and security. No, it is not NRC's job to advocate for or against nuclear power or the generation of increasing amounts of spent nuclear fuel. That was made abundantly clear when NRC was formed. The Commission's authority does include, however, the responsible advocacy of nuclear safety and security for the Nation, for both the short- and long-term. (0532-4 [Kotra, Janet])

Comment: Beyond that, the NRC should focus on finding ways for the US to be powered by solar energy, perhaps changing its name to the Nuclear Regulatory and Solar Energy Expansion Agency. (0543-7 [Senkiw, Sheryl])

Comment: Unfortunately, reprocessing proponents have used this opportunity to promote reprocessing as the solution for managing our nuclear waste. Contrary to their claims, however, reprocessing is extremely expensive, highly polluting, and a proliferation threat, and will actually complicate the management of irradiated fuel. Nor will reprocessing obviate the need for, or "save space" in, a geologic repository. The United States has a unique opportunity to re-evaluate our nuclear waste management plan. We can make wise decisions about safeguarding

radioactive waste or go down the risky, costly, and proliferation prone path towards reprocessing. (0545-2 [Patrie, MD, MPH, Lewis E.]

Comment: Prohibit reprocessing: The reprocessing of irradiated fuel has not solved the nuclear waste problem in any country, and actually exacerbates it by creating numerous additional waste streams that must be managed. In addition to being expensive and polluting, reprocessing also increases nuclear weapons proliferation threats. (0545-5 [Patrie, MD, MPH, Lewis E.]

Comment: My list of radioactive waste neutralization methods includes the electrino fusion power reactor, Hawkings' generator of cold electricity, collective ion accelerator, dematerialization using highest powered positive ions ever, photo-deactivation using gamma rays, implosion machine which duplicates ball lightning, Radha Roy's transmutation process, Barker's method, Gillembarado's method, Keller catalytic process, transmutation of low-level nuclear waste into glassy substance with super high voltage, Brown's gas, combining Brown's gas with bucking magnetic fields inside a plasma ball, Bearden's method, Russian process using liquid lead bismuth to trigger transforming in the form of neutrons, accelerator-driven transmutation of waste, Brown's gas-metal matrix process, photoremediation, ZIPP fusion process, RIPPLE fission process, low-energy nuclear transmutation electrolytic cells, plasma induced/injected transmutation, Kervran reactions, Monti process, higher group symmetry electrodynamics, plasma gasification melting, low-energy nuclear remediation with ultra-low momentum neutron generator, flame-free incineration in a catalyzer, John Hutchison's raygun, and fusion-fission hybrid reactor. More information on many of these methods is available at www.padrak.com/vesperman. (0550-1 [Vesperman, Gary])

Comment: The Department Of Energy refuses to neutralize radioactive waste because of its insane policy of preserving its supply of bomb-grade uranium and plutonium for manufacturing nuclear weapons. The Nuclear Regulatory Commission would better serve the nuclear power industry by vigorously developing methods of neutralizing radioactive waste. (0550-2 [Vesperman, Gary])

Comment: In 2012, a Catholic nun and two other non-violent peace activists went through 4 layers of security to the heart of the Y-12 National Security Complex in Oak Ridge, TN to draw attention to the U.S. violations of International Law and the Nuclear Non-Proliferation Treaty and the threat to life on the planet. Four weeks later, the hole in the fence had not been repaired and 2 other persons had inadvertently traveled into prohibited areas. U.S. nuclear facilities should be secure. They are not. (0552-1-16 [Macks, Vic])

Comment: Reactor owners and the NRC are not credible sources for protection of the public safety and health with respect to management and oversight of nuclear waste and reactor vulnerabilities that impact the safety of onsite withdrawn spent fuel. Risks are not/can not be eliminated as demonstrated over the years. (0552-2-29 [Macks, Vic])

Comment: Hallmarks of the nation's nuclear weapons program have been and still are extraordinarily sloppy record-keeping, careless handling of deadly materials, and blind faith in nature's ability to absorb anything. The Atomic Energy Commission (AEC) originally served as a watchdog and industry booster. The dual roles conflicted, so the Department of Energy (DOE) and the Nuclear Regulatory Commission (NRC) were created to separate them. Both maintain cozy, mutually-supportive relations with the industry and neither is known for trying to protect public health or, least of all, the well being of other living entities. (0553-4 [Wilshire, Howard])

Comment: The number of safety violations at U.S. reactors varies dramatically from region to region. A congressional study awaiting release points to inconsistent enforcement. The authors of the report wrote, "NRC cannot ensure that oversight efforts are objective and consistent. (Uneven enforcement suspected at nuclear plants." (AP, Oct 16, 2013) (0556-1-28 [Lampert, Mary])

Comment: The number of safety violations at U.S. reactors varies dramatically from region to region, pointing to inconsistent enforcement, according to a congressional study awaiting release. The authors of the report wrote, "NRC cannot ensure that oversight efforts are objective and consistent." (Uneven enforcement suspected at nuclear plants. AP, Oct. 16, 2013.) (0556-1-35 [Lampert, Mary])

Comment: NRC needs to pause for a mental enema. NRC needs to take its risk assessment experts and store them in a spent fuel facility. Insulting? It's only the mild truth compared what should be said to NRC as one of the most politically- and industry-compromised agencies between earth and Betelgeuse. You nuclear morons allow Diablo Canyon to continue operating near major earthquake faults. Now that kind of decision making requires an IQ level somewhere below that of an aphid. The problem with addressing the NRC in any meaningful or scientific fashion about nuclear power or nuclear waste is that NRC suffers from the "three-monkey" syndrome. Now, the NRC partner in crime, the Department of Energy, came up with the bright solution for how to manage mixed nuclear waste in New Mexico at Sandia National Laboratories Mixed Waste Landfill. The waste is left in unlined pits and trenches leaking into Albuquerque's drinking water aquifer. DOE/Sandia installed a dirt cover ABOVE the wastes. So now I've given NRC something to be proud of-you're not quite as imbecilic as the DOE/Sandia criminals. (0559-2 [McCoy, Dave])

Comment: Spent fuel should NOT be reprocessed. Reprocessing takes an enormous amount of energy and creates additional radioactive and chemical waste streams (no matter how many nuclear proponents claim otherwise). (0562-13 [Hoffman, Ace])

Comment: ...and all of the best thinkers in the world to team up to find solutions to get rid of the nuclear waste in a NOT harmful way and implement alternative energy supply solutions asap. There are enough out there, suppressed by the military/energy industrial complexes. (0564-3 [Meincke, Doro])

Comment: Do not allow fuel reprocessing. There is more than enough nuclear material already in existence to destroy all life on earth; 4. Stop allowing shipment of spent fuel to the U.S. from other nations for reprocessing or disposal; 5. Do not allow the disposal of fracking waste and radioactive waste in salt caverns, as this destabilizes the ground in surrounding areas (think Bayou Corne); (0566-10 [Tocornal, John])

Comment: Do not allow reactors to operate beyond their design lifespans (0566-9 [Tocornal, John])

Comment: Here's an idea: Let's stop bombing and occupying other countries and funnel the money into nuclear safety and alternative energy development! (0570-4 [Boosinger, Marilyn])

Comment: Utah further notes, in an apparent contradiction to NRC staff engaging in a clearly independent manner, staff, apparently on its own initiative, aided Private Fuel Storage, LLC ("PFS") in retaining its storage license, notwithstanding PFS had earlier requested to terminate its license due to a lack of funds.⁵ [footnote 5 text: In 2006, the NRC issued the only away-from-reactor, dry storage license to PFS for a facility to be located in the State of Utah on the Skull

Valley Indian Reservation . Staff document that "[s]ince it had taken a considerable amount of effort and resources to license the PFS [],the NRC thought it prudent to notify PFS of [the potential to be classified as a small entity] in light of the decision by the Department of Energy to site an Interim Storage Facility." NRC Conversation Record between Terry Pikens and Chris Allen, dated February 6, 2013.] Subsequently, staff reversed an earlier decision and waived all PFS annual licensing fees.⁶ [footnote 6 text: Notwithstanding almost a year prior NRC staff determined that waiving PFS licensing fees was not in the public interest, on September 27, 2013, Mr. James Dyer reversed his prior decision and granted PFS a full exemption from all annual fees, retroactive to January 1, 2013. In direct contradiction to his earlier reasoning, Mr. Dyer determined that it is "unfair" that the Department of Interior has not issued necessary approvals given the district court overturned Interior's decisions to deny the PFS lease agreement and the requested rights-of-way. In making his decision, Mr. Dyer failed to recognize or acknowledge that the district court held that Interior could in fact disapprove the lease agreement and deny the right-of-way requests but such denials must be made in a manner consistent with the ruling . See Skull Valley Band of Goshute Indians v. Davis, 728 F. Supp. 2d 1287 (D . Utah 2010).] (0579-2 [Smith, Amanda])

Comment: Please increase the wind and solar technology, for real, not just by giving some money to companies that donated to elections. It's time to move beyond democrat and republican goals. The parties and lobbyists do not have our best interests at heart. The people are finally waking up to this. (0581-2 [Rohl, T.]

Comment: I urge the Nuclear Regulatory Commission to continue its strong, independent oversight of commercial nuclear energy facilities -- the operation of existing plants, licensing new reactors, renewing the operating licenses of existing reactors, and the management, transportation and disposal of used nuclear fuel. (0598-6 [Wicks, Tonja])

Comment: So, with that specific concern in mind, my attention turns to Chapter 9.0 "List of Preparers" (Pages 9-1 to 9-5) of the DGEIS. "Tables 9-1 and 9-2 provide a listing of the NRC [staff] and CNWRA [Center for Nuclear Waste Regulatory Analyses] staff involved, their experience, and their role in preparing this draft GEIS." (Page 9-1, lines 6 - 7). There are three individuals listed as expert contributors whose function was to prepare the Waste Confidence DGEIS Sections pertaining specifically to "spent fuel pool fires." Presumably, Appendix F "Spent Fuel Pool Fires" was the result primarily of their work. I contend that, of these three individuals, NOT EVEN ONE of them is genuinely qualified to competently and adequately address the complexities of the issue. Dr. Todd Mintz has a Ph.D. in Materials Science and Engineering, but, ominously, he has only ONE year of relevant experience, and he is not a trained Nuclear Engineer. Mr. Donald Helton only has a Master's degree in Nuclear Engineering, and he is not a trained expert in Chemical or Materials Science or Civil or Environmental Engineering. Finally, Mr. Michael Wentzel only has a Bachelor's degree, and his degree is in Microbiology -- which begs the question: How can he possibly be qualified to prepare an EIS analysis of spent fuel pool fires? Many DGEIS Preparers have twenty or more (20 +) years of relevant experience, but, unfortunately, all of the listed experts who prepared the analysis of spent fuel pool fires dramatically fail this seniority test. Thus, it seems to me that a travesty is occurring in plain sight, and I am taking this opportunity to clearly express my grave concern. I suppose the NRC could argue that if the three individuals put their heads together, they would equal 1 (one) qualified individual. However, I would respectfully rebut that. (0603-13 [Schonberger, David])

Comment: Re: "externalities;" The U.S. Supreme Court recently heard oral arguments in a case pertaining to regulations under the Clean Air Act -- the Cross-State Air Pollution Rule of 2011, also known as the "good neighbor rule," generally applied to emissions from coal-fired

power plants. (www.marketplace.org, Dan Weissmann, 12/9/13; David Weinberg, 12/9/13.). It is possible that the Court's pending decision could have implications for the nuclear power industry, given that releases of dangerous emissions into the environment are "routine." (Beyond Nuclear). Perhaps the NRC could consider taking proactive steps to reduce the toxic footprint of the industry which it is supposed to regulate. (0603-23 [Schonberger, David])

Comment: South Carolina Electric & Gas Company (SCE&G), V. C. Summer Nuclear Stations (VCSNS) Units 1, 2 and 3 has reviewed the proposed changes under NRC-2012-0246 dated September 13, 2013. Docket ID NRC-2012-0246 was issued by the Nuclear Regulatory Commission (NRC) through 78 Federal Register 56,776 "Waste Confidence--Continued Storage of Spent Nuclear Fuel" and 78 Federal Register 56,621 "Draft Waste Confidence Generic Environmental Impact Statement." VCSNS representatives attended the meeting held in Charlotte, North Carolina on November 4, 2013 as documented within ML13323B474. VCSNS has actively worked with NEI on this matter and fully concurs with the position taken by NEI for Docket ID NRC-2012-0246. (0606-1 [Garza, John])

Comment: There is, however, reason to expect that commercial nuclear power will not compete economically with energy efficiency and modern dispersed and distributed electrical generation technologies that get cheaper as more of them get mass-produced and deployed. The wide-spread deployment of these technologies renders obsolete the "base-load" central-station paradigm niche occupied by nuclear power. Already, the cost of installed nuclear capacity is 4 and 5 times or more the cost of renewable technologies that have zero fuel costs. (0608-8 [Crocker, George])

Comment: The Commission needs to avoid the influence, that the nuclear industry's trade association - The Nuclear Energy Institute (NEI), has over the NRC which is supposed to regulate the nuclear industry's actions. (0610-3 [Brechin, Vernon])

Comment: Although the NRC was spawned from the U.S. Atomic Energy Commission it was left out of controlling the radioactive waste generated by the nuclear weapons test program which resulted in about 830 underground nuclear explosive tests. Each of those tests resulted in the release of radioactive debris whose composition is quite similar to the spent nuclear fuel discharged from commercial nuclear power plants. In April 1997, a report was issued by the U.S. Department of Energy's Nevada Operations Office's Environmental Restoration Division, Nevada Environmental Restoration Project. That report title is Focused Evaluation of Selected Remedial Alternatives for the Underground Test Area (DOE/NV--465, UC-700). On page 8-3 of the report is Table 8-1 - Comparison of Conceptual Costs of Various Alternatives. In the Open-Pit Mine option, which would involve the most extensive clean-up but still a partial one, the estimated cost was \$7.29 trillion. All, but the least expensive option were rejected, leaving primarily long-term monitoring. All other options were considered impractical for various reasons, including costs. The end result is that the problem of potential future contamination is being passed on to future generations so that today's people can continue to live in their customary ways. It's time we pull our heads out of the sand and realize the scope of dealing with radioactive hazards that last for hundreds of thousands of years. (0610-7 [Brechin, Vernon])

Comment: In addition there is no safe way to reverse engineer the nuclear fission reaction once it is started in nuclear reaction. Dr. Rhada R. Roy, nuclear physicist, proposed the Roy Process to reverse engineer nuclear waste, yet to date the Roy Process has never been considered. Since even if reverse engineering was possible, under the current regulations it could never be realized, since the only permissible method for dealing with spent fuel is limited to burial. (0611-29 [Shapiro, Susan])

Comment: The Department of Homeland Security, FEMA, Department of the Interior Department of Agriculture, Department of Energy and Department of Defense need to be actively engaged in any and all decisions regarding long term nuclear waste storage. (0611-51 [Shapiro, Susan])

Comment: Establish a independent Nuclear Waste Administration, whose participants must include the Reactor community. The Blue Ribbon Commission's most valuable finding was that waste storage issue need to be consent-based and include buy in by the local communities/Reactor communities must have equal representation in any waste storage decisions. Non binding consultation with reactor communities does no provide adequate consent. It is necessary to establish a permanent Nuclear Waste Administration Board which will include equal number of Reactor community stakeholders and industry stakeholder. (0611-57 [Shapiro, Susan])

Comment: In November, I attended the NRC Waste Confidence hearing in Oak Brook, Illinois. I wanted to hear what everyone had to say. Attending there, were a majority of antinuclear citizens and a minority of attendees who were clearly paid by Exelon to testify. Over and over, those young nuclear engineers who were so hubristic to state that they have total confidence in their nuclear plants, and have no questions as to its safety clearly do not know the history of nuclear plants in the state of Illinois nor the history or narratives of those communities surrounding nuclear plants in the state of Illinois. No comments by those bought by Exelon reflected any nuanced opinion with an iota of a doubt of the complexity of the energy situation that we are presented with here. (0612-2 [Takarabe, Tamae])

Comment: There was an Exelon employee who claimed that the government had enough funds to mop up a nuclear disaster. With our government in its precarious financial situation and with the state of Illinois in such financial dire straights, I wonder if those funds are actually there, and if such a disaster were to happen, is it enough? This may seem like an aside, but when Kurt Vonnegut was an anthropology graduate student at the University of Chicago, in the late 1940's, the physics department at the university claimed that it had achieved total knowledge in the realm of physics. Today, and yesterday, all of us know that, science had just started to scratch the surface of what will be discovered in the following 70 years in physics. (0612-4 [Takarabe, Tamae])

Comment: Every other one of NEI's claims is similarly twisted logic and should not be considered. NEI has a vested interest in the outcome of this WCD and has exhibited bias in favor of the nuclear industry which funds them, instead of in favor of public safety, at every juncture in these proceedings. (0616-9 [Hoffman, Ace])

Comment: In addition to a real plan like that outlined above [a plan for consolidated interim storage on Federally-owned lands], here are some more suggestions: (1) The plan should specify close cooperation with local cities and towns. (0618-10 [Johnson, Roger])

Comment: [I respectfully urge the Commission to] Conduct site-specific assessment of existing storage systems and require tighter controls on fuel in pools[.] (0620-13 [Rivera, Evelyn])

Comment: [I respectfully urge the Commission to] Modify its proposal to state that there no longer exists a basis for waste confidence, and propose the U.S. Congress amend the Nuclear Waste Policy Act to require specific, achievable plans for permanent disposition of nuclear waste before any new permits are granted to create it. (0620-15 [Rivera, Evelyn])

Comment: This is similar to the ongoing unwillingness of our nation's legislative and executive representatives to recognize the threats from this waste issue over multiple decades and address the situation before the interests of the industry. The human and civil rights of all people have been declared to be "without standing" in the context of these proceedings. The laws that created the NRC and endowed it with its "independent" status, legalized the production of massive quantities of radioactivity by an industry which has no concern about, responsibility or legal liability for deadly consequences of its actions by virtue of being "regulated" by an agency of the government and has assured its deployment across the country via a licensing process which routinely downplays those impacts. (0620-8 [Rivera, Evelyn])

Comment: Any operation that generates spent nuclear fuel should be located far from any productive farm land and far from any populated area to mitigate the damage done in event of loss of cooling to spent Nuclear fuel. (0634-10 [Cato, Michael])

Comment: The private sector should have to provide unsubsidised private insurance to cover the costs of any disaster involving storage of spent nuclear fuel. This is vital if safety is to be taken as seriously as it should be. There should be no legislative limits on liability in event of an accident. (0634-12 [Cato, Michael])

Comment: In fact it should be generated away from population centres and farm land in the first place, as it is very difficult to move when hot, which is when it is difficult to manage and potentially very dangerous. (0634-3 [Cato, Michael])

Comment: In order to ensure private nuclear power suppliers and private handlers of spent nuclear fuel take safety seriously in their businesses, the government should not provide free insurance for accidents, or limit liability for private entities running waste producing nuclear facilities such as power plants, or to private entities storing nuclear waste. The increased costs of gaining private insurance, and the monitoring that comes with that will undoubtedly be greater motivation to take safety much more seriously than has been the case in the past. Three mile Island, Chernobyl and now Fukushima being the most public examples of how important every motivation to keep storage of waste , and facilities that generate that waste as safe as possible. (0634-4 [Cato, Michael])

Comment: Nuclear contamination of food is very serious, and storage of nuclear waste has to be as safe as possible. The consequences are so costly for a mistake with for example recently used nuclear fuel, that it is reasonable to spend vast sums of money to make it as safe as possible. If the private sector is unwilling to take the risk to store fuel safely without legislative insurance subsidies limiting their liability, then the government should take control of the rad waste problem. There should be no legal limits placed on liability with regard to storage accidents. To limit liability is to shield the private sector from a powerful motivating factor to get their storage up to a safe standard. The public deserve better than that. (0634-8 [Cato, Michael])

Comment: Xcel Energy has participated in the preparation of and has carefully reviewed the comments filed by the Nuclear Energy Institute by letter dated December 20, 2013. We fully subscribe to and adopt those comments. (0638-3 [Glass, Peter])

Comment: It needs to be pointed out that claims made by the Nuclear Energy Institute are nothing but self-serving business PR. Their claims consist of twisted logic and should not be considered. Of course the NEI has a vested interest in the outcome of this Waste Confidence Decision. Of course the NEI. shows bias at every juncture in favor of the nuclear industry (which funds them). (0640-8 [Geary, B.])

Comment: The majority of Americans, both Liberal and Conservative, do not care about Party Politics when it comes to something as important as our countries energy future and safety thereof. We must use the findings of our trusted "scientists" who have done the work already and the rest of the world who has recycled fuels for 30+ years and move forward with the U.S. solution. We started making terrible political decisions in the 1970s, which has now spiraled in to a political game for some politicians, which must stop. Much of the rest of the world recycles spent nuclear fuel safely and without proliferation incident, the science and facts are not different here in the U.S. than the rest of the world, so quit squandering our U.S. tax Utilities funds and get back to work on the obvious solutions, Please!!!. (0644-3 [Chunglo, Steve])

Comment: ANA supports independent state and federal regulation of SNF storage and disposal facilities. Independent regulation is essential for technically sound nuclear waste facilities, confidence in the competence and oversight of their management, and to ensure effective public participation and accountability. Fifty years of little or no regulation of nuclear weapons facilities resulted in contamination of those sites that will take decades and hundreds of billions of dollars to address. Additional legislation is required to establish a robust regulatory regime, which must include elimination of the pre-emption of state and federal regulation of radionuclides. (0646-10 [Hanson, Courtney])

Comment: ANA opposes reprocessing. Reprocessing for nuclear weapons accounts for much of the contamination at DOE sites, and the HLW from reprocessing remains an immediate and long-term health and environmental threat. Commercial reprocessing at West Valley, New York, also was an environmental and economic disaster that remains a burden. It is clear that fissile materials should not be separated from spent fuel. ANA is aware that consolidated SNF storage is seen by some as a way to promote reprocessing. For example, the SRS Community Reuse Organization report of March 2013 endorsed a linkage between spent fuel storage and reprocessing. (0646-12 [Hanson, Courtney])

Comment: ANA opposes expanding the mission of the Waste Isolation Pilot Plant (WIPP) to include disposal of commercial waste or high-level waste. Since 1979, federal law has limited WIPP to handling defense transuranic waste. It would do great damage to the credibility of laws and agreements covering any future nuclear waste storage or disposal site if the WIPP mission were changed. Moreover, WIPP is technically precluded from accepting such waste because of various deficiencies, including that it is surrounded by many oil and gas wells and that bedded salt is rapidly deformed by thermally hot waste. (0646-13 [Hanson, Courtney])

Comment: ANA supports a sustainable energy policy that focuses on increased energy efficiency and clean renewable energy technologies. (0646-15 [Hanson, Courtney])

Comment: The Department of Energy (DOE) has approximately 90 million gallons of HLW; most is stored in more than 230 tanks at Hanford, Washington; Savannah River Site, South Carolina; and Idaho National Lab, Idaho. DOE also manages about 2,500 metric tons of SNF. About 70,000 metric tons of commercial SNF is primarily stored at the reactor sites; about 2,000 metric tons more commercial SNF is created each year. ANA supports improved storage for HLW liquids and sludges immediately and solidification of those wastes as soon as possible. ANA recognizes that HLW and SNF will continue to be stored at DOE sites for decades. (0646-24 [Hanson, Courtney])

Comment: ANA supports scientifically sound, publicly accepted environmental protection standards before any SNF disposal site selection activities begin. The Environmental Protection Agency (EPA) should engage in a rulemaking process to establish new disposal standards.

That process requires adequate funding from Congress. EPA standards should be in place before any siting work commences so that generic standards guide the site selection process. (0646-7 [Hanson, Courtney])

Comment: Dear NRC: your proposed decision with regard to storage of nuclear waste at San Onofre shows that you are not being professional or competent in your duties! Your sworn duty is to protect the public, not to rubber-stamp the industry agenda. If you're only going to rubber-stamp, then why are you in this job? (0649-1 [Imhoof, Christina])

Comment: The US policy concerning radioactive "waste" (terminology somewhat akin to the term "side-effects" of medications, as if they are inconsequential -- when they are actually just not the effects being marketed to consumers) has always been woefully negligent from a standpoint of public safety, is apparently being considered by the NRC to be doubled-down on. Polite discourse has not the means to express my derision of you as individuals for being lap-dogs for a nuclear industry that is headed by military-state maniacs. It makes me wish there truly was a God, so that there would be a Hell for you and they to spend eternity in for what you have done to endanger life on this planet. (0651-1 [Wells, Jim])

Comment: I once studied nuclear chemistry, and performed some laboratory work in the field. It seemed (and seems) to me that enormous amounts of research money went in to discovering commercial applications, and almost zero into how to deal with its consequences responsibly, Being true alchemy and having the unlimited funding behind it of the Pentagon, the only true barrier to having concurrently figured out how to completely de-toxify any and all nuclear material was will -- which to say was sorely lacking is an understatement, because it was purposefully ignored. The shame on you all for that only scratches the surface of the personal consequences you deserve. (0651-2 [Wells, Jim])

Comment: Do the right thing!! (0661-1 [Individual, Anonymous])

Comment: The Price Anderson Act should be repealed. The nuclear facilities should have their own insurance of at least \$1 trillion to \$9 trillion per reactor based on their location. Stop nuclear bailouts and welfare to the nuclear industry. Enact curie limitation. Enough curies have already been produced. (0662-11 [McClintock, Francene])

Comment: Defense should phase out/decommission nuclear weapons ASAP. (0662-13 [McClintock, Francene])

Comment: The new organization [as recommended by the Blue Ribbon Commission] should be enacted through the legislative branch, not the executive. More public hearings and public access to reports/meetings is needed. The public has a right to comment on appointees. The agency should be in charge of all waste including low level waste buried in trenches, which needs to be exhumed. (0662-14 [McClintock, Francene])

Comment: Knowing that radionuclides such as Iodine-129 with a 1/2 life of 15.9 million years and Technetium-99 with a 1/2 life of 213,000 years will be contained in this repository and that nuclear waste must be isolated from the environment for at least 10 - 20 times the 1/2 life of the radionuclide, also known as it's hazardous life, the law should be changed. Current law only states that high-level waste should be isolated from the biosphere for 10,000 years. Since we know this is impossible, we should at least admit that to ourselves and stop the deceit and cover-up. (0662-7 [McClintock, Francene])

Comment: Nuclear industry comments on the proposed Waste Confidence rule are being provided under the auspices of the Nuclear Energy Institute (NEI), and Duke Energy endorses those industry comments. (0672-1 [Jamil, Dhiaa])

Comment: We can use our spent fuel to generate more energy and, in the process, reduce the amount of waste and the longevity of the waste (right now we have to store waste for a set period of time, but we could substantially reduce that time period by using up the long-lived waste and turning it into energy). Recycling is currently utilized in France and has been done for decades. Recycling nuclear waste is an option available for us (in the U.S.) in the future[.] (0674-3 [Lang, Amanda])

Comment: The other important policy needed to support renewable energy is expansion of the transmission grid. We have heard the comment that since adequate transmission is not available right now we need to continue to expand the use of nuclear energy. That comment is incorrect for two reasons. First, expanded transmission is occurring right now. The Federal Energy Regulatory Commission (FERC) has over the past few years adopted policies to promote expansion of transmission lines. The most recent FERC action is Order 1000 adopted on July 21, 2011. And every area of the country has a regional transmission organization (RTO) that promotes and coordinates expanded transmission in each respective region. In the Midwest, for example, the Midwest RTO (MISO) has approved a number of transmission expansion projects designed to accommodate increased renewable energy production and they are ready for regulatory approval. Second, it takes at least 10 years for a new nuclear plant to be licensed and put on line. New transmission will begin to be constructed within the next year or two, long before we would gain any alleged benefit from additional nuclear power. Furthermore, a new nuclear plant, which would not be needed when renewable energy becomes dominant, would be licensed for probably 40 years and undoubtedly relicensed for another 20 years. We would be stuck with 60 more years of radioactive waste that could be avoided with the right policies supporting renewable energy. (0688-21 [Taylor, Wallace])

Comment: Finally, we have reviewed the comments being submitted by Diane Curran and colleagues, along with expert declarations, on behalf of various environmental groups and organizations. The Sierra Club Nuclear Free Campaign agrees with and adopts those comments and declarations. (0688-22 [Taylor, Wallace])

Comment: •My comment of February 17, 2012²⁵ [footnote 25 text: Available in ADAMS (<http://adams.nrc.gov/wba/>) at Accession Number ML12052A045.]("Rather than expend limited resources on efforts to extend the time that increasing quantities of spent nuclear fuel may be stored at the nation's reactor plant sites . . . the NRC should simply proceed to comply with Section 114(d) of the Nuclear Waste Policy Act of 1982, as amended (NWPA)" (footnote omitted)); and •The D.C. Circuit Court's Order, dated August 3, 2012, holding the mandamus proceeding in abeyance (as described in *In re: Aiken County*: "[W]e followed a cautious approach in our decision more than a year ago when we declined to issue mandamus against the Commission at that time. But the Court's majority clearly warned that mandamus would eventually have to be granted if the Commission did not act or if Congress did not change the law. Since then, despite the clear warning, the Commission has still not complied with the statutory mandate. On the contrary, the Commission has reaffirmed that it has no plans to comply with the statutory mandate. In the face of such deliberate and continued agency disregard of a statutory mandate, our precedents strongly support a writ of mandamus."). Given all these clear and conspicuous indicators, and NRC's actions and inactions in response thereto, over the course of 41 months,²⁶ [footnote 26 text: That is, from NUREG-1100, Vol. 26, dated February 2010 to *In re: Aiken County*, dated August 13, 2013.] it is reasonable to question

whether NRC has sufficiently robust management and oversight systems to identify what compliance looks like. (0692-12 [Skov, Jeff])

Comment: We would like to emphasize that reprocessing generates more nuclear waste than you start with, that the experimental reprocessing at West Valley, NY was a failure that left a completely contaminated site that we are having enormous difficulty getting properly cleaned up, partly due to inadequate funding. (0693-4-9 [Warren, Barbara])

Comment: There is no way to safely store the waste! Please fully inspect all existing plants & their processes. (0696-2 [Becker, Joanna])

Comment: Entergy agrees with the NRC Staff⁴⁹ [footnote 49 text: *Id.*] and NEI⁵⁰ [footnote 50 text: NEI Comments.] that the indefinite storage scenario is not likely to occur. (0697-1-27 [Bessette, Paul] [Kuyler, Raphael])

Comment: A central Long Term Storage site must be found north of Lake Okeechobee in a location that is 1,000 feet high and inland from I-95. The spent fuel should be transported up The Florida Turnpike to somewhere around Sebring or north up Hwy 27. I-95 goes through downtown Miami and has increased traffic and more accidents which makes the Turnpike the preferred route. North Florida or south Georgia would be less populated but the long distance would rule that area out. Both South Florida Nuclear Power Plants have been lucky to not have had a hurricane storm surge hit them yet. (0701-14 [Wilson, Greg])

Comment: A solution for the Nuclear Spent Fuel problem must include a method to render spent fuel back into a harmless material in the near future. (0701-5 [Wilson, Greg])

Comment: Also, consolidated storage is a bad idea. We don't need a bunch "temporary" storage sites around the country, with their associated transportation risks. These risks would be even greater for "centralized interim storage". (0702-4 [Scarff, Steve])

Comment: The continuation of the nuclear program must require industry to rise to a level it has never been called to do before, and it is up to the NRC to raise the calling of the industry players to more fully be responsible for their participation in that industry. If the NRC cannot do that, then likely Fukushima will be our last opportunity to learn a lesson about nuclear power here on earth. Maintaining or diminishing current regulatory levels that created the present on-going nuclear waste confidence issue will produce more of the same. (0703-4 [Vandel, Nikohl] [Vandenberg Clermont, Elaine])

Comment: The problem with reading something like the Federal Register is that there are so many voices involved in the writing, there is no "bottom line" its like a "middle ground" at best.* Unfortunately for the #GlobalNuclearIndustry, they are irresponsible stakeholders and their input to the voice of the Federal Register is too loud for the #commondefense of our nation, and in truth, our planet. But, I'm just sayin'.... (0703-5 [Vandel, Nikohl] [Vandenberg Clermont, Elaine])

Comment: I believe that if the US NRC wants to be a major player in the global scene, it is time for it to empower itself to that level and take a bold role of leadership amongst its peers, and support in common those with whom humanity's "common defense" is held, the Original Nations, the United Nations and other globally recognized governments -- as opposed to those global economic clubs we seem to mostly be beholden to because ??!!! (tangent, I know.) (0703-8 [Vandel, Nikohl] [Vandenberg Clermont, Elaine])

Comment: I am writing to express my disagreement with the NEI's recommendations and encourage the NRC to proceed with utmost caution, placing public safety above all other concerns. (0705-1 [Spring, Janet])

Comment: NEI is clearly prejudiced in favor of the nuclear industry. Its biases should not be allowed to influence public policy. The NRC should investigate all sources of information and make a cautious decision that prioritizes public safety. (0705-6 [Spring, Janet])

Comment: NRC should immediately commence a draft rulemaking process to rectify its deficiencies. (0706-3-16 [Fettus, Geoffrey])

Comment: Policy Statement, Licensing and Regulatory Policy and Procedures for Environmental Protection; Uranium Fuel Cycle Impacts, 47 Fed. Reg. 50,591, 50,593 (Nov. 11, 1982). In the 1990 update to the Waste Confidence Rule, the Commission also acknowledged that if it were to change its waste confidence decision, it would have to revisit the adequacy of Table S-3. 55 Fed. Reg. at 38,490. The NRC has not meaningfully updated Table S-3 or WASH-1248 for decades. As the Commission explained, a planned update: [w]as delayed because, by the mid-1980's, there were no new applications for construction of nuclear power plants, nor, at that time, were any future ones predicted. Consequently, there was no regulatory need to update Table S-3 and competing priorities for rulemaking resources eventually resulted in the cessation of activities on the table. Since the mid-1980's, the NRC has revisited the issue of revising the value for radon-222 in Table S-3 on more than one occasion, but in each case higher priority rulemakings led to a halt in these efforts. *New England Coalition on Nuclear Pollution; Denial of Petition for Rulemaking*, 73 Fed. Reg. 14,946, 14,947 (March 20, 2008). (0706-5-1 [Fettus, Geoffrey])

Comment: 2. The Baltimore Gas & Electric Decision[.] As described above, in 1979, NRC published its final Table S-3 rule. 44 Fed. Reg. 45362 et seq. (1979). Table S-3 is, in brief, a numerical compilation of the NRC's estimates of resources used and effluents released by fuel cycle activities supporting a year's operation of a typical light water reactor. From this, the NRC decided that NRC Licensing Boards should assume, for the purposes of NEPA review, that permanent storage of nuclear waste would have no significant environmental impact (the so-called "zero release assumption"), reactor operations would have no significant impact on the environment, and thus none of these issues should affect the decision whether to license nuclear power plants. NRDC and the State of New York challenged Table S-3 as a violation of NEPA and the Administrative Procedures Act (APA), the proceedings were combined, and ultimately, the Supreme Court ruled on the issue. At the "heart of the dispute" was the viability of Table S-3, 44 Fed. Reg. 45362 et seq. (1979). *Baltimore Gas & Electric v. NRDC*, 462 U.S. 87 (1983). The Supreme Court reversed a Court of Appeals ruling for NRDC and New York, finding that the NRC, in its final S-3 Table, "summarized the major uncertainties of long-term storage of nuclear wastes, noted that the probability of intrusion was small, and found the evidence 'tentative but favorable' that an appropriate storage site could be found." *Id.* at 87. The central holding of BG&E is straightforward – the NRC complied with NEPA's requirements of consideration and disclosure of the environmental impacts of its licensing decisions. *Id.* at 88. But as discussed in comments below, the fundamental bases upon which the Supreme Court relied to find the NRC's actions lawful are no longer valid or applicable, and such a situation has a significant impact on the NRC's NEPA obligations for the relicensing of existing facilities and licensing of new facilities. (0706-5-2 [Fettus, Geoffrey])

Comment: a. The rationale for the BG&E decision no longer spares NRC from having to perform a GEIS/NEPA review for addressing the environmental impacts of the storage of

nuclear waste[.] In 1983, the Supreme Court found that the NRC, in its final S-3 Table, "summarized the major uncertainties of long-term storage of nuclear wastes, noted that the probability of intrusion was small, and found the evidence 'tentative but favorable' that an appropriate storage site could be found." *BG&E v. NRDC*, 462 U.S. at 87. The central holding of *BG&E* is straightforward -- the NRC complied with NEPA's requirements of consideration and disclosure of the environmental impacts of its licensing decisions." *Id.* at 88. But in dicta, the Supreme Court explained that the zero-release assumption and, indeed, the entirety of Table S-3 rule was made for a limited purpose, and that it would be supplemented with an explanatory narrative. *Id.* at 101. Also, a separate and comprehensive set of programs has been undertaken to serve the broader purposes of long-term waste disposal technology and site selection. *Id.* See note 1, *supra*. Second, the Court emphasized that the zero-release assumption is but a single figure in an entire Table, which the Commission expressly designed as a risk-averse estimate of the environmental impact of the fuel cycle. *Id.* at 102 and 103. And third, the Court was careful not to tread into the area of the NRC's special expertise. *Id.* The crucial bases for the Supreme Court's decision to uphold the NRC's defense of the validity of Table S-3 are no longer valid, and the NRC must revisit this decades-old Table S-3 and all associated decisions regarding the environmental impacts of the uranium fuel cycle with new, "hard look" NEPA review. As the Court itself noted, "no one suggests that the uncertainties are trivial or the potential effects insignificant if time proves the zero-release assumption to have been seriously wrong. After confronting the issue, though, the Commission has determined that the uncertainties concerning the development of nuclear waste storage facilities are not sufficient to affect the outcome of any individual licensing decision." *Id.* at 98 (emphasis added). (0706-5-4 [Fettus, Geoffrey])

Comment: b. The bases for Table S-3, including the zero release assumption, are no longer technically supportable, accurate or consistent with policy[.] At the time of *BG&E* decision, the NRC considered bedded salt as suitable for disposal either of reprocessed high-level waste or un-reprocessed spent fuel. Yet, the Proposed Waste Confidence rule of 2008 states that salt formations are not being considered for spent fuel disposal for technical reasons. Hence, the technical underpinning of Table S-3 is inconsistent with current law and the NRC's own understanding of salt repositories. Indeed, disposal in salt, which was the original basis for the S-3 Table in estimating the environmental impact of high-level waste or spent fuel disposal, is only considered suitable for high-level waste resulting from reprocessing, but reprocessing is not the current policy, and nor should it be.⁴⁸ [footnote 48 text: Spent-fuel reprocessing and plutonium-fueled fast reactors are well-proven commercial disasters. The United States, Europe, and Japan spent tens of billions of dollars in the 1970s and 1980s trying to develop plutonium fast-breeder reactors (like the proposed Global Nuclear Energy Partnership "advanced burner reactors," but with uranium "blankets" added to "breed" more plutonium than is consumed in the reactor). These fast reactors proved to be uneconomical, highly unreliable, and prone to fires due to leaking liquid sodium coolant, which burns spontaneously when it comes in contact with air or water. For a full discussion, see <http://www.nrdc.org/nuclear/gnep/agnep.asp>.] Rather, direct disposal of spent fuel, for which the NRC would not consider salt formation, is now the current policy. (0706-5-5 [Fettus, Geoffrey])

Comment: More pointedly, presuming "zero release" of radioactivity when disposing of spent fuel runs directly counter to all established scientific understanding of the expected performance of any geologic setting. One glance at Appendix A to this filing demonstrates this fact. Radioactivity will be released from a repository – the dose and timing of such release is a matter for standards and licensing, but the point remains. Radioactive dose is the result of positive releases of radionuclides into the human environment. As far back as 1983, the report on geologic isolation prepared for the DOE by the National Research Council shows positive doses

attributable to both fission products as well as actinides in un-reprocessed spent fuel as well as from fission products in reprocessed high-level waste in all settings other than salt that were evaluated – tuff, granite, and basalt. The Supreme Court's concerns – that the problems would be neither trivial nor insignificant if the zero-release assumption turned out to be wrong – were well taken. Where, for example, is the Commission's analysis of the estimated range in the collective dose from the proposed Yucca Mountain repository, and what is the basis for concluding that the Table S-3 is still valid in light of this collective dose range? Moreover, the original scope of Table S-3 (and the underlying document in WASH-1248) is inadequate and outdated. Along with failing to address the environmental impacts of spent fuel disposal, the table looks only at the health impacts of an individual plant licensing decision. The Table fails to account for the cumulative impacts of licensing many plants, the economic costs of disposing of all waste generated by the uranium fuel cycle, or even adding those costs to the other costs of a nuclear power plant. Nor does the Table compare the total costs of building and operating a new nuclear facility (and ultimately disposing of associated waste and funding the decommissioning costs) with the costs of the no action alternative or with other alternative sources of energy. (0706-5-6 [Fettus, Geoffrey])

Comment: Oppose any proposal to transport and stockpile nuclear waste at interim sites throughout the country. This proposal is risky and unnecessary and it therefore should not be seriously considered. (0707-6 [Werner, Shahla M.]

Comment: Every (other) one of NEI's claims is (similarly) twisted logic and should not be considered. NEI has a vested interest in the outcome of this WCD and has exhibited bias in favor of the nuclear industry which funds them, instead of in favor of public safety, at every juncture in these proceedings. (0709-9 [Wythe Elnagar, Romi])

Comment: NRC expressly excludes reprocessing of commercial nuclear waste and the reprocessing waste that results from this GEIS ^{xviii} [footnote xviii text: NUREG 2157 page xxv “ES.6 What is Not Covered in the Draft GEIS? The NRC is evaluating the continued storage of commercial spent fuel in this draft GEIS. Thus, certain topics are not addressed because they are not within the scope of this review. These topics include: •noncommercial spent fuel (e.g., defense waste) •commercial high-level waste generated from reprocessing • Greater-than-Class-C waste •foreign spent fuel stored in the United States • need for nuclear power •reprocessing of commercial spent fuel.] Nonetheless, NRC has engaged in meetings considering new regulations specifically for licensing of reprocessing factories. NRC should not foster plutonium separation as a waste "management" option. NRC says it does not set policy, so NRC should stay out of the geopolitics of plutonium. We reject any promotion of the idea (by any party) that increasing the volume and destabilizing its form further in order to separate plutonium improves the confidence that this waste will not pose a threat to public health and safety. Plutonium separation is a direct threat to global stability and liquid, caustic forms of this waste are worse than fragile fuel rods. We reject the idea that corporations should be allowed to use fission, or generate new or extract plutonium at all. (0711-22 [Olson, Mary])

Comment: Where has US NRC considered incorporation of the Principles of Precaution in its regulatory role? (0711-27 [Olson, Mary])

Comment: Nuclear proponents feel the need to reassure decision-makers and the public that nuclear waste is not an insuperable problem, because otherwise their industry has no future. This creates a conflict of interest that has clouded the judgment of nuclear proponents and led them to make a number of exaggerated and unsupportable claims that are not scientifically verifiable. Law-makers have been misled into enacting legislation obligating the federal

government to "dispose" of the industry's irradiated nuclear fuel, based on false assurances from the industry that the disposal problem had been solved, when in fact it had not been solved and is still not solved. Decision makers have placed their trust in nuclear proponents who have been more concerned with meeting the public relations needs of the industry than the long-term safety concerns associated with the ever-growing inventories of highly radiotoxic and indestructible waste byproducts. The NRC should not allow itself to be a party to this deception. (0714-1-18 [Edwards, Gordon])

Comment: The NRC's job is to protect the public health and safety and to protect the environment over the long term. To carry out its responsibilities NRC must rely on sound science and develop prudent policies for the future, undeterred by the industry's perceived public relations needs. (0714-1-20 [Edwards, Gordon])

Comment: *NRC lacks a demonstrated safety culture by its own definition. It therefore is in no position to be responsible for the institutional management of spent-fuel into the indefinite future.* At a meeting between NRC and Entergy Corporation at the Palisades NPP in Sept., 2012, NRC attempted to define for Entergy what it meant by having a "nuclear safety culture": *"Nuclear Safety Culture is the core values and behaviors resulting from a collective commitment by leaders and individuals to emphasize safety over competing goals to ensure protection of people and the environment."* [NRC side show, Palisades reactor presentation, 9/12/12] In further dialog and exposition on the topic, then-Region III Director Chuck Casto offered that it meant, "Going beyond what's required." NEIS pointed out to NRC and those present that, by this very definition, NRC itself possesses no "nuclear safety culture," since it repeatedly allowed innumerable "competing goals" – utility profits, production and operation timelines, strict adherence to unreasonable comment periods, numerous license waivers and variances, unwillingness to adopt the precautionary principle, even after Fukushima, etc., as examples --to govern its behavior and decision making, none of which were for the public good. d.) *"Betrayal is a solid rational basis for distrust."* – *journalist and author William Boardman*[.] Subsequent actions or lack of actions (and certainly many previously documented ones) on the part of NRC have borne out the accuracy of the above criticism. (0716-18 [Kraft, Dave])

Comment: •By a 4 to 1 vote, the Commission voted against quicker implementation of Fukushima lessons learned, delaying them at U.S. Fukushima-designed reactors for up to 6 years. Those four Commissioners later forced out the Commission Chair Gregory Jaczko – the only one in favor of more rapid implementation of safety measures. According to authors John Byrne and Steven Hoffman, since the 1980s the NRC has generally favored the interests of nuclear industry and has been unduly responsive to industry concerns. The NRC has often failed to pursue tough regulation. At the same time, it has sought to hamper or deny public access to the regulatory process and created new barriers to public participation. (Source: *Governing the Atom: The Politics of Risk*, 1996)[.] •The number of safety violations at U.S. nuclear power plants varies dramatically from region to region, pointing to inconsistent enforcement in an industry now operating mostly beyond its original 40-year licenses, according to a congressional study awaiting release...the reasons aren't fully understood because the NRC has never fully studied them, the report says. Right now, its authors wrote, the "NRC cannot ensure that oversight efforts are objective and consistent." (Source: "Uneven enforcement suspected at nuclear plants," AP, Oct. 16, 2013)[.] (0716-20 [Kraft, Dave])

Comment: •"In a letter submitted Friday afternoon to internal investigators at the Nuclear Regulatory Commission, a whistleblower engineer within the agency accused regulators of deliberately covering up information relating to the vulnerability of U.S. nuclear power facilities that sit downstream from large dams and reservoirs. The letter also accuses the agency of

failing to act to correct these vulnerabilities despite being aware of the risks for years." (Source: Flood Threat To Nuclear Plants Covered Up By Regulators, NRC Whistleblower Claims, Huffington Post, Sept. 14, 2012)[.] •"A separate former senior Democratic aide who has worked with Jaczko, Magwood and Flint said that Yucca is the impetus for the industry's opposition to the outgoing chairman. "Magwood "and the industry hate Greg because they think he was put on the commission by Reid, who's anti-Yucca, and he's gonna be a Reid stooge. And you know what? They're f*cking right," the former aide said. "That's exactly why he was put on there. But that commission and that agency were complete and total captives of the nuclear industry. One and the same." (Source: "Nuclear Regulatory Commission Chairman Steps Down," Ryan Grim, Huffington Post, May 21, 2012)[.] While NRC may be legally charged with regulating the nuclear industry, and in completing the DGEIS and mandates emanating from the New York Court decision of 2012, the responsible thing for NRC to do would be to inform Congress of its incapacity to carry out such responsibilities absent a safety culture; recuse itself from future efforts on the DGEIA; and appoint, assign, or recruit an independent public research body to conduct such efforts. We would be happy to provide references for such a public body. (0716-22 [Kraft, Dave])

Comment: Our health is being compromised. Witness the leukemia studies conducted not only in England and France, but the one here in Illinois focused on the Clinton reactor. (0722-3 [Headington, Maureen])

Comment: You make nuclear regulation look ridiculous. For shame, NRC. (0723-6 [Shadis, Raymond])

Comment: Its way past the time to begin putting PUBLIC SAFETY FIRST! For years people of the state of California and beyond have shouted against the insanity that is the NRC! Building plants on/near earthquake faults, having substandard safety regulations, and inept people in very important positions regarding PUBLIC HEALTH & SAFETY!! It's time to rethink the entire industry and its use of nuclear materials and how where why it is properly disposed of (if there is even such a thing).. We are watching and your actions and decisions will weigh heavily on us and the future generations you impact! (0731-2 [Brotine, Howard])

Comment: I testified at the Minnetonka, Minnesota meeting Dec 4, 2013. And a date I quoted was wrong! I said 1876 and meant to say 1871!, in reference to the law that gives corporations the rights of "persons." Persons are human beings. This business and other fossil fuel industries are guilty of laws against humanity and nature. Their politics are extremely TOXIC and defies the BILL of Rights, and they abuse the English language in the courts! Mr. President, Senators, Congressmen and women, NRC....Admit a mistake has been made. "Move to Amend" the 1871 Law that gives anyone the right to foreclose on the FUTURE! ON HUMANITY, ON ALL LIFE! (0744-14 [Bonniwell, Colleen])

Comment: Consider EMOTO's science. Base economic markets on cooperatives, renewable energies and sustainable agriculture. ECO SAFE! With access to pure water for all life. (0744-4 [Bonniwell, Colleen])

Comment: No interim storage. Do not force the waste on any state domestic or International. More time is needed for these determinations to get it RIGHT! From now forward - remove the corruption in this industry allow the people to secure the future that these Industries had and have threatened. The people know! (0744-7 [Bonniwell, Colleen])

Comment: AREVA is in agreement with and endorses the comments submitted by the Nuclear Energy Institute (NEI). (0745-1 [Kelley, Devin])

Comment: The agency of the Nuclear Regulatory Commission under the U.S. Constitutional dictates of its administrative law responsibilities have failed in their responsibilities to protect the Inalienable Rights of Citizens of these United States. (0750-2 [August, Bernard])

Comment: The NRC and this "Waste Confidence Hearing Process" is a sham publicity stunt ". Their are hundreds, if not thousand of studies done on the issues of nuclear waste from the nuclear fuel cycle processes. And billions of dollars already spent on the nuclear waste problem and no remediation in sight for this (at a minimum) 200,000 year problem. The Nuclear Regulatory Commission must be replace with a truly transparent body and not a "revolving door of inside lobbyist from the" Nuclear Energy Institute" and their "associated industries". This is a world wide issue... Only a world wide collaboration through a fair and just political economy will re-mediate the nuclear waste problem . The Nuclear Regulatory Commission and Its" "current mindset" must be decommissioned. (0750-3 [August, Bernard])

Comment: In addition, inspections on the current active power plants are needed to assure safety for all of us. (0752-2 [Abdro, Ann])

Comment: We do not have safe and secure heavy lift technology to remove these materials away from the biosphere (towards the sun) and storage has been the orphan of the industry since its inception. (0755-2 [Calnan, Christopher])

Comment: Decades of accidents and cover-ups in the " nuclear industry" sanctioned by military predominance must end today. Leaks in waterways like the Columbia River and Three Mile Island incident , are a legacy that is marred at best and still not studied as thoroughly as other more visible accidents in other countries such as Chernobyl ,then USSR. Thank our Founding Fathers for the insight to build such a thoughtful constitution for this country ,which allows for mistakes and the power to learn from them. This allows for true knowledge to pervade the American Experience and thankfully does not overtly sanction the Emperor/King Hidden new clothes syndrome. (0755-5 [Calnan, Christopher])

Comment: Dear NRC: your proposed decision with regard to storage of nuclear waste at San Onofre shows that you are not being professional or competent in your duties! Your sworn duty is to protect the public, not to rubber-stamp the industry agenda. If you're only going to rubber-stamp, then why are you in this job? (0776-1 [Kuttler, Eugenij])

Comment: What a sham the nuclear industry is. We cannot trust them. (0790-2 [Richardson, Carlos])

Comment: I am writing in strong support of the San Clemente City Council Resolution 13-53, and I strongly urge the NRC to make public safety its very highest priority, true to the mission with which it has been entrusted. (0796-1 [Hanna, Helen])

Comment: Our state government documents even indicate that California has plenty of power without nuclear. These facts must be taken into consideration. (0796-3 [Hanna, Helen])

Comment: For more than 60 years the nuclear industry has been producing nuclear waste. During the last 60 years this same industry has not come up with long-term solutions that are protective of human health and the environment for as long as the waste remains hazardous.

The primary reason industry has not created permanent protective solutions for radioactive waste is because the US Government has not forced the industry to create solutions to deal with this deadly waste. The NRC has an opportunity to end the 60 years of procrastination by demanding that industry store this waste, treat this waste so that is it protective to human health and the environment for as long as the waste remains hazardous. (0798-1 [deBruler, Gregory])

Comment: An Important Factor That Does Not Lend Itself to Generic Assessments[;] History of Neglect[.] Comment: Hallmarks of the nation's nuclear weapons program have been and still are extraordinarily sloppy record-keeping, careless handling of deadly materials, and blind faith in nature's ability to absorb anything. The Atomic Energy Commission (AEC) originally served as a watchdog and industry booster. The dual roles conflicted, so the Department of Energy (DOE) and the Nuclear Regulatory Commission (NRC) were created to separate them. Both maintain cozy, mutually-supportive relations with the industry and neither is known for trying to protect public health or, least of all, the well being of other living entities. (0805-4 [Wilshire, Howard])

Comment: I am not only for us, but for my children and future generations. I am so sick of saying this over and over. I don't want fracking in my country, I don't want my water and soil contaminated, I don't want GMOs in my food, and I want everyone to wake up to reality. (0806-1 [Jones, Angela])

Comment: We strongly support the written and verbal comments of the Prairie Island Indian Community and City of Red Wing. We urge a careful reading of the critique submitted by NAWO and Nukewatch, who have been 'on duty' for the public interest in nuclear safety and health issues, collectively, for over 60 years. (0820-5 [Eide-Tollefson, Kristen])

Comment: Tritium leakage happened at both Point Beach and Kewanee in Wisconsin. Worse yet, concerns about this tritium leakage were dismissed during license extension approval with the NRC claiming that license extension approval process was the inappropriate time to address concerns involving off-site contamination of drinking water with tritium. If the license extension approval process is the inappropriate time and the GEIS is the inappropriate time to address non-generic complaints, when is the appropriate time? How did the NRC get so bureaucratic that it has lost sight of what should be its primary duty to protect the public and environment safely? Sufficient oversight assessment requires the safety of environment and living organisms have highest placement as the highest priority on the decision tree. When safety of environment and living organisms including humanity sits at the top of the decision tree by its highest priority ranking, then it becomes the gatekeeper. When safety is the gatekeeper, it pre-empts insufficient safety and does not approve or extend licenses when a safe endpoint for storage and disposal of nuclear waste industry-wide remains unknown. (0823-11 [Michetti, Susan])

Comment: To the extent that NRC, along with other federal regulatory and consumer protection agencies, is not actively sufficiently collecting and sharing raw data about ionizing leaks in time, date, and location variables required for further scientific research and analysis (which can be used to expand our ability to protect the full environment and living organisms), that is the extent to which the NRC is standing in the way of the discovery of deeper and wider scientific knowledge about ionizing radiation and possibly the potential solutions to solve the horrendous problem of all of this lethal waste without any safety assurance case to be able to isolate and contain this waste for the full duration of its ionizing lives. (0823-20 [Michetti, Susan])

Comment: The failure to sufficiently collect and openly and transparently share the full sets of raw data required for moving forward constitutes a failure to approach a most highly scientific

and technological job in the most scientific and safest way. This inadequacy of raw data stands in the way of scientific progress and slows down improvements to safety. (0823-21 [Michetti, Susan])

Comment: The environmental assessment stage of rigorous rational scientific thinking requires developing an accurately valued decision tree as oversight priorities that serves as an appropriate gatekeeper. When we are dealing with safety from some of the most lethal and toxic substances on earth, safety assurances are very critical to survival and well-being of humanity and the environment. Safety assurances for the environment and humanity on this limited finite planet where all people breathe the same air and drink the water, logically, are assigned the highest value and the highest placement on the decision tree. The safety of whole interconnected environment on this finite earth planet, which is the only place we have to live, requires being assigned the highest value. Our whole interconnected environment consists of that which sustains all living organisms in survival, particularly including the high quality clean air in the atmosphere and the high drinking water quality in the water cycle. Without safety assurances, the survival of living organisms within the fragile environment may be critically threatened quickly from extremely lethal and toxic nuclear radio-nuclides; thereby, decisions determined by rational thinking assign the highest value to the critically important survival of humanity and other living organisms, which, in turn, requires safety of the complete environment of this physical world planet earth. The highest value is represented by the highest placement on the decision tree, which, in turn, provides appropriate oversight as the gatekeeper. (0823-3 [Michetti, Susan])

Comment: Appropriate decision-tree placement of environmental safety assurances in the highest position provides appropriate oversight as the gatekeeper of the path. The top of the decision tree begins with required logical pre-emption of dangerous unsolved problems with unknown solutions that get sent back, so to speak, to the "drawing board." Appropriate decision-tree placement and rational scientific thinking does not permit generation of lethal substances that cannot be safely contained throughout their full sets of life-times of thousands and millions of years because they are too dangerous for survival of well-being, health, and reproduction. When safety assurances are given their rightful weight and importance as the primary gatekeeper that drives possibilities in a properly designed scientific decision tree, logic recognizes that sufficient safety assurances would have preempted the most lethal substances on earth from being created in the first place. By logical corollary, only insufficient safety assurances allowed creation of lethal substances for which safe storage or disposal was unknown in the actual physical world. (0823-4 [Michetti, Susan])

Comment: Owners of nuclear power plants are too often not reporting problems accurately, timely, and completely with reliability and trustworthiness of integrity. Leaks require full identification of ionizing isotopes and their concentrations. The requirements of the NRC to protect the environment and public health necessitate that the NRC step up its enforcement actions to the point that complacency is eliminated. If owners of nuclear power plants do not take their responsibilities to the full environment and humanity with the honor of extreme seriousness and full honesty and transparency, then those plants require shut down. Other energy alternatives exist: solar and wind energy are readily available at reasonable costs without lethal risks to humanity and the environment. (0823-48 [Michetti, Susan])

Comment: If safety is an impossibility, we are left in a double-bind quandary. An irrational decision was made when the first nuclear power plants were licensed. That irrational decision arose from lack of rigorous and thorough assessment of the full set of potential impacts from start to ending of ionizing radiation. This involves the complete timeline into the distant future of

each set of each ionizing isotope's complete life span which goes thousands of years. This impossible problem originated with insufficient oversight. (0823-61 [Michetti, Susan])

Comment: Every licensing proceeding should review any safety considerations that are presented for scientific discovery surrounding unexamined assumptions that may introduce unreliability into the evidence and into the decisions, but this does not happen. (0823-70 [Michetti, Susan])

Comment: The extreme lethality of these most toxic substances on earth that, in turn, pose a most serious threat to the continuation of humanity deserves nothing less than complete, thorough, and rigorous scientific view of every detail. Anything less is negligent given the logical potential to wipe out humanity genetically; Malformed humans are already visible in the wake of Chernobyl. Scientific principles and analysis require constant hard work exploring attributes and characteristics with assorted measurements and their insights. Man-made failures with surprises, unpredictable events, and accidents emerge from inadequacies and lack of rigor in the scientific principles and thinking used for assessment, including insufficient testing and faulty application and maintenance; such errors arise from irrationality and the lack of wisdom in oversight. These man-made errors usually involve unexamined assumptions that were overlooked which resulted in accidents. Man-made accidents, even when extremes of climate change provide the final trigger, also likely point the path to lessons to learn to adapt increased safety, but this does not happen sufficiently. These safety issues, created by man's generation of unacceptable lethal toxics, can shed light on the possible discovery of new physical principles and deeper understanding of the information emerging from the data; but this doesn't happen sufficiently without complete transparency, honesty, and open-mindedness in search of environmental safety. Unanticipated weaknesses and structural flaws emerge from inadequate and incomplete scientific assessments where rigor and thoroughness was lacking or from inadequacies in product development and testing. The unknown requires identification and articulation to be accurately precise in scientific assessments. Anything less than complete openness and transparency in the application of the scientific method toward all details and analyses undermine, subvert, and distort scientific thinking and render it distorted and inferior to its full capacity to move us forward. Moving forward with reliable scientific progress requires openness with further testing, observation, and thinking, where the transparent attempts to identify the unknown are articulated as precisely as possible. (0823-71 [Michetti, Susan])

Comment: Moving forward involves the very dealing with the ugly problems transparently and openly that will generate the best responses that will lead to the best solutions. Lack of safety reliability usually emerges from human errors that distorted the accuracy, measurability, and repetitiveness of the Physical World and its physical laws of matter. Lack of reliability may emerge from physical changes that arose from that which was erroneously assumed to be constant, when what they required was additional scientific observation and verification of their constancy. Observations of the Physical World contains very wide and deep reliability in the behavior and reactions of its physical attributes, if considered sufficiently, from the atomic level up, excepting some deeper quantum phenomena and perhaps excepting black hole phenomena. (0823-73 [Michetti, Susan])

Comment: In order to more scientifically discover the facts of how solids, liquids, gases, chemicals, light, and other factors impact function, we request published and peer-reviewed high level scientific replicable research on toxicology, particularly that which involves all forms of various elements and any ionizing isotopes, manmade or found in nature, that are involved in the waste that requires a storage solution. (0823-80 [Michetti, Susan])

Comment: We call for research into the detailed significance of each residual adverse effect on the biophysical environment from any and all elements and ionizing isotopes as well as any other matter that require a long term storage solution. This includes geology, hydrogeology, surface water, terrestrial environment, aquatic environment, radiological conditions, air quality, noise, and vibrations. This includes impacts on human populations, wildlife, fish, insects, birds, plants and trees, including reproduction or gestation of bringing forth new beings. This includes impacts upon the function of warm-blooded humans and animals to generate heat in their blood; upon cold-blooded creatures to circulate blood; and upon plants to circulate sap, deposit green chlorophyll, and color flowers. Impacts on American Indian tribes should be thoroughly identified and studied. This includes impacts upon the function of living organisms to remain organized and to not experience disharmony of vibrations, disintegrating effects, atrophy and excessive early aging, malformations, changes in attraction and repulsion principles, changes in growth patterns. These are not all inclusive lists. Such studies should measure variables involving the full range of elements and their ionizing isotopes that require permanent long term storage in isolation under the actual wide variety of variables found in reality in terms of assimilation, attraction, and selection as well as by expulsion, excretion, and toxicity. Assessment of social context is required as well as ecological context of adverse effect with references to peer-reviewed scientific literature and "grey" literature. (0823-81 [Michetti, Susan])

Comment: To summarize my comments it is obvious that the NRC minimizes the calculated risk and incurred cost of nuclear power, exposing an unknowing public to risks far greater than revealed by NRC reports and documents. (0826-2 [Morgal, Rick])

Comment: Once a more realistic prediction of potential impacts of a spent fuel pool fire is presented it is equally necessary to ensure that until all the spent fuel is placed in dry cask storage there needs to be an education program to alert the entire US population to the health impacts associated with a spent fuel pool fire. The entire US population should then be educated on steps that should be taken in case of a spent fuel pool fire emergency before a spent fuel pool fire is experienced by the general public on TV. The NRC and the federal government should take pro-active steps to ensure immediate availability of potassium iodide tablets to all inhabitants within a 50-mile radius of each nuclear power plant and/or operational spent fuel pool. Current availability of potassium iodide tablets at local drug stores is non-existent. This fact needlessly exposes the surrounding community to significantly increased chances of thyroid cancer a few years after a successful spent fuel fire has occurred. Mainly through radical survivalist Internet-mail-order stores can potassium iodide tablets be purchased, making it virtually impossible for an ignorant general public to attain protection from radioactive iodide becoming concentrated in person's thyroids within the fallout region of a spent fuel pool fire. These tablets need to be available immediately following a spent fuel pool fire to all people within a 50-mile radius of the spent fuel pool. Stockpiles in a few strategic locations across the nation will not provide sufficiently rapid access to protect to the public. It is suggested that a local convenience store like 7-11 be the local repositories of potassium iodide tablets within the 50 mile radius of each of the nation's spent fuel pools with the public being told where to go to obtain the tablets. Additionally these tablets should be distributed to residents within the 50 mile radius of the spent fuel pool. Since Potassium Iodide tablets last 10 plus years this level of protection to the general public would not be that costly compared to the increased number of thyroid cancers that would result from allowing the general public to go unprotected. In the past the NRC has justified not providing these tablets except to residents in a very small radius around a nuclear power plant based upon cost. Fukushima should be a wake up call to the possibilities of a spent fuel pool fire. Due to prevailing winds, had Fukushima been on the West Coast of Japan the human and economic impacts would have been magnitudes greater. (0826-25 [Morgal, Rick])

Comment: Until the NRC incorporates a proactive education program that informs the public of potential impacts to the surrounding community and its inhabitants from a spent fuel pool fire it will be hard to have any sense of confidence in the NRC's approach to the storage of spent nuclear fuel. Additionally this education program must also be coupled with publically known repositories of potassium iodide tablets to provide the surrounding public a sense that the NRC is prepared to protect the public's safety from the dangers of nuclear materials. Seeing that "protection" is the NRC's number one *stated* priority, until that directive is filled with respect to a spent fuel pool fire, there can not be any sense of confidence in any other aspect of how nuclear waste material is stored for tens if not hundreds of years on the past sites of nuclear power plants. (0826-26 [Morgal, Rick])

Comment: Countries like Germany are shutting down their power plants due to the problems associated with accidents and spent fuel storage. (0826-5 [Morgal, Rick])

Comment: GEIS section 1.8.6: NRC has eliminated reprocessing, advanced reactors, and non-power reactors from consideration. While we understand that full consideration of these impacts might be beyond the scope of this GEIS, it would be useful if NRC would add an explanation of how it would separately address these impacts, particularly with respect to any generic consideration that might be conducted. (0827-7-4 [Ginsberg, Ellen])

Comment: Spent fuel storage is our nation's big problem and have to put all the wisdom together to find the best solution possible. NRC has to work hard for its duty of protecting people, but not prioritize big corporation's gain. So, I'll ask each of NRC staff people to work its noble mission hard and put priority first on public safety. (0831-3 [Collins, Yoko])

Comment: In the case of San Onofre, and in fact for all older reactors and reactors in known danger zones, decommission the old reactors, and startup Molten Salt Reactors(thorium) to burn the stored waste as fuel and reduce the danger we face long term (while producing power). In most case we can process in place, without the dangers of moving the waste, AND over time we eliminate an extreme danger zone for terrorist acts. This is not a replacement for sustainable/renewable sources of energy, but a supplement to them that also helps eliminate one of our biggest national security and health headaches. (0833-1 [Lieberman, Bruce])

Comment: The NRC should stop approving high burnup fuel. (0836-5 [Davis, Anonymous])

Comment: Most Americans have not been privy to the facts about Nuclear power plants and the horrific permanent waste they create. My family and I are disgusted with the lax way the NRC operates and how it is basically run by the Nuclear industry. The threat of disaster is real and it is plain stupidity to continue the way we have for decades leaving so much to chance. It's time some changes were made. The public safety should be the utmost concern of the NRC. It is not. Most Americans have no clue what is happening with nuclear and nuclear storage. If they did they'd be very upset. Business as usual, they are not informed of the truth about nuclear intentionally. This is unfair and devious. Too many things are forced on the public without their knowing for the sake of the all mighty dollar and we're paying for it! (0848-1 [Whiting-Broeder, Pamela])

Comment: Is spent nuclear fuel waste? The Department of Energy has determined that the vast majority of the nation's spent fuel inventory should be disposed of without the need for retrieval. Only a small portion is needed for research and possible feedstock for potential closed cycle operation,² [footnote 2 text: *ibid.*] should the significant hurdles of cost and safety of fast reactors be overcome in a few decades. It is often suggested that the US should reprocess

spent fuel despite the high cost and the fact that this multiplies the volume of waste that requires storage in a geologic repository by 6 times, not to mention the extensive pollution of air and water that accompanies reprocessing. Are partitioning and transmutation going to solve the spent fuel problem? Not any time soon nor without significant financial investment, according to the DOE.³ [footnote 3 text: SRS Citizens Advisory Board May 21, 2013 recommendation and DOE's response regarding partitioning and transmutation to reduce the burden of spent nuclear fuel, July 10, 2013, from David C. Moody, Manager, Department of Energy. http://cab.srs.gov/recommendations_2013.html.] While some of the nation's spent fuel is stored in dry cask storage, most is stored in vulnerable, overcrowded spent fuel pools. (0851-4 [Thatcher, Tamij])

Comment: Needed NRC Actions: 1. The NRC should promptly request supplemental appropriations to achieve a full restart of the Yucca Mountain proceeding. 2. The Commission should Order DOE as a party to the proceeding to request supplemental appropriations from Congress and to provide the NRC, under oath and affirmation, with a plan to restart all need DOE activities related to Yucca Mountain. 3. NRC should submit proposed legislation to the Congress that would amend the NWPA to transfer the DOE responsibilities to a new federal-private corporation. The draft legislation should transfer all Nuclear Waste Fund (NWF) fees and prior collections to the new federal-private corporation. This draft legislation should further specify that NWF monies be directly collected by the corporation and not be subject to Congressional appropriations. The NRC Commissioners and staff should vigorously press the Congress for passage of this legislation. In summary, NRC should make appropriate Waste Confidence technical findings and advocate a legislative arrangement where the dictatorial views of a powerful Senator can no longer undermine the Nation's nuclear safety program. Consign the politicians and their acolytes to a smoke-filled room. (0859-4 [Haughney, Charles])

Comment: UPS & Fed X tracks better than you do for radioactive materials be it medical or otherwise. (0862-4 [Thompson, Tammy])

Comment: You are an insult to what you are supposed to stand for & insulting the intelligence of everyone this will harm. I offend you (?) You offend everyone all of us/US & everything environmental without regret. For every child & person suffering or worse in nuclear/radioactive neighborhoods etc. their blood is on your hands. Stop wasting lives; our time & all our futures if my tax dollars are your salary & industry welfare we the people demand a refund. (0862-8 [Thompson, Tammy])

Comment: We must proceed to develop wind energy, solar and find other ways to live. We must be guardians and protect this beautiful earth that we are to care for. This is a monumental job, but it is what we need to do (0870-2 [Anonymous, Anonymous])

Comment: Instead of ignoring the problem, I believe we should let the new generation of scientists attempt to reduce, recycle and reuse the spent nuclear fuel and waste produced during our exploration. (0881-4 [Szymanowski, Jennifer])

Comment: [Will Congress please give the NRC some teeth and make law to] (2) reprocess and reuse nuclear energy[?] (0881-6 [Szymanowski, Jennifer])

Comment: I DON'T THINK NRC CAN IMPROVE THIS SITUATION...(OVER) UNTIL OUR NATION SUFFERS AN EVENT SIMILAR TO CHERNOBYL OR FUKUSHIMA, I SUPPOSE WE'LL HAVE TO TOLERATE THE "SMARTER-THAN-YOU" ATTITUDE I WITNESSED IN THE HEARING. (0895-2 [Stein, Ed])

Comment: • Table S-3 is clearly related to the NRC's findings regarding feasibility of spent fuel disposal, because the NRC has stated that it will not revisit the conclusions in Table S-3 unless it has reason to doubt its waste confidence conclusion regarding the feasibility of spent fuel disposal. 55 Fed. Reg. at 38,491. • As discussed in the Makhijani Declaration, Table S-3 assumes that spent fuel will be disposed of in a bedded salt repository. Based on that assumption, Table S-3 states that the environmental impacts of a spent fuel repository are zero. But Table S-3 is no longer technically valid, because the NRC has ruled out the assumption underlying Table S-3 that spent fuel can be safely disposed of in a bedded-salt repository. Makhijani Declaration, par. 8.20. However, NRC has refused to re-evaluate Table S-3, because – as discussed above – only a change in the waste confidence determination would cause NRC to revisit Table S-3. (0897-7-10 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: In its license renewal rule (Table B-1 of Appendix A to 10 C.F.R. Part 51), the NRC treats the environmental impacts of spent fuel disposal as insignificant for purposes of making license renewal decisions, based on the existence of EPA repository standards, but does not relate this decision to Table S-3, which concludes that spent fuel impacts are insignificant on completely different grounds. The NRC does not explain the inconsistency between Table B-1 and Table S-3. (0897-7-11 [Curran, Diane] [Goldstein, Mindy] [Kysor, Jillian])

Comment: Table S-3 is inadequate, incorrect, or obsolete in a number of respects. First, it assumes disposal in bedded salt; this assumption is obsolete. The NRC itself has ruled out disposal of spent fuel in salt formations on grounds of possible instability during repository operation: Although there are relative strengths to the capabilities of each of these potential host media [i.e., crystalline rock, clay, and salt], no geologic media previously identified as a candidate host, with the exception of salt formations for SNF, has been ruled out based on technical or scientific information. Salt formations are being considered as hosts only for reprocessed nuclear materials because heat generating waste, like SNF, exacerbates a process by which salt can rapidly deform. This process could cause problems with keeping drifts stable and open during the operating period of a repository.¹³⁰ [footnote 130 text: NRC 2010a, p. 81059, emphasis added] (0898-5-1 [Curran, Diane] [Makhijani, Arjun])

Comment: Second, Table S-3's assumption that disposal of spent fuel or high-level waste in bedded salt will result in zero releases (and hence zero radiation doses to the public after repository closure) has been shown to be incorrect as a generic conclusion. The most comprehensive review of radiation releases and radiation doses to the public from deep geologic disposal in a variety of geologic settings was done following the passage of the Nuclear Waste Policy Act (NWPA) in a 1983 study by the National Research Council of the National Academies.¹³¹ [footnote 131 text: NAS-NRC 1983, Chapter 9. Bedded salt radiation dose estimates are shown in Figure 9-5 (p. 262).] This study was commissioned by the Department of Energy. It shows that there is a risk of significant radiation doses¹³² [footnote 132 text: define "significant" doses in this context as being comparable to or greater than those defined in 40 CFR 190.10(a), which limits doses to the public from uranium nuclear fuel cycle operations] in all geologic media that were quantitatively examined, *including bedded salt*.¹³³ [footnote 133 text: See Chapter 9 of NAS-NRC 1983. Bedded salt radiation dose estimates are shown in Figure 9-5 (p. 262).] More recent assessments have confirmed that there is a risk of significant radiation releases and doses from a variety of geologic media. The NRC's assumption of zero releases and radiation doses from deep geologic disposal is therefore incorrect for both high-level waste and spent fuel even for bedded salt repositories. (0898-5-2 [Curran, Diane] [Makhijani, Arjun])

Comment: The other regulation that covers high-level waste disposal impacts is Table S-3 at 10 CFR 51.51. But this table is invalid for estimating high-level waste disposal impacts. Among other things, its underlying assumption of disposal in a bedded salt repository was repudiated by the NRC itself. Therefore, the NRC must prepare a new analysis in the context of its waste confidence decision. (0898-5-22 [Curran, Diane] [Makhijani, Arjun])

Comment: The NRC itself has conceded for well over a decade that the assumption of zero releases and zero doses for geologic disposal in Table S-3 is incorrect. It has not done so in so many words, but it has admitted in other regulatory contexts that radiation doses to the public would not be zero. In 1996, in the first license renewal GEIS (NUREG-1437), the NRC abandoned the zero-release, zero-dose assumption of Table S-3: For the high-level-waste and spent-fuel disposal component of the fuel cycle, there are no current regulatory limits for off-site releases of radionuclides for the candidate repository site at Yucca Mountain. If we assume that limits are developed along the lines of the 1995 National Academy of Sciences (NAS) report, *Technical Bases for Yucca Mountain Standards*, and that, in accordance with the Commission's Waste Confidence Decision, 10 CFR 51.23, a repository can and likely will be developed at some site that will comply with such limits, peak doses to virtually all individuals will be 100 mrem/year or less. While the Commission has reasonable confidence that these assumptions will prove correct, there is considerable uncertainty because the limits are yet to be developed, no repository application has been completed or reviewed, and uncertainty is inherent in the models used to evaluate possible pathways to the human environment. The National Academy report indicates that 100 mrem/year should be considered as a starting point for limits for individual doses, but notes that some measure of consensus exists among national and international bodies that the limits should be a fraction of the 100 mrem/year. The lifetime individual risk from 100-mrem/year dose limit is about 3×10^{-3} . Estimating cumulative doses to populations over thousands of years is more problematic.¹³⁴; [footnote 134 text: NUREG-1437 (1996), p.6-19] 8.23. As the above quote in paragraph 8.22 shows, the NRC cannot even assure that doses will remain limited to 100 millirem per year, the current annual limit in 10 CFR 20, much less any more stringent limit that is recommended by "national and international bodies." (0898-5-3 [Curran, Diane] [Makhijani, Arjun])

Comment: Renewables = common sense (0901-4 [Anderson, Janet M.])

Comment: Bloom Box is the choice of alternative energy for Google, FedEx, Walmart. Fuel cells from beach sand, corporate choice, now solar and fuel cell the rest, so we can trust the process that sustains us. Incredible renewables are waiting to be known and are discovered and realized by all who have the means to know and control what the hell they are doing. (0901-6 [Anderson, Janet M.])

Comment: Do your job. Regulate. Earn the "confidence" label. (0902-10 [Fasten, Susan])

Comment: It helped me to understand that there is no serious interest in properly regulating the deadly technology--only in protecting the nuclear industry. (0902-2 [Fasten, Susan])

Comment: Acknowledge that there are no real solutions to the problems posed by the nuclear industry. Show some humility. (0902-7 [Fasten, Susan])

Comment: Acknowledge that there are no real solutions to the problems posed by the nuclear industry. Show some humility! (0903-4 [Fasten, Susan])

Comment: Do your job. Regulate. Earn the "confidence" label. (0903-7 [Fasten, Susan])

Comment: Quit trying to push their agenda on the public. (0904-1 [Collins, Jessie])

Comment: Start figuring out what other lines of work you would like to go into. (0904-3 [Collins, Jessie])

Comment: I realize it is your job to protect and promote this deadly industry. However, I believe you understand the insanity of it all. (0904-4 [Collins, Jessie])

Comment: Table S-3, Summary of environmental considerations for uranium fuel cycle, contains errors and omissions that may rise to violations of NEPA and several other United States laws. I call your attention to the criticism of Walter H. Jordan, Ph. D., Administrative Law Judge in the TMI#1 Restart Hearings. "Deaths in future generations due to cancer and genetic effects resulting from the radon from the uranium required to fuel a single reactor for one year can run into the hundreds. (See Pohl, Search, Vol.7 No. 8, Aug. 1976). It is very difficult to argue that deaths in future generations are unimportant." Memo for James Yore from W. H. Jordan, dated Sep. 29, 1977, Errors in 10 CFR 51.20, Table S-3. I consider that this admission by an NRC staffer is very impactful as this is an admission of deaths not allowed into the cost benefit analysis and comes from a skilled member of the NRC staff. I request that the entire Table S-3 be re-evaluated to determine if the remaining data points are as deficient. (0906-1 [Lewis, Marvin])

Comment: The STP Nuclear Operating Company (STPNOC) endorses the NEI comments and agrees with NEI's responses to the four specific questions the NRC posed in the Federal Register Notice. Furthermore, STPNOC endorses the industry position that dry storage of spent fuel is a safe means for long term storage. (0914-1 [Koehl, Dennis L.])

Comment: The United States can solve all its problems of waste by going to "Thorium is a natural occurring element found on earth, the moon, mars... essentially everywhere. It is a slightly radioactive metal and is about four times more abundant on Earth than uranium. Because of its fertility, it can be used as fuel in a nuclear power plant. Why is thorium important if we already have uranium-fueled nuclear power plants? A thorium-fueled nuclear reactor generates hundreds of times the power of a uranium or coal power plant but produces essentially no waste. A thorium power plant would produce much less than 1% of the waste that a uranium plant of equal magnitude produces and, of course, would produce no carbon dioxide. More importantly, while the waste of a uranium power plant is toxic for over 10,000 years, the little waste that is produced in a thorium plant is benign in under 200 years. Even more impressive, the thorium power plant can be used to burn our current stockpile of nuclear waste. And yet, the benefits continue. The thorium power plant cannot "melt down", thorium cannot practically be used to make nuclear weapons, there is enough thorium in the United States alone to power the country at its current energy level for over 10,000 years, and the thorium power plant can be designed to be a plug and play module that could tap right in at the source of a current coal or uranium plant so there would be no need for laying a new grid. (0917-2 [Priano, Guy])

Comment: Now, although it sounds like science fiction, the potential of thorium power has already been witnessed. Studies and experiments were conducted from the 1950's until the 70's. Almost 20,000 hours of operation and the true value of thorium was proven as a superlative energy source in the molten-salt reactor experiment (MSRE) between 1964-1975. With all that said, we hear the same question from everyone who hears about thorium for the first time. "It almost sounds too good to be true, why isn't it already in use today?" Surf on if you

are one of these people. You'll find that there isn't a good reason."
<http://www.thoriumenergyalliance.com/> (0917-3 [Priano, Guy])

Comment: Re: footnote 3 at the bottom of Page 1-17, it should be pointed out that 80 years of operations should just be assumed, as a given, if NRC's granting of rubberstamps for 60 years of operations is any indication. Of 73 license extensions for 20 additional years of operations sought, all 73 have been approved by the Nuclear Rubberstamp Agency. Not one has been denied, no matter how age-degraded or problem-plagued the reactor, no matter how rogue the nuclear utility applying for the extension, nor how non-existent the safety culture amongst the reactor's management and workforce. The most painful such example, perhaps, was Vermont Yankee - NRC staff rubberstamped its 20-year license extension, despite deep, widespread opposition throughout Vermont and neighboring states, within days of the Fukushima triple-meltdown, at reactors of identical design and vintage to Vermont Yankee - GE Mark Is BWRs. If any applicant approaches NRC for approval for 80 years of operations, a rubberstamp is all but assured. NRC is itself a rogue, captured agency, captured by the industry it is supposed to regulate. This is very frightening, and dangerous. The Japanese Parliament concluded that the root cause of the Fukushima nuclear catastrophe was collusion between industry, regulator, and elected officials. We have that in spades here! (0919-3-9 [Kamps, Kevin])

Comment: At lines 23-24, NRC states "In accordance with 10 CFR 72.42, the initial license term for an ISFSI must not exceed 40 years and licenses may be renewed upon NRC approval for a period not to exceed 40 years." This reflects a decrease in NRC safety oversight, over time. In the early 1990s, casks were certified for 20 years of operations, with the option for 20 year renewals. But last decade, by a split vote (Chairman Diaz dissented), the NRC Commission allowed for 40 year extensions at one fell swoop. That first one went to Surry, which happens to have the oldest ISFSI in the U.S. Prima facie, it is fair to say that NRC doubling ISFSI license extensions from 20 to 40 years (both for initial licensing, and for license extension) marks a significant decrease in regulatory oversight. (0919-4-2 [Kamps, Kevin])

Comment: As mentioned above, 437 environmental and environmental justice groups protested NRC's licensing of PFS (see their letter, posted online at <http://www.nirs.org/radwaste/scullvalley/skullvalleygoshutesgroup1tr772005.pdf>). But NRC's oversight has been weakened even more since then, now allowing 40 year initial licensing for ISFSIs, followed by 40 year license extensions. (0919-4-5 [Kamps, Kevin])

Comment: As the old saying goes, "follow the money." Why are such potentially catastrophic societal risks taken by industry, and allowed by NRC? Well, vast fortunes are being made. The nuclear power industry, with lots of help from friends in government, have largely succeeded in externalizing their costs, risks, and liabilities onto the public, whether the rate-paying public, or the taxpaying public (actually, most people I know are both ratepayers and taxpayers!). Meanwhile, the industry pockets the profits made from large-scale electricity generation, not to mention the large-scale subsidies enjoyed, again, at the expense of the public. Why does industry and NRC work so hard to convince themselves and others that nothing could possibly go wrong with irradiated nuclear fuel? Why don't they do the health studies re: what "routine" radioactivity releases alone are doing to health in the area of atomic reactors and irradiated nuclear fuel storage sites, let alone the health and safety risks from potential disasters? To do so would risk the lucrative business they profit from, of course. So risks are downplayed in the public arena, while their armies of lawyers make sure, behind the scenes, that the companies will not be held liable if the worst happens. The public will be left holding the bag, yet again. Upton Sinclair's famous quote is apt: "It is difficult to get a man to understand something, when his salary depends on his not understanding it." (0919-5-8 [Kamps, Kevin])

Comment: Since trust is largely a function of how one is treated by another, it is a fair and realistic question to ask: how can the public have ANY confidence in an Agency with a track record like this?: (0921-3 [Kamps, Kevin])

Comment: By a 4 to 1 vote, the Commission voted against quicker implementation of Fukushima lessons learned, delaying them at U.S. Fukushima-type reactors for up to 6 years. Those four Commissioners later forced out the Commission Chair Gregory Jaczko-the only one in favor of more rapid implementation of safety measures. - According to authors John Byrne and Steven Hoffman, since the 1980s the NRC has generally favored the interests of nuclear industry and has been unduly responsive to industry concerns. The NRC has often failed to pursue tough regulation. At the same time, it has sought to hamper or deny public access to the regulatory process and created new barriers to public participation. (Source: Governing the Atom: The Politics of Risk, 1996) (0921-5 [Kamps, Kevin])

Comment: At the December 9, 2013 NRC Waste Confidence Draft Generic Environmental Impact Statement (WC DGEIS) call-in public comment meeting, I mentioned in my oral comments that day, in response to a previous commenter, that reprocessing of high-level radioactive waste -to extract still-fissile plutonium and uranium isotopes - is the single worst thing one can do with irradiated nuclear fuel that already exists, other than dumping it directly into the environment, that is. Making irradiated nuclear fuel in the first place was the first major mistake; reprocessing it would compound the mistake. The reasons for this include nuclear weapons proliferation risks, unleashing large-scale radioactive contamination that harms human health over wide regions, and an astronomically expensive price tag, which would be foisted onto the public's back, yet again. All that, and *we'd STILL need a dumpsite!* Please accept the attached pamphlet, "NUCLEAR FUEL REPROCESSING = WEAPONS PROLIFERATION: An inseparable link between nuclear power & nuclear weapons," as additional public comment in the Nuclear Waste Confidence DGEIS proceeding, as rebuttal against reprocessing being any sort of solution, given its very high costs and risks, given that it's dirty, dangerous, and expensive in its own right, as is nuclear power and radioactive waste in the first place (please also find attached the Beyond Nuclear pamphlet entitled "Dirty, Dangerous, and Expensive: The Verdict Is In On Nuclear Power" (created by Beyond Nuclear board member Kay Drey of St. Louis, MO). (0922-1 [Kamps, Kevin])

Comment: Prohibit reprocessing: The reprocessing of irradiated fuel has not solved the nuclear waste problem in any country, and actually exacerbates it by creating numerous additional waste streams that must be managed. In addition to being expensive and polluting, reprocessing also increases nuclear weapons proliferation threats. (0927-10 [Kamps, Kevin])

Comment: Dr. Arjun Makhijani, President of IEER, and one of the expert witnesses on behalf of an environmental coalition representing dozens of groups, including Beyond Nuclear, in this proceeding, coined the phrase "Hardened On-Site Storage (HOSS)" at a national environmental gathering in April 2002 held in Middletown, CT at Wesleyan University. The event was organized by Citizens Awareness Network of the Northeast. The Statement of Principles for Safeguarding Nuclear Waste at Reactors, an explication of HOSS, was first unveiled on Capitol Hill at a U.S. House hearing in September 2006 by Michele Boyd, on staff at Physicians for Social Responsibility. Already at that time, the Statement had been endorsed by well over 100 groups, representing all 50 states. The Statement of Principles was updated in August 2009 to include concerns about reprocessing. By March 2010, well over 170 organizations had signed on-including a number of coalitions, such as Alliance for Nuclear Accountability (a network of some three dozen groups), Michigan Environmental Council (a state-wide coalition of more

than 70 groups), etc. Thus, the Statement is endorsed by hundreds of groups, representing all 50 states. (0927-2 [Kamps, Kevin])

Comment: Unfortunately, reprocessing proponents have used this opportunity to promote reprocessing as the solution for managing our nuclear waste. Contrary to their claims, however, reprocessing is extremely expensive, highly polluting, and a proliferation threat, and will actually complicate the management of irradiated fuel. Nor will reprocessing obviate the need for, or "save space" in, a geologic repository. The United States has a unique opportunity to re-evaluate our nuclear waste management plan. We can make wise decisions about safeguarding radioactive waste or go down the risky, costly, and proliferation prone path towards reprocessing. (0927-5 [Kamps, Kevin])

Comment: More and more thorough inspections on current facilities are desperately needed. (0932-2 [Bridgeman, Janis])

Comment: MANY have already been relicensed, deemed safe with attempts to have them relicensed well before their first license any where neared those forty years. At a meeting in April of 2013, when questioned about the factoring of climate change and whether or not it was taken into consideration before relicensing, the answer was no. (0933-4 [Anonymous, Janet])

Comment: The NRC has been recklessly pursuing very long license extensions for nuclear power facilities which will be very fortunate to chug along to the end of its operating license -- let alone be able to safely operate for many additional decades. This point is related to my concern (under my Point B) about the distinctions between the radwaste sitting at commercial nuclear power facilities whose licenses have terminated (such as at San Onofre) and the radwaste sitting at commercial nuclear reactor sites where an operating license is still in effect (or to which a long license extension was granted sometimes even a decade before the current license is set to expire.) (0937-17 [Campbell, Bruce])

Comment: I realize that the alleged definition of "waste confidence" is necessarily referring only to the radioactive waste being stored after the operating license at a commercial nuclear power facility expires, and before this waste may eventually be taken to a geologic repository or to an interim storage site. Are there other documents and rulemaking procedures which deal with the radioactive waste which is stored at nuclear power facilities during electricity generation, refueling, and other phases preceding the expiration of the operating license? How does one find such documents? (0937-3 [Campbell, Bruce])

Comment: Adding to its ridiculous nature is the fact that the NRC takes the nonsensical steps of seeking to (and sometimes succeeding in) extend operating licenses at nuclear power facilities many decades beyond when regulators believe that the facilities will cease generating electricity. Most reactors need luck in operating through the end of their operating license -- let alone be able to successfully operate for additional decades. (0937-4 [Campbell, Bruce])

Comment: The NRC is too closely involved with the nuclear industry to make an objective decision regarding waste generation. (0938-2 [Sondheim, Steven])

Comment: Exelon supports the comments submitted by the Nuclear Energy Institute (NEI) on behalf of the industry related to this subject. (0942-1 [Helker, David P.])

Comment: Why doesn't the US start developing thorium reactors more? These would not only be cheaper and safer to run than the current nuclear reactors, but they would also use the radioactive waste as fuel, getting rid of it. (0966-1 [Hunt, Le])

Comment: Finally and most importantly, how about funding development of Liquid Fluoride Thorium Reactors? (0969-1 [Falis, Edward])

Comment: Until our Government DEMANDS that the CEO's and their worker's take ownership of the residue toxins they leave behind, and demand they live in these Communities, nothing will change. But they have outrageous incomes, whereby they can live (CEO'S) anywhere on the planet they please, far, far way, from the health hazards, they create. (0973-2 [Johnson, Bobie])

Comment: Also, we need to put more resources into nuclear fusion. This technology would solve all our energy problems not to mention our economic, geopolitical and environmental ones. (0976-1 [Sears, Peggy])

Comment: Switch immediately to proven demonstrated redundantly safe Thorium Reactors that can even reuse these wastes as fuel enough for generations of generating species wide! (0979-1 [Paul, Stephen])

Comment: We have a most hateful, unconcerned, spiteful Congress interested ONLY in a pay check and keeping the NRA dollars flowing. Congress doesn't give a damn about climate, nuclear waste or any dangers pollutants in the water we drink. (0980-1 [Brave, Jacqueline])

Comment: And what about recycling spent fuel rods like some other countries due??? (0981-1 [Levine, Jeff])

Comment: I would like to see the U.S. like France turn their spent rods back into reusable rods instead of letting them sit around and be dangerous. (0983-1 [Webb, Hubert])

Comment: Unfortunately, our elected officials have been driven by greed and the power of the wealthy instead of concentrating on the dangers caused by dangerous hazardous chemicals...as they have with the petroleum companies. (0989-1 [Wells, Harmony])

Comment: But for you to continue to perpetrate this blatantly obvious fraud that nuclear waste can be disposed of safely is criminal ,hasn't our federal Government and it's many agency's already proved to be corrupted as well as totally and completely disgraced this nation and the ideal's it boast's of daily . We think it's time just one of you treasonous failure's stepped up to finally earn the pay checks you steal each pay cycle you should be jailed and forced to return the pay you defrauded the American tax payer out of . OR DO YOUR JOB before we do it for you . now you don't have to take my word for it you can certainly continue to do the job you pretend doing and defraud the public until retirement or you can retire free of disgrace by just doing your bullshit job .. (0991-1 [Lavery, Michael])

Comment: Nuclear Regulatory Commission, where are you and why aren't you doing your job? We had this conversation after Fukushima. Why are we still having it and why hasn't anything been done? My recommendation: Send all used nuclear rods to Texas. I'm sure the Texas governor, their brilliant leader Rick Perry will certainly know what to do with them. And he can always get up to date advice from George W. Bush, our former fearless leader. (0992-2 [Thaw, Karen])

Comment: Also, please consider the health effects on the people who live and work near uranium mines. Take time to research the health effects on the Navajo Nation regarding uranium mining. (0993-1 [Henning, Marcia])

Comment: Finally, the EIS should consider the option of using THORIUM IN CURRENT nuclear plants and not making any nuclear waste at all in the future by comparing the environmental footprint of nuclear from mining to long term waste disposal to that of renewables and energy efficiency. (0994-1 [Severance, Beth])

Comment: THIS IS EMBARRASSING - AND SCARY! UNLESS NRC CAN TAKE ITS RESPONSIBILITIES SERIOUSLY, IT WILL BE TIME FOR CONGRESS AND/OR THE PRESIDENT, NOT JUST A COURT, TO INTERVENE, FOR OUR SAFETY. IF CURRENT PERSONNEL CAN'T FACE UP TO NUCLEAR INDUSTRY INTERESTS, MAYBE NEW FACES ARE CALLED FOR. (0997-1 [Goodwin, Liberty])

Comment: It is clear that the Nuclear Regulatory Agency sees it's purpose as providing the least possible regulation. The reason for that is clear and two-fold: agency commissioners and employees are devotees of nuclear power, and agency commissioners and employees look forward to working for the nuclear industry at high salaries when they leave "public" service. (0998-5 [Rosanelli, Donald])

Comment: It would be responsible to research the possibility of small triple-safe reactors that CONSUME as fuel, rather than generate, radioactive waste. (1002-1 [McNair, Robert])

Comment: IT IS AN OUTRAGE THAT THE NRC PURSUES IT'S IMPERIAL INTEREST IN PROFIT AS FAR MORE IMPORTANT THAN THE CONSEQUENCES OF SICKENING AND DESTROYING HUMANITY AND THE EARTH. THE NRC MAY KNOW A FEW THINGS, BUT THE REALITY AND THE TRUTH CONSISTENTLY REVEAL THAT YOUR DECISIONS ARE NOT BASED ON ADEQUATE KNOWLEDGE AND PUBLIC SAFETY BUT A PATHOLOGIC, GREEDY POLITICAL PURSUIT OF POWER...(NO BLOODY, CANCEROUS PUN INTENDED)WE ARE OPPOSED TO THE WAY YOU DO BUSINESS, WHICH KEEPS US ALL IN DANGER. WE ARE OPPOSED TO YOUR CARELESS MANIPULATIONS. (1004-1 [Dimondstein, Carla])

Comment: THE NRC IS A CORPORATE LOBBYING ENDEAVOR, AND NEEDS TO BE RETIRED, ALONG WITH ALL NUCLEAR PLANTS. THE LONGER THE NRC MAKES THESE DECISIONS, THE BIGGER THE MESS, MORE PROFOUND THE DISASTERS. (1004-3 [Dimondstein, Carla])

Comment: SCARY BEYOND COMPREHENSION! THE NRC IS A HOMICIDAL, CRIMINAL CARTEL, AND STUPID, IF YOU THINK WE'RE NOT PAYING ATTENTION! (1004-5 [Dimondstein, Carla])

Comment: Sixty years ago, while an undergrad at UCB, I waited table at the Claremont Hotel, where the AEC members had their conferences. As the Quakers were sending asparagus to Eisenhower and the AEC was issuing press release statements that everything was safe to eat, I was the waitress for the head table where I watched Glenn Seaborg, Ed Teller, and other dignitaries push all dairy and veggies away. In my early twenties, this was my first lesson in authoritarian duplicity. By congressional legislation, the AEC changed it's name to the NRC in 1974, in hopes of moving away from a poor reputation due to its lies and obscurations. I have hoped all my life that things would change, but Fukushima has demonstrated that there is still no honesty on the part of the overseers. Please prove me wrong. Please reverse this

dishonesty, and be honest about the hazards of the god-like power of nuclear fission. Having taken these awesome powers into our hands, it is mandated that we must evolve a higher, more god-like consciousness. As Einstein referred, "We must change our mode of thinking." You can do that now! (1005-1 [Vilen, Sydney])

Comment: How much could nuclear energy lobbyists be lining the pockets of the commission? Please do the right thing. (1008-1 [McMillian, C.C.])

Comment: I am all for eco-nuclear power (recycle waist) and eco-fracking (eco-liquids in ground) with transparent regulations to keep this industry honest. If these regulations are not enforced, big business will do everything they can to increase their profits with total disregard for the health and wellbeing of society and our environment. (1009-1 [Levine, JR])

50. Out-of-Scope Comments – HOSS and Expedited Transfer

Comment: Petition for rulemaking (PRM-72-6), item number 11, requests that the NRC ... "require Hardened On-site Storage (HOSS) at all nuclear power plants as well as away-from-reactor dry cask storage; that all nuclear industry interim on-site or off-site dry cask storage installations or ISFSIs be fortified against attack." Consequently, item 11's technical content appears to be relevant to the scope of the proposed rulemaking and it is mentioned in the draft technical basis. Therefore, the NRC may consider this petition in the course of developing the proposed rule. However, the NRC has not yet reached a decision on acceptance of this petition and this notice does not prejudice the agency's final action on whether to accept the requests in PRM-72-6. (0001-21 [Griffin, William] [Sipos, John] [Snook, Robert] [Springer, Darren])

Comment: For the HLRWs that already exist, require Hardened On-Site Storage (HOSS). Hundreds of environmental and public interest groups, representing all 50 states, have endorsed the Statement of Principles for Safeguarding Nuclear Waste at Reactors, which describes HOSS. Where possible, densely-packed, vulnerable HLRW storage pools, at risk of catastrophic fires and radioactivity releases, should be emptied into on-site dry cask storage that is "hardened": designed and built well, safeguarded against accidents, fortified against attacks, and protected against leakage into the environment. This should be expedited as a national security top priority. Locations where HOSS is not safe (places vulnerable to flooding, for example), hardened dry cask storage should be done as close to the wastes' point of generation as possible, as safely as possible. HOSS must be monitored and retrievable, and is but an interim measure. HOSS cannot be a permanent measure on the sea coasts and fresh water sources (rivers, lakes, reservoirs) of our country, due to rising sea levels and risk of leakage into our vital drinking water supplies. (0002-2 [Commenters, Multiple])

Comment: Hardened-on-site storage at relatively safe sites (not prone to earthquakes or flooding, etc.) should be the minimum standard for the existing waste. (0009-2 [Schwartzberg, Lora])

Comment: Nuclear waste should not be stored in pools for longer than 5-10 years. The improved HOSS (Harden On-Site Storage) method must be implemented for safe dry cask storage at reactor sites. (0023-10 [Bridges, Martha])

Comment: [E]liminating some of the spent fuel; and I'm not talking about some of the hotter fuel, and taking them out of the casks and taking them out of the pools and putting them in the dry storage sounds like probably the best that we can do to lessen the consequences of a drain

down, or of a fire, or of an earthquake. But, you know, I'm not sure if it was even addressed in this environmental impact. (0030-15-8 [Gray, Erica])

Comment: For the 70,000 metric tons of commercial high-level radioactive waste that already exists in the United States, for well over a decade a coalition of hundreds of environmental groups representing all 50 states have called upon the Nuclear Regulatory Commission to implement hardened onsite storage as a regulatory mandate to empty the vulnerable pools which are at risk of leaks and fires due to accident or attack or simple age degradation into hardened dry cask storage that is designed and built well, designed to last for not decades but centuries without leaking into the environment, designed to withstand terrorist attacks, and designed with safeguards against accidents, such basic safeguards as radiation monitors, heat monitors, and pressure monitors, which are not currently required. (0030-2-5 [Kamps, Kevin])

Comment: For that which already exists ---- some 70,000 metric tons worth in the U.S. ---- hundreds of environmental groups representing all 50 states have called on NRC for over a decade to require hardened on-site storage (HOSS). HOSS would empty the densely packed storage pools, vulnerable to leaks and catastrophic fires, into quality dry cask storage, that is designed and built to last not decades, but centuries, without leaking its deadly contents into the environment. HOSS would also be designed and built with fortifications against attacks, and safeguards against accidents, including such basic measures as monitors to track heat, pressure, and radioactivity, none of which are currently required. Although HOSS is but an interim measure, it should be mandated as a national security priority of the highest order. (0034-4 [Wagner, Jim and Virginia])

Comment: Secondly, high-level waste should be stored in hardened on-site storage or dry cast storage. (0035-2 [Fulton, Doris])

Comment: In addition, the transfer of waste from the pools to dry storage becomes more dangerous if we wait to do this transfer in the future so we should not delay. (0035-4 [Fulton, Doris])

Comment: While we are working on the solution, I am also concerned that many of our nuclear reactors have overcrowded fuel pools on site. These present safety threats to the communities and industries that surround the plants. The NRC should take immediate action to reduce the number of fuel assemblies in the water-filled pools. (0039-5 [Littlejohn, Nick])

Comment: Before transferring the fuel rods to cask storage, the cask storage needs to be examined and reinforced to be able to safely store the fuel rods particularly those that qualify as high burn up fuel. Hardened on-site storage of the casks should become the choice for storage. (0039-6 [Littlejohn, Nick])

Comment: We need to make sure that all waste is done as hardened on site storage. And that the NRC does not begin to issue licenses again until that is a state of the art nationwide. (0045-1-2 [English, Becky])

Comment: First, require all reactors to immediately harden the structures housing spent fuel pools, since at a minimum, spent nuclear fuel will have to stay in them for about five years for primary cooling. They are dangerous and vulnerable. We only need to look at Fukushima to see the very much imperiled spent fuel at the top of those reactors. (0045-6-5 [Andrews, Richard])

Comment: Second, move as quickly as possible to remove the spent fuel from fuel from cooling pools and into hardened dry casts that are small enough for transport. Not 125 to 150 tons, those are just too large for transport. (0045-6-6 [Andrews, Richard])

Comment: Third, the key difference from many other commenters, particularly from the environmental community and what I'm saying is, I want all of those casks removed to off-site facilities remote from heavily populated areas. And placed and dispersed arrays of burial bunkers to make them less vulnerable to terrorist attacks, and reduce the consequences if attacked. (0045-6-7 [Andrews, Richard])

Comment: Please insist that all above ground pools be emptied of rods that are 5years old and older and placed in dry cask storage. This is absolutely essential for all reactors that are shut down and waiting for decommissioning to begin because there will be fewer staff available to deal with any emergency. STORING SPENT FUEL IN DRY CASKS IS SIGNIFICANTLY SAFER THAN IN SPENT FUEL POOLS. PLEASE PROTECT THE PUBLIC! (0048-2 [Davidson, Judith])

Comment: It should also become obvious to observers that where high-level radioactive wastes already exist, Hardened On-Site Storage is the only immediately acceptable interim measure. This should be expedited as a top priority for our national security. (0052-3 [Tietjen, Jamie])

Comment: Please stop making nuclear waste. It is not safe and never will be. At least, use hardened storage. That makes waste somewhat safer. Indefinite storage is never safe. (0056-1 [Poulson, Judi])

Comment: Before transferring the fuel rods to cask storage, the cask storage needs to be examined and reinforced to be able to safely store the fuel rods particularly those that qualify as high burn up fuel. Hardened on-site storage of the casks could become the choice for storage. (0057-3 [Lamont, Dana])

Comment: Require all reactors to harden structures housing spent fuel pools since at a minimum SNF will have to stay in them for about five years for primary cooling. (0059-12 [Andrews, Richard])

Comment: Move quickly to remove all possible spent fuel from cooling pools and into hardened dry casks of small enough size for transport (0059-13 [Andrews, Richard])

Comment: The NRC claims that security measures have improved since 9/11 but no real actions have been required to secure the structures housing SNF, to make them hardened and not penetrable... and that quite frankly is not possible to accomplish under a determined attack. Scores of spent fuel pools remain in nothing more than a fragile shell of a building, yet contain far higher levels of radioactive materials than the reactor cores themselves. Even partially loss of cooling water or pool level could create a disastrous radioactive steam cloud, and potentially a zirconium oxidation fire releasing far more radioactivity than in the core. (0059-6 [Andrews, Richard])

Comment: In the meantime, for short- or interim-term storage, we urge the NRC to require immediate implementation of dry cask storage for adequately cooled spent fuel. (0064-2 [Skud, Bruce])

Comment: The NRC should require all nuclear power plants to move spent fuel into dry cask storage to minimize the risk to the public immediately after the spent fuel has cooled. Dry cask storage is inherently safer than wet storage of spent because it is air cooled. Wet storage depends on electrical generators to keep spent fuel cooled. Should generators fail and the ability to circulate cooling water be lost, the public would be put at serious risk. Geologic or weather-related events could disable the electrical generation used for wet storage, possibly setting off fires and radioactive release. (0064-9 [Skud, Bruce])

Comment: 70,000 metric tons of commercial high level nuclear waste have been created so far, with no long-term storage solution in sight. Overcrowding in irradiated/spent fuel pools is an unacceptable risk to the public. The NRC should take immediate action to reduce the number of fuel assemblies in the water filled pools, as well as analyzing the deficiencies of the current dry cask storage. (0065-1 [Payne, Gail])

Comment: Please require that radioactive waste be removed from spent fuel pools and stored on-site in protected casks, until long-term storage can be completed. In the absence of a long term repository for the nation's high level nuclear waste, the waste will continue to be stored onsite at the nation's operating and shut down reactor sites. A federal judge has ruled that the NRC's existing waste confidence decision is invalid in large part because of legitimate concerns about the potential environmental consequences in the event of a radiological release. For this reason, numerous independent experts have recommended the accelerated transfer of spent radioactive fuel from densely packed pools at reactor sites to much safer, more secure dry cask storage. Because these casks don't require electricity to cool the waste, they are far less vulnerable -- from severe weather, seismic events or terrorist attacks -- and therefore much less likely to result in a major release of radioactivity which would have potentially devastating human AND environmental consequences. (0071-1 [Borie, Edith])

Comment: The tens of millions of Americans who live near these de facto nuclear waste sites deserve to know that everything that can be done to minimize the risks to them is being done. The NRC's claims that there is no real safety difference between wet or dry storage -- only because they make the mistake of assuming that an unlikely event will never happen. Everyday, we are reminded that the improbable is becoming more probable -- severe storms like Hurricane Sandy, deadly hurricanes, tsunamis -- as a result of global warming. Assuming a bad event won't happen is the height of irresponsibility and runs counter to the NRC's primary mission of protecting public safety. The NRC is currently revising its waste confidence rule as required and in so doing it should stress that it will enact policies that will require reactor owners to thinning out spent fuel pools as quickly as possible after the fuel is cool enough to do so. (0071-3 [Borie, Edith])

Comment: New rules, yes! Rules that require that fuel assemblies in overcrowded onsite fuel pools be removed and placed in hardened, on-site cask storage within a reasonable time and before reactors are relicensed. (0075-4 [Hill, Barbara])

Comment: Next, move toward hardened on-site cask storage of spent fuel rods. (0078-3 [Mock, Neal])

Comment: As Fukushima continues to demonstrate, fuel stored in spent fuel pools is not safe from environmental hazards such as earthquakes and floods. The pools at Fukushima continue releasing irradiated water that crosses the Pacific to our shores, more than 1 year after the Fukushima disaster, and a "permanent" solution is not yet in sight. Clearly, storing spent fuel

rods in pools does not insure long term safety, yet some storage pools in the US already hold as much as 9 times the amount of spent fuel they were designed to hold. (0086-2 [Lewis, Carol])

Comment: NRC should also require use of hardened onsite storage to mitigate these risks, and should investigate the environmental impacts of failure of a single or multiple dry casks. (0089-7 [Shaw, Sally])

Comment: Irradiated fuel casks can withstand environmental disasters that spent fuel pools cannot, as evidenced by the continued function of the dry casks at Fukushima. The casks survived the 9.0 quake and continue to protect the irradiated fuel, even though the tsunami flooded them. These containers have not exploded; are not on fire; are not catastrophically leaking and do not require ongoing addition of liquid to cool. They are out-performing the pools on the site. (0089-8 [Shaw, Sally])

Comment: In the meantime, for short-term storage at plants we [No More Fukushimas] urge the NRC to require immediate transfer from wet storage to dry cask storage. (0112-10-2 [Skud, Bruce])

Comment: We need the NRC to get a grip on reality and to help us. We cannot have the fuel in the pool for 60 years or 40 years or 20 years. We need it expeditiously moved out of the pool and into dry casks. And that's going to cost hundreds of millions of dollars that we don't have. I hope the staff is writing this down because this is going to be a big problem at other merchant facilities. A big mistake was made when we moved into the merchant mode with these plants. And now we're seeing the reality unfolding in Vermont. So I would ask that you, you know, take a moment as you're working on your Confidence ruling here or Confidence rule here and get a grip on reality with regard to leaving that much waste in a pool at a single reactor site for 60 years. (0112-15-4 [Williams, Chris])

Comment: We support expedited transfer of a spent fuel and hardened dispersed dry cask storage. (0112-3-7 [Lampert, Mary])

Comment: [M]oving all spent fuel to hardened storage that can withstand climate change, power outages, accidents, and terrorism. (0112-31-8 [Johanson, Birgit])

Comment: Along with hundreds of other groups and many others here, we [Seacoast Anti-Pollution League] strongly support hardened on-site storage of this waste and removal of the fuel that's in the spent fuel pool as soon as possible. After Fukushima it's really getting absurd for the NRC and the industry to argue that dry cask and wet pools are equally safe. We've had a live action, full-scale experiment with extended power outages and water pump loss and the casks remain safe at Fukushima while the pools boiled, caught fire, exploded, you name it. I think that should make the point pretty clearly that these two approaches are not the same and they do not make us equally safe. (0112-5-4 [Bogen, Doug])

Comment: We can't afford to continue to maximize acceptable risk by filling or overfilling these pools while avoiding the cost of dry cask storage. We can pay some now to deal with this problem or pay much more later. And we'd rather not pay for it with our health and those of our children or grandchildren. (0112-5-6 [Bogen, Doug])

Comment: To protect against possible flooding in plants located on the coast, hardened dry cask storage as close to the source of generation as possible is recommended as an interim measure. (0112-6-4 [Wrenn, Nancy])

Comment: All of the fuel pools [at the Vermont Yankee Nuclear Power Station] should be immediately transferred into dry cask storage. Now, are we happy to have -- you know, I think we're going to end up with something like 60 dry casks on the banks of the Connecticut River. No. But I live five miles from those spent fuel -- that spent fuel pool and the risks are undeniable. And the improvement, the reduction of those risks is equally undeniable when you move to dry cask storage. (0112-7-6 [Sachs, Leslie Sullivan])

Comment: In regard to this Environmental Impact Statement, I do not believe that leaving the waste for 50 years in the pool at Vermont Yankee will be anywhere near as adequate as putting the waste into dry casks. That pool, again, as my wife said, is 50-feet, 60-feet off the ground. It's the Boiling Water Mark 1 Reactor. (0112-8-2 [Sachs, Gary])

Comment: To protect against possible flooding in plants located on the coast hardened dry cask storage as close to the source of generation as possible is recommended as an interim measure. (0116-4 [Wrenn, Nancy])

Comment: I support your REQUIRING ALL nuclear contractors to store all existing high level radioactive waste in Hardened On-Site Storage (HOSS). HOSS, dry cask storage that is "hardened" means: -designed and built well (not "cheaply"), -safeguarded against accidents and routine wear-and-tear (continuously monitored by trained personnel), -fortified against attack (treated as a national security top priority), -and protected against leakage into the environment (0 bq). HOSS cannot be permanently located on seacoasts and fresh water sources (rivers, lakes, reservoirs, underground aquifers) because of risk of poisonous leakage into our vital drinking and agricultural water supplies. Densely-packed, currently vulnerable HLRW storage pools, at risk of catastrophic fires and radioactivity releases, should be emptied immediately into on-site HOSS. For some inexplicable reason (if not the convenience of industry financiers), you have permitted nuclear power plant generators to be built next to rivers and oceans, free sources of water for cooling pools. These locations are not safe; they are vulnerable to flooding. Therefore, hardened dry cask storage should be done as close to the wastes' point of generation as possible, but on-site only as an interim measure. (0127-1 [Lee, Catherine])

Comment: The very real risks of nuclear waste continue at reactor sites which should have at the very least hardened on-site storage systems. (0139-2 [Hodik, Barbara J.])

Comment: We must beware! Get this stuff in dry casks as soon as possible and please require strict limits on how much spent fuel is allowed in the pools and how long they can remain there...should not be more than 5 years. Our waters will not keep up with more demand. (0145-2 [Sorensen, Laura])

Comment: Hardened on-site storage of the casks should be the choice for storage. (0149-2 [Powell, Michael])

Comment: Concrete and steel dry casks, on the other hand, do not require electricity because they are passively cooled by natural air flow. The dry casks at the Fukushima plant in Japan, for example, went relatively unscathed after the March 2011 disaster there. Independent experts at the Union of Concerned Scientists and elsewhere agree that radioactive waste that has cooled sufficiently should be transferred to dry casks. As the waste must eventually be transferred to dry casks in order to be shipped offsite, why not demand that this happen sooner rather than later and improve safety right now???) I would like to add my voice to those asking the question - Why have we not made our nuclear waste more secure??? - Do we want a terrorist attack on

our nuclear plants? Please do the sensible thing and begin the transfer of this nuclear waste into dry casks. Lets not wait until we have a disaster (0151-1 [Gale, Robert and Beverly])

Comment: Our [RiverKeeper] main concern with Indian Point and with the nuclear waste stored at Indian Point, we have currently over 200 metric tons of highly toxic, highly radioactive waste at the site. Our main concern is that the waste stored in the pools is vulnerable to terrorism, is vulnerable to accidents, it's leaked into the Hudson River, and so the overarching need, both immediately and in the long term, is to move the waste out of the spent fuel pools and into dry casks. (0163-2-2 [Musegaas, Philip])

Comment: At present hardened on-site storage (HOSS) seems to be the only solution, even though it obviously cannot be the final answer for safe storage that must last for thousands of years. (0174-3 [Thomas, Ellen] [Thomas, Ruth])

Comment: In achieving SCFE and satisfying our necessary corollary of making zero toxic nuclear waste we also can greatly reduce, and in effect, cap the magnitude of safe storage space needed. This will save money, helping alleviate our national debt burden as well as requiring less off-limits, posted land. I encourage you to make Hardened On Site Storage (HOSS) a significant component of your recommendations. Not only does HOSS eliminate the costs of transit and the dangers to public health from inevitable accidents, spills, leaks, fires on our highways, but it keeps the toxic waste where it already is-on already posted, off-limits, secured sites. These sites will be with us as such for a long time, even after nuclear power generation is phased out. 4. I urge you at NRC to bear in mind, to emphasize the merit of satisfying our necessary corollary and HOSS in forming your proposals for nuclear waste containment and storage. Our long term health and sustainability depend on it! (0188-2 [Howarth, Robert])

Comment: Instead of a so-called temporary proposal of transporting large quantities of these materials, our experts should adopt the safer plan of storing them in dry hardened, secure on-site facilities until a permanent, scientifically defensible and publicly acceptable waste solution is developed. This would allow the waste to be moved only once, to a permanent site. (0189-6 [Patrie, MD, MPH, Lewis E.]

Comment: I am also concerned that many of our nuclear reactors have over-crowded fuel pools on site. These present safety threats to the communities and industries that surround the plants. The NRC should take immediate action to reduce the number of fuel assemblies in the water-filled pools. (0198-2 [Cerrito, Robert])

Comment: Hardened on-site storage of the casks should become the choice for storage. (0198-4 [Cerrito, Robert])

Comment: I am extremely concerned about spent fuel rods in overcrowded fuel pools. I want to see spent fuel transferred to DRY CASKS as soon as possible. (0207-1 [Denton, Jill])

Comment: Establish hardened on-site storage (HOSS): Irradiated fuel must be stored as safely as possible as close to the site of generation as possible. Waste moved from fuel pools must be safeguarded in hardened, on-site storage (HOSS) facilities. Transporting waste to interim away-from-reactor storage should not be done unless the reactor site is unsuitable for a ROSS facility and the move increases the safety and security of the waste. HOSS facilities must not be regarded as a permanent waste solution, and thus should not be constructed deep underground. The waste must be retrievable, and real-time radiation and heat monitoring at the

HOSS facility must be implemented for early detection of radiation releases and overheating. The overall objective of HOSS should be that the amount of releases projected in even severe attacks should be low enough that the storage system would be unattractive as a terrorist target. Design criteria that would correspond to the overall objective must include: a) Resistance to severe attacks, such as a direct hit by high-explosive or deeply penetrating weapons and munitions or a direct hit by a large aircraft loaded with fuel or a small aircraft loaded with fuel and/or explosives, without major releases. b) Placement of individual canisters that makes detection difficult from outside the site boundary. (0222-16 [Zeller, Lou])

Comment: Require periodic review of HOSS facilities and fuel pools: An annual report consisting of the review of each HOSS facility and fuel pool should be prepared with meaningful participation from public stakeholders, regulators, and utility managers at each site. The report must be made publicly available and may include recommendations for actions to be taken. (0222-18 [Zeller, Lou])

Comment: I also endorse the Principles for Safeguarding Nuclear Waste at Reactors from the Institute for Energy and Environmental Research. (0230-13 [Garb, James])

Comment: Hardened On Site Storage, with earthen berms to isolate casks, should be required for all High Level Reactor Waste (HLRW) cool enough to store dry. For a greater margin of safety, low density configuration of the SFP should be required for all HLRW not placed in casks. (0230-9 [Garb, James])

Comment: I have no confidence that this is a safe solution for the people and environment of this county. It is a vital matter of public safety that spent fuel rods be moved from the overcrowded spent fuel pools into dry casks immediately. But this is only a short-term solution. (0232-4 [Hall, Caroline])

Comment: The NRC needs to require that spent fuel be moved out of vulnerable pools and into hardened on-site storage casks (HOSS). This should be required as soon as the fuel is cool enough to move relatively safely, rather than waiting until the pools are too full to take any new spent fuel otherwise. Require hardened onsite storage. (0233-5 [Dubois, Gwen L])

Comment: Empty spent fuel pools as soon as possible. (0233-6 [Dubois, Gwen L])

Comment: There are two things I am asking you to do. First, require that all spent fuel rods held in pools be put into dry cask storage as soon as is safely possible, As we learned from Fukushima, pool storage, especially the overcrowded pool storage we have a DCNPP (5x over the design), is one of the most unsafe situations we can have. I am asking you to make it as safe as possible. (0236-2 [Reinheimer, Alice])

Comment: The NRC should expedite reduction in the number of fuel assemblies in water-filled pools, securely transferring them to dry cask storage. (0244-14-11 [Prescott, Lisa Marie])

Comment: I had been to some information sessions by NEIS and I learned about hardened onsite storage and I expected that would be included in the document, but again, I didn't find any of that. (0245-31-3 [Fox, Tracy])

Comment: Just as it is around the country, the spent fuel pools in our region, I am from Baltimore, at Calvert Cliffs and Peach Bottom have several times the amount of radioactivity as the Daiichi 4 spent fuel pool. Peach Bottom shares the Mark 1 design like the Fukushima

reactors with the elevated spent fuel pool. Moreover, more and more of today's fuel is the radioactively hotter high burn-up fuel. The consequences of a loss of electricity would be catastrophic. We can't say just because a tsunami is unlikely that a Fukushima-like disaster can't happen here. Peach Bottom, within 50 miles of my city, is at risk from a sudden dam failure, as are 33 other reactors in our suite. Calvert Cliffs is three miles from the largest liquid natural gas terminal on the east coast, where a large fire explosion could occur. Climate change may bring more super storms up the coast like Sandy. The NRC needs to require that spent fuel be moved out of the vulnerable spent fuel pools and into not just safer dry casks, which of course are safer because of the double advantage of passive cooling and smaller amounts of radioactivity per cask, but into hardened onsite storage, safe from airplane attacks, terrorists, and explosions. This should be required as soon as the fuel is cool enough to move relatively safely, rather than waiting, as it is done now, until the pools are too full to take any new spent fuel otherwise. (0246-11-1 [Dubois, Gwen L])

Comment: Spent fuel into hardened onsite casks. (0246-11-6 [Dubois, Gwen L])

Comment: I also agree that we shouldn't avoid addressing our existing waste storage problems. And as suggested before, hardened onsite storage seems to be really the best answer. (0246-13-4 [O'Leary, David])

Comment: And we do prefer hardened onsite storage systems. (0246-16-9 [Michetti, Susan])

Comment: I also want to take opportunity remind the Agency, the NRC, that a large coalition of national, state, and local groups and organizations have been calling on this Agency for years to mandate the expedient transfer of spent fuel from overcrowded pools to hardened onsite storage, where this country's stockpile of lethal waste can be monitored until a permanent disposal solution is determined. I will just call on you again to consider taking action on this reasonable safeguard. (0246-22-6 [Fisher, Allison])

Comment: In achieving self-containment for eternity and satisfying the necessary corollary of making zero toxic nuclear waste, we also can greatly reduce and in effect, cap the magnitude of safe storage space needed. This will save money, helping alleviate our national debt burden, as well as requiring less off limits-posted land. I encourage you at NRC to make hardened onsite storage a significant component of your recommendations. Not only does HOSS eliminate the costs of transit and the dangers to public health from inevitable accidents, spills, leaks, fires on our highways, but it keeps the toxic waste where it already is, already posted in off limits secured sites. These sites will be with us as long -- for a long time, even after nuclear power generation is phased out. I urge you at NRC to bear in mind and to emphasize the merit of satisfying our necessary corollary and HOSS, informing your proposals for nuclear waste containment and storage. Our long-term health and sustainability depends on it. (0250-12-2 [Howarth, Robert])

Comment: We need to move the spent or irradiated fuel rods from pools at reactor sites to hardened onsite storage. I am a supporter of hardened onsite storage. (0250-29-1 [Rivard, Betsey])

Comment: If there ever is to be one site where the fuel would be, it would have to go to dry casks, anyway, to be transported, so I say move it to dry casks as soon as possible. (0250-29-2 [Rivard, Betsey])

Comment: Instead of a so-called temporary proposal of transporting high quantities of these materials, our experts should adopt a plan of stopping them and storing them in high dry hardened secure onsite facilities until a permanent scientifically defensible and publicly acceptable waste solution is developed. (0250-30-5 [Patrie, Lewis E.]

Comment: At present, hardened onsite storage seems to be the only solution, even though it obviously cannot be the final answer, for safe storage that must last for thousands of years. (0250-51-2 [Thomas, Ellen])

Comment: I am opposed to the Yucca Mountain solution. I believe that the waste should be as soon as possible transferred from the waste pools to hardened structures onsite. (0250-64-3 [Gupton, William])

Comment: And in the meantime, we have got to get our nuclear waste arsenal stored as safely as possible. And the best way to do that is to get it out of the spent fuel pools and into hardened onsite storage. (0250-66-4 [Hanson, Courtney])

Comment: And what I would really encourage is moving, you know, spent fuel out of the pools as soon as possible after the five years to dry cask or dry container storage, just because it is inherently safer. (0250-69-5 [Rundle, Steve])

Comment: The SLO [San Luis Obispo] Mothers For Peace have asked for expediency in moving Diablo Canyon's spent fuel rods from storage pools into onsite dry casks. (0251-2 [Baker, Sheila])

Comment: The Fukushima nuclear plant disaster shows us that radio-active pools of spent fuel cells are much more vulnerable to damage than those stored in dry casks. The inexorable conclusion is that reliance on long term storage in pools must end as soon as possible. The NRC should mandate an urgent, accelerated rate of transfer of spent fuels cells from pools to dry casks. (0252-3 [Golden, Leon] [Goldin, Martha])

Comment: Accelerate the schedule for transferring spent fuel rods from overcrowded spent fuel pools into dry casks. Some irradiated fuel pools in the U.S. currently hold up to 9 times the amount of spent fuel for which they were designed. The pools are not protected by redundant emergency makeup and cooling systems or housed within robust containment structures having reinforced concrete walls several feet thick. Irradiated fuel casks can withstand environmental disasters that spent fuel pools cannot, as evidenced by the continued function of the dry casks at Fukushima. The casks survived the 9.0 quake and continue to protect the irradiated fuel, even though the tsunami flooded them. These containers have not exploded; are not on fire; are not catastrophically leaking and do not require ongoing addition of liquid to cool. On the face of it, they are outperforming the pools on the site. Dry casks have the advantage of passive cooling via airflow, making them less vulnerable to natural disaster and sabotage. Spent fuel pools are attractive targets for terrorists and that has not been adequately considered! (0256-6 [Harkins, Lynne])

Comment: If anything, accelerate the schedule for transferring spent fuel rods from overcrowded spent fuel pools into dry casks, and complete a thorough review of storage issues. (0257-3 [Abbott, Dana])

Comment: The shift to dry cask storage should be accelerated. (0288-2 [Wickham, Wendelyn])

Comment: Your job and the responsibilities that come with it are awesome. You make decisions that not only affect us today but generations to follow. Not only human health and life but virtually every living organism will be affected if there is an accident or terrorist attack on any of the 104 reactors in this country. According to your NRC mission statement, your focus is on regulatory actions that protect health and safety of the public and the environment. Please, prove to us you mean it. Dry Cask Storage Immediately. (0290-5 [Brown, Marty])

Comment: [I urge that] spent-fuel transfer to hardened dry casks, not transport to “interim” storage sites, be incorporated in the final Rule. (0303-16 [Lamberts, Frances])

Comment: For many reasons – and because we know of their far superior safety from the Fukushima and North Anna reactors – the Rule, as a minimal measure, should mandate a speedy transfer to all sufficiently cooled SNF waste to hardened casks. (0303-4 [Lamberts, Frances])

Comment: Catastrophic nuclear accidents constitute an enormous, if not existential, menace for people in large areas around such facilities. The US has luckily – but barely several times – so far escaped these. Chernobyl and Fukushima demonstrate their horrific danger. In any possible such disaster, the SNF crowding in cooling pools creates large additional risks, which could be avoided through hardened dry-casking. (0303-9 [Lamberts, Frances])

Comment: I support safe expedited transfer of cooled spent fuel[.] (0309-3 [Green, Jeanne])

Comment: [I support]...hardened dispersed dry cask storage (concrete & steel). (0309-4 [Green, Jeanne])

Comment: Until then or if this does not happen, safe dry cask storage on site must be hardened for possible terrorist attack or other accidents. (0309-6 [Green, Jeanne])

Comment: The spent fuel must be put into dry cask storage for the immediate future. This is essential for the public safety. (0318-2 [Saltzman, Dale])

Comment: Therefore NRC must stop licensing new nuclear power plants and extending existing licenses unless and until a proven-safe permanent waste storage site is established, and in the interim require and implement HOSS as fast as possible. (0319-12 [Nichols, John])

Comment: Moreover NRC needs to require and implement Hardened On-Site Storage (HOSS) of wastes, as quickly as possible. (0319-2 [Nichols, John])

Comment: The NRC needs to mandate HOSS to store spent fuel more safely and securely at or near nuclear plants. HOSS solves the immediate dangers nuclear waste poses, without creating unnecessary risks. (0319-9 [Nichols, John])

Comment: For the HLRWs that already exist, require Hardened On-Site Storage (HOSS). Hundreds of environmental and public interest groups, representing all 50 states, have endorsed the Statement of Principles for Safeguarding Nuclear Waste at Reactors, which describes HOSS. Where possible, densely-packed, vulnerable HLRW storage pools, at risk of catastrophic fires and radioactivity releases, should be emptied into on-site dry cask storage that is “hardened”: designed and built well, safeguarded against accidents, fortified against attacks, and protected against leakage into the environment. This should be expedited as a national security top priority. Locations where HOSS is not safe (places vulnerable to flooding,

for example), hardened dry cask storage should be done as close to the wastes' point of generation as possible, as safely as possible. HOSS must be monitored and retrievable, and is but an interim measure. HOSS cannot be a permanent measure on the sea coasts and fresh water sources (rivers, lakes, reservoirs) of our country, due to rising sea levels and risk of leakage into our vital drinking water supplies. (0320-1 [Kennedy, David])

Comment: My second suggestion to you, therefore, is that sufficiently cooled fuel rods be transferred to dry, hardened canisters. In these, I understand, this highly radioactive waste material can be passively cooled, through air flow, instead of being dependent on continuous, deep-water cooling and uninterrupted electricity for the water pumping and circulation. At the Japanese nuclear plant in Fukushima, the dry-canister stored spent fuel was not affected by the earth quake and tsunami there. We, too, should better secure this material by placing it into safer, hardened, dry storage as soon as possible. In the Commission's regulation on these, nuclear-waste matters, the industry should be ordered to promptly perform this transfer. (0322-5 [Baker, Hannelore])

Comment: After you've had the fuel in the reactor you need about seven years in the spent fuel before you can safely put it into a cask and keep it sealed with all the thermal analysis and that kind of thing. So, we can't do it just immediately. And I think San Onofre has a plan for roughly 20 years to have that taken care of, so we have to -- the physics of it tell us we're stuck in the -- a minimum seven years before we can even move it out of the spent fuel pool. (0325-26-4 [Hannaman, Bill])

Comment: Last week, the Alliance for Nuclear Responsibility met with the NRC Chairman and the Office of Inspector General, and we asked will the NRC stand in California's way if we choose to invest in expedited transfer of spent fuel into a dry cask system? Yes, even the NRC admits it's marginally safer. SCE [Southern California Edison] stands ready to expedite, and as PG&E begins to realize that license renewal will be unprofitable, we expect they will follow suit. We ask the NRC, work on the process for safe transfer and storage and get out of California's way. (0325-3-5 [Becker, Rochelle])

Comment: Nearly all of this waste is currently being stored in overcrowded and unprotected pools when a safer alternative exists. So my third message is this, help protect us and future generations by, one, requiring the accelerated transfer of the waste from the pools into the more secure concrete and steel dry casks[.] (0326-10-3 [ZamEk, Jill])

Comment: "Your job and the responsibilities that come with it are awesome. You make decisions that not only affect us today, but generations to follow. Not only human health and life, but virtually every living organism will be affected if there is an accident or a terrorist attack on any of the 104 reactors in this country. According to your NRC mission statement, your focus is on regulatory actions that protect health and safety of the public and the environment. Please prove to us that you mean it; dry cask storage immediately." (0326-14-5 [Brown, Marti])

Comment: [E]mploy hardened onsite storage for the independent spent fuel storage insulation[.] (0326-15-10 [Schumann, Klaus])

Comment: I was especially appalled to learn that the conclusion in the draft against accelerated transfer of spent fuel assemblies from the pools to the dry casks is primarily based on a cost/benefit analysis. Given the catastrophic consequences of a mishap in the pools, this conclusion seems to be questionable at best. (0326-15-3 [Schumann, Klaus])

Comment: At a subsequent Senate Subcommittee Meeting, chaired by Senator Feinstein, she was having a hard time understanding why the NRC had not mandated, not encouraged, but mandated more rapid transfer of spent fuel to dry casks, as there were no problems with dry cask storage at Daiichi. Senator Feinstein is not alone in urging a speedier move to dry cask storage. The Union of Concerned Scientists has described the pools as a weak link in plant safety. It's of the opinion, that's their opinion, that the worst dry cask storage is immeasurably safer than vulnerable spent fuel pools. Astonishingly, the NRC, in its post-Fukushima recommendation, did not call for an acceleration of transfer of waste out of the pools. (0326-19-3 [Carrigan, Milton])

Comment: Currently, the NRC is allowing Diablo Canyon to exceed -- or to continue to store, the spent fuel assemblies in open storage. This must stop. The stark lessons of Fukushima should prompt you, the Nuclear Regulatory Commission, to require PG&E to move its spent fuel into dry cask storage in a meaningfully accelerated rate. (0326-43-4 [Rippner, Sharon])

Comment: I certainly have agreed with very much that has been shared. Primarily I'm going to speak of getting it into the dry casks as soon as possible. Spend the money. Money spent now, it may seem like a bunch. Later on it will seem to you, I believe it will seem to us to have been money well spent. (0326-52-1 [Fosmo, Vaughn])

Comment: Primarily I want to speak to putting the material in the dry casks. I'm not an authority on it but it seems to me that's valid. (0326-52-3 [Fosmo, Vaughn])

Comment: [I'd like to say]...accelerate the schedule for transferring spent fuel rods from over-crowded spent fuel pools into dry casks. (0326-53-6 [McGibney, Patrick])

Comment: I heartily suggest that the NRC use its leadership to hasten PG&E's mitigation of its spent fuel rods by transferring the remaining two-thirds of all those cool enough to dry casks, safer storage, not in years' but in months' time. (0326-58-3 [Davis, Adrienne])

Comment: I urge the NRC to fast track the transfer of spent fuel from spent fuel pools to dry cask storage as quickly as possible. (0326-59-2 [Cordes, Reo])

Comment: Let me first say that I'd like to see a rule immediately putting all the spent fuel, at least, in the concrete cylinders. (0326-64-1 [Nelson, David])

Comment: It's impossible to have confidence in any aspect of this Federal program. Tonight, I would like to speak to the very narrow issue of the pace at which waste is moved from the liquid pools into dry cask. And I'd like to direct my remarks to the NRC staff. For five years, the California Energy Commission has directed California's two nuclear utilities, PG&E and Southern California Edison, to accelerate the transfer of waste from the pools to dry casks with the very important caveat, consistent with all NRC rules. For five years, that direction has been stonewalled by both utilities. Now, I recognize that, for many at the NRC, this was regarded as unwelcome interference and second-guessing by the State of California in decisions that are considered to be, exclusively, the realm of the Federal government. That is not the case. These are rate-payer-driven decisions and they are entitled to considerable deference for that very reason. The origin of the policy was based upon reports from the National Academy of Science, expert testimony from a variety of distinguished professionals in the field, and in particular, a very highly-esteemed geologist who used to be known as Dr. Alison McFarland. (0326-7-1 [Geesman, John])

Comment: The Southern California Edison Company, last month, told the Public Utilities Commission that now that its plant is in decommissioning, it was going to attempt to move waste from the pools to dry casks, consistent with all NRC rules, as soon as practicable. The very words in the State of California's policy. If you live here in Central California, or Northern California, you're familiar with PG&E's latest advertising campaign. Every day we're working to do the right thing. I have a suggestion, starting tomorrow, why don't you step-up the pace of moving this waste from the pools to dry casks? (0326-7-3 [Geesman, John])

Comment: Hardened onsite storage has been endorsed by hundreds of environmental groups, and densely packed, vulnerable, high-level radioactive waste-storage pools that are at risk for fire and radioactive releases should be emptied onto onsite dry cask storage that is hardened, that is designed and built well, safeguarded against accidents, and fortified against attacks, and protected against leakage into the environment. (0327-20-6 [Clemons, Victoria])

Comment: Seventy-five percent of spent fuel is in fuel pools and allowed to remain there for as much as 60 years, often in overcrowded pools. The GEIS underestimates the risk of fuel pool fires and ignores safer alternatives of hardened onsite storage at the plant sites. (0327-27-3 [Macks, Vic])

Comment: That said, with what's already sitting precariously onsite in spent fuel pools -- and I'd like to say to the legal counsel I think you had it right the first time. It was the spent nuclear fools. Let's get it moved at least into a hardened onsite storage as soon as possible. (0327-39-6 [Izant, Carol])

Comment: Hardened with concrete, the casks could be safe against hopefully most disasters and terrorism. For instance, the casks at Fukushima were undamaged during that event. (0327-9-3 [McArdle, Ed])

Comment: In the interim, NRC must mandate the immediate movement of high-level waste that has been sufficiently cooled out of the fuel pools to dry storage containers, and those should be hardened onsite to improve safety and security (0328-9-7 [LaForge, John])

Comment: And the final thought I'd like to share has to do with hardened onsite storage, which is an environmental coalition consensus opinion, environmental groups numbering in the hundreds representing every single state in the U.S. has called for hardened onsite storage for over a decade. This would be a good step in the right direction in terms of keeping high-level radioactive waste out of the environment and getting it out of the vulnerable pools and putting it into a dry cask storage system that will last not decades but centuries into the future and itself will need to be replaced. (0329-11-5 [Kamps, Kevin])

Comment: In April of 2011, one of the strongest tornados known to man twisted a row of power towers about 500 meters from the Browns Ferry fuel pools. Both Browns Ferry and Sequoyah are in tornado corridors and have seen multiple invasions of severe weather. One thing Fukushima showed us is that hardened onsite storage can withstand extreme weather since the storage casks were not damaged by the tsunami, whereas the cooling pools were severely damaged and are still a major hazard. We want to once again request that the Nuclear Regulatory Commission require a specific accountable schedule for moving fuel rods from the cooling pools into safe hardened onsite storage at Browns Ferry Nuclear Power Plant and other Mark I and Mark II reactors. (0329-13-2 [Johnston, Gretel])

Comment: I think the only thing that I can agree with is the idea of starting to unload these overfull filled-to-the-brim spent fuel pools into hardened onsite storage, HOSS units, even though I know we have a big problem with this high burn-up fuel. And it seems that the industry, that the regulators have allowed the industry to produce this stuff without really knowing what to do with it. (0329-17-3 [Gray, Erica])

Comment: We need to get all of the spent fuel out of the pools as soon as we can into dry hardened onsite storage, or HOSS. (0329-18-5 [Carberry, Mike])

Comment: If you would like to have more information about the hardened onsite storage principles that these 135 organizations have signed onto, it's readily available on Sierra Club's website and from other websites of some of our partnering organizations, such as Beyond Nuclear and the Nuclear Information and Research Service. (0329-33-3 [Feldman, Jane])

Comment: In the interim, NRC must mandate the immediate movement of waste that has been sufficiently cooled out of the pools to dry storage containers, and those should be hardened on-site to improve safety and security. (0336-16 [Lish, Christopher])

Comment: While we are working on the solution, I am also concerned that many of our nuclear reactors have over-crowded fuel pools on site. These present safety threats to the communities and industries that surround the plants. The Nuclear Regulatory Commission (NRC) should take immediate action to reduce the number of fuel assemblies in the water-filled pools. Before transferring the fuel rods to cask storage, the cask storage needs to be examined and reinforced to be able to safely store the fuel rods, particularly those that qualify as high burn up fuel. Hardened on-site storage (HOSS) of the casks should become the choice for storage for the high-level radioactive waste (HLRW) that already exists. (0336-5 [Lish, Christopher])

Comment: Hundreds of environmental and public interest groups-representing all 50 states-have endorsed the Statement of Principles for Safeguarding Nuclear Waste at Reactors, which describes HOSS. Where possible, densely-packed, vulnerable HLRW storage pools, at risk of catastrophic fires and radioactivity releases, should be emptied into on-site dry cask storage that is "hardened": designed and built well, safeguarded against accidents, fortified against attacks, and protected against leakage into the environment. This should be expedited as a national security top priority. Locations where HOSS is not safe (e.g., places vulnerable to flooding), hardened dry cask storage should be done as close to the waste's point of generation as possible, as safely as possible. HOSS must be monitored and retrievable, and is but an interim measure. HOSS cannot be a permanent measure on the sea coasts and near fresh water sources (rivers, lakes, reservoirs) of our country due to rising sea levels and risk of leakage into our vital drinking water supplies. (0336-6 [Lish, Christopher])

Comment: Keeping the nuclear waste on the sites where it was produced is very probably the optimal choice at this point, especially if the plan were to include expeditious transfer of spent fuel into casks protected by berms or other hardened supra-structural systems. However, this represents the least bad option, not a desirable outcome. (0341-1-4 [Mermelstein, Richard])

Comment: Cracks have been found in the current tanks, and even though those cracks have not yet resulted in a disastrous leak, it is clear that the radioactive waste, wherever it is to be stored eventually, must be sufficiently diluted and stored in hardened containers. To allow this issue to continue to fester is both foolish and irresponsible. (0351-3 [Stein, Robert])

Comment: The EIS must consider safer options like Hardened On-Site Storage (HOSS) for storing the more than 70,000 tons of spent fuel that will be created and housed at nuclear plants by 2050 to reduce risk of leakage or terrorist attack. (0357-3 [Daily, G. Allen])

Comment: The NRC should take immediate action to reduce the fuel assemblies in spent fuel pools, as well as analyzing the deficiencies of current dry cask storage. (0357-4 [Daily, G. Allen])

Comment: Employ "Hardened On-Site Storage" for the ISFSI's. (0358-14 [Schumann, Klaus])

Comment: In addition, the draft is flawed because the conclusion against "accelerated transfer" is mainly based on its "cost-benefit analysis". Given the catastrophic consequences of a mishap in the pools, this analysis seems questionable at best. (0358-7 [Schumann, Klaus])

Comment: The NRC must mandate the immediate movement of waste that has been sufficiently cooled out of the pools to dry storage containers, and those should be hardened on-site (HOSS) to improve safety and security (0362-4 [Schietinger, Helen])

Comment: i think the sooner you get the waste into dry casks the better...please, for the sake of our children. (0364-1 [Yelda, Peter])

Comment: The nuclear industry is against permanent on-site hardened storage of nuclear waste to avoid what should be their financial responsibility to pay for unending storage and security, as well as liability. (0377-1-16 [Cuthbert, Lewis])

Comment: 2. Provide an accountable schedule for speedy removal of Limerick's high-level radioactive wastes from fuel pools into hardened on-site cask storage. (0377-1-7 [Cuthbert, Lewis])

Comment: WHY FUEL POOLS MUST BE UNLOADED AS SOON AS POSSIBLE INTO ONSITE STORAGE EVIDENCE BELOW SHOWS WHY NRC MUST REQUIRE NUCLEAR PLANT OWNERS TO REMOVE HIGH-LEVEL RADIOACTIVE WASTES FROM FUEL POOLS AS SOON AS POSSIBLE AND MOVE IT TO ON-SITE DRY STORAGE; Spent Fuel Pools: Are A Catastrophe Waiting To Happen; Are Vulnerable to Meltdown From Loss of Water and/or Loss of Power Through Accidents, Natural Disasters, or Terrorist Attacks by Plane or Missile; Are Packed And Can Be Turned Into Weapons of Mass Destruction; Spent Fuel In Pools Contains More Radioactivity Than Reactors Spent Fuel Rods Give Off Enough Radiation To Kill People In Seconds; Pools Are At High Risk From Loss of Water Accidents; Loss of Water Can Be Caused By Penetration by Aircraft or Missiles, Or By Extended Loss of Power Due To Natural Disasters. (0377-3-5 [Cuthbert, Lewis])

Comment: For nuclear wastes that already exist, NRC must require Hardened On-Site Storage (HOSS). ACE joined many other groups across the nation, endorsing the Statement of Principles for Safeguarding Nuclear Waste at Reactors. Densely-packed, vulnerable HLRW storage pools, at risk of catastrophic fires and radioactivity releases, should be emptied into on-site dry cask storage that is "hardened": designed and built well, safeguarded against accidents, fortified against attacks, and protected against leakage into the environment. This should be expedited as a national security top priority. In locations where hardened safe storage (HOSS) is not safe (places vulnerable to flooding, for example), hardened dry cask storage should be done as close to the wastes' point of generation as possible, as safely as possible. HOSS must be monitored and retrievable. HOSS cannot be a permanent measure on the sea coasts and fresh water sources (rivers, lakes, reservoirs) of our country, due to rising sea levels and risk of leakage into our vital drinking water supplies (0377-5-16 [Cuthbert, Lewis])

Comment: 3. Leaving the spent fuel in overcrowded, multilevel, unprotected cooling pools for long periods is irresponsible and dangerous and inviting disaster. Secure it in solid hardened well protected storage on site ASAP until a way can be found to neutralize it or a place can be found to permanently store this dangerous substance. This will eliminate the risk of transport accidents or incidents, contaminating surrounding areas during transport, and inviting vandalism and attack. (0381-7 [Fasten, Susan])

Comment: Please arrange to have used fuel pools at Diablo transferred as soon as possible to hard storage. Many years ago, before there were tight restrictions, I have flown over Diablo; open storage pools would be fairly easy for a suicide bomber to destroy. I am convinced a severe earthquake could create leakage. Even the hard casks should be transferred as soon as possible because of the possibility a very severe quake would tumble several down toward the plant and toward the ocean. I am writing out of concern for the many, many students I taught in the school district downwind from Diablo. (0389-1 [Atlee, Susan])

Comment: To lessen the danger now the NRC should require the immediate movement of sufficiently cooled waste out of the pools to dry storage containers, hardened on-site (HOSS). (0402-5 [Gross, Cheryl])

Comment: Additionally, we should learn from Fukushima and get waste out of spent fuel pools as soon as possible. (0404-3 [Smith, Roger])

Comment: In the interim, NRC must mandate the immediate movement of waste that has been sufficiently cooled out of the pools to dry storage containers, and those should be hardened on-site (HOSS) to improve safety and security. (0405-6 [Dugan, Pat])

Comment: In addition to not relicensing the Indian Point nuclear power plants in order to avoid the production of any additional dangerous waste, please require the expedited removal of spent fuel from pools into dry casks to reduce the safety risks of pool storage. (0407-3 [Kerr, Mary Ellen])

Comment: This requirement is best achieved with Hardened On-Site Storage. Hardened Onsite Storage has been endorsed by hundreds of environmental and public interest groups, representing all 50 states. Densely-packed, vulnerable HLRW storage pools, at risk of fire and radioactivity releases, should be emptied into on-site dry cask storage that is "hardened": that is, designed and built well, safeguarded against accidents, fortified against attacks, and protected against leakage into the environment. (0421-7 [Clemons, Victoria])

Comment: Although no viable long term solutions are currently available, the highly radioactive fuel rods which have sufficiently cooled must be immediately transferred into more secure, hardened on site, dry cask storage. This process should be accelerated in anticipation of California's next big earthquake. (0423-1 [Graves, Caryn])

Comment: The dangers to our community posed by storing nuclear waste here indefinitely requires us to become more involved in the decommissioning process. There are steps that could and should be taken to reduce the risk to our community by taking highly radioactive waste from vulnerable pools and move into fortified dry cask storage containers as soon as fuel rods are cool enough to be transferred; and/or by expediting storage and transport solutions for high burn up fuel. (0433-4 [Stone, Gene])

Comment: I don't agree with hardened on site, but the rest is right on. (0440-1 [Pieart, Richard])

Comment: In the interim, NRC must mandate the immediate movement of waste that has been sufficiently cooled out of the pools to dry storage containers, and those should be hardened on-site (HOSS) to improve safety and security. (0443-10 [Sabo, Betty])

Comment: The NRC claims in the DGEIS that security measures have improved since 9/11. But no remedial actions have been required to harden or fortify the structures housing SNF, to make them hardened and less penetrable...and that, quite frankly, is not possible to accomplish under a determined attack from terrorists or by sabotage from insiders. Scores of spent fuel pools exist in nothing more than a fragile shell of a building with little more than a thin metal roof, yet contain far higher levels and quantities of radioactive materials than the reactor cores themselves that are shrouded by containment buildings. Scenarios put forth by NRC and national lab publications regarding releases from spent fuel pools have not studied all of these potential modes of attack, and related failure modes of the spent fuel systems. Furthermore, I contest the statements by NRC that airspaces are or can be protected or defended. Hence, waste confidence security certainly does not exist. (0447-1-14 [Andrews, Richard])

Comment: I call on the NRC staff and commissioners to act immediately, taking the following steps with respect to spent nuclear fuel management, transport, disposal, and its regulation: - Require all reactors to immediately harden all structures housing spent fuel pools since at a minimum SNF will have to stay in the pools for about five years for primary cooling, even after reactor cessation of power operations (0447-2-11 [Andrews, Richard])

Comment: Move quickly to remove all possible spent fuel from cooling pools and place SNF into hardened dry casks of small enough size and designs to avoid secondary or subsequent repackaging and transfer for safe transport to remotely sited interim or final repositories (0447-2-12 [Andrews, Richard])

Comment: Since dry cask storage of spent fuel at nuclear power stations is a proven technology, and because it prepares spent fuel for eventual transport to a regional or national long term storage sites, I support the rapid deployment of dry cask storage. (0448-3 [Moncy, Charles])

Comment: Independent experts at the Union of Concerned Scientists and elsewhere agree that the dangerous, radioactive waste from spent fuel pools, that has cooled sufficiently, should be required to be transferred to safer, on-site dry cask storage. (0453-4 [Feathers, Jösan])

Comment: It is irrational for the NRC not to mandate immediate removal of as much spent fuel as possible from the overcrowded pools at our nation's Nuclear Reactors. As previously stated this is largely a matter of money. Safety is a secondary consideration. (0454-12 [Waldstein, Joe])

Comment: The proposed new Rule on Waste Confidence is deficient in the following three fundamental respects: 2. It does not require the transfer of Spent Fuel from storage pools into hardened on site dry cask storage as soon as the fuel becomes cool enough to make the transition. (0454-2 [Waldstein, Joe])

Comment: Nuclear fuel rods and assemblies must be removed from fuel pools as soon as they are ready to be and placed into dry cask storage. This applies to operating plants as well as plants being decommissioned. (0467-2 [Hynes, H Patricia])

Comment: Although no viable long term solutions are currently available, I insist on the immediate transfer of highly radioactive fuel rods which have sufficiently cooled in the

vulnerable pools into more secure, hardened on site, dry cask storage. This process should be accelerated in anticipation of California's next big earthquake. (0472-1 [Sheridan, Paul])

Comment: The DGEIS does not indicate that the NRC is currently taking any action to expedite removal of spent fuel rods from pools into casks. In fact, as discussed above, the recent COMSECY-13-0030 states that expediting fuel transfer will not be considered any further--it is essentially off the table. Moreover, this restricted analysis of one alternative was done outside the procedural protections and substantive requirements of NEPA. (0473-12-13 [Dean, Janice] [Griffin, William] [Mahowald, Philip R.] [Snook, Robert] [Springer, Darren])

Comment: My husband and I believe that there must be an immediate transfer from San Onofre of the highly radioactive fuel rods which have sufficiently cooled in the vulnerable pools, into more secure, hardened on site, dry cask storage. This process should be accelerated in anticipation of California's next big earthquake. (0477-1 [Tache, Jan])

Comment: The GEIS fails to consider the need to: Require ongoing hardened, bermed, on-site storage of spent fuel including during Safestor and decommissioning[.] (0490-6 [Chin, Rebecca])

Comment: In the interim, NRC must mandate the immediate movement of waste that has been sufficiently cooled out of the pools to dry storage containers, and those should be hardened on-site (HOSS) to improve safety and security. (0491-7 [Commenters, Multiple])

Comment: With this in mind the most rational approach is a concentrated effort to move any and all spent fuel that has aged enough to be stored in dry casks into dry storage immediately - this would greatly lessen the problems that would need to be managed if a large Earthquake were to occur. (0495-3 [Grigg, Richard])

Comment: [T]hat first immediate step should be to move any spent fuel that has aged enough to Dry Cask Storage as quickly as possible. (0495-5 [Grigg, Richard])

Comment: Sufficient NRC funding should be used to expedite the transfer of the millions of nuclear fuel rods currently stored in pools at power plants to dry, hardened onsite storage. (0499-1 [Ramsay, Rebecca])

Comment: The EIS must consider safer options like Hardened On-Site Storage (HOSS) for storing the more than 70,000 tons of spent fuel that will be created and housed at nuclear plants by 2050 to reduce risk of leakage or terrorist attack. (0507-2 [Giese, Mark M.])

Comment: The NRC should take immediate action to reduce the fuel assemblies in spent fuel pools, as well as analyzing the deficiencies of current dry cask storage. (0507-3 [Giese, Mark M.])

Comment: Please dry cask all spent nuclear fuel now. (0511-1 [O'Brien, Patricia])

Comment: Move all spent nuclear fuel into dry cask storage post-haste, and get it out of the spent fuel pools. (0515-6 [Stennes, Nancy])

Comment: The NRC must insist all domestic nuclear waste gets put into dry cask storage immediately. For-profit utilities must bear this cost and not fob it off on customers as they bought into unsafe nuclear power knowing there was no practical way of handling the waste. (0527-1 [Titus, Mary])

Comment: [I]t [short term solution] immediately creates good productive jobs while making the spent fuel much safer than it is sitting in spent fuel pools. Dry Cask everything that can be done now. Until the fuels are put into Dry Cask, there is a risk of a regional economy killing event due to power loss/natural disaster, or terrorist action. There have been far too many close calls in the last few years. Our good judgment in risk control has been decimated by lack of good choices and the hope of a Yucca mountain, always right around the corner. (0529-2 [Claybourne, Ana])

Comment: I insist on the immediate transfer of spent fuel rods which have sufficiently cooled for 5 years in the vulnerable pools into more secure, hardened on site, dry cask storage. (0529-4 [Claybourne, Ana])

Comment: Dry Casks stored in Hardened On-Site Storage is a safer alternative to open pools, and is endorsed by over 170 public interest groups in the US as an interim storage solution. Still, spent fuel must be re-casked every 100 years in this system. (0531-2-22 [Morgan, Sally])

Comment: The GEIS fails to consider the need to [r]equire ongoing hardened, on-site storage of irradiated/spent fuel including during reactor operation, after cessation of reactor operation, Safestor and decommissioning[.] (0537-6 [Commenters, Multiple])

Comment: --Require a low-density, open-frame layout for fuel pools: Fuel pools were originally designed for temporary storage of a limited number of irradiated fuel assemblies in a low density, open frame configuration. As the amount of waste generated has increased beyond the designed capacity, the pools have been reorganized so that the concentration of fuel in the pools is nearly the same as that in operating reactor cores. If water is lost from a densely packed pool as the result of an attack or an accident, cooling by ambient air would likely be insufficient to prevent a fire, resulting in the release of large quantities of radioactivity to the environment. A low density, open-frame arrangement within fuel pools could allow enough air circulation to keep the fuel from catching fire. In order to achieve and maintain this arrangement within the pools, irradiated fuel must be transferred from the pools to dry storage within five years of being discharged from the reactor. (0545-3 [Patrie, MD, MPH, Lewis E.])

Comment: --Establish hardened on-site storage (HOSS): Irradiated fuel must be stored as safely as possible as close to the site of generation as possible. Waste moved from fuel pools must be safeguarded in hardened, on-site storage (HOSS) facilities. Transporting waste to interim away-from-reactor storage should not be done unless the reactor site is unsuitable for a HOSS facility and the move increases the safety and security of the waste. HOSS facilities must not be regarded as a permanent waste solution, and thus should not be constructed deep underground. The waste must be retrievable, and real-time radiation and heat monitoring at the HOSS facility must be implemented for early detection of radiation releases and overheating. The overall objective of HOSS should be that the amount of releases projected in even severe attacks should be low enough that the storage system would be unattractive as a terrorist target. Design criteria that would correspond to the overall objective must include: --Resistance to severe attacks, such as a direct hit by high-explosive or deeply penetrating weapons and munitions or a direct hit by a large aircraft loaded with fuel or a small aircraft loaded with fuel and/or explosives, without major releases. --Placement of individual canisters that makes detection difficult from outside the site boundary. --Protect fuel pools: Irradiated fuel must be kept in pools for several years before it can be stored in a dry facility. The pools must be protected to withstand an attack by air, land, or water from a force at least equal in size and coordination to the 9/11 attacks. The security improvements must be approved by a panel of experts independent of the nuclear industry and the Nuclear Regulatory Commission. --Require

periodic review of HOSS facilities and fuel pools: An annual report consisting of the review of each HOSS facility and fuel pool should be prepared with meaningful participation from public stakeholders, regulators, and utility managers at each site. The report must be made publicly available and may include recommendations for actions to be taken. --Dedicate funding to local and state governments to independently monitor the sites: Funding for monitoring the HOSS facilities at each site must be provided to affected local and state governments. The affected public must have the right to fully participate. (0545-4 [Patrie, MD, MPH, Lewis E.]

Comment: The NRC should require that spent fuel be transferred from wet (pool) storage to dry cask storage on the most accelerated time schedule possible. (0548-3 [Gibson, Bruce])

Comment: DCPD also has a facility for dry cask storage of spent fuel, which is generally agreed to be the preferred means of spent fuel storage. Testimony before our Board has suggested that the loading of dry casks at DCPD is not occurring as fast as it could. Given the extra density of spent fuel in the pools and the risks specific to DCPD, we would request that the NRC require the transfer of fuel from the pools to dry casks to be conducted in the most timely manner possible. (0548-8 [Gibson, Bruce])

Comment: Irradiated fuel casks can withstand environmental disasters that spent fuel pools cannot, as evidenced by the continued function of the dry casks at Fukushima. The casks survived the 9.0 quake and continue to protect the irradiated fuel, even though the tsunami flooded them. These containers have not exploded; are not on fire; are not catastrophically leaking and do not require ongoing addition of liquid to cool. On the face of it, they are outperforming the pools on the site. Dry casks have the advantage of passive cooling via airflow, making them less vulnerable to natural disaster and sabotage. Spent fuel pools are attractive targets for terrorists. (Physicians for Social Responsibility, National Academy of Sciences, 9-11 Commission Report, Alvarez) Dry casks are less promising targets for terrorists because one would have to trigger failure in several casks to accomplish the same amount of radiation release as an attack on a spent fuel pool. Casking spent fuel should be expedited as a national security top priority. Transfer of irradiated fuel to casks should be done sooner rather than later. Since irradiated fuel will have to be put into dry containers to remove it from the reactor site when a repository is available, this process is not an "if" it is a "when." Public health will be protected better if the fuel is transferred now from cooling pools to casks. Robert Alvarez, Jan Beyea, Klaus Janberg, Jungmin Kang, Ed Lyman, Allison Macfarlane, Gordon Thompson, and Frank N. von Hippel, Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States, Science and Global Security, 11:1-51, 2003.
<http://mothersforpeace.org/data/20030122ReducingTheHazards?searchterm=spent+fuel+pools>.
"Safer Storage of Spent Nuclear Fuel", Union of Concerned Scientists, 2012.
http://www.ucsusa.org/nuclear_power/nuclear_power_risk/safety/safer-storage-of-spent-fuel.html. (0552-1-23 [Macks, Vic])

Comment: On-site storage of irradiated fuel rods in dry casks should be made safer and more secure by adoption by NRC of regulations to mandate HOSS (Hardened On-Site Storage). HOSS is a system whereby more space between the containers increases security, and earth mounds or berms form a barrier between the containers and any public-access points such as roads, delivery areas and water-front. HOSS also mandates real-time heat and radiation monitoring and would also provide for local community over-sight of the waste installation such as a citizen advisory board. (0552-1-24 [Macks, Vic])

Comment: Casking the spent fuel would prevent much of the hazard associated with transportation of high-level nuclear waste. However, locations where HOSS (Hardened On-Site

Storage) is not safe (places vulnerable to flooding, for example), hardened dry cask storage should be done as close to the point of generation as possible. HOSS cannot be a permanent measure on the seacoasts and fresh water sources (rivers, lakes, reservoirs) of our country, due to rising sea levels and risk of leakage into our vital drinking water supplies. Another major appeal of HOSS is that it is currently an interim storage choice that is safer and endorsed by the bulk of public interest groups concerned with nuclear issues. Over 170 groups in all 50 states have endorsed the concept of HOSS, including most groups near reactor sites. (NIRS) (0552-1-28 [Macks, Vic])

Comment: Hardened On-Site Storage systems (HOSS) should be used to store spent fuel more safely and securely at or near nuclear plants. HOSS reduces the immediate dangers spent fuel poses, without creating unnecessary risks.

http://ieer.org/wp/wpcontent/uploads/2010/03/HOSS_PRINCIPLES_3-23-10x.pdf (0552-2-7 [Macks, Vic])

Comment: Is expedited transfer more expensive? The short answer is that it shouldn't be. All spent fuel generated in the past and for the foreseeable future will eventually be transferred to dry casks located at reactor sites or centralized facilities. The only question is when. The total number of casks and size of the related facilities will be the same, whether or not transfer to dry casks is expedited or dragged out. Again, the only unanswered question is when the casks and pads will be built. There is no reason to think they will be cheaper 50-60 years after license termination. EPRI, 2012 Technical Report, *Impacts Associated with Transfer of Spent Nuclear Fuel from Spent Fuel Storage Pools to Dry Storage After Five Years of Cooling* estimated the cost to U.S. industry as a whole at \$3.5 billion to \$3.9 billion. The costs for all such transfers pale in comparison to the estimated cost of a spent fuel pool fire at Pilgrim: one reactor, \$488 billion. EPRI's estimates include purchasing casks; cask loading operations; dry storage facilities; annual operations and maintenance; construction, or expansion. (0556-5-6 [Lampert, Mary])

Comment: Concerned citizens hope to be able to get additional requests from other local communities, to force the federal government to remove nuclear waste from the now-closed San Onofre Nuclear (Waste) Generating Station, or at least, to give us hardened on-site storage, which neither the current dry casks nor the spent fuel pools provide. "Hardened" might mean underground, behind earthen berms, separated from each other, moved away from rail, ship, aerial and truck bomb access points, fewer assemblies in each cask, etc. etc.. These are standard anti-terrorism procedures which are NOT being done at our ISFSIs (Independent Spent Fuel Storage Installations, the current acronym for "semi-permanent nuclear waste dump and blight on the land.") Yesterday Donna Gilmore and I were suddenly interviewed by Fox 5 San Diego about Southern California Edison's shipment of Unit II's original reactor pressure vessel head to Clive, Utah. It's a dome-shaped object approximately 14 feet across. Edison says it weighs 77 tons, and says that standing six feet away from it for an hour will give you about as much radiation as watching television for about a year. Do they mean modern OLED screens or old tube TVs? Do they mean the most modern types of dental x-ray equipment when they say it's equal to a dental x-ray, or do they mean older machines that give out nearly an order of magnitude more radiation? Or even older ones that were even worse? Here's a link to the report based on the on-site interview with Donna Gilmore:

<http://fox5sandiego.com/2013/12/16/san-onofre-transport-nuclear-waste-out-of-state/#ixzz2nh3ycGur>. This report by 760KFMB gives additional information:

<http://www.760kfmb.com/story/24237142/77-ton-nuclear-component-on-the-road-from-san-onofre-to-utah>. Here's a link to my own animation of San Onofre's reactors, which shows the exact part they are moving (screen two (the two triangles at the top advance the screens)). Notice that the RPVH is a pretty small piece of the entire system:

<http://www.acehoffman.blogspot.com/2013/02/new-animation-shows-what-could-happen.html>. The RPVH is highly radioactive, although presumably it will be shipped facing down, so that most of the gamma emissions will be shielded by 8 inches of steel (with a lot of holes, which aim straight up, but presumably have been plugged with something). Underneath perhaps they will have a heavy metal plate several inches thick bolted to the bottom, and any gamma emissions that get through it will, presumably, mainly go into the ground beneath the vehicle as it travels down the road. Few will get through the eight inches of steel, few will get through the bottom plate and then bounce off the ground into where other vehicles with people might be, and so it is called "low level waste." The inner liner of the RPVH is made of the finest stainless steel available -- and millions of kid's braces could have been made with that steel, if it were not irradiated. Some of it might find its way into kid's braces some day by accident anyway. Edison sent out a press release about moving the RPHV and assured the public it was safe. Certainly, it won't catch fire and spread radiation, thus contaminating the local population and the air, water and land. (0562-2 [Hoffman, Ace])

Comment: Please dry cask the spent fuel that can be dry casked. (0563-1 [Songchild, Stephanie])

Comment: Move all spent nuclear fuel into dry cask storage post-haste, and get it out of the spent fuel pools. (0566-7 [Tocornal, John])

Comment: We send rockets to Mars, but do not have the ability to remove the waste? Garbage I say! We the people are at the end of our patience. Why must it be like pulling teeth to get the officials to do what they should have done a long time ago? Follow the money I say, and you'll find who's behind it all, and in my opinion, it's Edison! Game over. Get it out of here, and do it NOW! We closed SONGS, and we will win this battle as well. You're just making us work a little bit harder than necessary. (0567-2 [Taylor, Jeff])

Comment: I am not a scientist, so I am not qualified to suggest the best method for handling the staggering amount of nuclear waste produced in this country, but I know what the effects of radiation poisoning are, as well as the nearly insurmountable problem of safely sequestering spent fuel rods. As the spent fuel pools are intended for preliminary cool-down maintenance until they can be stored by other means, it is imperative to move ahead with implementation of secure interim storage methods, such as "dry casking," while pouring every effort into research and development of a reliable extreme long-term storage modality. Any method that relies upon uninterrupted electric supply is bound to fail eventually. (0570-2 [Boosinger, Marilynn])

Comment: Oh and please make the utilities put the commercial spent nuclear fuel in Dry Hard Casks...for safety. (0571-4 [Young, Jane])

Comment: Dry Cask storage is the most viable long term solution, held in a storage system local to the mother reactor mitigating the inevitable spillage of rail or road transport. (0573-2 [Gerhart, Dan])

Comment: This dangerous material at the now closed San Onofre nuclear power plant in California needs to be transferred to a federally designated safe depository, ASAP. (0583-1 [Connoy, Gina])

Comment: We demand that NRC desist from collaborating and favoring the energy producing companies that are responsible for this situation and actually protect and defend the public by removing the radioactive material stored a San Onofre immediately. (0587-2 [Ciferri, Flavio])

Comment: As Japans' Fukushima nuclear plant crisis has shown, the spent fuel pools are just as dangerous if not more so than the main nuclear reactor. So NO I do not want to see 60 plus years of 'legal' safe time for nuclear fuel to sit in the spent fuel pool. It should only be allowed to stay until the cooling period renders it safe to be put in dry casks. I believe the cool down period is on average around 5 years for fuel coming out of a core into the spent fuel pool. After the cool down period, the plant operator should not be allowed to put more nuke fuel rods into the spent fuel pool, until all the cooled down nuke fuel rods are dry casked. Any fuel rod that is 90 days past it's cool down date should start running up fines against the plant operator, say about 5000.00 USD a day per fuel rod. Bet the cheap plant operators would move the fuel out then. (0590-1 [Anonymous, Scott])

Comment: All spent fuel that can be dry casked should be. We can't have another Fukushima event! The FSPs located in the reactor buildings were never intended for long-term storage and it is completely inappropriate to continue this reckless behavior. (0595-1 [Farbish, Peter])

Comment: At the very least, please see fit to delay relicensing until such time as the dangerous quantity of highly radioactive spent fuel rods is transferred into dry casks. At present, that is the only safer option for this diabolical material. (0609-4 [Leon, Vicki])

Comment: Require all spent fuel once adequately cooled to be placed in Hardened Dry Cask Storage in robust casks with leak detection, like German Castor V cask which have low visual and low infrared signatures. Removal of excess spent fuel being stored in spent fuel pools beyond the original approved spent fuel pool design capacity, as soon as adequate cooled. Require all dry casks to be bolted down and bermed or placed in other robust structures. At Indian Point the dry cask are not even attached to the pad, and in the event of an earthquake seismic scientists from Lamont Doherty have identified the risk of tipping and rolling into the Hudson River. (0611-53 [Shapiro, Susan])

Comment: [I respectively urge the Commission] that hardened on-site storage casks be maintained[.] (0620-14 [Rivera, Evelyn])

Comment: Spent Nuclear fuel should be moved to dry cask storage as quickly as possible, spent fuel should not be stored where a fuel pool fire could affect people, farm land or even worse, a nuclear reactor anywhere near farm land or people. (0634-11 [Cato, Michael])

Comment: Fuel should be moved to dry cask storage as soon as possible, and needs to be moved away from population centres and farm land. (0634-2 [Cato, Michael])

Comment: The best plan I have heard suggests leaving waste in place using hardened on - site storage placed in earth berms. (0636-3 [Bluestein, Bonnie])

Comment: ANA supports Hardened On-Site Storage (HOSS) for commercial SNF to reduce the amount and density of spent fuel in storage pools, increase the amount of SNF in dry storage, and improve the safeguards to reduce the impacts of natural or human events. (0646-3 [Hanson, Courtney])

Comment: The Nuclear Regulatory Commission (NRC) should be required to establish HOSS standards by rulemaking for licensed reactors. (0646-8 [Hanson, Courtney])

Comment: APV suggests transferring HLRW to cask storage as soon as possible after removal from the reactors. (0648-11 [Price, Scott])

Comment: In the case of the HLRW that already exists, we suggest requiring Hardened On-Site Storage (HOSS) as opposed to removing the material. APV joins hundreds of environmental and public interest groups, representing all 50 states, in endorsing the Statement of Principles for Safeguarding Nuclear Waste at Reactors(*italics*), which describes HOSS. Quoting Beyond Nuclear's statement: "Where possible, densely-packed, vulnerable HLRW storage pools, at risk of catastrophic fires and radioactivity releases, should be emptied into on-site dry cask storage that is "hardened": designed and built well, safeguarded against accidents, fortified against attacks, and protected against leakage into the environment. This should be expedited as a national security top priority. Locations where HOSS is not safe (places vulnerable to flooding, for example), hardened dry cask storage should be done as close to the wastes' point of generation as possible, as safely as possible. HOSS must be monitored and retrievable, and is but an interim measure. HOSS cannot be a permanent measure on the sea coasts and fresh water sources (rivers, lakes, reservoirs) of our country, due to rising sea levels and risk of leakage into our vital drinking water supplies." (0648-4 [Price, Scott])

Comment: Accelerate ongoing hardened, on-site storage of spent fuel at all reactor sites. (0660-9 [Headrick, Gary])

Comment: Use HOSS until a repository is available. No interim storage facility should be allowed. All spent fuel in pools over five years old should be immediately removed and placed in HOSS. (0662-2 [McClintock, Francene])

Comment: If there will be no long-term, dedicated storage facility built (a la Yucca Mountain), all spent fuels ought be dry-casked ASAP. (0666-1 [Sams, David])

Comment: THE NUCLEAR WASTE STORED IN CASKS AT SAN ONOFRE CAN NOW BE SAFELY MOVED AND MUST BE RELOCATED IMMEDIATELY TO A LESS POPULATED AREA IN CALIFORNIA. THE REMAINING WASTE CURRENTLY IN POOLS MUST BE PLACED IN CASKS AS SOON AS POSSIBLE. (0673-1 [Massey, Jennifer])

Comment: Our lives and livelihoods depend on the safe regulation of this nuclear power plant [Diablo Canyon] and Nuclear Waste Storage Site, responsibilities of the NRC. We urge the NRC to order PG&E to transfer the radioactive wastes into dry casks storage on an accelerated schedule, rather than leaving the rods in densely packed spent fuel pools. (0678-1 [Georgi, Carol])

Comment: For the high level wastes that already exist, NRC should require Hardened On-Site Storage (HOSS). Hundreds of environmental and public interest groups, representing all 50 states, have endorsed the Statement of Principles for Safeguarding Nuclear Waste at Reactors, which describes HOSS. High level wastes currently in risky and vulnerable storage pools should be transferred as soon as possible into on-site dry cask storage that is "hardened": designed and built well, safeguarded against accidents, fortified against attacks, and protected against leakage into the environment. This should be a top national security top priority. Obviously locations vulnerable to flooding would not be suitable for HOSS, but nearby suitable nearby sites should be identified so transportation of such wastes can be minimized and accomplished as safely as possible. Also, HOSS must be monitored and not allowed to leak, especially into fresh water sources, including ground water. (0702-3 [Scarff, Steve])

Comment: Employ the safest possible onsite alternatives for existing nuclear waste, such as Hardened On-Site Storage (HOSS) to reduce risk of leakage or terrorist attack. (0707-4 [Werner, Shahla M.])

Comment: Will the NRC require its nuclear power plant licensees to implement hardened on-site storage for their irradiated nuclear fuel --- that is, require that the irradiated fuel be removed from vulnerable, high-density reactor waste pools for storage in hardened dry-storage casks fortified against attacks and natural disasters? (0715-4 [Drey, Kay])

Comment: The next two recently released documents are a speech and slideshow presented by Michael Weber, NRC's Deputy Executive Director for Operations, at the U.S. Nuclear Infrastructure Council Meeting on January 31, 2012.¹²⁰ [footnote 120 text: Michael Weber, Responding to Fukushima-Daiichi (Speech), ML12037A072 ("*Weber Speech*") (Jan. 31, 2012); Michael Weber, Responding to Fukushima-Daiichi (Slideshow), ML120310267 ("*Weber Slideshow*") (Jan. 31, 2012).] These documents discuss NRC's response to the Fukushima accident, focusing in particular on spent fuel pools. Director Weber acknowledged that the pools were not designed for the long-term storage of spent nuclear fuel, that zirconium fires can occur in pools, and that the consequences of a zirconium fire could be very large.¹²¹ [footnote 121 text: *Weber Speech* at 4-5.] Furthermore, he stated that since the fuel pools are located outside of the primary containment that houses the reactor, a release of radionuclides from the pool can reach the environment much more easily than a release from the reactor core.¹²² [footnote 122 text: *Id.* at 4.] Director Weber further acknowledged that thinning the spent fuel pools would reduce the potential land contamination and economic impacts if a large release occurred.¹²³ [footnote 123 text: *Weber Slideshow* at slide 20.] He stated that due to the threat of zirconium fires, NRC is studying the benefits of removing spent fuel to achieve lower fuel density in the pools. Additionally, Mr. Weber disclosed that NRC Staff is currently conducting a Spent Fuel Pool Scoping Study to assess the impacts of thinning the pools.¹²⁴ [footnote 124 text: *Weber Speech* at 5.] This development reflects NRC's new understanding of the risks posed by spent fuel pools, due in large part to the events at Fukushima. The State believes this new understanding must be reflected in a revised EIS and rule. (0718-2-11 [Sipos, John])

Comment: Accelerate ongoing hardened, on-site storage of spent fuel at all reactor sites. (0728-7 [Anonymous, Anonymous])

Comment: I am horrified with the conclusion of the draft study against accelerated transfer of radioactive waste from the pools to dry casks being based on a cost/benefit analysis. Cost/benefit?! Isn't our safety supposed to be top priority? Who do you work for? If you are not working for the tax payers who support you, should you not instead be getting paid by the nuclear industry? (0734-6 [Hisasue, Carole])

Comment: As a concerned resident of San Clemente our city is dangerous. We have an enormous amount of high spent fuel rods in our "backyard"..this highly radioactive waste needs to be removed as soon as safely possible.it is my understanding that 2/3 'a of it can be removed NOW. This MUST be moved immediately. Our city is densely populated with NO evacuation plan. Please do the right thing NOW. (0736-1 [Johnston, Christined])

Comment: As you decide on a "Plan", please make it fully responsible with removal swiftly, not over many years putting all the nearby residents in danger of leakage as they have discovered in Japan. Please do it right, swiftly and completely. Our children and grandchildren will thank you. (0737-1 [Meyer, Frederick])

Comment: Accelerate ongoing hardened, on-site storage of spent fuel at all reactor sites. (0741-4 [Giese, Mark M.])

Comment: [K]eep the waste at the plant sites in a hardened fashion. (0748-2 [DeLano, Harry])

Comment: [I believe the NRC must:] Accelerate ongoing hardened, on-site storage of spent fuel at all reactor sites[.] (0757-15 [Lynch, Laura])

Comment: Accelerate ongoing hardened, on-site storage of spent fuel at all reactor sites. (0774-9 [Revilla, Oscar])

Comment: It is in everyone's interest to Dry Cask as soon as possible. (0778-1 [Sorgen, Phoebe])

Comment: Fukushima showed the danger in relying on long-term storage of nuclear waste rods in spent fuel pools which require constant circulation of cooled water. Nuclear waste rods need be transferred to hardened dry cask storage as soon as possible, even if it is more expensive for electrical utilities. (0788-1 [Sattler, Alfred])

Comment: Accelerate ongoing hardened, on-site storage of spent fuel at all reactor sites. (0789-4 [Salto, Don])

Comment: Begin an emergency program to put spent fuel into dry cask storage. (0801-4 [Magyar, Michael])

Comment: While we wait and watch the global disaster at Fukushima, follow the currents of the great Pacific Ocean carrying radioactive waste to distant shores, destroying everything in its path, you act as if its is "business as usual." Why would you do anything less than humanly possible to secure the spent fuel rods into dry cask storage as soon as possible at Diablo Canyon nuclear power plant? It is your job, your responsibility. (0811-2 [Paulsen, Carol])

Comment: Get the spent fuel rods out of the pools and into dry casks. (0811-6 [Paulsen, Carol])

Comment: Second, the facility where the waste is stored should be Hardened On-Site Storage (HOSS) systems to resist anti-tank missiles, crashed commercial jets and similar means of attack. At ground level, this would mean layers of concrete, steel, gravel and other substances around and above the spent fuel. Neither spent fuel pools -especially the "attic pools" of the GE Mark 1 design -nor dry casks by themselves meet this criterion. (0815-5 [Gunter, Keith] [Izant, Carol])

Comment: The NRC has not proposed any sort of hardened storage which is the safest option. (0815-7 [Gunter, Keith] [Izant, Carol])

Comment: In Michigan and around the Great Lakes basin, citizens, corporations, and governments alike are responsible for the largest amount of surface freshwater in the world. Including Canadian reactors, there are 33 reactors on the Great Lakes basin which is even more reason to implement HOSS at all of these facilities. (0815-8 [Gunter, Keith] [Izant, Carol])

Comment: This leads to the consideration of fuel handling and storage at Browns Ferrys G.E. Mark I (Fukushima) reactors which was ignored and legally foreclosed as these reactor licenses were renewed. I believe that a risk and environmental safety analysis will show that reducing the high density wet fuel storage pools located overhead in buildings with little storm resistance (and subject to a recent station blackout caused by tornadoes) is a much more urgent problem than indefinitely long onsite storage. (0821-6 [Paddock, Brian])

Comment: Adoption of Hardened Onsite Secure Storage regulations (HOSS) would provide at least some sense of improved security from various causes of release to the environment or

terrorist exploitation, but NRC has never even proposed such rules and now wants to leap to forever storage in unhardened surface locations. (0821-9 [Paddock, Brian])

Comment: Additionally it is hard to imagine a single terror event inflicted upon a dry cask storage system that would equal the radiological fallout from a single successful terrorist aircraft attack on a full spent fuel pool where a zirconium cladding fire occurred. Removing the active cooling requirements and lowering the concentration of the spent fuel storage density as quickly as possible will enhance the surrounding community's confidence in short-term nuclear waste storage. (0826-21 [Morgal, Rick])

Comment: The NRC needs to stop allowing the nuclear power plant owners from utilizing dry cask systems that are not capable of protecting their contained fuel from an impact from a large aircraft. The Draft GEIS talks about storing fuel in casks for up to several hundred years. The casks used need to be able to endure whatever mechanical impacts we can foresee in our current society before we pass the site on to the next seven generations. Massive movable concrete ramps positioned in front of the cask lid could be used to deflect an aircraft from directly hitting the metal cover of the NUHOMS dry casks. The ramps could be segmented, allowing them to be moved to facilitate inspection and re-arrangement dry cask contents. Since the concrete pad is very thick where the dry cask transportation truck operates, the weight of the concrete ramps would not be a problem to the storage site. By orienting the ramps in front of the NUHOMS metal cover it would be possible to protect the dry cask sealed lid from direct impact from a large aircraft. Protecting the surrounding community from a possible dry cask dirty bomb fallout scenario less catastrophic than a spent fuel pool fire but still potentially very devastating to the surrounding community. (0826-27 [Morgal, Rick])

Comment: [S]ecure the existing reactor waste in hardened on-site storage. (0829-2 [Anonymous, Debra])

Comment: Page 4-81, external events on fuel pools... the pools are not in hardened containment buildings but instead have only a thin roof over them, only for decoration. Those in Mark I containments are elevated above the ground, like those at Fukushima. THESE STRUCTURES ARE UNSAFE! Your rules for Fuel Pools are wholly insufficient but you will not admit this because it will mean you will have to tell existing licensees that they will have to spend money for safety, or shut down. And even when they shut down, they are still left with the problem.. STANDARDS FOR FUEL POOL SAFETY, INCLUDING HARDENED CONTAINMENT MUST BE IMPROVED! (0836-57 [Davis, Anonymous])

Comment: The risks associated with spent fuel pools are real, and extreme consequences of mishaps, accidents, and space weather are relevant. Hardened On-Site Storage systems (HOSS) should be used immediately to store spent fuel more safely and securely at all near nuclear plants until a permanent storage solution is developed. HOSS solves many of the immediate dangers nuclear waste poses, without creating unnecessary risks associated with water cooled spent fuel pools. (0840-6 [Taylor, Tom])

Comment: The NRC emphasizes that the consequences to focus on are the radiological doses to humans which the report states are low in both cases because of the modeled successful evacuation and sheltering that limit the radiological doses. The nuclear plants have to transition to dry storage anyway to retain space in the pool. The NRC focuses on accident rem dose to the public as the health indicator of accident severity rather than miles of land uninhabitable, acres of farm land unusable, and dollar cost of the catastrophe. The NRC concludes that there is no significant safety benefit from reducing high density spent fuel pool storage to low density

storage. Thus, NRC rationalizes that transitioning to low density spent fuel pool storage is unnecessary. Likewise, the NRC also rationalizes that expediting the transition to dry cask storage which is significantly safer than pool storage is unnecessary. The NRC is serving the nuclear industry well. You and me? Not so much. (0851-6 [Thatcher, Tami])

Comment: Accelerate ongoing hardened, on-site storage of spent fuel at all reactor sites. (0860-9 [Headrick, Gary])

Comment: In addition, I would request that all irradiated fuel rods be put into hardened on-site storage, with berms, as soon as possible, rather than waiting until the fuel pools are filled. The longer we have to keep cooling those pools, the greater the risk of a failure and consequent disaster. (0864-9 [Gellert, Sally Jane])

Comment: Hardened with concrete the casks could be safe against most disasters and terrorism. For instance, the casks at Fukushima were undamaged. (0883-3 [McArdle, Ed])

Comment: Go to dry cask storage as rapidly as possible! (0888-9 [Wilvert, Rosemary])

Comment: [F]ind better ways to harden existing wastes in place[.] (0890-4 [Arnason, Deb])

Comment: [S]tore [nuclear radioactive waste] in hardened storage existing waste where it is! (0890-8 [Arnason, Deb])

Comment: HOSS = common sense (0901-3 [Anderson, Janet M.])

Comment: (XI-7) Table XI-1 shows how the United States could benefit from policies that ensured that critical infrastructure is designed to be robust and inherently safer. The benefits could include, for example, a reduction in the federal government's perceived need to conduct surveillance of the domestic population. That matter is a subject of current debate. Designing critical infrastructure to be robust and inherently safer would be part of a national strategy of protective deterrence. (XI-8) Nuclear facilities – including reactors, pools, and ISFSIs using dry casks – are components of critical infrastructure. In the context of storing spent fuel, a dry cask is more robust and inherently safer than is a pool equipped with high-density racks. A dry cask in an ISFSI with enhanced protection would be even more robust and inherently safer. Thus, the aspects of radiological risk that I discuss in this declaration are significant for national security, and could be productively addressed within the context of protective deterrence. The draft GEIS is oblivious to this matter, and does not respond to my recommendation as quoted in paragraph XI-6, above. More generally, NRC appears oblivious to its potential ability to benefit the nation by implementing principles of protective deterrence. (0916-3-10 [Curran, Diane] [Thompson, Gordon R.])

Comment: (XI-18) The third conclusion is as follows. The cumulative frequency of successful attacks on ISFSIs, now and in the future, could be decreased by providing ISFSIs with enhanced protection against attack. (0916-3-14 [Curran, Diane] [Thompson, Gordon R.])

Comment: First Dry Cast all available waste[.] (0917-1 [Priano, Guy])

Comment: Enclosed please find the signatures of many in our community who are asking that you take additional measures for our health and safety. That is, after all supposed, to be the guiding mission of your organization. Please adhere to your guidelines of public safety and require the industry to move waste into dry cask storage. (0918-2 [Church of New York, The Riverside])

Comment: As you are well aware, many hundreds of environmental organizations, representing all 50 states, have long called for Hardened On-Site Storage (HOSS) as the least-worst interim measure for safeguarding and securing irradiated nuclear fuel that already exists in the U.S. (0927-1 [Kamps, Kevin])

Comment: HOSS represents the national environmental consensus position for addressing the dire risks of pool storage, as well as current dry cask storage; not decades or centuries into the future, but right now. (0927-3 [Kamps, Kevin])

Comment: Establish hardened on-site storage (HOSS): Irradiated fuel must be stored as safely as possible as close to the site of generation as possible. Waste moved from fuel pools must be safeguarded in hardened, on-site storage (HOSS) facilities. Transporting waste to interim away-from-reactor storage should not be done unless the reactor site is unsuitable for a HOSS facility and the move increases the safety and security of the waste. HOSS facilities must not be regarded as a permanent waste solution, and thus should not be constructed deep underground. The waste must be retrievable, and real-time radiation and heat monitoring at the HOSS facility must be implemented for early detection of radiation releases and overheating. The overall objective of HOSS should be that the amount of releases projected in even severe attacks should be low enough that the storage system would be unattractive as a terrorist target. Design criteria that would correspond to the overall objective must include: --Resistance to severe attacks, such as a direct hit by high-explosive or deeply penetrating weapons and munitions or a direct hit by a large aircraft loaded with fuel or a small aircraft loaded with fuel and/or explosives, without major releases. --Placement of individual canisters that makes detection difficult from outside the site boundary. (0927-7 [Kamps, Kevin])

Comment: Require periodic review of HOSS facilities and fuel pools: An annual report consisting of the review of each HOSS facility and fuel pool should be prepared with meaningful participation from public stakeholders, regulators, and utility managers at each site. The report must be made publicly available and may include recommendations for actions to be taken. >-- Dedicate funding to local and state governments to independently monitor the sites: Funding for monitoring the HOSS facilities at each site must be provided to affected local and state governments. The affected public must have the right to fully participate. (0927-9 [Kamps, Kevin])

Comment: The terrorist threat to nuclear power reactors--brought home so clearly by the attacks of Sept. 11, 2001 as well as the U.S. federal government's admission that nuclear reactors are high on al-Qaida's list of potentially catastrophic terrorist targets--also raises concern about waste stored on-site at reactors. Pool fires caused by terrorist attacks could release massive amounts of radioactivity into the environment for hundreds of miles downwind, risking death and injury to hundreds of thousands of people. But dry casks, stored in concentrated rows (not unlike bowling pins) in clearly visible outdoor locations, are also very vulnerable to terrorist attack. Some concerned citizens groups have advocated "hardening" at-reactor waste storage, fortifying it against terrorist attack, such as by emptying vulnerable pools and dispersing and bunkering dry storage casks behind thick concrete, steel, and earthen shields to defend against attacks by high explosives or missiles (see www.nukbusters.org/issues/hoss). (0929-16 [Kamps, Kevin])

Comment: Page 4-81, external events on fuel pools... the pools are not in hardened containment buildings but instead have only a thin roof over them, only for decoration. Those in Mark I containments are elevated above the ground, like those at Fukushima. THESE STRUCTURES ARE UNSAFE. Your rules for Fuel Pools are wholly insufficient but you will not admit this because it will mean you will have to tell existing licensees that they will have to

spend money for safety, or shut down. And even when they shut down, they are still left with the problem.. STANDARDS FOR FUEL POOL SAFETY, INCLUDING HARDENED CONTAINMENT MUST BE IMPROVED. (0930-3-9 [Lutz, Ray])

Comment: Overcrowding in irradiated/spent fuel pools is an unacceptable risk to the public. The NRC should take immediate action to reduce the number of fuel assemblies in the water filled pools, as well as analyzing the deficiencies of the current dry cask storage. (0938-4 [Sondheim, Steven])

Comment: Spent nuclear fuel older than five years should be stored in dry, hardened storage casks. (0946-2 [Commenters, Multiple])

Comment: In the interim, NRC must mandate the immediate movement of waste that has been sufficiently cooled out of the pools to dry storage containers. (1007-4 [Diamond, Jim])

51. Out-of-Scope Comments – Reactor Accidents

Comment: It's my opinion that safety is compromised when the plant continues to operate in any capacity after it's expected operational life span. (0026-2 [Campbell, Mary])

Comment: In Russia the Chernobyl reactor was precisely the same design as Hanford's. Shouldn't that mean something to us? As for the Japan disasters, it does not take the proverbial rocket scientist to tell us that it is a very dumb idea to build three reactors close together on a major fault line. (0057-5 [Lamont, Dana])

Comment: Although Walter and his followers were unable to stop the first breeder project in the U.S., another group called the Joint Committee on Atomic Energy, talked the Atomic Energy Commission into making a study on what would happen if a reactor melted down. The following study was named the WASH-740 report, or the Brookhaven Report. In a nutshell, the report stated that: In the event of a nuclear meltdown, there would probably be 3,400 deaths, 43,000 injuries, and 7 billion dollars of property damage, PER EVENT!.... Keep in mind as far as property values went, as this was figured in 1950's dollars. (0100-23 [Behling, Steve])

Comment: [Y]ou have estimated the risk of a core melt with containment breach at a G.E. Mark 1 BWR at 1 in 1 million reactor years. Actual reality has revealed the risk to be 1 in 352 reactor years. That's 200 -- 2,841 times more likely than the NRC prediction. (0112-11-4 [Agnew, David])

Comment: The NRC concludes in Section 4.1.3 that the impact of indefinite storage on land use will be small. How does that jive with real world engineering experience? We don't have many examples in this area, but we do have one rather significant one, Fukushima Daiichi. That's the best real world data we have now. That says that every 50 years we will have a major leak of high-level nuclear waste that will render about 250 square kilometers unusable for a million years. That works out to be 5 million square kilometers or about one-thirtieth of the land area of the entire world. I claim that's catastrophic, not wrong. But my estimate is based on real world experience and EPA requirements. (0112-20-4 [Robinson, Herb])

Comment: And he [Gregory Jaczko] came back and he wasn't -- it wasn't a unanimous votes anymore to license new plants in South Carolina and Georgia or relicense Pilgrim, for example. It was 4 to 1, 4 to 1. He voted against and against and against and he started speaking the truth. And he really suffered the consequences like all whistleblowers do. The NRC doesn't want

to know the truth. And what he said was I really want to give him this credit, "All 104 nuclear power reactors now in operation in the United States have a safety problem that cannot be fixed. And they should be replaced with newer technology. Continuing to put Band-Aid on Band-Aid is not going to fix the problem." He continues to speak and he was in Boston a week or two ago and he spoke about Fukushima won't happen again. (0112-22-2 [Nestel, Hattie])

Comment: I focused my attention on the PRA, like the probabilistic risk assessment, and more exactly on the human reliability assessment part. Because if you look back on the history and you look at all the accidental incidents at the nuclear power plants, most of them came from the human errors. And humans are made to fail. We cannot avoid that. So it's better to design fail-safe reactors. (0112-28-1 [Diaconeasa, Mihai])

Comment: So I want to just make one other comment about the Santa Fe Institute. Does anyone here know the Santa Fe Institute? It's a think tank in Santa Fe, New Mexico. A group of scientists come together and discuss topics. And all of these students here that are studying at MIT, I've been at Harvard, I've been at Tufts, I've been at all these universities, okay, and I want to tell you how smart I am, okay. So the Santa Fe Institute brought together scientists from all over, all specialties around the nuclear physicists, the electrical, you know, engineers, the botanists, the M.D.s, they took all the medical specialties, you know, physical specialties, brought them all together, sat them in one room and said, "Listen, guys, we want you to think of -- I want you to figure out what percentage of information you know, you know, you know, you know, you know, you know, you know, you know, you know. That you are so certain that you can tell somebody 100 percent that there is nothing else that could ever happen." And you know what this group knew? 4 percent. So if I studied for 38 years as a doctor, have gone to seminars and learned everything that I want to try, I'm constantly in continuing education, taught at Tufts for eight years, how much information do I know? Maybe .10001 percent. And I know this much. So for those brilliant students at MIT, you know this much. And the confidence that we have to say that nothing could happen like Fukushima or Chernobyl or Three-Mile Island is so -- it's so arrogant on the part of this group to think that we have to be so -- we know everything. We know the engineering, we know -- they know this much, guys. This much. (0112-29-3 [Roman, Margo])

Comment: Furthermore, it's premature because the probabilistic risk assessment, which is a foundation of assessing the impact of the various areas you looked at, are currently based on pre-Fukushima assumptions and probabilities; and, therefore, it's inappropriate to use a PRA of yesterday to make any judgment in this area until it has been updated. I would direct you in this to Chairman Macfarlane's notation note on the SECY dealing with filtration where she goes into the problems with PRA that she's identified. (0112-3-2 [Lampert, Mary])

Comment: Thirdly the infrastructure of nuclear plants is aging and more subject to deterioration. (0125-4 [Kidney, Barbara A.])

Comment: Although I know that the risk of a serious problem under a nuclear reactor is small, the consequences can be so severe that they must be considered anyway. (0163-20-1 [Gellert, Sally Jane])

Comment: The last time I checked the Sunday New York Times real estate section, Three Mile Island, Chernobyl, and Fukushima were not places with many listings. Nor were there any articles indicating that there were customers looking to move to either of these three places. While I'm certainly not qualified to make any decisions for other concerning either our economic well-being or how to become a successful real estate entrepreneur, I know that an ecological catastrophe forcing millions to flee permanently from their homes and others not so fortunate

who could not escape in time and are left to die of various cancers due to radiation poisoning is bad for business..... And since millions of dead people are no longer able to be customers, it might be more cost-effective in the long run for those who are responsible for the storage of the lethal material which can kill us all to deal with the problem in a sane and sensible way that will assure the safety of the millions of people who have no desire to become casualties of a nuclear disaster. No amount of lawsuits or gracious letters of sympathy could ever undue the tragedies of Three Mile Island, Chernobyl, and Fukushima. (0163-26-2 [Amram, David])

Comment: I'm almost sure that no one working for the NRC wants to have an emergency phone call telling them that they and their families have to pack up and flee immediately from where they live even if it means becoming homeless. And if they survive, seeing aerial photographs of where they used to live now reduced to ghost towns. And this is not a plot for a grade-B movie. This is the reality of what's already happened. (0163-26-4 [Amram, David])

Comment: Let's spot-check the document. The document concludes in section 4.1.3 that the impact of indefinite storage on land use will be SMALL. How does that jive with real world engineering experience? We don't have many examples in this area, but we do have one rather significant one: Fukushima Daiichi. This is the best real world data we have, now. That says every 50 years we will have a major leak of high-level nuclear waste that will render a 250 km² area unusable for a million years. That works out to be 5 million km². About 1/30th of the land area of the entire world! I claim that is "CATASTROPHIC," not "SMALL." My estimate is based on straightforward, real world, experience and EPA requirements. (0208-5 [Robinson, Herb])

Comment: I am also EXTREMELY concerned about the vulnerability of US reactors to an extended loss of power event. It seems to me that this is a "single" mode failure that every US reactor is subject to. (0224-1 [Simon, Daniel])

Comment: So, as some of the previous speakers have mentioned, there are four reactors in Illinois which are Fukushima Daiichi twin designs. These are General Electric Mark I boiling water reactors located at Dresden and Quad Cities. And we've seen on live television what these reactors are capable of in terms of risks if you lose the electric grid and the emergency diesel generators for a long enough period of time. (0245-13-1 [Kamps, Kevin])

Comment: The, and just moving -- this whole probabilistic risk mitigation and assessment, it's just mumbo-jumbo, mangling of logic to make it seem that the risk on paper is small, and it just does not do that. (0250-5-8 [Safer, Don])

Comment: I am concerned about the safety of nuclear energy. It does not have a reliable safety history. There have been 26 accidents in the US since 1961, some with fatalities--that's 1 every 2 years, the most notable being Three Mile Island in 1979. (0276-2 [Kurz, Carol])

Comment: Three Category 9 accidents have all occurred since 1979. Risk-quantification models which hold major-accident chances as so remote that they can be discounted are no longer defensible. Given the horrific damage to people and the environment such accidents can unleash, neither is the Commission's apparent safety-analysis focus on minimizing cost to the nuclear industry -- see failure so far to mandate hardened dry storage -- instead of assuring health- and environmental protection for the citizenry. (0303-12 [Lamberts, Frances])

Comment: And I want to start by acknowledging some of the people who have spoken for all the great people that work at PG&E and their ethic of safety and everything. I'm sure they're very, very dedicated and intelligent people, and they're doing their very best to make that a safe

plant. And I just don't want to discourage any of them, but unfortunately, there's just so many different things that can go wrong in a complex system. And Charles Perrow, in his award-winning book, *"The Normal Accidents: Living with High-Risk Technologies,"* talks about this phenomenon. And he describes what happened at Three-Mile Island. I'd like to read you this story. I think it's revealing. "The incident began when leaking moisture from a blocked filter inadvertently tripped valves controlling the flow of cold water into the plant's cooling system. Redundant backup valves should have intervened, but were inexplicably closed, which would have been clear from an indicator light, but the light was obscured by a tag hanging from a switch above." "A tertiary line of technological defense, the relief valve, should have opened, but did not, while a malfunctioning indicator light erroneously indicated that it had. This led to a partial meltdown at Three-Mile Island." Now, if anybody had been smart enough and creative enough to think of this particular sequence of events, they would have calculated it to be one in a million, I don't know, one in a billion, but there are a million or a billion of these things out there that we don't even know about, that we can't calculate, so in the end, it becomes inevitable. (0326-34-1 [Phillips, Mark])

Comment: We were also officially told, for decades we've been told, that a meltdown is impossible and, yet, we all saw them happen. We were also told that a nuclear power plant can't blow up like an atomic bomb, but the whole world saw the mushroom cloud over Fukushima. (0327-29-3 [DeMare, Joseph])

Comment: This past summer, I also participated in a radiation exposure conference in Japan that included an onsite tour of the Fukushima Daiichi facility. I've seen firsthand what happens when design basis isn't enough, when multiple supposedly redundant backups, safety systems, fail. I've seen the devastation and driven to the abandoned villages. (0328-1-3 [Johnson, Ron])

Comment: We've already seen that nuclear accidents happen. Fukushima, Chernobyl, Hanford, Three Mile Island. (0329-16-5 [Hoffman, Ace])

Comment: All nuclear power plants release radiation and other pollutants into the environment as a matter of course throughout operation. Accidental releases of radiation into environment have already occurred at the majority of nuclear plant sites. Two nuclear power installations have had severe accidents involving explosions, fires, meltdowns and massive releases of radiation. The Chernobyl disaster, in 1986, resulted in the permanent relocation of 300,000 people, the severe contamination of over 1000 square miles of land, and a sizable geographical region being deemed uninhabitable for centuries. The Fukushima accident, in 2011, resulted in the evacuation of over 150,000, with ultimate numbers of displaced uncertain. But both Chernobyl and Fukushima accidents occurred in relatively unpopulated areas. (0341-1-10 [Mermelstein, Richard])

Comment: Entropy isn't addressed by the NRC waste document. The NRC concludes in Section 4.1.3 that the impact of indefinite storage on land use will be small. How does that jive with real world engineering experience? Real world data says that every 25 years we will have a major leak of high-level nuclear waste that will render about 250 square kilometers unusable for millennia. That works out to be 5 million square kilometers or about one-thirtieth of the land area of the entire world. (0348-11 [Agnew, David] [Roscoe, Lee])

Comment: The NRC has estimated the risk of a core melt with containment breach at a GE Mark 1 Boiling Water Reactor such as Pilgrim at 1 in 1 million reactor-years. Actual reality has proven the risk to be 1 in 352 reactor-years, 2,841 times more likely than NRC prediction. (0348-7 [Agnew, David] [Roscoe, Lee])

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Comment: In particular, the use of probabilistic risk assessments (PRA's) suffers fundamentally from the fact that their results don't reflect in the remotest real life occurrences. The reason appears to be that classical PRA's cannot sufficiently predict nuclear catastrophe because of the low base rate for such events AND that such events usually have a multitude of causes and/or causes based on human error or other contributors which are not calculable in mathematical equations. Examples: Three Mile Island occurred after 500 reactor years while the PRA prediction was once in three million years. Chernobyl after 300 reactor years, the prediction was once in ten million. And the prediction for Fukushima would have been off the scale altogether: for three reactor meltdowns and pool problems all at once? A series of unpredicted events combined with unforeseen human errors: a beyond design basis quake, a drop in the coastline, insufficient seawalls, emergency generators in the basement and battery back-up power for just eight hours. Remarkably, at Fukushima, dry casks remained unscathed while the pools still present enormous problems 2 1/2 years later. (0358-8 [Schumann, Klaus])

Comment: Entropy isn't addressed by the NRC waste document. The NRC concludes in Section 4.1.3 that the impact of indefinite storage on land use will be small. How does that jive with real world engineering experience? Real world data says that every 25 years we will have a major leak of high-level nuclear waste that will render about 250 square kilometers unusable for millennia. That works out to be 5 million square kilometers or about one-thirtieth of the land area of the entire world. (0373-11 [O'Malley, Brian])

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Comment: The licensee and the NRC have performed many tests which have not been placed upon the ADAMS search site because the data has not been purged, and the report has not been issued. This leaves the NUREG 2157 existing without adequate basis, and untimely and prematurely issued. To provide an example, I point to the NUREG 2121: Fuel Fabrication, Relocation and Dispersal During a LOCA. This was discussed in an ACRS subcommittee meeting on 11/7/2013. Apparently problems with the fuel in a LOCA were not fully answered, such as cladding failure, micron size fuel chips, and other LOCA concerns. Will there be an effort to allow comment to the NUREG 2157 from these tests that have not gotten into the record as yet before the NUREG 2157 issues in final form? The discussion specified that the final decision on these LOCA/fuel issues will take several months to answer. May I have a time line when reports and solutions will be issued for comment? (0376-1 [Lewis, Marvin])

Comment: The NRC consistently draws overly optimistic conclusions in the draft report as to the safety of the nuclear enterprise while ignoring the disasters. It cites the Fukushima catastrophe as proof that spent fuel pools can maintain their integrity even under great environmental stress and it talks about lessons learned; but it seems to ignore all the human consequences and misery attendant in this tragedy. It also ignores the vulnerabilities in the GE boiling water reactors such as those affected in Fukushima, which need to be remedied. (0410-27 [Nelson, Dennis])

Comment: Nuclear reactions are so dangerous because they are fundamentally uncontrollable. There is no off switch! Once enough purified, fissionable material is collected into a small enough space it achieves a life of its own. After a chain reaction has been initiated and the fuel has burned up to a certain degree it also becomes so radioactively and thermally hot that it is very difficult to handle. The reactor operator attempts to limit run-away chain-reactions using cadmium, boron and other neutron scavengers in control rods. Sometimes control fails because it depends on the physical integrity of the reactor. If the process gets outside of its design parameters, fuel assemblies and control rod channels can bulge, warp or distort in such a way as to prevent the proper insertion and operation of the control rods. This can lead to a rapid increase in the chain-reaction, a temperature excursion, further disruption of the reactor components and an eventual meltdown of the core. Even if the chain-reaction can be stopped the fuel components continue their radioactive decay and this keeps the fuel elements incredibly hot. If the cooling system fails to remove the decay heat from the rods and provide replacement water for that which evaporates, the rods can become exposed to air and can self-ignite burning the zirconium metal cladding. Zirconium is pyrophoric, i.e., will self-ignite and burn in air if the temperature becomes high enough. Uranium and plutonium metals are also pyrophoric and so will ignite and burn in air at high temperatures. Small modular reactors which can use metallic fuels are therefore fundamentally much more dangerous than the metal oxide fuels in common use today in large commercial reactors. (0410-7 [Nelson, Dennis])

Comment: You have estimated the risk of a core melt with containment breach at a GE Mark 1 BWR at 1 in 1 million reactor-years. Actual reality has revealed the risk to be 1 in 352 reactor-years, 2,841 times more likely than NRC prediction. (0419-4 [Agnew, David])

Comment: NRC regulations—10 C.F.R. § 50.68, Criticality Accident Requirements—require that safety analyses be conducted for scenarios in which fresh fuel assemblies, when housed in fresh fuel storage racks, *in a dry environment*, would be exposed to flooding, foam, or water mist, which fire fighting operations could cause. According to the NRC, “[f]oam or mist affects the neutron moderation in the [dry storage] array and can result in a peak in reactivity at low moderator density (called “optimum” moderation¹⁶¹ [footnote 161 text: J. M. Cano et al., “Supercriticality through Optimum Moderation in Nuclear Fuel Storage,” Nuclear Technology, Vol. 48, p. 251 (1980).])”¹⁶² [footnote 162 text: NRC, “Guidance on the Regulatory Requirements for Criticality Analysis of Fuel Storage at Light-Water Reactor Power Plants,” August 19, 1993, (ADAMS Accession No: ML072710248), Attachment 1, p. 4.] 10 C.F.R. § 50.68, Criticality Accident Requirements, states: Each licensee shall comply with the following requirements in lieu of maintaining a monitoring system capable of detecting a criticality as described in 10 CFR 70.24: If optimum moderation of fresh fuel in the fresh fuel storage racks occurs when the racks are assumed to be loaded with fuel of the maximum fuel assembly reactivity and filled with low-density hydrogenous fluid [water is hydrogenous], the k-effective [the estimated ratio of neutron production to neutron absorption and leakage] corresponding to this optimum moderation must not exceed 0.98 [below 1.0 is subcritical], at a 95 percent probability, 95 percent confidence level. This evaluation need not be performed if administrative

controls and/or design features prevent such moderation or if fresh fuel storage racks are not used. (0463-2-4 [Leyse, Mark])

Comment: Failure to Address Defects of Mark 1 Containment Vessel: NRC's own nuclear experts have known for years that the Mark 1 design, including its containment vessel are flawed and particularly susceptible to a major nuclear accident. Yet, NRC utterly failed to even mention this new information in their LR EISs -- the very document where such problems are to be investigated and publicly vetted. The WCGEIS needs to be revised to address this safety concern and how it could affect spent-fuel storage, including potential accidents. The WCGEIS needs to consider the option of closing down and not reissuing licenses to reactors, including those based on the Mark 1 design. (0496-6 [Batobato, Alicia])

Comment: The lessons of Fukushima are that loss of reactor control is not an acceptable risk given the systems and designs in use. The reactors can and will melt down in less than 5 hours if loss of external power occurs. The designs are flawed, the operators in both the TMI and Fukushima cases failed to prevent damage when they had the opportunity. The public was lied to in both cases and there was a coverup of information critical to public safety. These are crimes against humanity. (0514-2 [Fahey, John])

Comment: The vulnerability of the population of United States to sources of radioactive contamination from outside our borders must be studied and disclosed, including ongoing risks associated with the nuclear accident at Fukushima Dai'ichi. What would be our strategy for dealing with nuclear waste and contamination that would arise from an event of similar magnitude in the United States? (0522-4 [Rogers, William])

Comment: The probability of an accident relied upon is outdated and ignores qualitative factors. NRC Chair Macfarlane explained in her Notation Vote to SECY-12-107, pp. 3-4 that: ¹⁸ [footnote 18 text: <http://www.nrc.gov/reading-rm/doc-collections/commission/cvr/2012/2012-0157vtr.pdf>] Postulated frequencies of accidents at nuclear power facilities in the U.S. are often expressed anywhere from one in 1,000 years to one in 1,000,000 years (but) it's important to recognize that the world has seen three severe accidents at nuclear facilities in the past 33 years, or essentially one every 10 years, on average... The existing record for severe accidents at nuclear facilities worldwide over the past three decades versus the theoretical performance of nuclear power facilities in the U.S., highlights our struggle to assign uncertainties to these types of quantitative measurements. (If) current agency guidance while performing cost-benefit analysis...include(d) the potential costs of offsite releases similar to those experienced in Japan after the Fukushima accident, for instance...Any postulated changes to the way the agency addresses the evaluation of economic consequences of accidents would clearly increase the costs averted side of the equation and move the results in the direction of being more cost-beneficial. (0556-2-12 [Lampert, Mary])

Comment: The Nuclear Regulatory Commission cannot simply hide behind the proposition that the possibility of a nuclear explosion here is remote and therefore unlikely to happen. I am sure that the same was said in Japan and see what has happened. (0587-1 [Ciferri, Flavio])

Comment: On the other hand, one only has to look at Fukushima to know what will happen if we keep on running our nuclear reactors until they break. Loss of lives. Loss of land. Loss of income. (0616-4 [Hoffman, Ace])

Comment: On the other hand, one only has to look at Fukushima to know what will happen if we keep on running our nuclear reactors until they break. Loss of lives. Loss of land. Loss of income. (0709-4 [Wythe Elnagar, Romi])

Comment: A disastrous fire in March 1975 [at the Brown's Ferry Reactor in Alabama] nearly caused two of its reactors to melt down. The NRC adopted fire protection regulations in 1980 seeking to prevent another serious nuclear plant fire. But the three reactors at Browns Ferry, along with nearly four dozen other reactors in the U.S., still do not comply with fire protection regulations more than three decades later...It's not the cumulative effects of regulation that the NRC should be evaluating. The NRC should be concerned about the cumulative effects of non-regulation. (Paper by David Lochbaum, UCS, "Cumulative Effects of Non-Regulation," August 23, 2012)[.] (0716-21 [Kraft, Dave])

Comment: Significant New Information Regarding Spent Fuel Pools[.] The past three years have seen several developments involving the storage of spent nuclear fuel that NRC should take into consideration in the Proposed Rule and the DGEIS. CEQ regulations, to which NRC gives deference, and NEPA caselaw recognize that over time new information may become available that should be factored into the decision-making process or used to update a previous EIS. Agencies must supplement a previously issued EIS when "[t]here are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts."⁶⁹ [footnote 69 text: 40 C.F.R. § 1502.9(c). See also *Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 374 (1989) ("If there remains major Federal action to occur, and if the new information is sufficient to show that the remaining action will affect the quality of the human environment in a significant manner or to a significant extent not already considered, a supplemental EIS must be prepared" (internal citations omitted)).] Similarly, when new information comes to light over the course of a rulemaking, the federal agency should ensure that such information is taken into account in the rulemaking process and that any resulting NEPA-APA-AEA rulemaking does not impede consideration of such information in site-specific regulatory proceedings. As the colloquy during the January 11, 2012 Commissioners' meeting made clear, with respect to severe accidents, Staff's position is not that real world consequences and environmental impacts of such accidents would be insignificant, but rather that there is a low probability that precursor accidents will occur. Based on this supposed low probability, the Staff categorizes the environmental impacts from severe reactor accidents as "small."⁷¹ [footnote 71 text: Id. at 80-81.] But NRC's characterization of severe accidents as "small" ignores the significant consequences that would ensue if a severe accident were to occur. The reports and photographs of the consequences of Fukushima's multi-reactor accidents depict impacts that were anything but "small." NRC's logic is simply no longer tenable in a NEPA review of the site-specific environmental impacts associated with issuing an operating license. The destruction of four GE-designed reactors at Fukushima-Daiichi in March 2011 shows that severe accidents are neither improbable nor are the environmental impacts of severe accidents at power reactors or spent fuel pools "small." The consequences of those severe accidents, including the radiological contamination of portions of Fukushima Prefecture, show that the real world consequences of severe accidents are not "small." In light of the Fukushima accidents, recent regulatory actions and statements, and newly released documents, the State believes that NRC should consider the information contained herein to be significant and should pursue a site specific and site wide severe accident mitigation alternatives analysis for Indian Point. (0718-2-1 [Sipos, John])

Comment: Various other organizations and individuals have pointed out the lessons to be learned from the Fukushima accident. Former NRC Commissioner Victor Gilinsky wrote in the *New York Times*: "[F]ederal regulators have yet to absorb the lessons from this crisis" and

pointed out the dangers of a Fukushima-like accident at Indian Point.¹⁰⁵ [footnote 105 text: Victor Gilinsky, Indian Point: The Next Fukushima?, New York Times (Dec. 16, 2011).] Additionally, the Natural Resources Defense Council ("NRDC") released a document warning, "An accident at one of Indian Point's reactors on the scale of the recent catastrophe in Japan could cause a swath of land down to the George Washington Bridge to be uninhabitable for generations due to radiation contamination."¹⁰⁶ [footnote 106 text: Natural Resources Defense Council, Nuclear Accident at Indian Point: Costs and Consequences, (Oct. 2011), *available at*: <http://www.nirs.org/reactorwatch/aging/nrdccaccidentip1011.pdf>.] (0718-2-8 [Sipos, John])

Comment: On the other hand, one only has to look at Fukushima to know what will happen if we keep on running our nuclear reactors until they break. Loss of lives. Loss of land. Loss of income. (0856-4 [Fritz, John])

Comment: (XII-4) Over a period of decades, pursuit of short-term cost minimization has increased the radiological risk of nuclear power production in various respects. This pursuit influenced the design of the nuclear power plants that participated in the Fukushima accident of 2011. Other manifestations of this pursuit include reactor power uprates, use of higher-burnup fuel, shorter refueling periods, and use of high-density racks in spent- fuel pools. (0916-3-16 [Curran, Diane] [Thompson, Gordon R.])

Comment: On the other hand, one only has to look at Fukushima to know what will happen if we keep on running our nuclear reactors until they break. Loss of lives. Loss of land. Loss of income. (0931-3 [Masullo, Ginny])

52. Out-of-Scope Comments – Fukushima

Comment: The operation and attempted clean up of these hundreds of plants that have been built all over the world will be a legacy of death and destruction the likes of which have never been seen before upon the earth. We already have ample proof of that with Fukushima. Please do not try to tell me that I am exaggerating. The waste that was dumped and piped into the seas around Europe is concentrating in the sealife and distorting them permanently. It is washing up on the beaches and poisoning the children and giving people cancer all over the place. This effect will go on in perpetuity, due to the half life and toxicity of the substances sumarily dumped out into our life giving ocean to "dillute". When regulators routinely use weak measuring devices to obtain deceptively low readings, government publishes seismic maps that show no activity in a proposed area by simply not measuring it and we are constantly told there are no dangers from Fukushima because radation will be dilluted while Russian and Chinese sources say they are finding that it is concentrating, there is NO CONFIDENCE to be had. (0014-2 [Bolognini, Franceseca])

Comment: You know the risks and you know the alternatives. Let's recall Fukoshima which is not over yet! Make the shift now, Stop trying to enrich corporations who, if they were human, would be psychopathic personalities. We, the real people, deserve real protection from the unreasonable risks of nuclear energy and nuclear wastes! (0018-2 [Arnason, Deb])

Comment: We have seen the consequences of poor risk-management at Fukushima. We have not excuse for not planning for the unexpected, not when the stakes are so high. (0021-2 [Biddle, Lynn])

Comment: Fukushima is teaching us daily about the unimaginable dangers of a catastrophic event. (0023-8 [Bridges, Martha])

Comment: Fukushima. How can you begin to put out something generic and not take into account what is happening as we speak? Fukushima sadly is being kept out of our media. You get a little bit on it here and there, or you really have to look for it on the Internet, but it's a real problem. It's happening now. And I would wage the electronic minds of Japan where most of electronics even come from. If they can't figure out how to stop it, then certainly how can we? (0030-22-4 [Headington, Maureen])

Comment: There were a lot of rumors at Fukushima 4, but those rumors turned out to be false. The fuel in seven pools, including three that were in buildings that completely blew up, is still safe. It's still under water. Very robust structures, a lot of nuclear cultures. (0030-6-6 [McCullum, Rod])

Comment: There is an artificial distinction really made in the EIS over just the waste and not looking at the waste in the fuel pools. The material in the pools is essentially waste itself. And so if you look at what happened at Fukushima, maybe the fuel pools didn't themselves blow up or disperse at this point, but it is irradiated fuel that did that and that did get dispersed. So we do have living proof that this material can cause unacceptable risks, and then we get down to whether one considers what has happened in Japan as acceptable, and of course common sense says that it's not. (0030-8-7 [D'Arrigo, Diane])

Comment: Regarding the risk of pool fires, we need only look at Fukushima Daiichi Unit 4 in Japan. That reactor building was badly damaged by the hydrogen explosion that took place there. The HLRW storage pool is now open-air. Another bad quake could topple the entire building, including the storage pool. If the cooling water is lost, some hundreds of tons of HLRW could then catch on fire in a short period of time. The catastrophic release of hazardous radioactivity directly into the environment would dwarf what has occurred up to this point since March 11, 2011. (0034-7 [Wagner, Jim and Virginia])

Comment: And now, of course, we've got the nuclear pollution that is infesting the entire Northern Pacific Ocean fish and has been found already from Fukushima. (0045-12-7 [Kinsey, Bob])

Comment: At the Japan, Fukushima Dai-ichi site, used fuel was stored in seven pools and nine dry storage containers when the earthquake and tsunami and subsequent explosions occurred in March 2011. All of this fuel was protected and remains in safe storage today. (0045-13-3 [Allen, Rick])

Comment: We try to prepare for all the eventualities that we can and we hope that the operators that are putting together these facilities are preparing for these eventualities and that they're listened to. In Fukushima, for instance, the people who created those plants, there were people involved in the creation of that plant who have problems with the placement of the plants and the way they were putting it together. They weren't listened to and they left that project and it was still created and this is what we have today. So there are people involved who can affect the process and bring up ideas in case we have disasters like an earthquake, like a tsunami, like a flood. (0045-8-4 [Bartlett, Bill])

Comment: The NRC reminded us that Fukushima dry storage casks survived the tsunami in 2011. What kind of dry storage casks were these? How far away from the reactors that were damaged and are still out of control today were these casks stored? (0063-9 [Magda, Marni])

Comment: Business as usual isn't going to get the job done, just ask the people of Fukushima prefecture. (0067-2 [Parrish, Dave])

Comment: In Fukushima, tens of thousands of Japanese have been displaced from their homes and businesses -- and their lives and livelihoods severely impacted, because radioactive fuel waste was stored in pools and could not be cooled when the electricity went off. (0071-2 [Borie, Edith])

Comment: The explosion of the spent fuel pool in reactor number 4 at Fukushima resulted in bits of fuel assemblies blown up to a mile from the reactor. These are more than hot particles, they are lethal chunks of highly irradiated fuel assemblies that TEPCO and Japans NRA had full confidence would be safely stored in that fuel pool indefinitely. Their probabilistic assumption was wrong. Therefore NRC has no basis for making a similar assumption generically about all nuclear waste sites in the US. (0089-12 [Shaw, Sally])

Comment: The casks, the dry casks at Fukushima continued to function as they were designed after the disaster there. (0112-7-4 [Sachs, Leslie Sullivan])

Comment: I -- you know, in a few days, on November 8th, all of you in this room probably, because you follow the issue, will be holding your breath watching to see what happens in Fukushima when they attempt to move - those fuel assemblies out of the fuel pool. We don't need anymore lessons-learned from Fukushima. (0112-7-7 [Sachs, Leslie Sullivan])

Comment: We've all seen the, Fukushima 1, Fukushima 2, and Fukushima 3. Except Fukushima 3 held plutonium in it. How much plutonium is damaging to the human body? Is it a one-hundredth of a gram? How many pounds were in Fukushima 3? 500? But let's turn a blind eye to that. (0112-8-3 [Sachs, Gary])

Comment: We write to you in urgency. The situation around the world at radioactively contaminated sites is not good, and it is clear that the situation at the Fukushima Daiichi reactor site is progressively deteriorating, not stabilizing. We write because of your personal interest in a sustainable future, but also because you are the Executive for global organizations charged with protection of the public's health, public safety and the common good when it comes to radioactivity, radiation and nuclear technology. Together we call upon you to act immediately to:

1. Prevail upon international organizations and Japan to replace TEPCO with a worldwide engineering group to take charge of the Fukushima nuclear disaster.
2. Appoint a group of experts independent from either TEPCO or IAEA to advise the new engineering group to establish a risk informed stabilization, containment and remediation plan for Fukushima.
3. Create a well-funded oversight panel of local citizens and local elected officials to ensure transparency and accountability of both of the above groups, as well as to facilitate well-informed self-determination and further recovery of the impacted populations.
4. Call upon the Japanese government to admit financial costs in excess of \$500B USD.

<http://mobile.reuters.com/article/idUSBRE92417Y20130308?irpc=932>; And Gundersen, Arnold, http://www.amazon.co.jp/japanesecharacters/dp/4087206289/ref=sr_1_1?ie=UTF8&gid=I378938739&sr=8-1&keywords=gundersen

5. Call upon the Japanese government to assure adequate funding for decontamination of the prefecture and site.;
6. Call upon the Japanese government to cease the massive incineration program underway in Japan which carts and bums rubble from the earthquake and tsunami, much of it toxic and some of it radioactive, in municipal incinerators.

(0113-1 [Caldicott, Helen] [Ehrle, Lynn Howard] [Freeman, S. David] [Grodzinsky, D.M.] [Gunderson, Arnie] [Koehnlein, Wolfgang] [Koerblein, Alfred] [Meyer, Alfred C.] [Mironova, Dr. Natalia] [Patterson, Jeffrey J.] [Pflugbeil, Sebastian] [Preobrazhenskaya, Natalia] [Scherbak, Yuri] [Sovacool, Benjamin K.] [Starr, Steven] [Wing, Steve] [Yablokov, Alexey])

Comment: 7. Any projection of total cancers or deaths from the Fukushima disaster is premature; and any previous publications need to be viewed as "speculative" at best. It is clear now that the Fukushima Daiichi nuclear disaster is far from over, and that there can be no credible estimate of total environmental or human health impacts because the radiological release has not ceased and the outcomes from exposing large populations to low doses over long time frames is unclear. A final estimation of the radiological release from the Fukushima Daiichi site, of necessity lies in the future; perhaps the distant future. Therefore, it remains of utmost importance to monitor radioactivity and provide and increase protective measures to individuals and communities. *When* future updates to such studies are done, it must be incumbent upon the researchers to revise previous findings, not merely extend them, since it is known that key data from the past were not included--such as the World Health Organization omitting the radiation exposures to members of the public prior to being evacuated (the first 4 days of the disaster; Becker, Oda 2012: <http://www.greenpeace.org/international/Global/internationalbriefings/nuclear/2013/2012/OdaBecker.pdf>). In addition Japanese physicians and scientists in Japan must be allowed and supported to treat and report Fukushima related health consequences. Nuclear calamities to date result in institutional pressure to under report and even distort patient health data and other evidence (see, for example: The Advisory Committee on Human Radiation Experiments, Final Report <http://archive.org/details/advisorycommitteeOOunit> and Steven Winget al. (1997). "A reevaluation of cancer incidence near the Three Mile Island nuclear plant: the collision of evidence and assumptions". Environmental Health Perspectives (Brogan & Partners) 105 (1): 52-57.) Such institutional pressure is now contributing to a downplaying of the true impact of the Fukushima accident. Further, slavish reliance on past exposure assumptions is not advisable, not only because these assumptions could have been subject to this type of pressure, but also because every nuclear catastrophe/exposure is different; according to the UN Special Rapporteur on Health, who references applicable research in his report: "Though experiences from the Three Mile Island and Chernobyl accidents provide invaluable guidance, a narrow appreciation of the accidents would not provide proper guidance." [Report of the Special Rapporteur on the right of everyone to the enjoyment of the highest attainable standard of physical and mental health, Anand Grover, Mission to Japan (15-26 November 2012) p 9] (0113-3 [Caldicott, Helen] [Ehrle, Lynn Howard] [Freeman, S. David] [Grodzinsky, D.M.] [Gunderson, Arnie] [Koehnlein, Wolfgang] [Koerblein, Alfred] [Meyer, Alfred C.] [Mironova, Dr. Natalia] [Patterson, Jeffrey J.] [Pflugbeil, Sebastian] [Preobrazhenskaya, Natalia] [Scherbak, Yuri] [Sovacool, Benjamin K.] [Starr, Steven] [Wing, Steve] [Yablokov, Alexey])

Comment: 13. The Fukushima disaster has inflicted suffering from family, social and economic disruption and loss of cultural traditions including food sources and family shrines. These losses are causing visible impacts on the mental and physical health of children, parents, grandparents, and whole communities. While it is radioactivity that will prevent their return to that life, there are many dimensions in which harm has been done. Those responsible for constructing and operating the reactors, and accumulating irradiated fuel, should be accountable to the people impacted. The Special Rapporteur's report says legal structures should "(e)nsure that TEPCO and other third parties are held accountable for the nuclear accident and that their liability to pay compensation or reconstruction efforts is not shifted to taxpayers." (0113-9 [Caldicott, Helen] [Ehrle, Lynn Howard] [Freeman, S. David] [Grodzinsky, D.M.] [Gunderson, Arnie] [Koehnlein, Wolfgang] [Koerblein, Alfred] [Meyer, Alfred C.] [Mironova, Dr. Natalia] [Patterson, Jeffrey J.] [Pflugbeil, Sebastian] [Preobrazhenskaya, Natalia] [Scherbak, Yuri] [Sovacool, Benjamin K.] [Starr, Steven] [Wing, Steve] [Yablokov, Alexey])

Comment: When the women farmers from Fukushima came here a year ago, that is one thing they said that stuck with me hard. That in Fukushima they had no place to rest safely at the end of each exhausting day is traumatic. Imagine you go to lie down and you know your pillow is

contaminated with radiation. Then also imagine that your family is divided, maybe forever. The elders did not want to leave their homes. Men stayed behind to work while women left with children. Imagine, imagine... But don't just imagine. (0120-3 [Seeman, Laurie])

Comment: Now the issue has been forced, I guess in part by the looming potential of global catastrophe from reactor 4 at Fukushima. How much of this extraordinary threat could have been prevented if Japan (TEPCO) had been required to spend the extra money for what I understand to be much safer but more expensive dry cask storage - not to mention all the other places around the globe put at equal risk because of the same short-sighted "frugality"? (0126-2 [Houston, Ann E.])

Comment: We're currently on the edge of our chairs, to see what happens with the latest Fukushima caper ... taking out the hot rods. AT LEAST wait to see what happens there!! It may not be good, from the inherent danger, to the hiring policies, to the quirks of fate and nature involved! (0133-1 [Sunflower, Susan])

Comment: The agency must resolve many technical issues including long-term waste integrity, vulnerability, deterioration and accidents, in particular, the nuclear waste stored at Fukushima. (0144-2 [O'Nan, Margaret S.])

Comment: The lessons of Chernobyl and more recently the tragic disaster of Fukushima speak for themselves. Two and a half years later and STILL leaking nuclear radioactive waste unchecked into the Pacific Ocean and our Earth's atmosphere is unconscionable and inexcusable. This alone is a potentially life ending time bomb for planet earth and all its life forms as the corium continues to melt down with no remedy in sight. Already the costs in damage to human life, contamination of species of marine and plant life, and biosphere disruption are difficult if not impossible to quantify- and it has not yet been contained. (0156-2 [Heinle, Helen])

Comment: Please examine the dire situation in Japan, which is already contaminating the ocean and our food chain, as the prime example of what we don't want! (0158-5 [Payne, Joanne])

Comment: Even in Fukushima where the nuclear reactor accident was initially ascribed to a tsunami following an earthquake, recently both the operator Topco and the Japanese government have admitted that the disaster was preventable. (0163-16-3 [Wolf, Peter])

Comment: An image I have in my mind right after Fukushima is a young mom in a shelter with her five-year-old and she said "Before the accident I didn't think about it. Now my husband is still working at the plant after the accident, and I don't know what our future holds." Another person trained as a nuclear physicist, her sister asked her "What is the impact on human health?" She said "We didn't learn that in our studies." And I was with Laurie Seeman the day we met with the organic farmers, the moms from Fukushima a year ago, who said they had to send their soil to France to be tested, and that instead of protecting their children at the schools, the government raised the allowable levels. Last week at an event on nuclear energy, Naoto Kan, the prime minister of Japan when Fukushima occurred, said that he had been a supporter of nuclear power, but after the Fukushima accident I changed my thinking 180 degrees. He said that the first days of the accident it looked like an area that included Tokyo. He said "We do have accidents such as an airplane crash and so on, but no other accident or disaster can affect 50 million people." And Jaczko, the former NRC Chair, said Fukushima exploded the myth that severe accidents wouldn't happen. Severe accidents can and will. Just yesterday I got word that

more marine life is dying in the Pacific Ocean. Food in California is contaminated. (0163-49-2 [Evans, Laurie])

Comment: Consider Fukushima. (0174-12 [Thomas, Ellen] [Thomas, Ruth])

Comment: However, the experience of the Japanese disaster at Fukushima Daiichi makes it clear that on-site storage of large accumulations of nuclear waste greatly worsens the dangers of natural disaster, attack, or accident that can fracture containment, destroy backup systems, or hinder repairs. (0190-3 [Phelan, Steven] [Phelan, Walter])

Comment: The Fukushima nuclear plant disaster is still recent enough to cause concern[.] (0205-9 [Lyons, Laura])

Comment: The Fukushima disaster has shown that we must be far more vigilant about the storage of nuclear waste as well as the siting of nuclear plants. The Diablo plant is right on the edge of the Pacific, close to volcanic faults and shares many of the vulnerabilities of Fukushima. (0232-1 [Hall, Caroline])

Comment: The spent fuel pools at Fukushima are collapsing yet we continue to store fuel in pools. (0232-3 [Hall, Caroline])

Comment: I think that there is a white elephant in the room here that we're not looking at, and that is what is going on with Fukushima. For people to just blithely think that we can continue on using nuclear power as though it's a panacea or is the best thing, I think is crazy. (0244-10-2 [Betancourt, Nelson])

Comment: I've heard about Fukushima being a reason why you should not be confident in the safety of storage. What Fukushima's -- and a tragic and unacceptable event that it was -- is an example of why you shouldn't build a reactor at sea level in an area where there's a historical record of very tall tsunamis without sufficient protection, with safety systems vulnerable. (0244-11-10 [McCullum, Rod])

Comment: From what I've been hearing, everybody knows about Fukushima. There is a reporter on Fukushima that lives in Fukushima that keeps reporting live, reports every day. It's not on national news or anything. From what I get, it takes about six months to a year for this information to come out. He is reporting at TEPCO. Tokyo Energy has been lying quite a bit, and three of the cores have melted down into the ground. (0244-13-1 [Wilson, Greg])

Comment: Lessons learned from management of Japan's Fukushima nuclear reactors since March 11th, 2011, and those currently being experienced due to continuous leakage of radiation into groundwater, should nullify this viewpoint of environmental stasis. We face, in the coming days and in the coming year, the challenging and potentially dangerous transfer of 1300 spent rods from Fukushima reactor 4. Was the damage in Fukushima the result of stasis? Was it predictable? (0244-14-7 [Prescott, Lisa Marie])

Comment: In fact, in Fukushima, there were casks at that facility, they were knocked over, they were wetted, but they were safe and won't leak any radiation. And the spent fuel pool, as much as some of the media might have said that there was accidents because a spent fuel pool had lost water, none of the fuel became actually uncovered if you actually read the reports from the analysis after the accident. (0245-12-3 [de Graaf, Brandon])

Comment: And the pool risks are also highlighted by what's happened after Fukushima Daiichi. As Linda Lewison mentioned earlier, the extraction of the high-level radioactive waste from a unit fuel pool is about to begin at Fukushima Daiichi Unit Number 4. It's a very dicey operation. The cooling water at one point was saltwater, so the fuel is likely corroded. The fuel may be bent, it may be damaged, it could fail during this unloading procedure. (0245-13-2 [Kamps, Kevin])

Comment: Fukushima in 2011 is important because we have four Mark I's here in Illinois. Radiation is still pouring into the Pacific Ocean as workers frantically try to keep rods covered with water. Now there's talk of robots to remove rods from the reactor without causing a catastrophic fire. This accident wasn't supposed to happen but it did. And it should be a wake-up call for all of us. In the U.S., spent fuel pools are even more crowded than Japan's. (0245-14-2 [Kurz, Carol])

Comment: The fact is that this kind of meeting and conversations pro and con took place in Japan not so long ago where the technicians and the proponents of nuclear power assured the public that they were informed, that things operated carefully, well-designed, highest technology, security, no previous accidents. All that is gone now. Japan itself almost became a failed state. It remains to be seen whether they can sustain themselves. Tokyo was heavily irradiated in the accident. The Japanese government lied about that because of business interests. Japanese government elevated the standards of radiation allowable for children to address the severity of the contamination rather than evacuate them because the main concern was money. (0245-25-2 [Lehman, Dale])

Comment: Fukushima, the world's worst nuclear accident that will continue for centuries, just as the other nuclear accidents have, only this one being a triple meltdown, poses new challenges that none of the great engineers thought of and some they should have. (0246-15-1 [Minniss, Regina])

Comment: Yesterday, Reuters put out from Tokyo, Wednesday, November 13, 2013, Fukushima: now for the tough part. The operator of Japan's crippled Fukushima nuclear power plant will this week begin removing 400 tons of highly irradiated spent fuel in a hugely delicate and unprecedented operation fraught with risk. Carefully plucking out more than 1,500 brittle and potentially damaged fuel assemblies from the plant's unstable Reactor No. 4 is supposed to take about a year, and will be seen as a test of Tokyo Electric Power Company's ability to move ahead in decommissioning the whole facility and would likely take decades and cost tens of billions of dollars. The world is watching as we hold our breath. What about the human cost? The NRC uses the acronym ALARA, A-L-A-R-A, in nuclear dealings, as low as is reasonably achievable, which means making every reasonable effort in maintaining exposures on ionizing radiation as far as below the dose limits as practical. I remind you there is nothing practical that is going on in Fukushima. We don't even have the technology that is needed in this ongoing crisis. And what we have seen in Japan is they simply raise the dose level that is accepted. And do we actually think things would be different here? Essentially the people in Japan have been turned into test subjects. Shame, shame. This is criminal. And what about the children that are most susceptible to radiation? (0246-3-2 [Gray, Erica])

Comment: After Fukushima, the Nuclear Regulatory Commission ordered staff to review the 24 Fukushima twin reactors here, of which Illinois has four, two at Dresden and two at Quad Cities, and come up with a series of safety recommendations to be implemented to make sure that U.S. reactors were adequately safeguarded and protected. A number of safety upgrades were recommended. The Nuclear Regulatory staff presented these recommendations to the commissioners, as you all now. To date, the Nuclear Regulatory Commission has not acted on

these safety recommendations. Many groups supported the closing of these 24 reactors until these safety inspections took place. This also has not happened. (0246-9-1 [Lewison, Linda])

Comment: The reason I tell you what you already know is to make the point -- how can we have confidence in the Nuclear Regulatory Commission if you don't even listen to the most serious findings of your own staff? (0246-9-2 [Lewison, Linda])

Comment: Another thing I'm wondering if you know, that the butterfly genes have been mutated in Fukushima by radiation. How many know that the butterflies are now deformed? Have you heard that? Okay. Another thing to raise your hand on: September 12th of last year the Reactor 4 in Fukushima has sunk 31 inches in the ground. (0250-22-3 [Hands, Tara])

Comment: We know it from Fukushima. We know -- I mean, great grannies in Fukushima are giving up their life in Japan, are giving up their life to clean up the mess there. I don't want to do it here. And I don't want my grandchildren to do it, either. (0250-26-3 [Maphet, Sheila])

Comment: I was at the site, actually, with my best friend who lives in Japan, Fukuoka, and her name is Aki. And in the middle of our conversation, all of a sudden the computer screen started to shake, and she jumped and screamed "Earthquake." She then had to hide in the small door frame of her one-bedroom apartment. That was the day that the tides rose and the triple meltdown happened at Fukushima. Since then I have heard heartbreaking stories of what the communities in Japan are going through; the sacrifices of the elders knowing that they face certain death, but still go out to help with the cleanup efforts; the mothers who are begging for the lives of their children, and crying out to the world, "Nidoto nai yoni," which means let it never happen again. (0250-28-1 [Embrey, Monica])

Comment: Remember Fukushima. (0250-51-8 [Thomas, Ellen])

Comment: Fukushima is a cautionary tale. But yet, we have failed to heed its warnings. The investigation of the Fukushima disaster found that the regulatory bodies NISA and NSC and the government body promoting the nuclear power industry METI failed, failed to correctly develop the most basic safety requirements, failed to assess the probability of damage, failed to adequately prepare for containing collateral damage, failed to develop a realistic evacuation plan. The official investigation determined those failures. (0250-52-3 [Amos, T.J.])

Comment: Fukushima is expected to cost \$14 billion to clean up, to whatever extent that might be possible, and to take 40 years. (0250-59-3 [Krotz, Susan])

Comment: In light of the difficulties experienced at the Fukushima Nuclear Plant, I request that the points and arguments made by the San Luis Obispo Mothers For Peace be considered as those of my own. A new and dangerous earthquake has occurred in the Fukushima area as TEPCO is transferring thousands of spent fuel rods out of dangerously stored pools. The world holds its breath with each minute of this operation in remembrance of that fateful moment in March 2011 when we became aware of the dangers we face with radioactive waste. (0251-1 [Baker, Sheila])

Comment: My comment is that Fukushima, Japan be the standard by which we proceed in the future. What better lesson is there that we can learn from? (0264-2 [Gutierrez, Ruth])

Comment: Fukushima, in 2011, is important because we have 4 Mark 1's here in Illinois. Radiation is still pouring into the Pacific Ocean as workers frantically try to keep rods covered

with water. Now there's talk of using robots to remove rods from the reactor without causing a catastrophic fire. This accident wasn't supposed to happen--but it did. And, it should be a wake-up call for us. In the U.S., spent fuel pools are even more crowded than Japan's. (0276-3 [Kurz, Carol])

Comment: The NRC reminded us that Fukushima dry storage casks survived the tsunami in 2011. What kind of dry storage casks were these? How far away from the reactors that were damaged and are still out of control today were these casks stored? (0280-9 [Magda, Marni])

Comment: I mean, people talk about Fukushima, and the truth of the matter is that after Fukushima, the emperor went on TV in Japan and he asked everybody in Japan to conserve energy because they were going to shut down these dangerous nuclear plants. And lot of people in Japan are very -- particularly the elderly people who are very trusting in the emperor, did what he asked. They turned off the heat, they conserved electricity, and they died. Who dies in these sort of energy conservation situations? Elderly. So, more people in Japan that actually died from energy conservation than from the radiation. (0325-32-2 [Lord, Stephen])

Comment: The cruel irony of the timing of this public hearing is that, as we speak, we and the world are witnessing the ongoing international environmental impact of the stricken nuclear plant at Fukushima, which is in such dangerous condition that a future earthquake, of which there is a high probability, "Could trigger a disaster that could decimate Japan and affect the entire West Coast of North America," according to prominent Japanese-Canadian scientist David Suzuki. (0326-4-3 [Brown, Jerry])

Comment: Most people agree that the outcome of possible future events is best predicted by the outcome of similar past events. I'm sure that on March 10, 2011, TEPCO, Japan's nuclear power company, would have assured their public that its power plants and waste storage systems were safe and able to withstand natural disasters. We all know what happened the next day on March 11th. Fukushima, Japan is still very much in the news. Two days ago, however, PG&E's senior vice president and chief nuclear officer, Mr. Halpin, attempted to convince readers of the Santa Maria Times that there has been no damage to Fukushima's open storage pools. We all know that recent pictures and articles appearing in numerous respected U.S. and foreign news outlets provide a very different description. (0326-43-3 [Rippner, Sharon])

Comment: And here is my explanation for that [mushroom cloud over Fukushima], and I'm sorry I have to go quickly because I only have three minutes, but plutonium and uranium are often soluble in water that has oxygen. However, if you remove the oxygen, the plutonium and the uranium precipitate out. This forms a layer of reactive substance on the bottom of your container. This is what I believe happened in the reactor that had the mushroom cloud over it, as opposed to the hydrogen explosions. So this plutonium and uranium built up on the bottom and they were held in pressure by the containment dome, and they started reacting nuclearly and there was an atomic explosion. This is also supported by the water tanks in Fukushima right now. They had water tanks where they put water in. They knew it was contaminated. They were monitoring the radiation and, suddenly, one of the tanks or many of the tanks, there were radiation spikes. Well, how is this possible? They didn't put more radioactive water in. How did it get more radioactive? Well, again, if you set a container and set it for a long time in water, the oxygen bubbles out. It becomes anoxic. At that point, the plutonium and the uranium precipitate, can precipitate out and cause a nuclear reaction on the bottom of the container, which can melt the container and cause radiation spikes, which is maybe what's happening at Fukushima. Is it what's happening at Fukushima? Is that what caused the mushroom cloud? You don't know. You don't know if I'm wrong. You don't know what you're doing. (0327-29-4 [DeMare, Joseph])

Comment: There are a number of transcripts included showing dialogue between individuals making decisions on behalf of the NRC and corresponding with TEPCO, the Tokyo Electric Power Company in Japan immediately following the earthquake and subsequent tsunami that struck the Fukushima Daiichi power plant on the coast of Japan in March 2011. Up until now, TEPCO, the NRC, and a number of notable news outlets have been reporting that the unit fuel pool at Reactor 4 escaped the brunt of the storm relatively intact, and that fuel rod removal was to begin in the third week of November of 2013. Inside the transcripts contain statements, "I know we're under a belief that Unit 4, the wall had been blown out, but regardless of that, someone would have to tell us of Units 1, 2, and 3." That quote was by a man named John Monninger. It's on page 390 of the FOIA documents that were released. Later on, a man named Chuck Casto, on page 403 said, "We need to probably let Bill and the Chairman of the NRC know that on yesterday we're going by what we thought, that with the explosion there was structural damage to the Unit 4 fuel pool. We don't really know if there's any integrity in that pool or not." And then one of the more damning documents enclosed shows that as of March 18th, 2011, a document titled, "Fukushima Reactor and Water Pool Release Considerations," shows that "adding to the uncertain situation cooling has been lost in the fuel storage pools in Units 1-4. The NRC believes that water from the Unit 4 storage pool completely drained and a violent zirconium and water reaction occurred resulting in the significant release of radioactivity to the atmosphere." Now, I'm going to pose a question that I know probably won't be answered, but it's one that I think that the employees of the NRC should consider. Using deductive reasoning, one could assume that the knowledge the NRC had since March 18th, 2011 has and was spun for public consumption. I want to know, and I know that others would like to know why have the actions of the individuals with -- inside the NRC and TEPCO been contradictory to the information known in March of 2011? The majority of the planet still thinks that there's a fuel rod removal going on, and it's not. It's a complete sham. I'm pissed off about this. I don't know about you guys. I think that these documents released by the NRC completely -- this Commission right here is completely illegitimate. (0328-13-1 [Wagner, Sam])

Comment: I'd like to just direct people for reference that if they want to know more about these documents that I'm referring to, to Google the word "Plume-Gate." It's arguably the largest active coverup taking place on this planet. (0328-13-4 [Wagner, Sam])

Comment: Let's go to Fukushima, for instance. What I have faith in and confidence is that we get to the bottom of what the true causes of the disaster in Fukushima were. The Japanese Diet, which is their legislative body, similar to our Congress, a few months after the Fukushima disaster of 3/11/11 took a look at the causes of Fukushima. And they determined that it was not the earthquake that caused the disaster, it was not the tsunami, but that it was a manmade disaster and that it was created by the collusion of industry, the nuclear industry; nuclear regulators; and government and that was the problem. And, obviously, we know that the main issue, ongoing issue, at Fukushima is the spent fuel pools. (0329-31-2 [Carberry, Mike])

Comment: What I don't understand in this whole Fukushima lessons learned thing is why we don't have a global emergency response team. Why has Fukushima gotten this far? What's going to happen when those nuclearized waters meet the nuclearized waters of the North Sea and what is that chemical reaction going to be are questions that come to my mind. (0329-6-2 [Vandel, Niki])

Comment: My comments today center on the problem of lack of transparency in the Japanese information about the Fukushima accident. Japan has recently passed a new secrecy law. Mere statements in the press or referral to secrecy law can garner a 10 year prison term and fines. The Manichi Shimbun, (shimbun means news in Japanese although my Japanese is very

limited), was sent a copy of the draft law with contents entirely blacked out. Although the NRC has faced problems in the Near term task force Recommendation 1 before the ACRS, I ask, "How can the NRC deal with the details of the Fukushima accident cannot be discussed without violating Japanese law"? (0378-2 [Lewis, Marvin])

Comment: Your sister agency in Japan also reassured the public that the nuclear facilities under its jurisdiction were safe. Then came Fukushima Daichi. (0380-4 [Holt, Joan])

Comment: The NRC states that the Fukushima disaster proves the design strength of spent fuel pools, in that all pools survived the tsunami and reactor explosions virtually intact. They do not mention the fact that these pools are now perched precariously six stories above the destroyed reactors and are almost impossible to access. Removing the spent fuel to a safer location would expose workers to high ambient, perhaps lethal, radiation levels. Photos of the pools in news reports from the site appear to show debris lying in the pools although the water level seems to be maintained. Two and a half years after the accident TEPCO has only just now begun to deal with this spent fuel and the outcome is still far from certain. (0410-12 [Nelson, Dennis])

Comment: Lessons from Fukushima are too readily dismissed and minimized in the EIS. This adversely impacts the formulation of the EIS. Fukushima has caused massive environmental degradation, evacuation of a large area, and there is a high probability that it will increase the incidence of malignancies in humans. These lessons must influence the gravity and precautions we need to take in managing nuclear waste. One example of this is that by defining the timeframe of waste management starting once a reactor is decommissioned avoids addressing a Fukushima type incident. The EIS must address situations wherein a functioning reactor is in proximity to stored nuclear waste. Note that the Fukushima Nuclear Accident Independent Investigation Commission determined that an overly close relationship between regulators and industry representatives contributed substantially to the poor management of the Fukushima outcome. (0417-6 [Clark, Terrence])

Comment: Finding truth in disclosures from TEPCO and the Japanese Government will challenge the world as a result of the waste failure in Japan. (0438-2 [Lamb, Charles])

Comment: How many radioactive elements and isotopes are released from something like Fukushima, some of which eventually end up inside all of us? According to Asahi: about 1,000 kinds of radioactive materials have been released from Fukushima reactors. <http://enenews.com/asahi-sources-reveal-about-1000-kinds-of-radioactive-materials-released-from-fukushima/comment-page-1#comment-195658> Let's focus on just 93 out of the 1,000 total, shall we? There are 93 different long lived radioactive elements that hang around and pollute both the environment and us for at least 17,000 years and up to BILLIONS of years in total decay life. Want to see the list of all 93? 93 Long life Radiation Contaminants, A Problem For Billions Of Years; via A Green Road Blog <http://agreenroad.blogspot.com/2012/03/93-long-lived-nuclear-elements.html> Fissioning reactor corium blobs at Fukushima are STILL releasing this long lived radiation TODAY, with no known turn off date. The media and regulatory bodies keep saying this plant is in cold shutdown. But is it really? (0498-15 [AGreen Road Project, Anonymous])

Comment: Fukushima Reactor 3 released 500 - 6000 pounds of plutonium into the air, and possibly 20 tons of uranium when it exploded. No, it was NOT a hydrogen explosion. WHERE IS FUKUSHIMA REACTOR 3? - IT SEEMS TO BE MISSING? (0498-7 [AGreen Road Project, Anonymous])

Comment: To elaborate, the GEIS Abstract states that "The objective of this draft Waste Confidence Generic Environmental Impact Statement is to examine the potential environmental impacts that could occur as a result of the continued storage of spent nuclear fuel (spent fuel) at at-reactor and away-from-reactor sites until a repository is available." The cruel irony of the timing of this Public Hearing is that -- as we speak - we and the world are witnessing the ongoing international environmental impacts of the stricken nuclear plant at Fukushima, which is in such dangerous condition that a future earthquake -- of which there is a high probability -- "could trigger a disaster that could decimate Japan and effect the entire West Coast of North America," according to the prominent Japanese-Canadian scientist David Suzuki. (0501-2 [Brown, Jerry])

Comment: Without full legal liability of operators, they are encouraged to cut corners on safety. The nuclear industry is now facing the largest potential legal liability from Fukushima contamination entering people's lungs in Seattle and Oregon. There is only a metal she'd covering on spent fuel pools. (0512-4 [Bibb, William])

Comment: NRC FOIA documents, and numerous reports by international experts such as those at Woods Hole have shown the Fukushima accident had dire consequences. NRC documents released under FOIA dated March through May of 2011 clearly indicate the severity of the Fukushima Daichi disaster. This event was supposedly was mathematically impossible; it nonetheless occurred. It could occur in the U.S. The events taking place at Fukushima are horrifying; perhaps thousands of people are already dying from radiation-related illnesses. The incidence of cancers and diabetes have risen dramatically. These facts are well documented. (0515-2 [Stennes, Nancy])

Comment: Hundreds of U.S. Navy personnel from the U.S.S. Ronald Reagan are now sick and dying from radiation poisoning they got when exposed to the Fukushima reactor melt-down plumes during "Operation Tomadachi." Three nuclear reactor cores escaped containment, and are "MIA." They are contaminating the aquifer and an underground river running under the plant. Water flows directly into the Pacific Ocean. Tepco has had to release highly radioactive water during typhoon events, and due to failure of its water storage tanks. Tepco and the IAEA recently asked for public "permission" to dump all the contaminated water into the Pacific. It is unthinkable; unconscionable. "Dilution" is irrelevant; isotopes harm and kill when ingested or inhaled. The Pacific Ocean food chain could collapse, or entire species and fisheries be wiped out due to Pacific Ocean radiation contamination. The plume of radioactive water emanating from the Kurushio current in Japan travels directly across the Pacific. Destination: the U.S. West Coast, and in particular, California. The plume is supposed to arrive in March, 2014. It will impact our coastline for at least 10-20 years. Fishery collapses (sardines, herring, salmon) in the Pacific, and massive die-offs of marine mammals from Alaska to Southern California, indicate something is terribly wrong in the Pacific biosphere. The immune systems of marine animals and plankton are likely being damaged by all the radiation coming from Fukushima; disease ensues. There is also a massive amount of tsunami debris drifting toward the U.S. West Coast from Japan. A lot of chemical toxins are contained in the water, in those debris flows. Imagine all the chemical plants and manufacturing facilities on the Japanese coastline, destroyed when the tsunami struck in March, 2011. The Pacific is being hammered by multiple sources of intense contamination. The radioactive isotopes coming from the Fukushima Daichi plant are highly suspect in the die-offs of marine mammals, fishes, and crustaceans. The scope of problems in the Pacific biosphere are truly staggering, when one considers them in their entirety. We can ill afford to have such a disaster occur in the U.S., even if it were to occur inland, and away from our coastlines, or the Gulf area. (0515-3 [Stennes, Nancy])

Comment: The risk to humanity is too great and Fukushima is proving that as it destroys the Pacific Ocean and Japan and will kill many more across the globe from its fallout. Why is there no advice or even mention of this ongoing nuclear catastrophe?? (0518-2 [Individual, Anonymous])

Comment: The on going crisis at Fukushima Daiichi is a global issue. It will not go away. Tepco is a energy company for profit. They cannot solve this problem. The global community must be involved in order to have a chance of containment. The problems of storage are not limited to Fukushima. The same issues prevail at every single nuclear plant in the world. Something must be done and it must be done right now. We, as a planet, have no more time to waste. (0520-1 [Perez, Robert])

Comment: Dear NRC--please release information about the Fukushima meltdowns and public health consequences immediately. We are not fooled by the lack of information and doublespeak. We know the truth and it is your duty and obligation to disseminate this truth to the public at large. Should you refuse your duty, you will be held accountable in the court of public opinion and I would assume eventually be named in the myriad of lawsuits which are certainly pending. (0521-1 [Temple, Scott])

Comment: I want to know the truth on Fukushima with data regarding radiation levels everywhere in the world including cancer statistics. (0533-1 [Individual, Anonymous])

Comment: The radiation from Fukushima has reached Florida and California shores and has been found in fish there. (0539-4 [Luttinger, Lionel])

Comment: The NRC should also be focusing its attention on the ongoing emergency of radioactive contamination coming from Fukushima Japan, and protecting US citizens from that disaster. (0543-6 [Senkiw, Sheryl])

Comment: Bob Alvarez of Institute for Policy Studies has calculated that Fukushima Daiichi Unit 4's pool contains ten times the amount of hazardous radioactive Cesium-137 than was released by the Chernobyl catastrophe. Dai-ichi fuel pool number 4 is an ongoing catastrophic risk in an ongoing tragedy in which many are exposed to continuing radiation, loss of their homes, safe food and water, etc. (0552-2-10 [Macks, Vic])

Comment: In fact, Japan weighed evacuating Tokyo's 35 million people even as they downplayed the risks in public. "...The report quotes the chief cabinet secretary at the time, Yukio Edano, as having warned that such a "demonic chain reaction" of plant meltdowns could result in the evacuation of Tokyo, 150 miles to the south. "We would lose Fukushima Daiichi, then we would lose Tokai," Mr. Edano is quoted as saying, naming two other nuclear plants. "If that happened, it was only logical to conclude that we would also lose Tokyo itself." The report also describes the panic within the Kan administration at the prospect of large radiation releases from the more than 10,000 spent fuel rods that were stored in relatively unprotected pools near the damaged reactors." http://www.nytimes.com/2012/02/28/world/asia/japan-considered-tokyo-evacuation-during-the-nuclear-crisisreport-says.html?_r=2&hp. (0552-2-11 [Macks, Vic])

Comment: NRC FOIA documents, and numerous reports by international experts such as those at Woods Hole have shown the Fukushima accident had dire consequences. NRC documents released under FOIA dated March through May of 2011 clearly indicate the severity of the Fukushima Daiichi disaster. This event was supposedly was mathematically impossible; it nonetheless occurred. It could occur in the U.S. The events taking place at Fukushima are horrifying; perhaps thousands of people are already dying from radiation-related illnesses. The

incidence of cancers and diabetes have risen dramatically. These facts are well documented. Hundreds of U.S. Navy personnel from the U.S.S. Ronald Reagan are now sick and dying from radiation poisoning they got when exposed to the Fukushima reactor melt-down plumes during "Operation Tomadachi." Three nuclear reactor cores escaped containment, and are "MIA." They are contaminating the aquifer and an underground river running under the plant. Water flows directly into the Pacific Ocean. Tepco has had to release highly radioactive water during typhoon events, and due to failure of its water storage tanks. Tepco and the IAEA recently asked for public "permission" to dump all the contaminated water into the Pacific. It is unthinkable; unconscionable. "Dilution" is irrelevant; isotopes harm and kill when ingested or inhaled. The Pacific Ocean food chain could collapse, or entire species and fisheries be wiped out due to Pacific Ocean radiation contamination. The plume of radioactive water emanating from the Kurushio current in Japan travels directly across the Pacific. Destination: the U.S. West Coast, and in particular, California. The plume is supposed to arrive in March, 2014. It will impact our coastline for at least 10-20 years. Fishery collapses (sardines, herring, salmon) in the Pacific, and massive die-offs of marine mammals from Alaska to Southern California, indicate something is terribly wrong in the Pacific biosphere. The immune systems of marine animals and plankton are likely being damaged by all the radiation coming from Fukushima; disease ensues. There is also a massive amount of tsunami debris drifting toward the U.S. West Coast from Japan. A lot of chemical toxins are contained in the water, in those debris flows. Imagine all the chemical plants and manufacturing facilities on the Japanese coastline, destroyed when the tsunami struck in March, 2011. The Pacific is being hammered by multiple sources of intense contamination. The radioactive isotopes coming from the Fukushima Daiichi plant are highly suspect in the die-offs of marine mammals, fishes, and crustaceans. The scope of problems in the Pacific biosphere are truly staggering, when one considers them in their entirety. We can ill afford to have such a disaster occur in the U.S., even if it were to occur inland, and away from our coastlines, or the Gulf area. Robert Alvarez, formerly of the DOE, has said the spent fuel from Reactor 4 at Fukushima alone, if its building were to fail and it fell to the ground, could "end civilization" as we know it. (0566-2 [Tocornal, John])

Comment: We truly should learn more, and apply the lessons from Fukushima Daiichi. An international response to the crisis is desperately needed. (0566-5 [Tocornal, John])

Comment: Why hasn't the NRC rounded up all the brilliant minds in this world to address the problem of Fukushima right now? TEPCO and the gov of Japan are not dealing well with this.. and it affects us all. (0580-2 [Shinker, Carol])

Comment: NO MORE FUKUSHIMAS!!!! (0588-1 [Johnson, Joe])

Comment: Fukushima has given all of us a play-by-play of the multiple ways in which things can go terribly wrong with nuclear facilities in a natural disaster--and even more in the aftermath of unforeseen circumstances. It has vividly shown us, in real time, how beautiful communities and fertile soils surrounding a nuke facility can turn into toxic never-never lands after an accident or a partial meltdown. Two years in, and Fukushima's problems continue to mount. Now they are our problems, too, as radioactive materials and contaminated water continued to flow into the Pacific and circulate through the air that arrives on our California shores. (0609-2 [Leon, Vicki])

Comment: The ongoing problems, with the Fukushima Daiichi nuclear power plant, need further analysis that should be applied to this EIS study. The level of confidence that was behind the design of that plant and its storage pools reflects the level of confidence that many in this country have for the production of nuclear energy and the storage of the spent nuclear fuel

assemblies. The ongoing attempts to deal with that situation serves as a fine example of how deeply denial can play in the ways we cope with failures of our confidence. (0610-6 [Brechin, Vernon])

Comment: In light of the ongoing and uncontrolled horrors of the Fukushima Nuclear Crisis, which continues to spew hundreds of thousands of tons of highly radioactive water into the Pacific Ocean for nearly three years, with "sanctioned" plans to dump ALL the water into the Pacific, and continuing to burn unfiltered radioactive waste into the air, and the US-influenced IAEA and former NRC advisers to Japan recommending we "dump it all" into the ocean or store it in the deep sea; and no acceptable means of containment in sight, I cannot logically find any reason to continue to produce more nuclear waste. (0617-6 [Zure, Lisa])

Comment: The government needs to come clean about the impact of Fukushima on the West coast of North America. The FOIA documents from Fukushima PROVE the government willfully covered up that dairy products tested positive iodine-131, and the NRC and EPA chose NOT to tell the public. (0623-3 [Individual, Anonymous])

Comment: Right now the only answer for the cooling water at Fukushima is dumping it in the ocean. We may not see it, but it's going to affect all marine life in the pacific as water is to marine life as the air is to man. Horrible, horrible, horrible. (0625-5 [Mandrell, Rebecca])

Comment: Why won't the gov't admit Fukushima is destroying the Pacific and negatively affecting humans? Honesty and truth is it gone? St Louis Waste - I don't even know where to begin. So much under the ground, close to a smoldering fire, in the middle of large metro area. Dig it up and turn it into Glass? risk releasing more shit into the atmosphere? It snowed in STL on the 14th of Dec and my kids played in it. Found out that the snow is contaminated with FUKU crap about 70cpm. No one cares, especially not the NRC. Promotion no Protection!!!! I have seen no one comment, no news stories about Fukushima here in the US. The only thing is ENENEWS. FOIA docs prove the lies the NRC and govt are complicit. (0631-1 [Reimer, Matt])

Comment: I propose that every member of the NRC, the DOE, and the EPA; every drafter of environmental impact statements related to nuclear power; every person who supports the existence and expansion of nuclear power be required to personally visit Fukushima today ---- -> to speak with the victims about their tragic experiences; their losses of family members and friends and homes and communities ; and the cancers and other health issues that have already developed and will continue to develop into the future. -> to observe first hand the ongoing contamination of air, land, and sea they are experiencing with no end in sight. -> to observe the millions of tons of radioactive water that is being poured daily into the Pacific Ocean and understand that it is now contaminating all of our oceans as well as our own west coast. Only then can there be an intelligent, responsible, sensible discussion about nuclear power. Only then can there be responsible suggestions, proposals, and decisions about the problems and future of nuclear power here in the US. (0641-2 [Fasten, Susan])

Comment: I have been closely following the Fukushima meltdowns in Japan as I live in Portland OR and see and feel the effects of this extremely powerful waste product that is in our ocean fronts and air streams. We, as American citizens deserve more truthfulness and protections from the harmful effects of radioactive waste products. Also the birds, fish, sea mammals, starfish and all other species deserve protection from this disaster which is ravaging wild populations and virtually killing the Pacific Ocean. (0656-1 [Bonney, Mary])

Comment: How do we contain Fukushima? "THE WALL: The Thin Ice; Even with walls very tall, The water continues to fall: How high will suffice? Plus, cracks in the ice, Will require more cubes in the wall. There's no ice which they can install; To completely encircle it all; Plus, flows over the top Make the need never stop; For another cube in the wall. No education at all, No thought control to recall: Leave them kids alone, There's no time to postpone Another cube in the wall. I've seen the wall-written scrawl-- Nothing will help now at all; You can pile on more ice, But here's doomer advice: It's all just cubes in the wall." BenjaminTheDonkey (0663-1 [McClintock, Francene])

Comment: The three core meltdowns in Japan are quite literally out of our control. There doesn't seem to be anything we can do about it at this point. We are actually suggesting ideas like building a wall of ice to contain the situation. In my experience, when I pull an ice cube out of the freezer, it instantly starts to melt. And to the best of my knowledge, the corium (melted fuel rods), is, by most peoples standards, quite warm. It's been nearly three years since the earthquake and tsunami that destroyed the Fukushima Dai-ichi nuclear power plant, and there is hardly a peep about it on the corporate news. This can be described as a media blackout. Obviously the nuclear power industry is very powerful, with teams of lobbyists, lawyers, apologists, "scientists" who claim it's safe, etc. It's no wonder to me that the news isn't reporting on it. But the honest truth is that this situation is bigger than anything else the news could possibly be reporting on. Budget deficits, immigration reform laws, congressional gridlock is all going to take a back seat when a critical mass of people start to realize that everything in the Northern hemisphere is poisoned, and demand to know more about it. All food is radioactive, and the water might now give you cancer. It took TEPCO over two years to admit that the reactor core in reactor unit 1 (I believe) melted down in a matter of hours, not days. I'm not an authority on the subject, but I am an electrical engineer who is fascinated with radioactive physics. I have a couple of geiger counters, and am part of a network actively collecting and sharing data on the situation, and I'm now actively seeking work in the Southern hemisphere. Small bits of uranium pellets have been found hundreds of miles away from the Fukushima Dai-ichi plant, suggesting to me that it's now saturated the Northern hemisphere, and the only way to escape it is to move South. I don't mean to be an alarmist, but I am a realist. The situation is very bad, and what's worse is that all of my friends and family, except for a few exceptions, have no idea what I'm talking about when I mention the irradiation of the Northern hemisphere. I have to start explaining the situation in very basic terms, and finally lead up to the current situation. It can take hours, or days, to explain what's going on. (0670-2 [Anonymous, Brian])

Comment: Duke Energy concurs with NEI that NRC should add a discussion of the lessons learned from the March 2011 accident at Fukushima Daiichi. It is now clear that used fuel in both wet and dry storage at Fukushima Daiichi withstood the various challenges of the event without significant damage. However, because of confusion during the initial days of the Fukushima Daiichi accident, there is considerable misunderstanding on this point. Unfortunately, many people continue to believe erroneously that damage to fuel in storage at Fukushima Daiichi contributed to the offsite consequences from the accident. It would be very beneficial from a public understanding perspective if NRC would clarify this point in the supporting information associated with the Waste Confidence final rule. (0672-6 [Jamil, Dhiaa])

Comment: NIC believes that NRC should add a discussion of the lessons learned from the March 2011 accident at Fukushima Daiichi. It is now clear that used fuel in both wet and dry storage at Fukushima Daiichi withstood the various challenges of the event without significant damage. It would be very beneficial from a public understanding perspective if NRC would

clarify this point in the supporting information associated with the Waste Confidence final rule. (0685-8 [Davis, Ed])

Comment: •The Fukushima Dai-Ichi 2011 ongoing nuclear disaster presents especially significant issues regarding the dangers of spent nuclear fuel (not acknowledged in the GEIS). (0693-1-6 [Warren, Barbara])

Comment: Fukushima: Lessons Learned, is I hope the wake-up call for the NRC to realize that the industry is not self-empowered enough to manage emergency situations. Perhaps the fear factor of being the corporation at the helm of a nuclear plant melting down was too much for the corporate executives to come out and say, "OH MY, We ARE absolutely SCREWED!" immediately. The instinctive need of corporations to protect secrecy and maintain autonomy has no place in the world of nuclear meltdowns. I think this is the fundamental level that the NRC must incorporate in its Rules of authority with the nuclear industry. (0703-2 [Vandel, Nikohl] [Vandenberg Clermont, Elaine])

Comment: The industry could and should do better at being a responsible part of the nuclear waste water reclamation for the benefit of New Industry. Clearly, as we witness the ONGOING disaster of #Fukushima, we are reminded that if such a disaster would strike here in America, the same response MUST be expected by the current #GlobalNuclearIndustry. Without an adequate #NuclearFirstResponseTeam, the thought of what a disaster at #DiabloCanyonNuclearFacility under the "control" of PG&E is simply, beyond depressing. It brings so much fear of death and destruction to that region, of course its depressing and scary and why do we do this to ourselves?! (0703-6 [Vandel, Nikohl] [Vandenberg Clermont, Elaine])

Comment: After Fukushima, the Nuclear Regulatory Commission ordered its staff to review the 24 Fukushima twin reactors here in the US, of which Illinois has four, two at Dresden and two at Quad Cities. NRC staff was asked to come up with a series of safety recommendations, to make sure that U.S. reactors were adequately safeguarded and protected. A number of safety upgrades were recommended. The Nuclear Regulatory staff presented these recommendations to the NRC commissioners, as you well know. To date, the Nuclear Regulatory Commission has not acted on these safety recommendations. Many groups around the country supported the closing of the 24 Fukushima twin reactors until these safety inspections took place. To date, this recommendation also has not been acted on. (0708-1 [Lewison, Linda])

Comment: The reason I tell you what you already know is to make the point: How can we have confidence in the Nuclear Regulatory Commission if you don't even listen to the most serious findings of your own staff? (0708-2 [Lewison, Linda])

Comment: So, if we can't trust the Nuclear Regulatory Commission to act on its own staff recommendations [regarding the Fukushima Task Force recommendations], how can we have confidence in the NRC acting responsibly in the future? (0708-4 [Lewison, Linda])

Comment: Several reports have discussed the significant new information generated by the Fukushima accident. On April 19, 2011, Dr. Arjun Makhijani of the Institute for Energy and Environmental Research submitted to NRC a declaration in support of an emergency petition to suspend all pending reactor licensing decisions pending investigation of the lessons learned from the Fukushima disaster.⁹⁵ [footnote 95 text: Declaration of Dr. Arjun Makhijani in Support of Emergency Petition to Suspend all Pending Reactor Licensing Decisions and Related Rulemaking Decisions Pending Investigation of Lessons Learned from Fukushima Daiichi, ML111091181 (Apr. 19, 2011).] Dr. Makhijani outlined the significant new information that has

come out of the Fukushima accident including: the unanticipated compounding effects of simultaneous accidents at multiple co-located reactor units, including spent fuel pools; the unanticipated risks of spent fuel pool accidents, including explosions; the frequency of severe accidents and explosions; the inadequacy of safety systems to respond to long-duration accidents; and the health effects and costs of severe accidents.⁹⁶ [footnote 96 text: *Id.* at 5.] Makhijani highlighted the unprecedented nature of the accident, noting, "In the entire history of nuclear power, there has not been another major accident (level 5 or above) that has involved multiple major sources of radioactivity—including multiple reactors and multiple spent fuel pools."⁹⁷ [footnote 97 text: *Id.* at 6. The Near-Term Task Force acknowledged that before the Fukushima accident, NRC had not anticipated an accident involving multiple units and spent fuel pools. In a May briefing one member stated, "Also, if you look at the way that we've analyzed accidents in the United States and the way that we deal with them, it really focused on a single unit being affected. Fukushima is a situation where multiple units were affected at the same time. So our EP [emergency preparedness] requirements focus on a single unit event . . . And if you're dealing with a multiple unit event at the same time, you have considerations with regard to adequate staffing, how to triage, who makes the decisions on how to triage, and how you go about proceeding with what you need to do first." Nuclear Regulatory Commission, Briefing on the Task Force Review of NRC Processes and Regulations Following the Events in Japan, Transcript of Proceedings, at 19-20, ML111360513 (May 12, 2011).] He asserted that the information from the simultaneous system failures at Fukushima should be used by NRC to evaluate the safety and environmental implications of co-locating multiple reactors and spent fuel pools. (0718-2-5 [Sipos, John])

Comment: In October 2011, the NRC Advisory Committee on Reactor Safeguards ("ACRS") acknowledged that the Fukushima accident has provided new information regarding the hazards posed to spent fuel pools by falling debris.¹⁰⁰ [footnote 100 text: Advisory Committee on Reactor Safeguards, Initial Review of: (1) the Near-Term Task Force Report on Fukushima and (2) Staff's Recommended Actions to be Taken Without Delay, at 7 ML11284A136 ("ACRS Review") (Oct. 13, 2011).] It noted, "The Fukushima accident clearly demonstrates that hydrogen combustion events can cause significant structural damage. Such damage can also cause debris to fall into the spent fuel pools with subsequent potential ramifications not heretofore considered."¹⁰¹ [footnote 101 text: *Id.*] The ACRS found that the leaching of the debris may change the pool water chemistry, causing the aluminum racks to corrode and eventually degrading their integrity.¹⁰² [footnote 102 text: *Id.* at 9.] It also noted, "These events at Fukushima have reminded us that spent fuel pools at nuclear power plants can be contributors to the overall risk posed by the plants."¹⁰³ [footnote 103 text: *Id.* at 10.] (0718-2-7 [Sipos, John])

Comment: Furthermore, the findings of the Near-Term Task Force support the argument that the Fukushima accident provides significant new information. "The Task Force concluded that the Fukushima Dai-ichi accident . . . provides new insights regarding low-likelihood, high-consequence events that warrant enhancements to defense-in-depth on the basis of redefining the level of protection that is regarded as adequate."¹⁰⁷ [footnote 107 text: *Near-Term Task Force Report* at viii.] In short, based on the information from the Fukushima accident, the Task Force found that NRC should create new regulations to protect against occurrences that it previously characterized as having "small impacts" due to their low probability. Fukushima has shown that low probability, high consequence events do occur and therefore, they must be considered and measures must be taken to mitigate their potential consequences. In acknowledging this fact and suggesting measures to mitigate such dangers, the Task Force Report constitutes significant new information that must be considered in this proceeding. The Fukushima accident and the recommendations of the Task Force also show that site-specific factors must be taken into consideration with regard to accidents involving spent fuel pools. The

different characteristics of each pool affect the chances of a radionuclide release and the appropriate response to prevent a release. At Fukushima's boiling water reactors, the spent fuel pools are located high up in the reactor buildings, making it difficult for water to be added in an emergency, "[h]owever, TEPCO's approaches to adding water to pools revealed a lack of preparation for this contingency."¹⁰⁸ [footnote 108 text: *Thompson 2011 Report* at 19. The boiling water reactor design was developed by the federal government's Idaho National Laboratories and the General Electric Company in the 1950's.] Responding to the site-specific problems at Fukushima, "many of the actions recommended in the Task Force report have plant-specific features, and therefore require plant-specific regulatory attention."¹⁰⁹ [footnote 109 text: Gordon R. Thompson, Declaration of Gordon R. Thompson Addressing New and Significant Information Provided by the NRC's Near-Term Task Force Report on the Fukushima Accident, at 2, ML11223A283 (Aug. 11, 2011).] For example, the Task Force recommends that plants install "seismically qualified means to spray water into the spent fuel pools."¹¹⁰ [footnote 110 text: *Near-Term Task Force Report* at 46. This proposal is similar to a recommendation made by the National Academy of Sciences back in 2006. *NAS Report* at 55.] Such means will vary due to site-specific factors such as the location of the spent fuel pool. Additionally, the ACRS noted: "[T]he vulnerabilities of spent fuel pools under accident conditions and the need for measures to assure adequate coolant levels are design specific. . . . Staff should initiate a request for information for licensees to document details such as their current plant-specific spent fuel pool instrumentation, sources of spent fuel pool makeup and cooling, power supplies, contingencies and procedures for alternate makeup sources, etc. This information would better inform subsequent staff efforts and would help focus industry communications with respect to these issues." [footnote 111 text: *ACRS Review* at 10.] The Fukushima disaster also highlighted the importance of safety-related systems for spent fuel pools. According to a Near-Term Task Force member, "[T]ypically the spent fuel pool makeup and cooling systems in the United States are not safety-related systems. Loss of cooling in the spent fuel pool was expected to be a very slow-evolving, non-design basis accident situation. So the requirements for those systems are less stringent than they are for other systems addressing design basis accidents." [footnote 112 text: Comments of Jack Grobe Deputy Director of the Office of Nuclear Reactor Regulation, before Advisory Committee on Reactor Safe Guards, Fukushima Subcommittee, at 87, ML11229A243 (Aug. 16, 2011).] For this reason, the Task Force recommendations include measures such as providing safety-related AC electrical power for pools and installing safety-related instrumentation to monitor the pools from the control room that can withstand design-basis natural phenomena. While the Commission ordered the installation of instruments to measure the level of pool water and relay that information to the control room, other measures to mitigate or minimize the impacts of severe pool accidents also exist. NRC should also acknowledge that NRC's Appendix R fire safety regulations (promulgated in the wake of the Brown Ferry fire) do not extend to spent fuel pool facilities. (0718-2-9 [Sipos, John])

Comment: Spent nuclear fuel, one of the most dangerous and long-lasting substances known to humans, was never meant to be stored long-term and densely packed in pools at nuclear plants. When many of these facilities were built, AEC and NRC told the public that the spent fuel would be stored temporarily in pools only for a brief time before being promptly removed from the host communities. Contrary to those assurances, spent nuclear fuel has remained in densely packed spent fuel pools for decades. The events at the Fukushima nuclear facilities should serve as a lesson to reinforce what is already known—long-term storage of spent fuel in pools poses significant environmental risks and impacts. (0718-3-6 [Sipos, John])

Comment: I have a niece, nephew and brother. The children are Japanese-American, and since March 11, 2011 I have been trying to get them out ! of ! Japan! They will not leave. I mourn the loss of life in the oceans. (0744-9 [Bonniwell, Colleen])

Comment: I'm not a nuclear decommission expert by far, and even I can see what's right in front of me. The disastrous handling of decommissioning the Fukushima nuclear plant, the discharge of contaminated water into the waters surrounding the plant and into the Pacific, as well as the extraction of spent nuclear fuel has gone long enough. There are other solutions that need to be urgently looked at and implemented without hesitation or interference on behalf of interested third parties and bureaucratic bodies[.] As I've said before, I am not an expert, however there is a man who quite clearly is a certifiable expert in the field of nuclear plant decommission. Arnie Gundersen of Fairewinds Energy Education, a non-profit organization aimed at educating people like me and the thousands of people like me who know little about the process of dealing with disasters such as the one at Fukushima, has demonstrated his wealth of knowledge on the subject, has shared this knowledge with the world, and has offered constructive, effective solutions time and time again. I implore you to listen to this man, his colleagues, and others like them, before it becomes too late to do anything at the site of the Fukushima meltdowns. Mr. Gundersen's website can be viewed at the following address: <http://fairewinds.org/>[.] Thank you for taking the time to read my thoughts and I wish for everyone involved in the clean-up and decommissioning of the Fukushima Nuclear Plant a quick and healthy success. (0759-1 [Resnyanky, Dmitry])

Comment: Look What's happening in Japan and to the Pacific Ocean and will be all of them ! Those were 2 Spent Fuel pools that burned and exploded ! The only thing that's going to fix the Fukushima's disaster is a Time Machine ! 3 cores in full meltdown. 300 tons or more of highly radioactive water running into the sea. These spent rods have to be looked after for thousands of years !!!!! Putting more and more on the heads of the unborn to deal with !!! (0784-2 [Earl, David])

Comment: With hindsight it is clear that the public was not informed of critical developments during the first few days and weeks of the Fukushima disaster. The public was harmed as a result. We should learn from this historical fact. Not only was Tepco silent about what FOIA documents now reveal as 3 meltdowns in the early days of the Fukushima accident, but FOIA documents also reveal that a contingent of US nuclear engineers and scientists were active participants in the technical response to the 3 meltdowns, as they occurred. For me it is clear that the development of the 3 meltdowns was well known to the US nuclear industry as the meltdowns occurred. And yet this situation was kept secret. Regardless of why--whether it was considered a national security issue, or whether it was merely to prevent panic--the dire situation at Fukushima, and the likely creation of radioactive fallout, was kept secret. As a result of the meltdowns, airborne radioactive Iodine-131 was beginning to circle the globe. But the public was not informed. Pregnant women in the northern hemisphere should have taken steps to minimize their exposure. But they were not informed. Sailors on the USS Reagan were exposed to high doses of radiation from the radioactive plumes. But they were not informed. (0801-1 [Magyar, Michael])

Comment: Fukushima: Lessons Learned, is I hope the wake-up call for the NRC to realize that the industry is not self-empowered enough to manage emergency situations. Perhaps the fear factor of being the corporation at the helm of a nuclear plant melting down was too much for the corporate executives to come out and say, "OH MY, We ARE absolutely F*CK*D!" immediately. The instinctive need of corporations to protect secrecy and maintain autonomy has no place in the world of nuclear meltdowns. I think this is the fundamental level that the NRC must incorporate in its Rules of authority with the nuclear industry. (0838-3 [Clermont, Elaine])

Comment: The industry could and should do better at being a responsible part of the nuclear waste water reclamation for the benefit of New Industry. Clearly, as we witness the ONGOING

disaster of #Fukushima, we are reminded that if such a disaster would strike here in America, the same response MUST be expected by the current #GlobalNuclearIndustry. Without an adequate #NuclearFirstResponseTeam, the thought of what a disaster at #DiabloCanyonNuclearFacility under the "control" of PG&E is simply, beyond depressing. It brings so much fear of death and destruction to that region, of course its depressing and scary and why do we do this to ourselves?! (0838-7 [Clermont, Elaine])

Comment: In light of the ongoing and uncontrolled horrors of the Fukushima Nuclear Crisis, which continues to spew hundreds of thousands of tons of highly radioactive water into the Pacific Ocean for nearly three years, with "sanctioned" plans to dump ALL the water into the Pacific, and continuing to burn unfiltered radioactive waste into the air, and the US-influenced IAEA and former NRC advisers to Japan recommending we "dump it all" into the ocean or store it in the deep sea; and no acceptable means of containment in sight, I cannot logically find any reason to continue to produce more nuclear waste. (0844-6 [Anonymous, Anonymous])

Comment: Re: lines 19 and following, "Spent fuel pools are housed in shield buildings at nuclear power plants with boiling water reactors or in fuel buildings at plants with pressurized water reactors..."--The shield buildings, so called, did not survive the earthquake, tsunami, meltdowns and explosions in March 2011 at Fukushima Daiichi nuclear power plant in Japan. Now, those high-level radioactive waste storage pools, at Fukushima Daiichi Units 1, 2, 3, and 4, are exposed to the open air. The U.S. has 23 identically designed GE BWR Mark I reactors still operating. The U.S. has an additional 8 similarly designed GE BWR Mark II reactors still operating. Attached to these comments is a fact sheet I wrote in the aftermath of the Fukushima Daiichi nuclear catastrophe re: Mark I and II HLRW storage pool risks in the U.S. The NRC should address those risks in this DGEIS, but has not done so. (0919-4-20 [Kamps, Kevin])

Comment: This is especially true regarding General Electric Mark I and Mark II Boiling Water Reactor high-level radioactive waste storage pools. The U.S. has 23 Mark I reactors, and another 8 Mark II reactors, that are identical (Mark I) or very similar (Mark II) in design and even vintage to the four reactors at Fukushima Daiichi destroyed by the nuclear catastrophe there which began on March 11, 2011. (0926-3 [Kamps, Kevin])

Comment: The ongoing catastrophe at Fukushima stands as a warning for what can happen. If we are fortunate, this crisis may eventually be resolved. Our entire northern hemisphere could be at risk if the damaged tank of spent fuel rods explodes. The potential of this nightmare is already with us. Do everything you can to minimize the danger here in the United States. (0963-1 [Jacopetti, Anna])

Comment: Please protect us from future Fukushimas. And pray that Fukushima may eventually be an object lesson, not the end of life as we know it. (0963-3 [Jacopetti, Anna])

Comment: Although I am a US citizen, I have been living in Japan and have seen first hand the disaster of Fukushima. If such a disaster can happen in an advanced, safety-conscious society like Japan, it can happen in the US. We need to make sure there are no more Fukushimas. (0972-1 [Brunelli, Crystal])

Comment: The idea of siting a plant at Fukushima when both scientific and environmental groups opposed it shows how short sighted corporations are. After the tsunami in 2003, Tepco did no reevaluation of the possibility of earthquake and furthermore after the meltdowns refused to deal with the water leakage or the urgent need to blanket the plant in cement as was done at Chernobyl. Furthermore shutting down nuclear power plants will be an extraordinarily difficult,

dangerous and costly process which must be undertaken now. And of course, our corporate dominated government here instead of pushing the Japanese government hard to act decisively allowed it to leave the decision making to Tepco and the government, get this absurdity, is only now doing something because it wants the 2016 Olympics in Tokyo. (0974-2 [Conley, Patrick])

53. Out-of-Scope Comments – Yucca Mountain

Comment: Yucca Mountain has already failed, and our current 70,000 tons of nuclear waste surpasses capacity. (0023-6 [Bridges, Martha])

Comment: And the United States was on a similar towards used fuel disposition at Yucca Mountain when some non-germane politics really intervened in that process. Fortunately, as a result of the court order from the U.S. Appeals Court, the NRC is back on the job to begin re-prosecuting that license application. And the Council urges the Department of Energy and the NRC to proceed expeditiously with the safety review of the Yucca Mountain construction authorization application. In particular, completion and issuance of the SERs and, if necessary, or as necessary, a request for additional appropriations. (0030-23-9 [Blee, David])

Comment: [C]onsistent with federal law and in light of recent decisions by the U.S. Court of Appeals, it is our hope that the Department of Energy and the NRC will proceed expeditiously with the safety review of the pending Yucca Mountain construction authorization application and consummation of the nearly completed safety evaluation reports. Since 1982 the Government has accumulated a nuclear waste fund of \$30 billion from money collected from customers of nuclear electricity. It is time to use that money for its purposes, progress towards a national repository. The Nation has already spent upwards of \$10 billion on Yucca Mountain and the American people deserve to see the results of an independent, objective safety review performed by the NRC. As President Obama himself pointed out at the beginning of his first term in office, regulatory decisions should be based on sound science not politics. (0045-15-2 [Sandos, Theann])

Comment: The United States made significant progress towards geological disposal, up to the point where the Yucca Mountain licensing process was abruptly ended in 2010. The Energy Department had documented its safety case in a license application and a final Environmental Impact Statement. The Nuclear Regulatory Commission concluded an exhaustive review of these documents and sent DOE more than 600 detailed scientific and technical questions. The Department of Energy answered all the questions to the NRC's satisfaction. The NRC was preparing the Safety Evaluation Report when the process was abruptly halted. The President appointed a commission to examine nuclear waste management issues, and they issued a report that suggested finding two or three alternate sites using a concept-based process. Legislation is pending in the Senate to begin the process of selecting alternate sites. Recently, the U.S. Court of Appeals ordered the NRC to resume the Yucca Mountain licensing process, which will further inform our efforts towards geological disposal. Even if development of the Yucca Mountain repository is not resumed, both the industry and some members of Congress, are calling for the NRC to complete and issue the safety evaluation report. (0045-5-3 [Cannon, Tom])

Comment: Is there any way that the Yucca Flats Nuclear waste storage facility can be salvaged and opened? After spending so much money on this strong looking facility in the middle of a desolate area, I was disappointed to hear it's been abandoned due to a previously

unknown fault line. I'm wondering if a study can be done to see if it can't be retrofitted and made strong enough to withstand a 9.0 magnitude earthquake. (0073-1 [Jackson, Bruce])

Comment: I would like to voice concern, irritation, and displeasure at our government, including the NRC, on what happened with Yucca Mountain. We spent over \$9 billion of evaluations and designs to a facility and then turn around and for political reasons without a fair hearing basically have suspended work on it. That's a crime. And it's us as taxpayers in the time when we're talking about budget deficits and what's going to happen, to have that money wasted is unconscionable. There have been multiple reports dating back as far as 1945. And all of them concluded that out of, you know, they looked at options but that Yucca Mountain was a good site for repository and it was better than the other options that were being looked at. (0112-17-2 [Stamm, Steve])

Comment: [T]he truth is there is no real plan to isolate high-level radioactive waste materials effectively for the amount of time really necessary to protect public health and safety, their primary objective. (0163-22-8 [Shaw, Gary])

Comment: Seismic reality tells us that Yucca Mountain couldn't work. Sure, there was politics against it, but ultimately, those politics will come and go with the decades. Ten years from now the politics that affected that will have no meaning whatsoever, but the reality in science will still be the same if not worse. (0163-35-4 [Shaw, Jeanne])

Comment: I also had the opportunity to visit Yucca Mountain in Nevada as well as the highly successful Waste Isolation Pilot Project (otherwise known as WIPP)-which is a Department of Energy facility 2,500 feet underground in a New Mexico salt dome - currently being used to permanently store high activity transuranic nuclear waste. All of the information I received regarding Yucca Mountain as a Commissioner led me to the conclusion that it is an appropriate and safe facility to permanently dispose of our used fuel. While the political process in Washington has delayed the NRC staff from filing its final safety report, I am highly confident that the NRC will eventually validate the safety of Yucca Mountain-and allow DOE to meet its statutory responsibility to provide a permanent used fuel storage facility. Further, the demonstrated success at the WIPP facility strongly underscores the ability of our nation to identify, permit and operate a high level waste facility to address the long term management of used fuel-irrespective of Yucca Mt. (0180-2 [Merrifield, Jeffrey])

Comment: Second, our nation should meet its legal obligation to take permanent responsibility for used fuel by completing the licensing and construction of the Yucca Mountain site. (0180-7 [Merrifield, Jeffrey])

Comment: For years we have been counting on a depository in Yucca Mountain, Nevada, to solve this problem, but public protest and political infighting prevailed over scientific consensus. This rule is a sleeping pill to help us forget Yucca Mountain. (0190-2 [Phelan, Steven] [Phelan, Walter])

Comment: I also advocate the restart of the NRC and DOE review of the Yucca Mountain license application. (0201-5 [Fregonese, Vic])

Comment: The United States made significant progress towards disposal, up to the point where the Yucca Mountain licensing process was abruptly halted in 2010. The Energy Department has documented its safety case in a license application in a Final Environmental Impact Statement. The Nuclear Regulatory Commission conducted an exhaustive review of

these documents and sent DOE more than 600 detailed scientific and technical questions. DOE answered all these questions to the NRC's satisfaction. The NRC was preparing the Safety Evaluation Report when the process was abruptly stopped. The President appointed a commission to examine nuclear waste management issues, and they issued a report that suggested finding two or three alternate -- alternative sites using a consent-based process. Legislation is currently pending in the Senate to begin the process of selecting alternative sites. Recently the U.S. Court of Appeals ordered the NRC to resume Yucca Mountain licensing process, which will inform -- further inform our efforts towards geologic disposal, even if development of the Yucca Mountain repository is not resumed. Both the industry and some members of Congress are calling for the NRC to complete and issue the safety evaluation report. (0244-12-4 [Ratchford, James])

Comment: Now, I could get up here and tell you how Chernobyl or even Fukushima could happen in this country, but I won't do that because safety culture, my safety culture won't let it. For all we have achieved, for all the record of safety, I believe it's going to get better. I believe young people are going to be better. \$26 billion on the nuclear waste fund, the courts have asked NRC to do this. I would also ask the NRC to restart the Yucca Mountain licensing process. And they're also looking at what the Department of Energy is doing with that money. (0245-34-5 [McCullum, Rod])

Comment: People have put in pieces and bits and kind of thrown away things like Yucca Mountain. I suspect many people here realize that Yucca Mountain was chosen for political rather than scientific reasons. The site has been subject to two earthquakes in the last 15 years, one of which partially destroyed the building that was built on there. So, it's really not a seismically stable area to be a real resource to store or be a real storage thing. (0245-45-2 [Aguilar, Margaret])

Comment: Finally, we encourage the NRC to facilitate waste removal and permanent disposal by complying with the nuclear waste policy act and moving, expeditiously, with the completion of the Yucca Mountain license application. Such actions will go a long way toward giving our members, other stakeholders, and the public the assurance that the Federal government will make good on its promises. (0246-12-3 [McMurrian, Katrina])

Comment: I also believe that the NRC should complete their review of the Yucca Mountain repository. (0250-10-3 [Tampas, Courtney])

Comment: However, I also firmly believe that the NRC should complete the review of the Yucca Mountain license application submitted by the Department of Energy. Pending a positive review of the application, construction and operation of the Yucca Mountain facility should proceed as a national priority, in accordance with the Waste Policy Act. There is a safe and effective solution to used fuel management. We just need to implement it. (0250-13-3 [Herwig, Bill])

Comment: I had the opportunity to visit Yucca Mountain in Nevada twice, as well as the highly successful Waste Isolation Pilot Project, otherwise known as WIPP, which is a Department of Energy facility 2,500 feet underground in New Mexico, in a salt dome currently being used to store high-activity transuranic nuclear waste. All the information I received regarding Yucca Mountain as a commissioner led me to the conclusion that it is an appropriate and safe facility to permanently dispose of used fuel. While the political process in Washington has delayed the NRC staff from filing its final safety report, I am highly confident that the NRC will eventually validate the safety of Yucca Mountain, and allow DOE to meet its statutory responsibility to

provide a permanent used fuel storage facility. Further, the demonstrated success of the WIPP facility strongly underscores the ability of our nation to identify, permit and operate a high-level waste facility to address the long-term management of used fuel, irrespective of Yucca Mountain. (0250-4-2 [Merrifield, Jeffrey])

Comment: Second, our nation should meet its legal obligation to take permanent responsibility for used fuel by completing the licensing and construction of Yucca Mountain. (0250-4-5 [Merrifield, Jeffrey])

Comment: And that includes not only addressing Waste Confidence but arriving at a final decision to allow the licensing and review of the licensing for the federal repositories authorized by Congress that we all know is Yucca Mountain. So I think that is first and foremost. (0250-61-6 [Little, Jim])

Comment: I also am very interested in the NRC bringing the Yucca Mountain license application back into play with the Department of Energy. I think that is another area where we need to get some traction to get some motion, so would like to go on record to say that we really need to do that. (0250-62-4 [Fregonese, Vic])

Comment: I am pleased to note that the NRC Commissioners directed the NRC staff to finish the safety evaluation report for the Department of Energy's Yucca Mountain construction authorization application. This process will allow the NRC to proceed carefully and thoughtfully through the evaluation of this site for safe storage for spent nuclear fuel. We need the NRC to get the storage done safely and securely. Based on years of study the use of Yucca mountain as a monitored retrievable storage appears to be a much better alternative than leaving the spent fuel rods in the casks located at the shutdown nuclear plant facilities. The retrievable storage allows for future use of the valuable isotopes in the spent fuel. (0286-3 [Hannaman, Bill])

Comment: Well, I'm pleased to note, and I think some other speakers mentioned this, that the NRC Commissioners have directed the NRC staff to finish the Safety Evaluation Report for Yucca Mountain's construction authorization process. If that came in before we had the interim facilities ready, well, that would be good news because then there would be a place to put things. So, I think there's a timing here as to whether we actually launch into these interim facilities because now we're on a path to look at and possibly have Yucca Mountain as the place to send the fuel. So, we need to get the NRC to -- this strategy, whatever it is, should be done safely and securely. Based on the years of study at Yucca Mountain as a monitored retrievable storage facility, it appears to be a much better alternative to me than leaving the spent fuel rods in the casks located near the plant facility. And the retrievable storage allows for recovery of the valuable isotopes that are in those fuel rods. (0325-26-5 [Hannaman, Bill])

Comment: I'm very pleased to hear today that the Federal government charged the NRC with proceeding with review of licensing for Yucca Mountain. That's an important step forward. That licensing process will come up with the engineer's review of what is needed for the licensing process. The rest of the licensing will need to go through Congress. One of the companies I work with worked on the Blue Ribbon Commission, and I'm real pleased with the results of the Blue Ribbon Commission. (0325-4-3 [Quinn, Ted])

Comment: Last August, there was ruling by the U.S. Court of Appeals for the District of Columbia, the NRC acted illegally when it suspended its work in 2011 on the Yucca Mountain Nuclear Waste Repository, and the Court ordered the NRC to continue its evaluation of the nuclear waste site. The NRC then ordered staff to finish and release safety evaluations that

were shelved two years ago when the current administration in Washington withdrew support for the project. This was done without regard to the consequences of storing nuclear waste above ground in dry caskets or in water pools. The NRC claimed that there was limited funding to continue work on the project. Although dry cask storage is relatively safe, removing the waste to the Yucca Mountain Repository would be far better than storing it above ground as it is now. At Yucca Mountain, the used nuclear fuel will be isolated 1000 feet below dry rock and 1000 below the water table, and within 1000 years, I've read, 99 percent of the radioactivity in the used fuel would be eliminated through the natural process of radioactive decay. A good solution? No, but we do have the waste fuel now that needs to be taken care of, and we have a perfectly safe solution at Yucca Mountain, which including taking the risk of transporting the fuel to the repository. Speeding up the removal of the waste from the water pools into dry casks, as recommended, does not solve the problem. Ironically, a problem that was created in the first place by opposition of environmental groups, such as the Mothers for Peace, and others, to the Yucca Mountain Project. (0326-46-1 [Byrne, Peter])

Comment: After 60 public hearings and completed studies recommended by the National Academy of Science, the Department of Energy, and the U.S. Geological Survey, among others, the Department of Energy, in 2002, certified that Yucca Mountain meets site selection requirements. I'm asking that local and state leaders put aside politics and provide political support for fully-funding and reopening the Yucca Mountain Repository. (0326-46-2 [Byrne, Peter])

Comment: The nuclear industry paid for, ahead of time, the Waste Repository and the U.S. Department of Energy never came through, and that's a shame. I stood on Yucca Mountain. I went out and toured it. It's a perfect spot. I say let's put it there for now. Let's go get it, when we can use it, later. (0326-48-2 [Zawalick, Steven])

Comment: Waste disposal. Yucca Mountain is a solution to that problem. There's nothing wrong with that. And I hate to see NRC blowing the future of nuclear power. (0327-36-5 [Lamberger, Paul])

Comment: And now this gets us to the problem. It appears that the \$30 billion invested by the nuclear power industry to set up Yucca Mountain in Nevada is off the table. But I guess the nuclear power industry didn't really pay for it because the public paid for it with increased electric rates. (0327-42-5 [Faris, Kelly])

Comment: But, on a lighter note in my closing, I went when I was campaigning a little bit with a couple of folks to try to prevent the Yucca Mountain thing. I don't think the Yucca Mountain deal is a good thing, because water leaks in there, and you don't want to have water around leaking in when you have radioactive waste. (0328-15-4 [Davis, Leslie])

Comment: From 2008 to 2010, the NRC conducted an exhaustive review of these documents and sent the Department of Energy more than 600 detailed scientific and technical questions. DOE answered all these questions to the NRC's satisfaction, and the NRC was preparing its safety evaluation report when the process was stopped in 2010. (0328-5-6 [Pickens, Terry])

Comment: Recently, the U.S. Court of Appeals ordered the NRC to resume the Yucca Mountain licensing process which will further inform our efforts towards geologic disposal. Even if development of the Yucca Mountain repository is not resumed, the NRC has directed its staff to complete the work on the safety evaluation report on the Department of Energy's construction authorization application for the proposed Yucca Mountain Repository. (0328-5-8 [Pickens, Terry])

Comment: I think the NRC is ignoring the most recent D.C. Circuit decision which told the NRC to go to Congress and ask permission to stop collecting the radioactive waste fee because there seems to be no plan at hand for ever finding permanent geologic storage, which is what the rationale for that fee and statute was. (0329-12-9 [Paddock, Brian])

Comment: The lack of industry people that really need to know how to bring the waste that we have -- we have to do something with it. And putting it in the middle of Yucca Mountain, which is going to go -- they ruled. We go Yucca. Go put it in Yucca. (0329-19-4 [Vandel, Niki])

Comment: I see the dangers. I've studied in an academic way. I've become familiar with projects, the failed project of Yucca Mountain. (0329-4-2 [Messer, Diane])

Comment: [W]e also have the super volcano in Yellowstone Park, which, from what I've seen on the science movies, would basically cover the Yucca Mountain repository with volcanic ash and rock probably around 2,000 degrees. So that storage place would not be suitable if Yellowstone was to blow up, and that's 60,000 years past due from blowing up. (0329-8-8 [Wilson, Greg])

Comment: The NWPA is the "definite Federal policy" that establishes waste confidence-its very purpose is to "provide a reasonable assurance that the public and the environment will be adequately protected from the hazards posed by high-level radioactive waste and . . . spent nuclear fuel." Its status as law was thrown into question by the U.S. Department of Energy's (DOE's) 2010 motion before NRC's assigned Atomic Safety and Licensing Board ("Licensing Board") to withdraw the DOE's construction authorization application for Yucca Mountain, and NRC's actions in response to that motion. However, the August 13, 2013, *In re: Aiken County* ruling by the U.S. Court of Appeals for the District of Columbia Circuit ("D.C. Circuit Court") reaffirmed that the NWPA is indeed the law of the United States. The Court held that the NRC had been "flouting" and "defying" it. (0355-1 [Skov, Jeff])

Comment: The NRC's errant decisions and delay were less protective of the public health and welfare than compliance with the NWPA would have been. NRC's decisions and actions served to prolong storage of spent nuclear fuel (SNF) at the plant sites, which are usually near both important bodies of fresh water and significant population centers, and summarily foreclosed its placement deep underground in a dry, desert environment, far removed from population centers, on an expansive, guarded federal government reservation. Although the ultimate licensing and opening of Yucca Mountain cannot be presupposed, NRC's compliance with the NWPA would at least have let the NWPA-prescribed process continue, and certainly (as described above) at least 41 months of continued onsite storage would have been saved. (0355-3 [Skov, Jeff])

Comment: Economic security - The delay and resulting uncertainty stemming from the NRC's "flouting" and "defying" the NWPA -uncertainty associated both with resolving the waste confidence issue and with trust in the regulator to implement federal statutes enacted to provide waste confidence-cause investors to doubt the future availability of inexpensive, plentiful, reliable, non-price-volatile baseload electricity for industrial-scale enterprises in the U.S. Therefore they invest instead overseas where such doubt is less. (0355-5 [Skov, Jeff])

Comment: And these are still not the worst of it, which gets to the second point. I must respectfully disagree that "[t]he August writ of mandamus against the NRC related to NRC's review of DOE's Yucca Mountain construction authorization application, not waste confidence." In fact, there is a widely held view that *In re: Aiken County* fundamentally impacts the waste

confidence rulemaking. First, it highlights the NRC's incongruous position that it can both (1) resolve the vacatur and remand handed to it in *New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012), provide the "reasonable assurance" the D.C. Circuit Court required of it in *Minn. v. NRC*, 602 F.2d 412 (D.C. Cir. 1979), and provide the "reasonable confidence" it promised when it denied the Natural Resources Defense Council's (NRDC's) petition for rulemaking in 1977 (42 FR 34391, 34393) AND (2) simultaneously "flout" and "defy" (paraphrasing *In re: Aiken County*) the NWPA. However, the *In re: Aiken County* decision saddles the rulemaking with a more substantial, fundamental, and obvious infirmity. The argument goes like this. The NRC seeks to issue a new rule, which the agency will aver has been produced in accordance with the Atomic Energy Act (AEA), the Administrative Procedures Act (APA), the National Environmental Policy Act (NEPA), and maybe others. These are all federal laws, like the NWPA. Until the NRC studies and understands why it failed to implement the NWPA over the course of 41+ months (despite several clear indicators, described below, of the wrongfulness of the agency's actions), can substantiate that NRC's compliance with the AEA, APA, NEPA, etc., are not similarly affected, and can point to sound corrective actions it has taken to prevent recurrence of the failure in the future, then few would be willing to ascribe any legitimacy to the rule, or, to the extent that the rule establishes law, to credit NRC with intent to abide by it. The NRC's situation is similar to that of one of its licensees when NRC finds a fundamental breakdown of the licensee's Quality Assurance Program. Until that fundamental breakdown is addressed, the NRC has little confidence in any pronouncements from the licensee. Everything becomes suspect. Similarly, until the NRC convincingly addresses its fundamental failure to abide by the law, as documented in *In re: Aiken County*, few will have any confidence in any pronouncements by the NRC that are purported to be based in law. (0355-7 [Skov, Jeff])

Comment: As mentioned above, there were several clear indicators that should have made apparent that NRC was failing to implement the NWPA, including: -The plain language of the NWPA ("The Commission shall consider an application for a construction authorization" and "shall issue a final decision approving or disapproving the issuance of a construction authorization" within three years, with provision for a one-year extension); -The ruling of the Yucca Mountain Licensing Board in LBP-10-11, dated June 29, 2010 ("[W]e deny DOE's motion to withdraw the Application. We do so because the Nuclear Waste Policy Act of 1982, as amended (NWPA), does not permit the Secretary to withdraw the Application that the NWPA mandates the Secretary file [and] at this point, mandates progress toward a merits decision by the Nuclear Regulatory Commission on the construction permit."); - The Order of the Commission itself that sustained the ruling of its Licensing Board, CLI-11-07, dated September 9, 2011 ("[T]he Commission finds itself evenly divided"); - The ruling in (the previous) *In re: Aiken County*, 645 F.3d 428, 436 (D.C. Cir. 2011), which contested the DOE's attempted withdrawal of the application and apparent decision to abandon development of the repository ("[W]e note that the NWPA requires the Commission to review the application . . . and therefore we must assume that the Commission will comply with its statutory mandate"); - The NRC's own pleadings in *In re: Aiken County*, filed with the D.C. Circuit Court on February 13, 2012 ("The NWPA directs NRC to issue a decision approving or disapproving an application within 3 years from the date the application is submitted, but allows the agency a one-year extension. 42 U.S.C. § 10134 d)."); and - The D.C. Circuit Court's Order, dated August 3, 2012, holding the mandamus proceeding in abeyance (as described in *In re: Aiken County*: "[W]e followed a cautious approach in our decision more than a year ago when we declined to issue mandamus against the Commission at that time. But the Court's majority clearly warned that mandamus would eventually have to be granted if the Commission did not act or if Congress did not change the law. Since then, despite the clear warning, the Commission has still not complied with the statutory mandate. On the contrary, the Commission has reaffirmed that it has no plans to comply with the statutory mandate. In the face of such deliberate and continued agency

disregard of a statutory mandate, our precedents strongly support a writ of mandamus."); All of this leads to the conclusion that it is crucial for the NRC effectively to address-to "own"-the writ of mandamus. That was the driver behind my question of whether NRC had ever been confronted with one. I have been told that it has not, i.e., before *In re: Aiken County*. If that is true, then NRC might misapprehend the significance of the writ. The D.C. Circuit Court Rules call it an "extraordinary" writ. The U.S. Supreme Court terms it a "drastic" remedy (see, e.g., *Cheney v. United States Dist. Court for D. C.*, 542 U. S. ____ (2004)). (0355-8 [Skov, Jeff])

Comment: Purpose of this letter is to bring your attention to the responsibility of the Department of Energy's commitment to provide safe storage of spent nuclear fuel currently being safely stored by PG&E at the Diablo Power Plant. Please resume review of the Yucca Mountain license application and proceed with whatever process is necessary to establish storage sites. (0387-1 [Emmons, Roger])

Comment: The second option concerns waste storage. The U.S. Government created a waste storage site at Yucca Mountain, Nevada, just for this waste. However, Democrats in Congress have prevented the site from operating. Commission members please put pressure on these Congressional members to allow the Yucca Mountain waste site to operate. (0390-3 [Kirkland, Gary L.])

Comment: In the mean time, I support opening Yucca Mt. if only to relieve currently operating nuclear plants of their need for more space for their SNF. (0418-2 [Davison, David])

Comment: The Nye County, Nevada Nuclear Waste Repository Project Office (NWRPO) appreciates the opportunity to provide comments on the NRC draft rule and Generic Environmental Impact Statement on Waste Confidence (GEIS) and continued storage of spent nuclear fuel as requested by the Nuclear Regulatory Commission (NRC) in a September 13, 2013 Federal Register Notice(FR 56776). Our comments, in large part, reiterate points made to NRC staff in previous comments made by the NWRPO to the NRC staff on previous related matters. In particular, these include comments made by the NWRPO in our December 28, 2012 letter to NRC regarding Waste Confidence GEIS scoping; comments made in our November 25, 2008 letter to the NRC regarding the "Update and Proposed Revision to the Waste Confidence Decision;" and comments made by the NWRPO in our February 16, 2012 submittal to the NRC staff regarding the NRC Draft Report for Comment, Background and Preliminary Assumptions for an Environmental Impact Statement -Long-Term Waste Confidence Update, December 2011," which echo and complement our comments contained in this letter. It is requested that NRC reconsider the comments in those documents in light of recent court rulings regarding the legality of NRC's unilateral action to suspend the Yucca Mountain licensing process and NRC's recent agreement to restart that process and abide by the recent writ of mandamus issued to NRC. (0544-1 [Enriquez, Elizabeth])

Comment: Without following Federal law requiring that a repository be constructed and operated at Yucca Mountain, there is no assurance of repository availability at any time in the United States. Recent illegal actions by NRC and DOE to halt the Yucca Mountain Project led to the DC Circuit court remand of the 2010 Waste Confidence Rule. (0544-2 [Enriquez, Elizabeth])

Comment: The United States does not currently have a national policy for the permanent storage of high-level nuclear waste. The Obama administration has determined that the Yucca Mountain site, which has been mired in bad science and mismanagement, is not an option for geologic storage of nuclear waste. (0545-1 [Patrie, MD, MPH, Lewis E.])

Comment: I have attended nearly every Nuclear Regulatory Commission hearing on San Onofre for nearly 20 years. For more than a decade we were told by Southern California Edison (with no objection from the NRC) that the waste problem was essentially solved because the waste would go to Yucca Mountain. But Yucca Mountain is an imperfect solution: Before the federal government stopped the project (or at least slowed it to a crawl), one of the last problems they could not be sure they had any good science about was "drip shields" which were to protect the fuel rods -- that were to be permanently entombed at the site -- from water dripping from above. The shape, material, thickness, and expected durability of the shields were all undecided, but my recollection is that the last design was an upside-down flattened out V shape made out of 4-inch thick titanium. And no one knew how long it would last, but 300 years was an outside estimate, or at least the hope. After that, good luck. What the transport vehicles would look like, and whether they would use rail or roads or both, was all undecided when the project was stopped, despite 10s of billions of dollars having been spent. (0562-4 [Hoffman, Ace])

Comment: Yucca Mountain was cancelled not for political reasons, but for reasons of public health, due to the uncontainable and uncontrollable radioactively released and the release of ?heat waste? from nuclear fission for thousand of years. (0611-27 [Shapiro, Susan])

Comment: ANA opposes Yucca Mountain, which is a technically flawed, politically chosen site. As the State of Nevada, tribal, and non-governmental organizations have shown, Yucca Mountain has many technical flaws, including seismic and volcanic issues and rapid groundwater flow, which preclude the site from meeting adequate disposal standards. In 1987, Congress inappropriately selected Yucca Mountain as the sole repository site, a clearly political, not technical, decision. (0646-9 [Hanson, Courtney])

Comment: In response to the U.S. Court of Appeals Mandamus decision, the NRC's recent order to the NRC staff to restart the Yucca license proceeding beginning with a focused effort to update and publish the Safety Analysis Reports is an important first step in demonstrating confidence that a repository can be licensed in a safe and regulatory compliant manner. (0685-10 [Davis, Ed])

Comment: We encourage the NRC to request the necessary funds from Congress to facilitate timely completion of the Yucca Mountain license review. (0689-5 [Boyd, David])

Comment: Prior to finalizing the rule and associated DGEIS, the NRC should •Complete an analysis to determine the root and contributing causes of the failures of the NRC's management and oversight systems relative to compliance with the Nuclear Waste Policy Act of 1982, as amended ("NWPA"),¹ [footnote 1 text: Codified at Title 42, The Public Health and Welfare, of the U.S. Code, Section 10101, et seq.] that led to the ruling in *In re: Aiken County*, dated August 13, 2013,² [footnote 2 text: 725 F.3d 255 (D.C. Cir. 2013).] by the U.S. Court of Appeals for the District of Columbia Circuit ("D.C. Circuit Court"); •Complete an "extent of condition" evaluation to determine whether NRC's implementation of other statutes and regulations has been or is similarly affected; •Implement immediate corrective actions to address any failures identified by the extent of condition evaluation; •Formulate and implement robust corrective actions to prevent recurrence based on the root cause analysis and extent of condition evaluation; and •Issue a report documenting the above. The report should directly answer the questions listed in the "Discussion" section below. The activities of the NRC's Office of the Inspector General (OIG) should be included within the scope of the root cause analysis and extent of condition evaluation. Consideration should be given to tasking an independent outside entity to complete the requested actions. The requested actions are consistent with commonsensical management principles; the expectation expressed in the concurring opinion in *In re: Aiken County* that

"[t]oday's judgment should ensure that the Commission's next chapter begins with adherence to the law"; the principles embodied in the agency's regulations at 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," which the agency applies to its licensees; and the traits of a positive safety culture (see the NRC's "Final Safety Culture Policy Statement," 76 FR 34773, 34777-34778, dated June 14, 2011). The requested actions are warranted because of (1) the significance of the failures of NRC's management and oversight systems that led to the *In re: Aiken County* ruling; (2) the need to assure that those systems are repaired sufficiently to provide confidence that this rulemaking is well supported by rigorous, across-the-board statutory compliance; and (3) the need to assure that the DGEIS assumption of ongoing "institutional controls" is valid. As discussed below, until the requested actions are completed, the rulemaking and DGEIS are patently defective. More importantly perhaps, the requested actions will also help assure that the NRC's quest for waste confidence, and, more broadly, the nation's quest for safe, secure, ultimate³ [footnote 3 text: The enormous residual energy content of the nation's spent nuclear fuel (SNF) (see FN 32, *infra*), the proposition that the world's fossil fuel supplies are finite and decreasing, the growing deterioration of the world's air quality resulting from fossil fuel combustion (see FN 19, *infra*), and the emerging burgeoning of robotics all suggest that SNF energy recovery may be a prosperous and beneficial future enterprise. For purposes of this comment, however, that is a decision for a younger generation.] disposal of its spent nuclear fuel (SNF) do not (further) devolve into a Sisyphean ordeal-with nuclear power proponents, nuclear weapon nonproliferationists, and rule-of-law advocates forever pushing the "waste" boulder up the mythological hill, only to have political operatives roll it back down again. (0692-1 [Skov, Jeff])

Comment: Commonsensical management principles dictate that significant failures by an organization warrant (1) study to understand both the extent and the causes (root and contributing) of the failures and (2) subsequent formulation and implementation of suitable corrective actions to prevent recurrence. These principles are embodied in the agency's regulations at 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action,"²² [footnote 22 text: In relevant part, this criterion states: "Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. *In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition*" (emphasis added).] which it applies to its licensees, and are consistent with the traits of a positive safety culture (see the NRC's "Final Safety Culture Policy Statement," 76 FR 34773, 34777-34778, dated June 14, 2011), including, in particular: •Leadership Safety Values and Actions-Leaders demonstrate a commitment to safety in their decisions and behaviors. •Problem Identification and Resolution-Issues potentially impacting safety are promptly identified, fully evaluated, and promptly addressed and corrected commensurate with their significance. •Continuous Learning-Opportunities to learn about ways to ensure safety are sought out and implemented. •Questioning Attitude-Individuals avoid complacency and continuously challenge existing conditions and activities in order to identify discrepancies that might result in error or inappropriate action. (0692-10 [Skov, Jeff])

Comment: The extent of condition evaluation is important to determine whether there are other statutes and regulations that the NRC is "flouting" and/or "defying." This is not a splenetic concern. That is, there were several clear indicators that should have made apparent that NRC was failing to implement the NWPA, including: •The plain language of the NWPA ("The Commission shall consider an application for a construction authorization" and "shall issue a final decision approving or disapproving the issuance of a construction authorization" within three years, with provision for a one-year extension); •The ruling of the Yucca Mountain

Licensing Board in LBP-10-11,²³ [footnote 23 text: 71 NRC 609 (2010); see at , beginning at p. 609. Also available in ADAMS (<http://adams.nrc.gov/wba/>) at Accession Number ML101800299.] dated June 29, 2010 ("[W]e deny DOE's motion to withdraw the Application. We do so because the Nuclear Waste Policy Act of 1982, as amended (NWPAA), does not permit the Secretary to withdraw the Application that the NWPAA mandates the Secretary file [and] at this point, mandates progress toward a merits decision by the Nuclear Regulatory Commission on the construction permit."); •The ruling in (the previous) *In re: Aiken County*, 645 F.3d 428, 436 (D.C. Cir. 2011), on July 1, 2011, which contested the DOE's attempted withdrawal of the application and apparent decision to abandon development of the repository ("[W]e note that the NWPAA requires the Commission to review the application . . . and therefore we must assume that the Commission will comply with its statutory mandate");²⁴ [footnote 24 text: The concurring opinion by Judge Kavanaugh in that case culminated-after 19 pages of well-reasoned, tightly woven legal analysis-with the clear conclusion that "*the ball in this case rests . . . with the Nuclear Regulatory Commission*" (emphasis added).] •The Order of the Commission itself that sustained the ruling of its Licensing Board, CLI-11-07, dated September 9, 2011 ("[T]he Commission finds itself evenly divided"); •The NRC's own pleadings in *In re: Aiken County*, filed with the D.C. Circuit Court on February 13, 2012 ("The NWPAA directs NRC to issue a decision approving or disapproving an application within 3 years from the date the application is submitted, but allows the agency a one-year extension. 42 U.S.C. § 10134(d).") [.] (0692-11 [Skov, Jeff])

Comment: The thoroughness of the cause analysis is also important. For example, it has been posited that NRC did not complete its review of the Yucca Mountain application because the Congress failed to appropriate sufficient funding. Fair enough. However, a probing analysis would inquire further: Why did the Congress fail to appropriate sufficient funds for NRC to continue its review? The answer to that may be that NRC *failed to request* sufficient funds. For example, see NUREG-1100, Vol. 26, dated February 2010, Executive Summary, pp. 9-10: "The FY 2011 budget *request* for High-Level Waste Repository is \$10.0 million ... Major activities the requested resources will support include the following: ... Work related to an orderly closure of the agency's Yucca Mountain licensing support activities ..." (emphasis added). A thorough cause analysis would then seek to understand why the NRC failed to make the request for sufficient funding. The "why" question is then repeated until a root cause is determined. This methodology has been termed the "why staircase" by root cause analysis practitioners. (0692-13 [Skov, Jeff])

Comment: The questioning attitude is also crucial. The public, the nuclear industry, and doubtless the NRC Staff would appreciate answers to a variety of questions: •Why did over a year go by between receipt of all briefs (on *July 19, 2010*²⁷ [footnote 27 text: See "2010 Annual Report on Commission Adjudication," SECY-11-0008 ("OCAA Report"), at Attachment: "Commission Adjudicatory Decisions, January-December 2010," p. 9 (January 13, 2011).]) requested by the NRC Secretary's Order of June 30, 2010²⁸ [footnote 28 text: Available in ADAMS (<http://adams.nrc.gov/wba/>) at Accession Number ML101810432.](which established an expedited briefing schedule relative to Commission consideration of Licensing Board Order LBP-10-11²⁹ [footnote 29 text: 71 NRC 609 (2010); see at <http://pbadupws.nrc.gov/docs/ML1305/ML13056A621.pdf>, beginning at p. 609. Also available in ADAMS (<http://adams.nrc.gov/wba/>) at Accession Number ML101800299].), and the Commission's subsequent Order sustaining the Licensing Board's ruling, CLI-11-07, on *September 9, 2011*, even though the Commission was on record (CLI-10-13, dated April 23, 2010), on this very matter, with this guiding leadership touchstone: "[W]e think the prudent course of action is to resolve the matters pending before our agency as expeditiously and responsibly as possible"? •Relatedly, are the words "expeditiously" and "responsibly" terms of

art within the agency, and, if so, should they be properly defined in the U.S. Code of Federal Regulations (CFR) so that no one is potentially misled? Note that a year's delay is all the more conspicuous given that the statutory scheme only allows three years total (with the possibility for an additional fourth year if warranted) for the NRC to render a final decision on the merits on the DOE's Yucca Mountain construction authorization application. (0692-14 [Skov, Jeff])

Comment: •Since considerable benefits from the NRC's errant decisions run to the nuclear utilities—e.g., their SNF management costs are being paid by the taxpayer through the Treasury Department's Judgment Fund, the considerable corpus³⁰ [footnote 30 text: See "Department of Energy's Nuclear Waste Fund's Fiscal Year 2013 Financial Statement Audit," OAS-FS-14-02, December 2013 ("As of September 30, 2013, the U.S. Treasury securities held by the Department related to the NWF had a market value of \$36.6 billion").] of their investment into the NWF is being preserved, and they retain title and ready access to a quantity of SNF that, as of almost a decade ago, had the energy equivalent of *over six billion barrels of oil* (see here;³¹ [footnote 31 text: Testimony of Mr. Kyle E. McSillarow, Deputy Secretary, U.S. Department of Energy, before the U.S. Senate Committee on Energy and Natural Resources, S. Hrg. 108-658, July 13, 2004, p. 10.] search for "6 billion barrels of oil")³² [footnote 32 text: For comparison purposes, consider that, as of December 17, 2013, the price of oil (light crude) was \$97.51 per barrel and the price of gold was \$1,244.40 per ounce (troy). There are 147.3 million ounces (troy) of gold in the United States Bullion Depository at Fort Knox, Kentucky (see here). That gold is worth \$183.3 billion (i.e., 147.3 million oz. troy times \$1244.40 per oz. troy). Six billion barrels of oil are worth \$585 billion (i.e., 6 billion barrels times \$97.51 per barrel). Thus, the nation's spent nuclear fuel constitutes an asset worth over three times more than all the gold in Fort Knox.])—was consideration given to the potential appearance of collusion between the NRC and the nuclear utility industry, especially when not a single utility joined in the petition for mandamus that resulted in the D.C. Circuit Court's August 13, 2013, ruling? Does NRC refute this implication? •Was consideration given to pursuing obstruction of justice charges in accordance with 18 U.S.C. 1505 or conspiracy charges in accordance with 18 U.S.C. 371, since (1) "a systematic campaign of noncompliance" was *evidently* being "orchestrated" within NRC, as stated in the concurring opinion in *In re: Aiken County*, and (2) outside "advice" in that regard (i.e., to unlawfully "close out" the Yucca Mountain licensing proceeding) had been provided, as stated by counsel for NRC at oral argument³³ [footnote 33 text: See on p. 39 of the transcript, lines 5-6.] for *In re: Aiken County* on May 2, 2012? (0692-15 [Skov, Jeff])

Comment: •Why does this comment need to be made? That is, when faced with the D.C. Circuit Court's August 13, 2013, ruling, and possessed of common sense, and familiar both with the traits of a positive safety culture and the content and intent of 10 CFR 50, Appendix B, Criterion XVI, and mindful that the significance of the NRC's failures is likely per se, since it was pronounced by the second highest court in the United States, but also circumstantially apparent (in accordance with the Statement of Considerations supporting the 10 CFR 50.9 rule³⁴ [footnote 34 text: 52 FR 49362, 49364, dated December 31, 1987 (As applied to licensees: "The fact that a licensee considers information to be significant can be established, for example, by the actions taken by the licensee to evaluate that information. Thus . . . there are objective indicia of recognition that can be used by the NRC in determining whether a licensee in fact recognizes the significance of the information in question.")]).] from the lengths NRC has gone to evaluate and/or address the ramifications of the condition—e.g., NRC's recent effort to evaluate the need for expedited transfer of SNF from pools to dry casks,³⁵ [footnote 35 text: See "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor," Draft Report, June 2013; available in ADAMS (<http://adams.nrc.gov/wba/>) at Accession Number ML13133A132.] this rulemaking initiative, etc.—why has no root cause analysis been initiated already? Should efforts be initiated to

bolster a questioning attitude within NRC? *In re: Aiken County* identified serious failures of the NRC's management and oversight systems relative to the NWPA, and the clear potential for a virtual colander of compliance relative to other statutes and regulations. Without significant efforts to understand the extent and causes of the failures, and to establish sound, thoughtful corrective actions to prevent their recurrence, the NRC cannot in good faith attest that the instant rulemaking complies with any governing statute. The rulemaking is consequently defective. The final reason that NRC must take the requested actions relates to the assumption in the DGEIS of ongoing "institutional controls."³⁶ [footnote 36 text: Per Section 1.8.3 of the DGEIS: "To evaluate the potential environmental impacts of continued storage, this draft GEIS makes several assumptions. . . . Institutional controls, i.e., the continued regulation of spent nuclear fuel, will continue. This assumption avoids unreasonable speculation regarding what might happen in the future regarding Federal actions to provide for the safe storage of spent fuel.] Implicit in this assumption, and made clear by the words themselves, is a requirement that the governing institutions have control. In the wake of *In re: Aiken County* that cannot be said of the NRC; at least, that is, until the actions requested herein are completed. As a result, the DGEIS is defective. (0692-16 [Skov, Jeff])

Comment: Prior to finalizing the waste confidence rule and associated DGEIS, the NRC should determine the extent and causes (root and contributing) of the failures of the agency's management and oversight systems that led to the adverse ruling in *In re: Aiken County*. Any failures identified by the extent of condition evaluation should be addressed immediately. Robust corrective actions to prevent recurrence should then be formulated and implemented, based on the results of the root cause analysis and extent of condition evaluation. Finally, NRC should issue a report documenting the above. The report should directly answer the questions listed in the "Discussion" section above. The activities of the NRC's Office of the Inspector General (OIG) should be included within the scope of the root cause analysis and extent of condition evaluation. Consideration should be given to tasking an independent outside entity to complete the requested actions. These actions are warranted because of: (1) the significance of the failures, including the considerable financial impact to the taxpayer attributable to the NRC's unjustified delay—over \$805 million,³⁷ [footnote 37 text: As a final point of comparison, had this \$805 million been afforded to the United Nations Children's Fund, UNICEF (formerly the United Nations International Children's Emergency Fund), some 1,290,000 infants and children could have been nourished, vaccinated, and provided emergency medical care over the course of those 41 months when the NRC had "the ball" (see FN 24, *supra*) but unlawfully failed to advance it. That is, based on the 50¢ per day per child value quoted by Ms. Alyssa Milano in UNICEF's recent television advertisement (see here), \$805 million divided by \$0.50 per child per day, divided by 30.4375 days per month (on average), divided by 41 months equals 1,290,000 children.] as detailed above—the added risk to the public health and safety from the additional months of proximity of the majority of nation's spent nuclear fuel to sizeable fresh water sources and significant population centers, the risks associated with additional SNF handling evolutions at the plant sites, the numerous adverse health impacts from protracted national reliance on fossil-fueled power plants, and creditable indirect economic and national security impacts; (2) the need to assure that NRC's management and oversight systems are repaired sufficiently to provide confidence that this rulemaking is well supported by rigorous, across-the-board statutory compliance; and (3) the need to assure that the DGEIS assumption of ongoing "institutional controls" is valid. (0692-17 [Skov, Jeff])

Comment: •Also difficult to quantify is the burden that NRC's errant decisions have placed on the nation's economy. The delay and resulting uncertainty stemming from the NRC's decisions—uncertainty associated both with resolving the waste confidence issue and with trust in the regulator to implement federal statutes enacted to provide waste confidence—cause

investors to doubt the future availability of inexpensive, plentiful, constant, reliable, non-price-volatile baseload electricity for industrial-scale enterprises in the U.S. Therefore they invest instead overseas where such doubt is minimized. (0692-19 [Skov, Jeff])

Comment: The NWPA is the "definite Federal policy"⁴ [footnote 4 text: NWPA, Sec. 111(b)(2); codified at 42 U.S.C. 10131(b)(2).] that establishes waste confidence. Its very purpose is to "establish a schedule for the siting, construction, and operation of repositories *that will provide a reasonable assurance that the public and the environment will be adequately protected* from the hazards posed by high-level radioactive waste and such spent nuclear fuel as may be disposed of in a repository"⁵ [footnote 5 text: Id. at Sec. 111(b)(1); codified at 42 U.S.C. 10131(b)(1).] (emphasis added). Its status as law was thrown into question by the U.S. Department of Energy's (DOE's) March 3, 2010,⁶ [footnote 6 text: Available in ADAMS (<http://adams.nrc.gov/wba/>) at Accession Number ML100621397.] motion before NRC's assigned Atomic Safety and Licensing Board ("Licensing Board") to withdraw the Department's construction authorization application for the Yucca Mountain repository, and NRC's decisions, actions, and inactions in response to that motion. However, the August 13, 2013, *In re: Aiken County* ruling by the D.C. Circuit Court reaffirmed that the NWPA is indeed the law of the United States. The Court held that the NRC had been "flouting" and "defying" it. NRC did not request a rehearing following this ruling. (0692-2 [Skov, Jeff])

Comment: •Importantly, the NRC's decisions, actions, and inactions that led to the *In re: Aiken County* ruling and, indeed, the text of the ruling itself substantially undermine the agency's reputation as an independent and transparent regulator. Such a tarnish is hard to remove, even once the decision is made to do so. The NRC Chairman's prepared remarks for presentation on November 11, 2013, at the American Nuclear Society's Winter Meeting²⁰ [footnote 20 text: NRC document S-13-011, released November 14, 2013.] are illuminating in this regard. In six pages, the words *independent* and *independence* appear 13 times, and the words *transparent* and *transparency* appear 3 times. However, the word "Yucca" does not appear, even though the current NRC has been reduced to veritable impotence—disempowered of its fundamental authority to issue or renew power reactor licenses—because of its decisions relative to Yucca Mountain, and despite the fact that the agency is under a writ of mandamus—a "drastic" remedy—from the second highest court in the United States, to "promptly continue with the legally mandated licensing process" for Yucca Mountain. Those prepared remarks thus suggest that the NRC is still in denial regarding the import and effect of the writ of mandamus, that it still considers Yucca Mountain to be a dead proposition, that it still views the NWPA to be some sort of "okay-to-violate" ("OTV") statute,²¹ [footnote 21 text: The proposition that there are "okay-to-violate" ("OTV") statutes is a very slippery slope that opens the door for multiple difficult questions; for example: Can the NRC give the public some criteria for determining which statutes are OTV statutes? Are those criteria inviolable or are some of them OTV also? Which ones? Are there OTV regulations also? If NRC designates its OTV statutes based on input from, say, Senator Reid's office, could those communiques be posted on NRC's website, so that NRC's current list of OTV statutes is readily discernable? Should NRC rulemaking documentation include certification that the rule was prepared, reviewed, and adopted only in accordance with statutes that were not and are not on the current NRC OTV List (and that the rule itself has been designated to not be OTV)?] and that it regards "independent" as a word like "um" or "uh"—to be used liberally without much thought or concern that some meaning will be conveyed. (0692-20 [Skov, Jeff])

Comment: It is well-documented that the Yucca Mountain repository is of intense political interest.⁷ [footnote 7 text: See, e.g., "In Deal, Aide to Reid To Be Named to NRC," Washington Post, November 23, 2004 ("In a deal to let 175 of President Bush's nominees take office, an

adviser to new Democratic leader Harry M. Reid, the Senate's staunchest opponent of a nuclear waste dump in his home state of Nevada, will be named to the Nuclear Regulatory Commission."); "Reid to National Republicans on Their Desire to Ship Nuclear Waste to Yucca Mountain: 'Hell No,'" Sen. Harry Reid Press Release, September 17, 2010 ("Nevada is not the nation's dumping ground and it never will be as long as I have something to say about it").] However, we should not accept that NRC's violation of the NWSA is just "politics as usual." NRC's management and oversight systems need to be sufficiently robust to overcome political intrusions, whether overt or covert, before they lead to unlawful actions. That NRC cannot be insulated from politics does not excuse its "flouting" and "defying" the law, in the words of the D.C. Circuit Court. The use of that word "flouting" by the Court is particularly troubling since it conveys the Court's conclusion that there was an element of contempt in NRC's actions.⁸ [footnote 8 text: To "flout" means "to show contempt (for)" (Collins), "to treat with contemptuous disregard" (Merriam-Webster), "[t]o show contempt for; scorn" (American Heritage). The word thus goes beyond insouciant and even willful violation of the law; it connotes-it means-*contemptuous* disregard for the law.] The concurring opinion went so far as to declare that "a systematic campaign of noncompliance" was being "orchestrated." That word "orchestrated" is often associated with conspiracy indictments. (0692-3 [Skov, Jeff])

Comment: The D.C. Circuit Court is generally held to be the second highest court in the United States.⁹ [footnote 9 text: See, e.g., "President Obama Announces Three Nominees for the D.C. Circuit Court," White House Blog, dated June 4, 2013, quoting President Obama: "The D.C. Circuit is known as the second highest court in the country, and there's a good reason for that."] Its August 13, 2013, ruling was effectuated by issuing a "writ of mandamus" to the NRC. A writ of mandamus is a court order used, *inter alia*, to compel a government agency to do its duty. The Court's rules¹⁰ [footnote 10 text: CIRCUIT RULES of the UNITED STATES COURT OF APPEALS for the DISTRICT OF COLUMBIA CIRCUIT (Together with the corresponding Federal Rules of Appellate Procedure), Circuit Rules Effective January 1, 1994, As Amended Through December 1, 2013, Federal Rules Effective July 1, 1968, As Amended Through December 1, 2013 (see here).] identify it as an "extraordinary" writ.¹¹ [footnote 11 text: See Rule 21, "Writs of Mandamus and Prohibition, and Other *Extraordinary* Writs" (emphasis added).] The U.S. Supreme Court calls it a "drastic" remedy.¹² [footnote 12 text: See, e.g., *Cheney v. United States Dist. Court for D.C.*, 542 U.S. 367 (2004) ("In light of the *drastic* nature of mandamus" (emphasis added); "This is a '*drastic* and extraordinary' remedy 'reserved for really extraordinary causes'" (quoting *Ex parte Fahey*, 332 U.S. 258, 259-260 (1947)) (emphasis added)).] Seasoned government attorneys allow that a writ of mandamus issued by the D.C. Circuit Court is a serious legal order, reflective of egregious agency behavior. (0692-4 [Skov, Jeff])

Comment: I have been told that the NRC has never received one. The failures of NRC's management and oversight systems in this instance were significant: •The NRC's errant efforts to close out the Yucca Mountain licensing proceeding have cost U.S. taxpayers upwards of \$805 million,¹³ [footnote 13 text: Through September 30, 2013, the Judgment Fund has paid out \$3.691 billion, comprising \$2.7 billion in settlements and \$991 million in court-awarded damages, to nuclear utilities as a result of the federal government's breach of the NWSA-prescribed "standard contracts" see DOE's Fiscal Year 2013 audit report for the Nuclear Waste Fund (NWF), Report OAS-FS-14-02, dated December 2013, p. 18. Based on the time duration between February 1, 1998 (*i.e.*, the breach start date), and September 30, 2013 (the "as of" date indicated in the DOE audit report), which is about 188 months (*i.e.*, 11 mos. for 1998; 12 mos. each for 1999 through and including 2012, or 12 x 14 = 168 mos.; and 9 mos. for 2013), the breach has been costing the Judgment Fund, on average, about \$19.633 million per month (*i.e.*, \$3.691b / 188 mos. = \$19.633m per month). NRC's NUREG-1100, Vol. 26, documented

NRC's decision to commence "an orderly closure of the agency's Yucca Mountain licensing support activities." *In re: Aiken County* ruled that closure decision was not lawful. Therefore, the NRC's share of the government's delay in curing the breach can reasonably be measured from February 2010, when NUREG-1100, Vol. 26, was issued, to August 13, 2013, when *In re: Aiken County* was issued. That's about 41 months (*i.e.*, 10 mos. in 2010, 12 mos. each in 2011 and 2012, and 7 mos. in 2013). Thus, at \$19.633 million per month for 41 months, the NRC's share of the federal government's delay in implementing the NWPA has cost the Judgment Fund at least \$805 million. Significantly, that money comes from the U.S. taxpayers and not from the utility-supplied Nuclear Waste Fund.] based on the consequent 41 months (at least) of additional, unjustified expenditures from the Treasury Department's taxpayer-supplied Judgment Fund to nuclear utilities in settlements and court-awarded damages resulting from the U.S. government's breach of the NWPA-prescribed "standard contracts." (0692-5 [Skov, Jeff])

Comment: •The NRC's errant decisions were less protective of the public health and welfare because they served to prolong storage of SNF at the plant sites, which are usually near both important sources of fresh water and significant population centers, and summarily to foreclose its placement deep underground in a dry, desert environment, far removed from population centers, on an expansive, guarded federal government reservation.¹⁴ [footnote 14 text: Although the ultimate licensing and opening of Yucca Mountain cannot be presupposed, NRC's compliance with the NWPA would at least have let the NWPA-prescribed process continue, and certainly (as described above) at least 41 months of continued onsite storage would have been avoided.] The delay attributable to NRC's errant actions has required utilities to transfer a corresponding additional amount of SNF from their spent fuel pools to dry casks; each of these manipulations presents a non-zero risk of mishap. Protracted dry cask storage at the plant sites provides the additional concerns that the casks are situated (1) in the weather and are therefore susceptible to weather-related degradation (see, *e.g.*, NRC's Information Notices 2012-20, "Potential Chloride-Induced Stress Corrosion Cracking of Austenitic Stainless Steel and Maintenance of Dry Cask Storage System Canisters," and 2013-07, "Premature Degradation of Spent Fuel Storage Cask Structures and Components from Environmental Moisture") and (2) in conspicuous view to terrorist planners.¹⁵ [footnote 15 text: The June 2, 2006, ruling of the U.S. Court of Appeals for the Ninth Circuit in *San Luis Obispo Mothers v. NRC*, 449 F.3d 1016 (9th Cir. 2006), lends substantial credence to the proposition that onsite dry cask storage might lead to or increase the risk of a terrorist attack because (1) the presence of the casks would increase the probability of a terrorist attack on the plant, and (2) the casks themselves would be a primary target for a terrorist attack.] That latter concern reflects that NRC's errant decisions have a national security aspect. (0692-6 [Skov, Jeff])

Comment: •The errant decisions have forced NRC to essentially disempower itself—the agency declared that it will not issue any new power reactor or Independent Spent Fuel Storage Installation (ISFSI) licenses or license renewals until "waste confidence" can be restored (see NRC's Order No. CLI-12-16, dated August 7, 2012, and associated SECY-12-0132, dated October 3, 2012). (0692-8 [Skov, Jeff])

Comment: The Commission's DGEIS and proposed rule demonstrate an unreasonable view of SNF disposal actions, virtually ignoring the delays in DOE's SNF disposal program, the breaches in the Standard Contract, the violations of the NWPA, and the suppression by Congress of appropriations to ensure good faith compliance with the NWPA and the Standard Contract. The federal courts declared in 1996 and 1997 that the obligation of utilities to pay the contract fees was a "reciprocal obligation" to the federal government's commencement of disposal of SNF by January 31, 1998,⁴ [footnote 4 text: *Indiana Michigan Power Co et al. v. DOE*, 88 F.3d 1272 (D.C. Cir. 1996); *Northern States Power Co v. DOE*, 178 F.3d 754 (D.C.

Cir., 1997).] an obligation that has now been breached for nearly 16 years with no end in sight. The United States Court of Claims is now regularly issuing decisions in litigated cases awarding utilities substantial damages for the federal government's contract breach, which on a combined basis equates to billions of dollars. Meanwhile, ratepayers have continued to pay duplicative costs for the contract fees under the breached Standard Contract as well as otherwise avoidable increased costs for expansion of SNF storage, new ISFSI facilities, higher decommissioning obligations, among other costs. At the same time, states and their taxpayers and ratepayers where SNF is stored face contingent liabilities involving unknown billions of dollars of future costs in the event that both the nation's nuclear utilities and the federal government permanently default in their obligations to dispose SNF. (0704-4 [Callen, Ronald C.] [Keskey, Donald L.]

Comment: The DGEIS and proposed rule do not promote or enforce the provisions, objectives, and goals of the NWPA and the Standard Contract or a timely decision on the Yucca Mountain License Application. A proposed decision that would in effect accept the extremely long-term or permanent storage ("non-disposal") of SNF at or near the nation's nuclear plants simply is not consistent with the NWPA or the Standard Contract. (0704-5 [Callen, Ronald C.] [Keskey, Donald L.]

Comment: The apparent escapist purpose or result facilitated by the DGEIS and proposed rule are reinforced by the federal government's inability or refusal to properly perform SNF disposal or to abide by federal court decisions clarifying and mandating said SNF disposal duties and obligations, as illustrated by *Indiana Michigan Power Co, et al v Dept of Energy*, 88 F3d 1272 (DC Cir 1996); *Northern States Power Co v DOE*, 128 F3d 754 (DC Cir 1997); *In re Aiken County*, U.S. Court of Appeals Docket No. 11-1271 (August 13, 2013); and *National Association of Regulatory Utility Commissioners v United States Department of Energy*, U.S. Court of Appeals Docket No. 11-1066 (November 19, 2013), and in numerous U.S. Court of Claims decisions awarding damages to utilities and appellate decisions arising therefrom. (0704-9 [Callen, Ronald C.] [Keskey, Donald L.]

Comment: Yucca Mountain Repository Project Formally Abandoned[.] In 2009, the federal government announced that the long awaited nuclear repository at Yucca Mountain, Nevada, was no longer a viable option.⁷³ [footnote 73 text: Nuclear Regulatory Commission, Draft Report for Comment, *Background and Preliminary Assumptions For an Environmental Impact Statement—Long-Term Waste Confidence Update*, at 2, ML11340A141 (Dec. 2011).] Subsequently, in March 2010, the Department of Energy ("DOE") submitted to NRC a request to withdraw its license application for the Yucca repository.⁷⁴ [footnote 74 text: Dep't of Energy Motion to Withdraw, *In re U.S. Dep't of Energy (High-Level Waste Repository)*, Docket No. 63-001, ASLBP No. 09-892-HLW-CAB04 (United States Nuclear Regulatory Commission), ML100621397 (Mar. 3, 2010).] Although the NRC's Atomic Safety and Licensing Board ("Board") denied DOE's request,⁷⁵ [footnote 75 text: HLW License Application Docket No. 63-001, Board Memorandum and Order (LBP-10-11), ML101800299, (June 29, 2010).] the decision was appealed and, after an evenly divided vote, the Commission ordered the Board to suspend its review by the end of fiscal year 2011, due to lack of funding for the upcoming fiscal year.⁷⁶ [footnote 76 text: HLW License Application Docket No. 63-001, Commission Memorandum and Order (CLI-11-07), ML11252A532 (Sept. 9, 2011). See also Memorandum from Catherine Haney, Director, Office of Material Safety and Safeguards, to Commission, *Update on the Yucca Mountain Program*, ML11180A265 (Sept. 1, 2011) (stating that the Yucca Mountain Program is on track to complete the closure of the Yucca Mountain licensing review by the end of Fiscal Year 2011).] In its final report, the federal Blue Ribbon Commission noted: The Obama Administration's decision to halt work on a repository at Yucca Mountain in

Nevada is but the latest indicator of a policy that has been troubled for decades and has now all but completely broken down. The approach laid out under the 1987 Amendments to the Nuclear Waste Policy Act (NWPA)—which tied the entire U.S. highlevel waste management program to the fate of the Yucca Mountain site—has not worked to produce a timely solution for dealing with the nation's most hazardous radioactive materials. The United States has traveled nearly 25 years down the current path only to come to a point where continuing to rely on the same approach seems destined to bring further controversy, litigation, and protracted delay. . . . Put simply, this nation's failure to come to grips with the nuclear waste issue has already proved damaging and costly and it will be more damaging and more costly the longer it continues . . . ⁷⁷ [footnote 77 text: *Blue Ribbon Commission on America's Nuclear Future*, Report to the Secretary of Energy, at vi ("*Blue Ribbon Commission Report*") (Jan. 2012).] The State recognizes that the U.S. Court of Appeals for the D.C. Circuit recently directed NRC to resume its review of the application for a license to store nuclear waste at the Yucca Mountain site. In re Aiken County, 725 F.3d 255 (D.C.Cir 2013). According to NRC, approximately \$11 million of Congressionally-approved funds remains. *Id.*, at 267. (0718-2-2 [Sipos, John])

Comment: When I visited the site on an ANS engineering tour in 2001, Stone and Webster contractors were plowing desert tracks leaving the site. No plan had been established for handling multi-purpose fuel canisters when they arrived via rail to the desert floor. It had not been decided if the peak temperature of storage casks would be above or below the boiling point of water. A super seal n' shield alloy had yet to be selected. A promising copper-21 that enduring years of beachfront exposure without blemish, fell apart in weeks when subjected to a theoretical storage vault environment. Engineers had just designed a bat (and guano) exclusive (loose-rubble-filled) cavern chimney, but it was untested; nor were engineers quite certain what other critters might set-up housekeeping in the storage vaults over time or whether they would piss alkali or acid. This is not a facetious remark when one is considering the response of materials to environment to which they are subjected over hundreds, thousands, or tens-of-thousands of years. Further the nuclear plume from two generations of nuclear weapons testing was known to pass beneath Yucca Mountain on its way to Death Valley, but it was as yet uncharacterized. So what comparisons, even theoretical, could be supported for the eventual plume from Yucca Mountain? I have seen no indication that these simple issues have been examined and resolved to this day. Has NRC looked at any of this? It is not evident in the GEIS and it ignores NRC's long-standing advice to its licensees, "Always consult operating experience." NRC must understand that barber chair confidence and affirmation are different than scientifically and technically defensible determinations. Further, how is it ethical or legal for the Commission to pronounce on the outcome of a licensing proceeding (Yucca Mountain) even before it has heard any evidence? (0723-3 [Shadis, Raymond])

Comment: The duping of the citizenry of the State of Nevada as a site to bury for "long term storage" the waste in salt mines has NOT been thoroughly modeled or studied and is basically flawed as a solution. (0755-3 [Calnan, Christopher])

Comment: I believe Yucca mountain to be the optimal place for storage. Storage should be on site for no more than 2 years, with waste then being shipped to Yucca mountain. The world can ill afford another Fukushima catastrophe. (0772-2 [Bogdan, Andrew])

Comment: Yucca Mountain has been determined to lack safety as a ionizing waste repository. The US government put major resources into developing Yucca Mountain to be as safe as possible and finally pulled out of that storage solution when safety was proven impossible. (0823-14 [Michetti, Susan])

Comment: Scientific thinking and analysis requires this decision to be at the top of the scientific decision tree for the safety case. By necessity of survival, safety of life forms and environment are required to be the highest and top value and priority for the decision tree which should open, transparent, and available to the public. Scientific thinking requires the NRC to seriously study the full ramifications of dozens of scientific studies pertaining to Yucca Mountain, including the National Research Council Report noting the "scientific impossibility" of making a container last 10,000 years. Specifically, DOE's own studies show that once containers begin to leak, Yucca Mountain rock is practically useless in holding back radioactive materials. President Obama, a pro-nuclear advocate, ended Yucca Mountain and cut off its funding, based on sufficient scientific evidence that it did not meet the safety criteria as a radioactive storage location. (0823-9 [Michetti, Susan])

Comment: As well, the proposed site of Yucca Mtn. is inadequate, as the mountain is 10% salt water and would erode any metallic housing for waste modules, among many other reasons. (0834-3 [Thabit, Nick])

Comment: The political actions of the past few years have halted NRC and DOE actions on Yucca Mountain. These actions occurred as a clear violation of the Nuclear Waste Policy Act (NWPA), a violation that has compelled the DC Circuit to issue a Writ of Mandamus to the NRC for its illegal halt to the Yucca Mountain licensing review and proceeding. This shutdown has been led by Harry Reid, the Senate Majority Leader and has been quietly condoned by the Obama Administration. The instruments of this halt were principally two Reid and Obama political appointees, the former Secretary of Energy, Stephen Chu and the former NRC Chairman, Greg Jaczko. All these individuals ignored the NWPA and other laws. There is no reason that this sort of mischief might not happen again, if a powerful politician chooses to sabotage a new high level waste program. This sort of political ruination could affect both another repository and a central interim storage facility for spent nuclear fuel. (0859-3 [Haughney, Charles])

Comment: The NRC and DOE fixation on Yucca Mountain is understandable; the nation has invested billions into the facility and the policy choices therein. This is a reality despite the fact that DOE, coupled with oversight by the NRC, has yet to produce a viable plan. Given the variety of alternatives - including such non-Yucca specific ideas as Monitored Retrievable Storage (MRS) and multi-purpose canisters (MPC's) - the Yucca project has been tried and failed multiple times as a solution to the nation's SNF storage problems. (0867-1-20 [Griffin, William])

Comment: In fact, the waste generated at Palisades from 1971 to 2010 may also be excess to Yucca, in that the proposed dump may never open. The State of Nevada maintains that NRC's "Nuclear Waste Confidence Decision" is erroneous, in that it biases NRC to favor the Yucca Mountain dump license lest it be proven wrong in its assurance to the public that a high-level radioactive waste geologic repository will open in the U.S. by 2025. (0919-1-10 [Kamps, Kevin])

Comment: Any waste generated at Palisades after 2010 would be excess to the capacity of the proposed national dump at Yucca Mountain, Nevada according to U.S. Department of Energy projections in its Yucca Mountain Final Environmental Impact Statement (Feb. 2002), as revealed in Tables A-7 and A-8 on pages A-15 and A-16 of Appendix A. (0919-1-9 [Kamps, Kevin])

Comment: DOE stated its preferred alternative was the Yucca dump, and examined the on-site releases of radioactivity no further. Dr. Makhiyani covers this issue in his expert commentary in

this proceeding. (DOE downplayed to the point of ignoring the catastrophic releases of radioactivity that would result if high-level radioactive wastes were actually buried at the Yucca site, the geologic unsuitability of which eventually caught up to itself, resulting in the proposal's cancellation.) (0919-2-12 [Kamps, Kevin])

Comment: Yucca's Final EIS wasn't final, after all, as the resistance to the dangerous plan mounted over time, and as the site's hydrological, geological, seismological, volcanological, etc., risks could no longer be suppressed. (0919-2-19 [Kamps, Kevin])

Comment: The United States does not currently have a national policy for the permanent storage of high-level nuclear waste. The Obama administration has determined that the Yucca Mountain site, which has been mired in bad science and mismanagement, is not an option for geologic storage of nuclear waste. (0927-4 [Kamps, Kevin])

Comment: If irradiated fuel rods are dangerous in pools and dry casks, then why not ship them to the proposed Yucca Mountain site in Nevada for burial? For one thing, Yucca Mountain is not a scientifically suitable site. Yucca Mountain is an active earthquake zone, prone to volcanic activity. Yucca leaks water like a sieve into the aquifer below, the sole source of drinking water for nearby farming communities. If waste were buried there, it would eventually leak into that drinking water, harming people downstream. In addition, shipping many tens of thousands of irradiated fuel casks cross country through 45 states plus Washington, D.C. (according to the U.S. Energy Dept.'s 2002 Final EIS for Yucca Mountain), through major metropolitan areas and America's breadbasket, past the homes of 50 million Americans carries unprecedented risks. The transport containers have been inadequately safety tested, most emergency responders are poorly trained and equipped for dealing with a radiation accident, and the health and economic impacts of a radiation release would be immense. Going forward with Yucca Mountain and such cross country transportation is ill-conceived and would make the nuclear waste dilemma worse, not better. (0929-17 [Kamps, Kevin])

Comment: Why was the storage facility build in Nevada at the cost of billions of tax payers monies that does not contain a single nuclear waste storage container or cask? What are you thinking? Sorry, I did not know that you know how to think!!!! (0985-1 [Von Duvillard, Serge])

54. Out-of-Scope Comments – Opposition to Nuclear Power

Comment: Stop making it. The only solution to the high-level radioactive waste (HLRW) problem is to not generate irradiated nuclear fuel in the first place. Our society's "preferred alternative" to nuclear power and the forever deadly radioactive waste it inevitably generates is efficiency and renewables, such as wind and solar power. As Dr. Arjun Makhijani, President of the Institute for Energy and Environmental Research, showed in his 2007 book Carbon-Free, Nuclear-Free: A Roadmap to U.S. Energy Policy, both fossil fuels and nuclear power can be completely phased out of the U.S. economy by 2040, and replaced by efficiency and renewables, without any further technological breakthroughs required, and for the same percentage of our Gross Domestic Product (GDP) as we currently spend on dirty, dangerous, and expensive fossil fuels and nuclear power. (0002-1 [Commenters, Multiple])

Comment: I am writing you because I am concerned about how we store our most hazardous waste, the radioactive fuel rods from nuclear reactors. We should not license or re-license any reactor until it has been proven that we can successfully isolate this waste. (0003-1 [Commenters, Multiple])

Comment: It's very important to have safety at our nuclear power plants. The Mobile Chernobyl idea is a very poor one and endangers a lot of people. How can you safely store the waste? Fukushima is an example of why nuclear power is a bad idea. (0005-1 [Poulson, Judi])

Comment: I protest most vigorously the idea of the passage of time being any guarantee that safe storage and containment will come along...I respectfully request a moratorium on any new licensure of nuclear power plants until the time when such storage and containment are an actuality, not a figment of a greedy industry's imagination. (0008-2 [Daly, John])

Comment: The only sane choice is to stop making additional nuclear waste. Our society's preferred alternative is efficiency and renewables, such as wind and solar power. (0009-1 [Schwartzberg, Lora])

Comment: [I]t is quite obvious that there is NO SAFE WAY to store or dispose of nuclear materials and wastes. ALL USE OF NUCLEAR POWER AND WEAPONS MUST BE BANNED. there is already more waste than we can ever properly store[.] (0010-1 [Zuckerman, Naomi])

Comment: As a citizen living in the state of Washington which is still contending with the clean up and contamination from the Hanford Nuclear site, I currently have zero confidence in the nuclear industry and how waste is managed. Although the last reactor was shut down in 1987, we are still dealing with clean up and containment of the continuous contamination and various harmful effects from this nuclear waste source. The tax payers have spent about \$2 million a year and counting. The deadline for cleanup/containment has been repeatedly extended and is now set for 2040, so, if the cost remains the same, taxpayers will pay about 27 million for clean up. At every stage of this site's development the public and government were assured of safety and ability to control the waste. They were incorrect. I have very little confidence that we may ever safely store nuclear waste and hope we cease to create this waste in the future. (0011-1 [Follett, Carol])

Comment: No nuclear waste should ever be considered safe. Decommission and shutdown all nuclear reactors immediately. (0012-1 [Swanson, Mark])

Comment: I have no confidence in any means of storage of nuclear waste that are purported to be capable of securely containing plutonium. The toxicity and half life of this substance make it literally and entirely impossible to handle in any convincing manner. Therefore, we should, on grounds of global morality and common sanity, not be producing it. (0014-1 [Bolognini, Franceseca])

Comment: As you reconsider our stance toward nuclear waste, please remember that my husband and I have no confidence in the ability of commercial or governmental entities to handle the waste appropriately over a long period of time. We have not seen any new reason why creating nuclear waste would be safer now. We know that generating energy with nuclear reactors offers an alternative to fossil fuels that harm the planet, but we would rather seek a better way that doesn't create a problem like nuclear waste. (0015-1 [Kemp, James] [Metcalfe-Kemp, Joni])

Comment: Stop making nuclear waste! Solar, wind, efficiency and geothermal are far more reasonable sources of energy than the forever deadly radioactive substances produced by nuclear power. You KNOW carbon and nuclear sources can be completely phased out by 2040, yet continue this crazy pursuit of expensive and dangerous nukes and fossil fuels! See CarbonFreeNuclearFree.org for just one simple solution. Also refer to Jeremy Rifkin's The Third Industrial Revolution and Renewable Energy World trade organization for many other viable

alternatives. Follow cloudy Germany's stellar example for distributed rooftop solar. Refer to Jon Wellinghoff of FERC who said we could easily switch our baseload to renewables in a few years! Check out what Eric Schmidt of Google laid out as an alternative plan. You will still have thousands of years of job security just from the nuclear wastes already present in our country! (0018-1 [Arnason, Deb])

Comment: Nuclear power is inherently unsafe and must be phased out. Its waste, including spent fuel rods, must be stored under the strictest conditions. (0019-1 [Handelsman, Robert])

Comment: From the beginning, until this day, there never has, nor will there ever be, a way to dissolve the waste; therefore, the entire nuclear program is both dangerous and deceitful and I recommend you dispense with your ridiculous "theories" of ways to safely retain and store waste and begin now to tell truth in the production of your conclusions and documents. Unless, and until, there is a way to dispose of it. I recommend you use your knowledge (to include scientific evidence of Chernobyl, TMI, Japan, the unsafe storage) in your documents to assist in ending furtherance of our dilemma of the waste (to include the furtherance of the production of waste via expansion of nuclear plants as in Georgia Plant Vogtle). (0020-2 [Carter, Pat])

Comment: North Carolina is one of the most beautiful states in the US. We moved here to get away from some of the idiocy of Alabama and the fact that business/power interests there were running rampant over the best interests of life and safety. Nuclear power now threatens to overrun common sense in North Carolina as well. PLEASE do not let this happen here. I urge you to consider holding firm on these extremely important points: (1) Stop the making of nuclear waste! Permit NO new nuclear power plants. (0023-1 [Bridges, Martha])

Comment: There is currently NO SAFE STORAGE option for nuclear waste, and there is no safe dose of leaking radiation. KEEP THE COURT'S BAN ON NUCLEAR LICENSING. (0023-11 [Bridges, Martha])

Comment: Spent fuel rods can no longer be routinely stored at nuclear reactor sites. No new nuclear plants should be permitted until a solution to nuclear waste storage is developed. Further, existing nuclear plants now reaching the end of their permitted lives should be decommissioned. (0024-1 [Thomas, Bill])

Comment: Finally, stop creating the waste! Decommission nuclear power plants, weapons facilities, etc. What we are already leaving future generations is enough a crime. (0028-2 [Craig, Anne])

Comment: I am a stakeholder. I don't represent anybody but myself as a mother of my daughter and hoping that she's going to have grandbabies one day that it may or may not be affected by the nuclear-ized water we already have. And now we're creating a situation where we do not have waste confidence because we do not have containment of the waste we already have. And if we ignore that -- and I don't know why the lawyers haven't already gone to the court and said we need more time because the president of Japan has said Fukushima is not contained. (0030-11-2 [Vandel, Niki])

Comment: I am not crazy about nukes. And I'm not confident in the Nuclear Regulatory Commission to site a permanent repository, particularly in this 25 to 30-year time frame. (0030-12-10 [March, Leslie])

Comment: The nuclear cycle is not carbon-free at all. Considering the entire cycle, like Leslie just said, it makes a significant contribution. And we've analyzed that if some of the money

going into the nuclear program were to go into a fast-paced efficiency and renewable program, we could reach a carbon-free scenario much, much quicker. (0030-13-1 [Sondheim, Steven])

Comment: Essentially it's time to stop the nuke con game. Stop producing this waste that we have nowhere to put it. Never guaranteed safety. The plan -- and the public like myself, the average person wants to see a plan where we start decommissioning them, taking the ones off fault lines. Look at Indian Point. Twenty million people in a 50-mile radius that there's no way you can evacuate. (0030-15-11 [Gray, Erica])

Comment: The question that must be answered in a reactor licensing decision is, if you look all the way to the end of the reactor's life, including decommissioning, spent nuclear fuel, or irradiated nuclear fuel storage and disposal, is having that source of electricity -- nuclear power - - worth all of the environmental costs, risks, and impacts that will then inevitably ensue? As soon as NRC licenses a reactor, the generation or creation of spent nuclear fuel, irradiated nuclear fuel, and all of its related costs, risks, and impacts will then follow. (0030-2-1 [Kamps, Kevin])

Comment: The mountain of commercial radioactive waste in the United States is now 56 years high, and we don't even know what to do with the first cupful. Obviously, the only real answer to the high-level radioactive waste problem is to stop making it. (0030-2-4 [Kamps, Kevin])

Comment: Our last three speakers who were from the nuclear industry are telling us that the nuclear power is clean, safe, and cheap, and they forgot to say that it was too cheap to meter. We all know that in reality nuclear power is dirty, dangerous, and expensive. And they're also claiming that nuclear power was a climate change solution, when in fact it's the most dangerous and expensive way we've ever thought of to boil water. They conveniently ignore the front-end energy use of nuclear power and the fuel cycle and the energy needed to babysit the nuclear waste for 200,000 years. So what we really need is a carbon-free and nuclear-free future or we won't have one. (0030-21-1 [Carberry, Mike])

Comment: We don't handle disasters well. Witness Katrina. We did not handle Sandy well. It is always the individual home owner and taxpayer. And in the case of nuclear, your home owner's insurance will not cover you on nuclear disaster. So in terms of what you are doing on behalf of the public and what is safe for them, what is good for them, you must take these things into account. Generic isn't good enough. You need to be spending the bulk of your time on the unimaginable. And as smart as we are; because I heard earlier on the pat on the back for we're smarter now than we were 50 or 60 years ago, we're not as smart as we will be 100 years from now, if we still exist. Actually, I think I'd prefer to be done by global warming, because a nuclear disaster will be so catastrophic and I don't think any of the folks from the nuclear power industry are going to be out there helping us dig out of the rubble for those who survive it. It is just inconceivable, inconceivable that you don't plan on the riskiest. I don't care if it's a -- as long as there's any risk whatsoever, consider that that might be what happens and the fact that you won't be able to control it. (0030-22-5 [Headington, Maureen])

Comment: So if you really want to have confidence, if you want people to have confidence in your rulemaking, in the ability of the NRC to contain, safely contain this radioactive debris -- well, not debris, but could potentially be debris through all of the transport, the storage, whatever -- I don't have that confidence. And I'm sorry, but this is why I can't really believe that nuclear power has a future, because there's too grave a danger. And the monetary consequences of a major disaster are too incredible to even contemplate. (0030-24-3 [Nelson, Dennis])

Comment: We don't need to make it [nuclear waste] anymore to generate electricity. Solar energy, wind power, energy efficiency, they all relegate nuclear power to a dead end and a historical mistake that future generations will already pay for until the basically end of time. We need to stop making any more radioactive waste. I realize that may be beyond the scope of this particular Waste Confidence rule, but I think it needs to be stated. (0030-5-2 [Safer, Don])

Comment: I'm just going to close by saying we just need to stop making more radioactive waste, and the Nuclear Regulatory Commission should start decommissioning every one of these reactors. There is not enough money to decommission them anyway at this point, and we need to stop making more radioactive waste. (0030-5-6 [Safer, Don])

Comment: The NRC has an opportunity right now to do the right thing, which is to admit the real long-term dangers and the immediate potential dangers from irradiated nuclear fuel, to stop making things worse by maintaining the moratorium on new licensing and license extensions, and to require protection of current and future generations. (0030-8-5 [D'Arrigo, Diane])

Comment: Given that there is no way to safely store radioactive waste, it is essential to avoid creating it in the first place. For that reason I urge you to permanently cease licensing new nuclear reactors and to permanently shut down the reactors currently operating in the United States. (0031-1 [Greene, Linda])

Comment: Nuclear power is under-regulated and dangerous and the risks to public health too high. It's too expensive for the US tax payer with hidden and implicit subsidies for uranium mining, radiation leak clean-up, insurance, subsidized financing, and decommissioning. There is no safe disposal method or even safe dump. Nuclear energy should be discouraged and more closely regulated. (0032-1 [Hatfield, Barry])

Comment: The only way to ensure that nuclear waste won't escape and cause mass environmental destruction is to not make it in the first place. Using existing clean technology, America can produce ALL the energy we need without generating nuclear waste. And, clean energy is cost effective. We must use the best technology available to safely enclose current nuclear waste. Don't generate more of a problem that we already have. No one knows what the weather, including seismic activity and violent storms, will be in the future. Nor can we control future generations. Remember the half life of plutonium. Nuclear energy isn't a risk worth taking. America deserves better. (0033-1 [Cobb, Sandra])

Comment: First of all, high-level waste would not be produced if we switched to renewable sources of power such as wind or solar which would cost no more than what we pay of our GDP for fossil fuels and nuclear. Nuclear power is the most expensive source of power, and insurance companies will not even insure nuclear power plants because of the likely catastrophic consequences. (0035-1 [Fulton, Doris])

Comment: I don't mind dying in my lifetime. But, the lifetime of nuclear plants? Questionable. So, tear 'em down! (0037-1 [Zidbeck, George])

Comment: No more nukes! Hanford's pollution did enough to us. (0038-1 [Scheller, April])

Comment: I am writing you because I am concerned about how we store our most hazardous waste, the radioactive fuel rods from nuclear reactors. We should not license or re-license any reactor until it has been proven that we can successfully isolate this waste. (0039-4 [Littlejohn, Nick])

Comment: I, my children, and my grandchildren need to tell you what you should know in the wake of Fukushima. Let's have NO MORE DEVELOPMENT OF NUCLEAR ENERGY in our future. We as humans should know better at this point. (0040-1 [Raynier, Kathleen])

Comment: I and my wife have long been steadfast opponents of nuclear power due to its long-term dangers to environment and humanity. To locate nuclear waste near the great lakes is to court disaster. (0044-1 [Talbot, J])

Comment: We don't believe that the NRC should be issuing any new licenses in view of the confidence issue, and a number of other issues as well, which I understand it's really not appropriate for me to go into this evening. (0045-1-3 [English, Becky])

Comment: Sierra Club, in case some of you may not be aware, is opposed to nuclear power in general, as we are also opposed to other non-sustainable forms of energy, such as fossil fuels. So my particular expertise in our chapter is working on that transition to clean renewable energies, and energy efficiencies in order to meet our needs. (0045-1-4 [English, Becky])

Comment: Nuclear energy is extremely expensive, prohibitively so. Without significant public subsidies it is too expensive to continue. Taxpayers shouldn't be expected to pick up the tab for dirty and dangerous energy production when clean renewable energy resources are far cheaper, safer, reliable, and available. (0045-10-1 [Navrkal, Alisa])

Comment: If a cloudy country like Germany can shut down its nuclear power stations and be powered by 50 percent renewable energy at times during this past year, the United States can, too. For the sake of our children and our future generations, it's time to transition beyond dirty and dangerous energy sources to a clean renewable energy future. (0045-10-2 [Navrkal, Alisa])

Comment: [T]he nuclear industry in Colorado [has] messed this up and cost us a lot of money, money that is not included in the cost per kilowatt hour for nuclear power when it said that nuclear power can provide power cheaper than renewable sources like wind and solar. (0045-12-1 [Kinsey, Bob])

Comment: [T]he [nuclear] industry is fully and irretrievably flawed, undeniably linked to weapons proliferation, and not capable of being operated safely, or even sanely, given the extreme catastrophic consequences to human health and the environment that could occur. And in many cases, already have occurred. I was born when President Truman was handed the keys to the nuclear bomb, within the days of that incident. For my entire life, ever since, the Government has been promising the benefits of nuclear technology, but all we really have to show is a legacy of broken and false promises. Plus, the reality of the dangers while laying all the problems of waste from this nuclear age on our children. When I grew up in Kansas in the 1950s, the AEC was planning a nuclear waste disposal repository in the Kansas salt mines. That never happened, nor has anything happened since, to solve the waste issue. (0045-6-1 [Andrews, Richard])

Comment: Finally, to discontinue any new licensing, or license renewals of any nuclear generating plant or facility, including all states of the fuel cycle. In other words, stop permitting waste generation. Better yet, withdraw all the current licenses, and totally focus on repository disposal. (0045-6-8 [Andrews, Richard])

Comment: [T]he Green Party, as a stance, we do not agree with nuclear power, but we disavow all nonrenewable energies in favor of renewable energies and we do understand that in

the interim there is a place for nonrenewable energies to maintain a steady energy grid, but long term we need to be thinking about phasing out these dangerous technologies in favor of more green technologies that can supply effective fuel sources. (0045-8-1 [Bartlett, Bill])

Comment: So the goal, more renewable energies, less nonrenewable poisonous energies. Let's not have a plastic island that's radioactive in the ocean, let's have more renewables. (0045-8-7 [Bartlett, Bill])

Comment: The projections here say they're trying to prepare for the 20 percent of energy that we use as nuclear energy now, into the future. But as a Green, I'd like to see us projecting less than 20 percent into the future while we prepare for that 20 percent. I won't take up anymore of your time. I appreciate everybody's hard work on this issue, because we are all relying on you to keep us safe on this. (0045-8-8 [Bartlett, Bill])

Comment: As an American who has lived comfortably and affordably in an entirely solar-electricity-powered and passively solar-heated home (in South Dakota!) for more than 5 years, I find it difficult to understand the reasoning of those who insist that nuclear power is a necessary part of our country's energy mix. Renewable energy technologies have now reached a level of maturity and reliability where we can move beyond the enormous problems associated with both fossil-fuel and nuclear power generation. Removal of the subsidies for these older technologies, thus leveling the playing field, will lead to a rapid transition to a much more sustainable future. A variety of careful scientific studies have shown that such a future is possible, given an appropriate level of political will and leadership. (0046-1 [Kelley, Don])

Comment: We must stop using nuclear plants because they are dangerous, leak, and are enormously expensive. We must increase SOLAR. IKEA is even selling solar now! Wind and the electricity generated from cattle manure is also good. But SOLAR is the very best. Stop doing all nuclear now. (0049-1 [Dolph, Ivar] [Dolph, Phyllis])

Comment: I AGREE TO THE SIERRA CLUB'S VISION ON THIS SUBJECT BUT LET US ALL REMEMBER!!! NUCLEAR WASTE GETS EVERYONE AND EVERYTHING SICK, A BAD SICK THAT BURNS INTERNALLY THAT NO ONE DESERVES. A TIME OF CHANGE IS HERE NOW! IGNORANCE IS WHAT WE ALL CAN'T AFFORD ANYMORE! TO LET NUCLEAR WASTE LEACH INTO AMERICA'S BLOOD STREAMS IS SICK IN ITSELF! DON'T BE WRITTEN THAT YOU DROPPED THE BALL. THERE IS ALOT OF GENIUS MINDS ALL AROUND THE WORLD AND THE ANSWERS DO EXIST. JUST PUT THE CALL OUT. WE ARE HERE TO HELP OURSELVES. SO LEAD ON. (0051-1 [Freund, Tim])

Comment: Measuring the risk of catastrophic failure of radioactive storage in cannot be done meaningfully in financial units. This type of measurement of this kind of outcome misses many of the detrimental and binding long term interrelated environmental problems that will continue to imperil our species and our planet for many millennia. When meaningful, the equivalent monetary value of of a single species' benefit to our ecosystem is often surprisingly large, such as that of the honeybee (for pollination) or the common brown bat (insect control). It should become obvious to observers of the overall "big picture" that the inherent risks and rising costs of nuclear-generated power are more than reason enough to stop making nuclear waste, and immediately put our resources into enhancing efficiency and rapid development of renewable sources of energy. (0052-2 [Tietjen, Jamie])

Comment: Production of nuclear power, it's use and it's waste are all unsafe. (0054-1 [Kurland, Miriam])

Comment: Instead of making the world safer for the next 7 generations, we are leaving radioactive toxicity for the next 7000 generations! To paraphrase Another Mother for Peace, "Nuclear power is not healthy for children and other living things." The only reason we have nuclear power is government subsidy, because it is more costly (and dangerous) than other power, both green and polluting. (0055-1 [Fast, Wendy])

Comment: I am writing you because I am concerned about nuclear plants and nuclear waste. Unfortunately, I have had personal experience with this particular issue. I lived near Hanford Nuclear plant when I was young. It wasn't safe. I don't think these plants can be safe. My family is left with health problems resulting from having lived in the area. We are basically viewed as collateral damage or something. Nothing is done. Years go by. We pay the price and those who created and released the material that harmed us are allowed to just ignore what they have done, now leaving cleanup to be paid for mostly by taxpayers. We don't really have a good, safe way to dispose of radioactive material. Transporting it is dangerous. Storing it is dangerous. Frankly, we need to stop refining and using these materials. More than enough damage and waste has already been created. (0058-1 [Turnbow, Lisa M.])

Comment: the entire nuclear technology and industry was fatally and irretrievably flawed, inseparably linked to weapons proliferation, and not capable of being operated safely or even sanely given the extreme catastrophic consequences to human health and the environment. (0059-1 [Andrews, Richard])

Comment: I call on the NRC to act immediately: Require all reactors to harden structures housing spent fuel pools since at a minimum SNF will have to stay in them for about five years for primary cooling. Move quickly to remove all possible spent fuel from cooling pools and into hardened dry casks of small enough size for transport and Remove all dry casks to ISFSI facilities away from populated areas of our country in dispersed arrays to make them less vulnerable to terrorists attacks, and reducing the consequences if attacked, and to discontinue any new licenses or license renewals of any nuclear waste generating plant or facility, including all stages of the fuel cycle. In other words stop permitting nuclear waste generation. Better yet, withdraw all current licenses. (0059-11 [Andrews, Richard])

Comment: Please do what is healthiest and best for all the people of America & the world. Looking at previous of history Rocky Flats, Chernobyl, Fukushima, etc., I don't have any faith that this can become a viable, clean energy source. Please focus on renewable, safe, healthy energy options. We are smart people. We could do this easily,.... IF the money & regulation flowed that way instead of into big business pockets. Your agency has the power to begin this change from focus on profit to what's truly best for ALL of us. BUT,will you? Please. (0062-1 [Clendening, Tommie])

Comment: No More Fukushimas urges the Nuclear Regulatory Commission (NRC) to continue the moratorium on licensing and relicensing commercial nuclear power plants until safe and permanent high-level nuclear waste disposal is available (assuming a safe solution is attainable). (0064-1 [Skud, Bruce])

Comment: At this juncture, the most logical and immediate way to begin to effectively address the spent fuel problem is to limit the generation of new spent fuel by stopping the licensing and relicensing of nuclear plants. A moratorium would ultimately end production of spent fuel at all nuclear reactors as plant operating licenses lapse. Obviously, the US would still need to address spent fuel that has already accumulated as well as spent fuel that will be generated from licensed plants. (0064-7 [Skud, Bruce])

Comment: Do you still claim nuclear power is safe? Ask the (mostly Native) Americans that are suffering from disease where uranium is mined. You thought serious accidents would never happen at nuclear power plants. Turns out they happen every 7-10 years. What power source requires such a large supply of water, which is getting in short supply as the earth continues to warm. What power source depends on electricity to keep massive disaster at bay? Only nuclear power. Let's end the use of this deadly 20th Century technology, and embrace the far cheaper (consider the cost of safeguarding the waste for 1,000,000 years) and safer wind, geothermal and solar energy sources. (0065-3 [Payne, Gail])

Comment: Each year, more long-lasting nuclear waste is created which directly impacts future generations of humans and living creatures on our planet. It is imperative that a plan be put into place and adhered to immediately to regulate and dispose of ALL nuclear waste to ensure life continues. (0067-1 [Parrish, Dave])

Comment: There is more than a bit of hubris in thinking that we can safely create and store nuclear waste that has a dangerous half-life that is twice as long as man's recorded history! Experience alone should encourage a changed approach to the pursuit of all technologies that generate dangerous waste and require such security and prolonged maintenance. (0069-1 [Spangenberg, Samuel])

Comment: We need less nuclear energy and more solar energy, energy made from our waste from landfills, sewers, farming operations, oil products from restaurants, and more. Biodiesel made from materials derived from research done at UTK, Oak Ridge, TN, and perhaps other areas, could really be key to the national energy future! However, before we can go forward, we need many more nonelitist, strongly-adversarial-to-rightwingers, pro-farming, rural areas and environment NewDEAL democrats to help in these and other areas of need. But we need much more investments in clean energy, biodiesel, etc, to help expand our clean energy horizons! We need companies, etc, to take some steps forward, and not allow clean energy or the energy economy to stagnate, and decline, when it could be prospering and accelerating to a better tomorrow! (0074-2 [Rowlett, Kimberly])

Comment: New rules, yes! Rules that require proven waste isolation methods before the licensing or relicensing of any reactor. (0075-3 [Hill, Barbara])

Comment: I am writing you because I am concerned that there is NO WAY to safely store, the radioactive fuel rods from nuclear reactors. We should not license or re-license any reactor ever again. We should decommission all nuclear reactors. Never ever have one operating in this world. They are not safe and there is no place to put the unsafe waste. One earth one people. (0077-1 [LeCour, Melinda])

Comment: My 6th grade science book sang the praises of nuclear energy, stating that in the nuclear powered future, we would have free, non-metered energy. In college, I witnessed 3 Mile Island and learned that there is no safe low level of nuclear radiation exposure due to potential recessive genetic damage. Since then, Chernobyl and Fukushima and the discovery that Yucca Mountain is not geologically stable have driven home the point that the environmental costs of fission far outweigh the benefits. The waste storage problem has always been ignored by dishonest economists and industry insiders who suffer from the hubris of deeming nuclear waste as an externality. One can not put out a fire by giving it more fuel. First do no more harm. (0078-1 [Mock, Neal])

Comment: First, do no more harm by initiating a moratorium on nuclear licenses and extensions. (0078-2 [Mock, Neal])

Comment: Once nuclear contamination extends beyond the containers designed to hold it there is no way of getting that contaminated waste back, and away from areas of environmental concern. Nuclear power should not be given the green light anymore. It is perhaps even more detrimental to the environment than are the CO2 emissions from power plants. Nuclear contamination does not eventually lose its toxicity until many years, and several generations or more, and by that time it has exacted enormous physiological, and biological damage to both humans, and the life forms that come in contact with it. There is not safe "forever" design for nuclear waste, and the best alternative is to eliminate it from the arsenal of potential energy systems. (0081-1 [Balgemann, Dennis])

Comment: There should be NO relicensing of nuclear facilities until there is a solution to nuclear waste storage, and that does not mean foisting it on Native American tribes or rural communities. PERIOD. (0082-1 [Long, Marcie])

Comment: What can I say about nuclear waste leaking at a site that is next to one of the biggest river systems on our continent? Are you insane? We have alternatives NOW that can replace coal and nuclear energy, so what is the holdup? Could it be giant piles of money to match the giant piles of coal and nuclear waste that are destroying this planet? (0082-2 [Long, Marcie])

Comment: There is no safe way to store nuclear waste, no containers, pools or indefinite storage sites that will prevent leaks for the hundreds of thousands of years it remains dangerous and deadly. The extreme danger lasts too far into the future to be certain of how to responsibly and safely deal with it then. The only solution to the problem of storing high-level radioactive waste is to not generate irradiated nuclear fuel in the first place. Historically it has proven to be too dangerous and uncontrollable, and the consequences of human error and natural disasters jeopardize life all over the Earth via buried waste leaking into ground water, dumping it in the ocean or releasing it into the air which circulates all around the globe. The NRC must address what to do with existing nuclear waste before licensing or relicensing any new or currently operating reactors, and you have no viable safe solutions, so stop licensing reactors and generating more hazardous radioactive waste. (0083-1 [Davis, Shelle])

Comment: I strongly urge you realize that high level nuclear waste cannot now be stored safely and not to approve new or renewal storage license requests. (0086-1 [Lewis, Carol])

Comment: I live within a 50 mile radius of the Vermont Yankee nuclear plant. I am very happy that it is going to cease operations soon, but knowing that the spent fuel from that reactor is planned to remain there means to me that the threat of nuclear disaster remains fully present. We don't need any additional nuclear waste while we can't deal with what we already have in a manner that is truly safe, safe not just for a decade, but for a century. (0086-6 [Lewis, Carol])

Comment: We have mortgaged future generations (as in my grandchildren and yours, and we can add an uncountable number of greats the the grandchildren and the rods are still killers). This makes no sense. To make matters even worse, the financial cost of nuclear power is so high that it is not viable without huge government subsidy. Stop the government funding, stop the expense, and stop the unconscionable danger. (0088-2 [Fast, Wendy])

Comment: Yet NRC arrogantly claims it is "confident" that what has happened at 3 reactors in Japan due to loss of power, loss of cooling capability and hydrogen explosions could NEVER happen here in reactors of nearly identical age and design. And because they think it could never happen, they do not consider the consequences of which Alvarez warns. This is faith-based science. We should not be creating any more highly irradiated nuclear waste until REAL science comes up with a solution. If they are so confident that a solution is at hand, NRC should put its money where its mouth is, shut down all reactors, stop making more waste, take care of the waste already manufactured by putting it in transportable dry casks, and suspend all new and recently renewed operating licenses until the final waste solution is built and in place, and the existing waste safely stored there. (0089-1 [Shaw, Sally])

Comment: This issue should have been addressed decades ago. Just dumping radioactive material at sea or into a hole in the ground is not a solution to the growing problem. The rocket ship into the sun suggestion for getting rid of nuclear waste isn't viable either. Get serious and take care of this problem now. Begin by decommissioning old and risky reactors at once and do not build new reactors. Do not create even more waste while we are trying to figure out what to do with what already exists. The "swords into plowshares" program was not well thought out. It was always assumed that some day somebody would figure out something to solve the problem and now sixty plus years later, we must. (0090-1 [Stonecipher, Carolyn])

Comment: Clearly the accident at Fukushima and 3 mile Island and other risky plants have proven that Nuclear energy is TOO risky and NOT worth the extremely deadly waste it produces! It is preposterous to me that we still consider this means of energy when we are facing such dire threats from carbon emissions! Retiring Nuclear and Coal powered plants must be done to ensure the very health and future of this country and the world. Millions die every year due to pollution by these fossil fuels and the effects of radiation span generations! (0092-2 [Scharin, Lisa])

Comment: This is a major problem...long-term storage of nuclear waste. Is that even a phrase that can go together and truly make sense? No! There is no long-term storage solution for radioactive waste because at one point and time or another, the "container" will no longer do its job and leak or break down. Therefore, I call for a move against nuclear waste and support for sustainable, unarmful energy production. Otherwise, we are only making more of a problem for future generations. Nuclear energy is not any sort of plausible solution for our nation's energy needs. (0099-1 [Dupiche, Sharon])

Comment: [T]he [radioactive fuel rods] remain toxic for hundreds of years. This is an on-going issue and the solution will require serious consideration and, perhaps, bold action. Moving away from nuclear energy seems the best solution. America must move toward environmentally friendlier, sustainable forms of energy. With your leadership, may we help direct the rest of the world toward that goal. (0103-1 [Thornlow, Ann])

Comment: Now is the time to put 'new energies' in place. Nikola Tesla's "free energy" technology has resulted in a simple, small machine: non-polluting and continuously renewing--drawing unlimited electrum from the atmosphere. One machine can provide a whole community with all the free energy needed. This means NO more utility bills, NO more pollutants, NO more cancer-causing by-products. Natural disasters are unleashing the toxic by-products of our archaic energy systems! This technology has been available for decades. If not now, when? (0104-1 [Rousseau, Barbara])

Comment: For an efficient economy, please recommend and use safe and sustainable energy. (0107-1 [Popa, Jeni])

Comment: There is no one who can tell you what to do with any nuclear waste. This is not just something I say, this is what experts in nuclear energy say. The closest we've come is to telling someone that putting it underneath the Nevada desert is safe. And I ask: For how many years? Please reconsider every assumption. Don't look at it from the standpoint of the folks wanting to promote nuclear waste (and the money involved). Look at it from the standpoint of your son or daughter's baby being exposed to a toxic dose of nuclear energy (during a meltdown). We have a moral duty to reject nuclear energy and the risks associated with it. (0109-1 [Sovereign, David])

Comment: On behalf of public safety, we [No More Fukushimas] urge the NRC to continue the moratorium on licensing and relicensing of nuclear plants until a safe, national disposal site is up and running. (0112-10-1 [Skud, Bruce])

Comment: At this juncture the only logical way to begin to effectively address the spent fuel problem is to limit the generation of new spent fuel by stopping the licensing and relicensing of nuclear plants. A moratorium would ultimately end production of spent fuel as operating licenses lapse. Obviously, the U.S. should still need to address -- would still need to address spent fuel that has already been accumulated. (0112-10-5 [Skud, Bruce])

Comment: The nuclear industry promised cheap, safe electricity from reactors which would operate for 40 years during which time its hellishly, God-awful waste would be safely removed. The industry has delivered on none of that. Instead leaving its, bleep, waste scattered across the country. A gift to accompany increased cancer rates for yet unborn generations. (0112-11-6 [Agnew, David])

Comment: You have allowed the owners to operate with insufficient funds to properly decommission their, bleep, cancer factories until such time as the financial climate may allow it. The NRC colludes with the industry to enable all of this and for what? For industry profits and little else. We don't need nuclear power. It is completely unnecessary in Massachusetts. And the nation can convert to renewable energy for the same money now spent on nuclear and fossil fuels. (0112-11-7 [Agnew, David])

Comment: We are seven decades into too cheap to meter and no one knows what to do with the industry's toxic waste. Whether the problem is NIMBY or scientific, the result is the same. No one knows what to do with the industry's bleep toxic waste. (0112-11-9 [Agnew, David])

Comment: We should not be creating any more highly irradiated nuclear waste until real science comes up with a solution. If they are so confident, the NRC should put its money where its mouth is and require all new and recently renewed operating licenses to be put on hold and shut the reactors down until the nuke waste solution that they have been saying is just around the corner for the past 30, 40 years is built and in place. (0112-18-2 [Shaw, Sally])

Comment: But believe me, a nuclear accident will occur somewhere and this is wrong. Unless we can guarantee that there will never be an accident again, we have to shut all these reactors down and for renewables. (0112-22-3 [Nestel, Hattie])

Comment: Confidence, give me a break. For the good of humanity we have got to stop this somehow. (0112-22-5 [Nestel, Hattie])

Comment: I just get so tired of hearing people say that nuclear power is clean. And I just want to say that we learned with the environmental movement that good science means when you're talking about fuel of energy production you have to look at the whole life cycle. You have to look at mining, you have to look at when you make the energy, and you have to look at how you deal with waste. So, I mean, look at coal. We're all up in arms about coal because of all the strip mining and what do we do to clean the air after it makes the energy? The same thing has to go for nuclear. There is just nothing clean or green about it. We all should have learned something about this lesson as children, though, I want to say. And I'm a mother and I'm going to sound like one. If you play, you have to clean up after yourself. And if you do not, you get your toys taken away. That's the way it goes. (0112-24-1 [Darling, Ann])

Comment: My name is Karen Silkwood and so is the name of everybody else in this room who spoke against nuclear power tonight. And just remember what they did to her. They being the NRC, our U.S.A. government, and everybody who owns the nuclear power plants. (0112-30-1 [Parks, Sheila])

Comment: So for me who -- I spent a lot of years working against nuclear weapons and now I'm back here on nuclear power, all nuclear power plants are crimes against humanity. Crimes against the flowers, the birds, the trees, the animals. Crimes against our planet Earth. (0112-30-4 [Parks, Sheila])

Comment: I support redesigning the entire legal basis for the NRC's regulatory enforcement: [including] closing aging reactors.... (0112-31-7 [Johanson, Birgit])

Comment: No nuclear plant is safe. We had a major problem at mile -- Three-Mile Island. Russia had a major disaster at Chernobyl. Now Japan with G.E. Technology has a two and a half year old lethal nuclear problem. They do not have -- which they do not have technical or financial resources to deal with. We have no time to waste if we want human, animal, and plant life to survive. Please decommission all nuclear plants. Finance the best scientists and engineers to explore safe ways to do this. Finance the best people to research and develop renewable energy, solar and wind. I believe the U.S. should follow Germany's example in how to move forward in this direction. (0112-33-1 [Sullivan, Cornelia])

Comment: Passing this problem off to the next generation once again is clearly not acceptable and it's the reason that we're all here. We must have a viable solution to -- before relicensing is done and/or we start any new plants. (0112-5-10 [Bogen, Doug])

Comment: Both of these organizations [Women's International League for Peace and Freedom, Mass Peace Action] have long opposed nuclear power plants. We are pleased that the Vermont Yankee Plant owners have decided to phase out this plant and we hope that a similar action will take place at the Plymouth, Massachusetts plant in the near future. (0112-6-1 [Wrenn, Nancy])

Comment: We [Women's International League for Peace and Freedom, Mass Peace Action] concur that the nation has a very serious challenge in protecting the environment surrounding these plants and the many other aging plants in the country from hazards associated with storage of nuclear waste. We are aware of the continuing pollution from the Fukushima plant in Japan and the apparent impossibility of containing it. We urge that as soon as possible all U.S. nuclear power plants be phased out in favor of renewable wind and solar sources of energy. (0112-6-2 [Wrenn, Nancy])

Comment: The NRC and the Nuclear Power Industry have us caught between a rock and hard place. We urge that these plants be phased out. (0112-6-6 [Wrenn, Nancy])

Comment: We have a problem. We have a problem in terms of climate change and we have a problem in terms of nuclear power. Nuclear power is unnecessary. I don't consider it a clean energy source because -- oh, that was a nice - clean-air electricity. That was great. I'd never heard that before. Thank you. I'll get to look that up when I go home tonight. That's a new acronym, clean-air electricity. (0112-8-6 [Sachs, Gary])

Comment: I am not happy with Nuclear Regulation Commissinor, Fracking gas land industry and Coal Industry, which causes major problems for health and global warning. I am urging all NRC, LNG, Whitehouse and US Government to shut down all nuclear power plants, nuclear factories, tracking gasland stations and Coal Industries because they all have same issue. People living or working in nuclear, tracking or coal zone sare containmated and dangerously exposes by chemical and radiation. Radiation covers entire New York State, portions of Connecticut and New Jersey. (0114-1 [Endo, Yuki])

Comment: Please SHUT DOWN NUCLEAR/COAL/FRACKING INDUSTRY. All these industries destroy beautiful view of NY and all other States. (0114-3 [Endo, Yuki])

Comment: Both of these organizations [Women's International League for Peace and Freedom, Mass Peace Action] have long opposed nuclear power plants. We are pleased that the Vermont Yankee plant owners have decided to phase out this plant and we hope that a similar action will take place at the Plymouth, Mass. plant in the near future. (0116-1 [Wrenn, Nancy])

Comment: We concur that the nation has a very serious challenge in protecting the environment surrounding these plants and the many other aging plants in the country from hazards associated with storage of nuclear waste. We are aware of the continuing pollution from the Fukushima plant in Japan and the apparent impossibility of containing it. We urge that as soon as possible, all U.S nuclear power plants be phased out in favor of renewable, wind and solar sources of energy. (0116-2 [Wrenn, Nancy])

Comment: NRC and the nuclear power industry are thus caught between "a rock and a hard place" for which there is no good solution but to stop any future production of nuclear waste. (0116-6 [Wrenn, Nancy])

Comment: I am also sure that no one working for NRC wants to have an emergency phone call telling them that they and their families have to pack up and flee immediately from where they live, even if it means becoming homeless, and if they survive, seeing arial photographs of where they used to live, now reduced to a series of ghost towns. This is not an outline for a plot of a grade B horror movie. This is the reality of what has already happened, and if we don't have the courage to act now, it will happen again. (0117-2 [Amram, David])

Comment: I know that an ecological catastrophe forcing millions to flee permanently from their homes and others not so fortunate who cannot escape in time and are left to die of various cancers due to radiation poisoning is BAD FOR BUSINESS!!! Since millions of dead people are no longer able to be customers, it might be more cost effective in the long run for those who are responsible for the storage of the lethal material which can kill us all [to] deal with the problem in a sane and sensible way, that will assure the safety of the millions of people who have no desire to become casualties of a nuclear disaster. No amount of lawsuits or gracious letters of

sympathy can ever undo the tragedies of Three Mile Island, Chernobyl and Fukushima. The NRC has the chance today to avoid another one in our back yard. (0117-3 [Amram, David])

Comment: I oppose any expansion of Nuclear waste facilities. I oppose Nuclear power and ask for Indian Point and all other Nuclear plants to be closed. They are too much of a National security risk and pose to much of a safety threat. (0124-1 [Wieder, Dr. Robin])

Comment: Obviously, nuclear energy is always unsafe and life threatening, to all species, including food crops. It involves use of radioactive materials that even in the best case scenario remain radioactive and dangerous for hundreds of thousands of years. (0125-2 [Kidney, Barbara A.])

Comment: Additionally, nuclear plants are always subject to accident, earthquakes and terrorist attacks. Obviously they are extremely dangerous and extremely foolish. Only the sad fact that a few people are allowed to make large sums of money from them keeps them operating. If our society weren't allowing this, there would be no motivation for any sane person to choose to perpetuate nuclear energy. (0125-5 [Kidney, Barbara A.])

Comment: Fukushima's reactor 4 has me very, very much on edge, where I will stay until the problem is resolved, one way or the other. I simply do not understand how any one industry is allowed to gamble with the health of the entire planet; it seems inconceivable. How do we explain that to our children? (0126-4 [Houston, Ann E.])

Comment: I expect you to regulate, not cater to the financial needs of this industry that is literally killing life on the planet through cancer. Other sources of energy that do not pollute for billions of years exist and should be substituted. As Dr. Arjun Makhijani, President of the Institute for Energy and Environmental Research, showed in his 2007 book *Carbon-Free, Nuclear-Free: A Roadmap to U.S. Energy Policy*, both fossil fuels and nuclear power can be completely phased out of the U.S. economy by 2040, and replaced by efficiency and renewables, without any further technological breakthroughs required, and for the same percentage of our Gross Domestic Product (GDP) as we currently spend on dirty, dangerous, and expensive fossil fuels and nuclear power. (0127-5 [Lee, Catherine])

Comment: As a voting citizen in NC, and near an existing nuclear plant, I am urging you to stop making nuclear wastes. We have more and are slowly creating more CLEAN renewable sources of electricity. We need to stop taking chances in creating storage facilities that will leak and have even more accidents. NRC is ignoring the real risks of spent fuel. Other countries are increasing the use of solar and wind. Please do the same. (0128-1 [Wood, Keely])

Comment: Fukushima is so frightening that it's a wonder people are still pro nuclear! With no solution in sight, the world watches to see if their worst fears will be realized! Where are we going to store our spent fuel rods? Not in my backyard! (0129-1 [Cunningham, William and Barbara])

Comment: As long as Fukushima is grappling with their already worst case scenario, we should not build or renew leases at our own facilities. Nuclear supporters claim we are safe and nothing will happen here in the US. We need to decide how to deal with all the rods now stored in the facilities. How many is too many? We're walking a fine line here. Hopefully you will not cave in to pressure from pro nuclear activists and will enforce laws already in place and make stricter ones to keep us all safe. Global warming is already threatening our planet. We have a lot

of work ahead of us. Please help make our earth sustainable for future generations. (0129-3 [Cunningham, William and Barbara])

Comment: I'm writing because I'm really worried about nuclear waste, and I don't think we should be encouraging nuclear energy till after this problem has been solved. If it ever is solved. It seems to me that touted solutions are untried, and that no-one wants to accommodate the waste and we should stop pretending that that will be a solution at some stage. This is terribly dangerous stuff, and we shouldn't be keeping it in temporary storage either. (0132-1 [Karson, Ann])

Comment: Let's find alternative ways to meet our energy needs that are neither fossil-fuel based or nuclear. And while we wait for alternative ways to be more adequately developed, let's at least not aggravate the nuclear situation. Please let's stop making nuclear waste. (0132-2 [Karson, Ann])

Comment: The Draft Generic Environmental Impact Statement is ERRONEOUS in stating a storage solution can be found in the next 60 years, give or take a few decades! ACTS of GOD and other Fukushima's will occur. But don't invite them into OUR planet! Let's act like global leaders and quit the nukes! (0133-3 [Sunflower, Susan])

Comment: The impossibility of getting rid of nuclear waste makes it unethical to continue creating it, as we are burdening future generations with it, many thousands of generations into the future. As long as it continues to be created, and thus has need of being stored, the communities in which it is stored will suffer negative consequences. Sending such waste to poor, rural communities is akin to social injustice in more recognized forms. Please, for the sake of our communities, our environment, and our progeny, do not allow it to be stored here anymore. (0134-1 [Johnston, Josiah])

Comment: The knowledge about the dangers of nuclear waste was available in the nineteen-forties. Back then the science teacher in Highland NY High School, John Gaffney, described how cancer was caused by nuclear radiation. Energy companies wanted to build a nuclear power plant on Black Creek near Highland NY, but the high school science teacher convinced the local population that it was too dangerous for the area, because of the radiation. So the energy companies went down the Hudson to Peekskill whose science teacher was not quite so astute (or perhaps he wasn't listened to). Those board members and officials in Peekskill were more influenced by money and promises, so today we can see what the nuclear waste problem truly is. Other people with dollar signs in their eyes discovered that you could turn nuclear waste into depleted uranium and make it into weapons and use it in Iraq. The children in Iraq suffer from the lack of vision of those who would push nuclear energy as safe environmentally. How could any humane and ethical person make weapons to destroy children (or anybody else)? SUGGESTION: Some have suggested that USA could put the waste back where they took the uranium out. I don't think we should, but the US government could do a health study on how local populations and miners are affected by the mining of uranium. Perhaps such a study would be exploiting the Native Americans again, with the profit going to the corporations. But such a study might emphasize the problems with nuclear waste. (0135-1 [Cypser, Betty])

Comment: If there is no real plan and no real solution, then we should not make any more. Anything less would seem self-destructive and a shameful legacy for our grandchildren and their grandchildren. (0136-11 [Shaw, Gary])

Comment: The US should stop generating nuclear waste since no scientifically proven solution. (0139-3 [Hodik, Barbara J.]

Comment: Nuclear fuel should not be produced on this continent, let alone stored. It's NOT safe, it never was safe, and it's never going to be safe. I don't understand how any nuclear plant anywhere on Earth could be allowed to operate in the 2 1/2 years since Fukushima. What is the plan to safely deal with that? You have all these regulations and guidelines, how are they working out for Japan and the rest of the world right now? When is that accident being 'safely' dealt with? You already have a free, safe, nuclear reactor to use. It's called the sun. (0140-1 [Nickerson, Samantha])

Comment: Right now. My suggestion to NRC is to please revoke the license to operate all reactors as soon as possible, that is the best and only solution to waste management, if any. (0141-2 [Tonohira, Yuko])

Comment: There should be no more licensing or re-licensing of nuclear reactors until the permanent disposal of radioactive waste has been determined, proven and funded. (0143-3 [Arauz, Jorge])

Comment: Please NRC: Let's stop kicking the can down the road pull up our moral muster and quit making more nuclear waste. As a grandma, I am pleading for the 6,000 generations that will be stuck with this horrible man made substance. Do you ever cry for the children who have thyroid cancer in Fukushima? I do. You should try it some time. It might send some blood from your heart to your brain and change your mind. (0145-4 [Sorensen, Laura])

Comment: Without a scientifically proven solution for safely disposing of nuclear waste, we must stop making it. Clean, renewable sources of electricity are readily available and affordable, so there is no excuse for continuing to rely on nuclear power. No technology has yet been proven capable of containing radioactive waste for the hundreds of thousands of years necessary to protect the environment. Debates continue over whether it is even possible to do so, but unfortunately the U.S. has failed even to identify a viable site for a nuclear waste repository despite two decades, billions of dollars, and a federal mandate to do so. (0147-1 [Fallon, Gloria])

Comment: I am a retired pathologist with boards in Nuclear Medicine with no illusions about nuclear power, nuclear weapons and radiation. Nuclear energy is an energy source whose time never came, a spinoff of the Manhattan Project to make doomsday weapons which to this day have done nothing except vaporize Japanese children. Opportunists like Edward Teller were determined not to abandon the technology they had created and found willing supporters in government and the military, people desperate to wield power over others for their own personal indulgences, while reasonable and ethical citizens saw nothing but death and destruction in its future. (0154-1 [Richardson, Don])

Comment: The human race stands today on the verge of social, environmental and moral collapse. Our present course is now very probably irreversible and the odds of a human presence on Earth 100 years from now is low. Greedy and ignorant people with power have brought us to this path to extinction. They populate business, banking, corporations, government and the military with no regard for the future of Mankind, including their own children. The fuel pool #4 at Fukushima is poised to collapse and render the Northern Hemisphere uninhabitable. Meanwhile Mr. Abe has traveled to Turkey to boost for Japanese nuclear technology. This is a perfect example of the insanity that pervades that industry. Profits

before survival is madness. We have gotten used to living so far above our means that we cannot face the obvious: we must greatly reduce our population, our consumption of non-renewable resources, and use only cleaner and cheaper energies if we are to leave anything for our progeny. This means an END to nuclear technologies and stopping the production of yet more isotopes which will be with the planet forever. Human survival is incompatible with nukes. What are you telling your own children? (0154-2 [Richardson, Don])

Comment: It is time to accept this and shut down the industry as quickly as is practical. (0155-3 [Preschle, Gus])

Comment: I am writing to express my desire for no more nuclear energy to be used- either weapons or power plants. (0156-1 [Heinle, Helen])

Comment: There IS NO ARGUMENT left for continuing to build Nuclear Power plants. NO MORE. In fact we should be shutting down and dismantling the ones that are currently in operation. We know there are technologies available for free clean energy sources,(i.e. Tesla technologies) It is high time to put the safety and well being of ALL LIFE ON EARTH ahead of the profits of elitists and the power structures that be and allow these clean technologies to be brought forth. NO MORE NUKES. (0156-3 [Heinle, Helen])

Comment: I "get" that we must find energy sources to replace fossil fuels, and I strongly agree. What I don't understand is why, with so many possibilities for increasing renewable energy, we would spend money on nuclear energy that produces toxic waste that no one has figured out what to do with. No informed person wants it near them or their children. No informed person wants it transported near them or their children. Accidents might be rare, but they are sure to happen, and are always devastating. That is not true for renewables. I do not want more nuclear power stations. I do want more renewable energy. (0157-1 [MacKenzie, Therese])

Comment: We should not license or re-license any reactor until it has been proven that we can successfully isolate and properly store radioactive waste. (0159-2 [Evjion, Virginia])

Comment: Due to storage problems of nuclear waste, nuclear power is not a safe mode of energy. We should shut down our nuclear reactors and invest in safe, green energy that will also create good jobs. (0159-3 [Evjion, Virginia])

Comment: The use of nuclear power, on the whole, needs to be re-thought as we are now more aware of the hidden costs of nuclear power. Germany is at the beginning of a bold step into the construction and exclusive use of renewable, non-nuclear energy production. We need and must also head that direction, boldly rather than timidly. (0161-2 [Rose, Melene])

Comment: I think we should start working on the solution and stop making more of the waste right now. (0163-10-2 [Kimmich, Erl])

Comment: [T]here's a level of absurdity that almost cannot be responded to and so this is simply a plea, and I speak on behalf of the Public Health and Sustainable Energy, PHASE, and the Council on Intelligent Energy and Conservation Policy, but also, of citizens and a mother and for somebody whose great grandchildren, I guess, will be around when the waste is still sitting there, please, please take this serious. (0163-12-3 [Lee, Michelle])

Comment: I'm wearing this green headband on my head to represent something because I'm a very metaphorical person. It's my constant unrelenting awareness that Indian Point with its tons

of new and old fuel rods poses an ever-present danger to myself, the people I care about, my students, my colleagues. It never goes away, and it might look funny and it might look like "Oh, there they are those crazy activists doing their thing again." We have to lighten it up a little bit, okay. You have to have some fun with it because it's serious and it doesn't go away and most people don't think about it. I do, and my cohorts do, but it's there and it's nasty and it's in my brain like background man-made radiation all the time. I'm not a math teacher. I'm an English teacher. But I know this. I know that it's unconscionable that this stuff is going to be around as a legacy, you know, a poisonous legacy for -- I wrote this down -- not only our great-great-great-great-great-great grandchildren, but also their great-great-great-great-great grandchildren. I can't even say it. And their great-great-great grandchildren. Basically, 12,000 generations. And it's just wrong. It's wrong. (0163-14-2 [Schepart, Margot])

Comment: A mother who is adamantly opposed to leaving lethal legacy of high-level radioactive waste for my children and the generations to come. (0163-15-3 [Garner-Ritter, Maureen])

Comment: As a homeowner with an old and troubled toilet, I would cease to use it if it became so filled with waste that I could no longer flush it. I would not consider -- I would not continue to sit there and eliminate any more waste into it. And the thought of leaving little empty boxes that may degrade around my house is absurd and you might say "That's crap." (0163-15-5 [Garner-Ritter, Maureen])

Comment: Imagine now that you have this apocalyptic event with the waste at Indian Point and we're not going to be measuring it in dollars. We will be measuring it in lives and futures. If we could have prevented Hurricane Sandy, we would have. It is counterintuitive, uneconomical, irresponsible, and I dare say immoral not to close down the waste factory now. (0163-15-6 [Garner-Ritter, Maureen])

Comment: There's no real plan and no real solution, so we shouldn't be making any more. To do anything less than that seems absolutely self-destructive. (0163-22-9 [Shaw, Gary])

Comment: I really feel that people have said a lot of things that need to be said, but the thing that keeps coming back to me is the issue of what are we doing to the future? What are we doing to the future? I started out in college in engineering physics, which would have led me on the path to a career perhaps in nuclear physics, and I found it wasn't what I needed. I ended up finishing with a degree in philosophy. There are logical and ethical issues here. One of the logical issues has to do with denial. There is a problem that we can't wish away, but we keep trying to. (0163-23-1 [Fullerton, Dan])

Comment: And that the CASE organization Clean and Safe Energy is created by the nuclear -- the nuclear energy industry. So we want you to know about the disconnect. We want you to know that we don't believe you anymore, if we ever did. And the people who do, I just want to say one word, which is Kool-Aid. I believe that a new study has come up that shows that there -- it's going to take the best minds of the century for the next hundred years to figure out what to do at Fukushima; is that correct? Right? Right. Okay. So I will stop now. (0163-24-5 [Allen, Judy])

Comment: I am not happy with the Nuclear Regulatory Commission fracking gas land industry and coal industry, which cause major problem for health and global warming. I am urging all NRC, liquified natural gas, White House and United States government to shut down all nuclear power plants factories, fracking gas land station, and coal industry because they all have same

issue. People living or working in nuclear, fracking, or coal zone are contaminated and dangerously exposed by chemical and radiation. (0163-27-1 [Endo, Yuki])

Comment: Please shut down nuclear, coal, fracking industry. All this in -- all these industries destroy a beautiful view of the New York and all other states. (0163-27-3 [Endo, Yuki])

Comment: What will our grandchildren think of our actions today relating to making more nuclear waste. Their lives, their friends, family, and community's lives depend on what we do today in this era. The injustice is that the choice is ours not theirs. They have no choice, no voice. It takes everyone working together to make a better world for our grandchildren. We have two short songs, and we ask if you can to join in. At least hum along. You need to drown us out. The first song is Killer Radioactive Waste to the tune of "Home on the Range." Just hum it. Hum "Home on the range." This is for the grandchildren. (0163-28-3 [Cypser, Betty])

Comment: Oh, give us a home where the grandkids grow strong, where they live long, live strontium free. Where we don't have to fear, waste vision is near, where rain fall is iodine free. We've made tons of that waste. It's a waste we don't know how to store. It can't be made safe. It costs billions to make. Where's the sense in us making some more. The waste is not safe. Oh, we're told that it's safe. Now we know that's not true. Exposure to low levels kills. No safe lower limit means we've had more than our fill. Un-contained the waste circles the globe. We've made tons of that waste. It's a waste we don't know how to store. It can't be made safe. (0163-28-4 [Cypser, Betty])

Comment: Tons, tons of that waste. It's a waste that's a hazard to store. It can't be made safe. It costs billions to make. It's insane to be making some more. (0163-28-7 [Cypser, Betty])

Comment: It can't be made safe. It costs billions to make. It's insane to be making some more. (0163-28-8 [Cypser, Betty])

Comment: Don't put your waste in my backyard, your backyard, our backyard. Don't put your waste in our backyard (0163-28-9 [Cypser, Betty])

Comment: So here I am to say just very simply that we've hackled about this for 30 years. We've done nothing and we still have nuclear waste deposit all over the nation and doing nothing is the same as letting the bully have their way. We really need to get our act together and do something. (0163-3-1 [Peck, Joe])

Comment: So I just want to say we are the generation to stop producing this mess, okay. I'm determined and a lot of people, who you don't see here, are also determined. (0163-31-4 [Tonohira, Yuko])

Comment: I have confidence that they will wonder in bewilderment what people in our day were thinking when the choice was made to continue with nuclear power and continue generating this waste instead of switching to renewables. (0163-34-6 [Azulay, Jessica])

Comment: What's real is nature and science, and what's real is that nuclear waste is forever. There's no time span that's conceivable to human beings that can deal with nuclear waste and its time span. (0163-35-2 [Shaw, Jeanne])

Comment: It's beyond not being worth the risk. It's not worth anything. It's got to stop being made. (0163-35-6 [Shaw, Jeanne])

Comment: Frequently within the document, as I skimmed it, I noticed a phrase "the reasonable approach," the reasonable approach which basically eliminated what most of the people here tonight have asked for, but it seems to me the only reasonable approach is Germany's. Stop making it. Phase it out in a decade. Figure out how to operate an advanced industrial economy with safe alternatives. (0163-36-2 [Brown, Jeffrey])

Comment: I'm old enough to remember a whole lot of lies starting for me with the Vietnam war, with what got us into the Vietnam war, the Iraq war, asbestos poisoning, the tobacco industry, the risks of smoking and enough of the lies except the lie about clean nuclear power. When -- it's true that nuclear energy doesn't produce carbon in the actual production of energy of electricity. However, from the start of mining and building and all the other things that go into making a plant startup, there's plenty of damage done and it's not economical. It's definitely not economical. Amory Lovins, a brilliant scientist who works on practical solutions and is a co-founder of the Rocky Mountain Institute, has said nuclear power is not -- is not viable and that efficiency and the development of more sustainable methods of getting energy are the way to go but -- I just urge everybody to look up on Google Joanna Macy and her idea for the storage onsite of this poison fire and the creation of communities around each site that will keep the story -- that will tell the story of the poison fire for generations and generations and pass it along so that as people come up, they know that this is something that they have to respect and that as science and storage improves, the most up-to-date storage will be taken[.] (0163-39-3 [Sack, Emily])

Comment: In Breezy Point my neighbors, for whom these were their primary homes that they lost, where there's nothing left now but sand, but we can -- somehow or other people will go back to Breezy Point. Now you look at the maps there's nothing there. In two years, three year it will be back, but you look at those same maps of Fukushima, people aren't going back. Tens of thousands of people are never going back, so just make -- put this waste, which is now overflowing these spent fuel pools, into dry cask storage immediately and stop creating more of the stuff. (0163-40-3 [Dengler, Allegra])

Comment: So anybody who has any kind of intelligence or is past the age of five knows for sure that nuclear energy is very unsafe. But -- thank you. But a process that human beings, we all engage in this at times, is rationalization, right. If a truth is too inconvenient, we generate pseudo reasons why what we're doing that's really dangerous is really okay. So that's something that's going on. (0163-41-3 [Kidney, Barbara A.])

Comment: I was in Germany recently. They have a fabulous sustainable energy program. It's incredible the progress we've made. Let's make that our model going forward. (0163-42-4 [Fry, Mark])

Comment: I think it's time for a major shift in thinking towards evaluating risks and, you know, et cetera. And I'm going to call upon somebody whose name may ring a bell, Dick Cheney. Remember him? He used to be vice president. He said the following about a completely different matter, the war on terror. Sometime after 9/11 he is supposed to have said this, "You may convince me that the risk of another 9/11 attack on our country is low. Low probability we'll call it, but if it does happen, the consequences will be huge. So we will call it low-probability, high-consequence equation." Bringing the top around to this one, I could believe perhaps, I don't really, but I could believe everything I've heard from, you know, the union gentleman from Indian Point, the engineer about the safety of the casks, the young people talking about clean energy and how we need it. I could believe all of that and yet I'm still stuck with this low-probability, high-risk equation. Low probability is not the same thing as saying no -- no

possibility, right. I keep hearing this phrase "small risk" in the GEIS, but small risk is not no risk, and unless we had -- we really have no risk in all of this, the consequences are so huge. We spent millions and billions of dollars in pursuit of Cheney's idea about low risk but high probability, so we have the war on terror. If we use the same kind of thinking towards solving our energy problems, getting rid of the low-risk nuclear and, you know, some of the other things that are also low risk, I'm sure like fracking, and really put that same attention, you know, into solving our energy and environment problems that we're putting into the war on terror, I think we could do it. I mean frankly, if Germany, the high-energy use country that it is, can do away with nuclear power plants, why can't the states? (0163-43-1 [Dalton, Andrew])

Comment: It's so fundamentally and fearsomely apparent that a mistake has been made. Starting to generate nuclear energy before a plan was formulated regarding the used rods was the mistake and is now a huge problem. We can stop compounding this mistake by closing operations until such time as we have a solution to that problem. There is a time for every purpose, to make mistakes and a time to recognize that a mistake has been made and to stop making that mistake. It is so absurd. It reminds me of "How do we make pigs fly?" Well, we don't know, but let's just forward -- go forward as if we did know and drop them out of planes and hope a plan will be developed before they land. It's double speak. Waste Confidence. I mean the ministry of truth has been at work folks. (0163-44-1 [Marcley-Hayes, Janet])

Comment: We have to close the nuclear reactors, put that money, the millions and billions of dollars into developing renewable energy. It's not that hard. (0163-44-2 [Marcley-Hayes, Janet])

Comment: [T]o me it is, yes, incredible that we continue to generate profoundly, profoundly toxic material whose toxicity lasts, as many people have said, beyond our imaginations and which I do not have any confidence that we can store safely. (0163-47-1 [Segal, Elizabeth])

Comment: First, I would like to dispel the myth that nuclear power is carbon-free energy. It is the seventh most carbon-intensive energy source we have. Uranium mining is one of the most fossil-fuel intensive industries out there. Converting yellowcake into uranium is very fossil-fuel intensive and transporting the fuel is very expensive as well and takes a lot of truck trips. Nuclear energy in general is the most expensive way we have in the world to generate power. I don't know why we're still generating power using nuclear energy. The fact is that cheaper wind is closing down nuclear power plants. Yankee -- Vermont Yankee closed because it was losing money. The only nuclear power plants being built in this country are in South Carolina, and they have to pre-charge their rate payers in order to afford to build these plants, and these rate payers are also paying for the cost overruns of these plants. These plants are unsustainable economically. They're also unsustainable environmentally. We need to take away government-subsidized insurance policies for these plants. (0163-48-2 [Meyer, Bill])

Comment: Once we stop the farce and take away the nuclear-subsidized policy, there will be no nuclear industry in this country or anywhere else. (0163-48-4 [Meyer, Bill])

Comment: I would ask the nuclear -- NRC to -- the only solution we could have is to immediately stop generating all nuclear power. Move to wind, solar, and efficiency. (0163-48-8 [Meyer, Bill])

Comment: And finally, finally, to pursue licensing on the basis of a Waste Confidence Rule that is not inspiring of confidence is both illegal and immoral, so now that I have the opportunity finally to voice my opinion, and I hope that some of you will join me in a show of hands. (0163-9-3 [Gerard, Daniele])

Comment: This is not "Hate Mail." Every job has its challenges and I'm sure you are doing your best in the way you know how. But did you know that a conversion of just 15% of US parking lot acreage to photovoltaic rooftops would produce more electricity than the entire US generates today? Please STOP THE WASTE. We have other alternatives now. (0165-1 [Osta, Hanna])

Comment: I have no confidence in nuclear power. We need to follow Germany and phase out all nuclear power. (0167-1 [Barton, Jim])

Comment: NO MORE NUCLEAR WASTE! We don't want nuclear power. We need to deal with the current waste!! (0168-1 [Jacobs, Kamri])

Comment: Until we find a way to safely store radioactive waste indefinitely, we must stop creating it. (0169-1 [Ober, Jack])

Comment: NO NUKES! NO THANKS! Keep us all healthy and well! (0171-1 [Kinnicle, Kat])

Comment: As an individual living on the coast of Cali in earthquake country, nuclear power is endangering my community and my livelihood. STOP THIS INJUSTICE! (0173-1 [G., Brittany])

Comment: We encourage the NRC decision-makers to, this time, give FULL consideration to ALL the inherent negative aspects of adding more radiation to an environment already forever polluted by the dropping and testing of nuclear weapons, routine or accidental releases from nuclear power plants and weapons complexes, enrichment facilities and supporting operations, and the release of radiation during and after hurricanes, tsunamis, earthquakes, and other natural disasters. (0174-11 [Thomas, Ellen] [Thomas, Ruth])

Comment: We agree with those who ask the NRC to stop building new nuclear facilities, stop extending the licenses of existing nuclear power plants, don't expose the nuclear workers and the public by transporting nuclear waste until and unless there is a final resting place. (0174-2 [Thomas, Ellen] [Thomas, Ruth])

Comment: This seems to indicate that the only sane approach would be to stop producing nuclear waste. In seventy years of producing nuclear weapons and nuclear energy we have found no way to dispose of the radioactive waste created that will not continue to threaten life on earth. (0174-4 [Thomas, Ellen] [Thomas, Ruth])

Comment: I have been studying the nuclear waste situation for the past 20 years, having lived in the shadow of nuclear energy plants both here in NC and previously in Florida. I have attended conferences to deal with the issue and have heard former government employees say that this area of the Southern US (at least a 5-State radius) has been referred to as a "Nuclear Sacrifice Zone." After Fukushima and in the light of Yucca Mountain not being licensed (a good thing), I am unwilling to add (nuclear) fuel to the (radioactive) fires by permitting either (1.) more costly nuclear power plants generating more nuclear waste or (2.) any vague rules being applied to the centuries-long storage of hazardous nuclear wastes. Personally, I believe the current wastes must be safely stored in place and that no new waste be generated until and unless there is a reliable way to deal with the existing waste. (0175-2 [Arnason, Deb])

Comment: Solar, wind and geothermal energy are quite feasible to become our primary energy sources per the Federal Energy Regulatory Commissioner, Jon Wellinghoff. We must be following Germany's lead to convert to renewable sources by 2020! All NRC licensing, planning

and permitting should be directed towards the phase out of nuclear energy and existing nuclear waste storage safety. Then you can change your name to the Renewables Regulatory Commission, the RRC, and keep your jobs. (0175-3 [Arnason, Deb])

Comment: What I am clear on is that enough is enough. There is no truly safe or eternally secure storage solution for nuclear waste. Folks who are much more knowledgeable than I will speak to this. There is no safe dose of radiation, and to pursue licensing nuclear power plants on the basis of Waste Confidence is illegal and immoral. We need to stop producing this stuff, first off. Are we mad to even consider continued nuclear power generation knowing full well we really don't know what to do with the waste. We've opened a Pandora's box. Let's try to close the lid a bit. No new nuclear plant licenses and no license renewals. DECOMMISSION NOW! (0177-2 [Craig, Anne])

Comment: Today I am here to speak up for what I believe to be an underrepresented population. I'm here to represent all the anomalous creatures out there that support and thrive off of nuclear waste. If our nation was ever to abandon the nuclear power that has so faithfully supplied us with the precious energy that nourishes our comforts and warms our microwavable dinners, we might be allowing the one eyed, one horned, flying purple people eaters to slip into extinction forever. There has also been claims amongst world renowned cryptozoologists that the endangered and extremely rare chupacabra may also perish without nuclear waste, along with our heroic population of mutant vigilante superheroes. Oh, the tragedy. Of course, these creatures will most likely be able to survive at a dwindling rate for the next millennia off our current radioactive waste, but we have to think ahead for the future generations of mutants and vigilante superheroes. Increasing our demand for nuclear energy is perhaps the only viable solution to their dwindling population, and the rapidly increasing humanoid population. Now, I understand there is some concern for the health of non-mutant normies out there. I believe repetitive exposure of radiation in smaller doses has extremely protective benefits. Remember, visit your dentist, radiologist, and local airport scanner as much as possible. And for the nuclear family with lower income who would not be able to afford frequent visits to a professional administrator of small scale radiation, a trip to the ocean would be an apt substitute. Thank you for time and consideration. (0184-1 [Diem, Larkin])

Comment: Precautionary principle; From Wikipedia, the free encyclopedia The precautionary principle or precautionary approach states that if an action or policy has a suspected risk of causing harm to the public or to the environment, in the absence of scientific consensus that the action or policy is harmful, the burden of proof that it is not harmful falls on those taking an action. The principle is used by policy makers to justify discretionary decisions in situations where there is the possibility of harm from taking a particular course or making a certain decision when extensive scientific knowledge on the matter is lacking. The principle implies that there is a social responsibility to protect the public from exposure to harm, when scientific investigation has found a plausible risk. These protections can be relaxed only if further scientific findings emerge that provide sound evidence that no harm will result. In some legal systems, as in the law of the European Union, the application of the precautionary principle has been made a statutory requirement in some areas of law. Regarding international conduct, the first endorsement of the principle was in 1982 when the World Charter for Nature was adopted by the United Nations General Assembly, while its first international implementation was in 1987 through the Montreal Protocol. Soon after, the principle integrated with many other legally binding international treaties such as the Rio Declaration and Kyoto Protocol. (0186-1 [Robinson, David])

Comment: Well for the record, I care. I care about my children, my grandchildren and the welfare of all future generations and I consider it my responsibility not to willingly do them harm through my actions today, especially, through a totally unnecessary activity such as boiling water through the use of a nuclear chain reaction to create steam that runs a nineteenth century technology turbine in an inefficient, dirty and environmentally irresponsible and obsolete method of generating electricity. We don't have to do this because we can dramatically reduce energy consumption through public policies that drive conservation and energy efficiency, as well as the deployment of clean, safe and renewable technologies that harvest the sunlight, the wind, geothermal heat, the ocean waves and tides. At best, the current schemes for storing our existing nuclear waste amount to kicking the can down the road and leaving this legacy as an unsolvable problem for future generations. And, if that doesn't seem irresponsible enough the irrationality is vastly compounded by the fact that the intention is to continue producing more nuclear waste, build more nuclear plants, waste more energy, divert more investment away from the development of truly safe and clean renewable technologies, even though we have no solutions, practical or political to the safe long-term storage of high-level nuclear waste. (0187-3 [Friedman, Avram])

Comment: For more than twenty-five years I was a plumbing contractor. On occasion I would be called by a frantic person who had a flooded basement because a water main had broken. Water was everywhere, knee deep or higher, damaging the structure of the building, ruining the contents, under-mining the foundation. When that happens I can tell you with expert certainty that the first thing you do to address this problem is to shut off the water supply. Then you begin to deal with the water that has already accumulated. If you don't shut off the water first, all subsequent efforts at solving the problem are more or less futile. Any sane, thoughtful and intelligent person understands this. There is no difference in the logic of dealing with our current conundrum on high-level nuclear waste. The first thing we have to do is to stop making more nuclear waste. (0187-4 [Friedman, Avram])

Comment: Safe Containment For Eternity (SCFE) must be the objective, the mission of your containment work. With half lives for radioactive nuclear wastes ranging from 30 years for strontium and cesium to some 24,000 years for plutonium-239, and time till permissible human exposure ten times half life, it follows as a necessary corollary that that "the making of toxic nuclear waste must be reduced to zero". In our physical world we sometimes cannot achieve the ideal, but often we can and do approach it very closely. There are some good uses for nuclear energy, e.g. in medicine and in astronautics. But, we know that bombs and weapons are not included in the short list -neither are nuclear power plants. There are better means than these to provide the needs for life on our shared Earth. (0188-1 [Howarth, Robert])

Comment: Do not precautionary principles call for rapidly phasing out nuclear power. Our nation should be accelerating maximum development of ending wasteful energy practices, improving energy efficiency and putting resources planned for the very excessive and escalating costs of nuclear power into truly renewable energy resources, especially solar, wind and geothermal? Ending the generation of radioactive waste would be the most effective single step toward addressing our radioactive waste dilemma. (0189-5 [Patrie, MD, MPH, Lewis E.]

Comment: We are all downwinders - with unknown, man-made radionuclides in our bodies. Human intellect has not devised a way to determine how much radioactive material we as individuals or as a population has absorbed. Neither has human intellect the capacity to discern if there is a human burden which will ultimately threaten human existence. Precautionary principle directs us to stop making radioactive waste. (0189-8 [Patrie, MD, MPH, Lewis E.]

Comment: You simply CANNOT "dispose of" high-level radwaste like a dirty, snotty Kleenex (after a bad cold)! NO industry should be allowed to continue generating toxic waste (either radioactive or chemical) which it has no ability to manage properly. Both the nuclear industry and the U.S. Department of Energy (USDOE) do NOT have a licensed, operating irradiated nuclear fuel (i.e., high-level radioactive waste) management facility. Therefore, the nuclear industry should NOT be allowed to create anymore of this long-lived, extremely radio-toxic waste! (0196-2 [Nelson, Dennis R])

Comment: The USNRC should NOT be allowed to grant any new commercial nuclear reactor operating licenses or give any more 20-year license extensions to older operating commercial nuclear reactors until a permanent, deep-geological high-level radioactive waste management repository is built, licensed, and fully operating. (0196-3 [Nelson, Dennis R])

Comment: In conclusion, rather than a "so-called 'nuclear renaissance,'" America's nuclear enterprise is in the midst of a "NUCLEAR RETREAT." [Any new commercial nuclear reactor construction MUST be totally covered by federally-subsidized taxpayer loan guarantees and/or state-based utility customer-funded "Construction Work-In-Progress" (CWIP).] If there are no new nuclear reactor licenses or current nuclear reactor licensing extensions, then so be it! (To paraphrase an older expression: "That's the way the '[radioactive] cookie' crumbles!") (0196-6 [Nelson, Dennis R])

Comment: With our nuclear enterprise "financially imploding," and the competitive energy marketplace economics favoring a total nuclear phase-out: QUITE FRANKLY, HAVING ABSOLUTELY NO CONFIDENCE IN THE USNRC'S "SO-CALLED 'RADIOACTIVE WASTE CONFIDENCE'" IS ACTUALLY ONE OF THE BEST THINGS WHICH CAN HAPPEN TO OUR NATIONAL ENERGY POLICY!! [We already have a "Mountain of Radio-toxic Waste Nearly 71 Years High," and it is high time to go "Beyond (and End) the Nuclear Age."] At the same time, the energy economics are favoring the rapid implementation of a non-nuclear, non-fossil-fuel energy strategy, which is based upon these five things: [1] The immediate removal of all federal nuclear (and fossil fuel) subsidies wasting taxpayers' money, and the immediate termination of all state-based "Construction-Work-In-Progress" (CWIP) wasting ratepayers' money. [2] The full practical use of the best technologies and techniques for greatly increasing our energy efficiency (or, in other words, improving our energy productivity). [3] More utilization of combined heat-and-power (otherwise referred to as commercial/industrial co-generation). [4] Well-designed/properly sited and installed dispersed and distributed appropriate renewable energy technologies using solar, wind, solid biomass, liquid biofuels, methane biogas, wave and tidal, hydro, and geothermal. [5] A "'smart' electricity grid" with advanced energy storage. (0196-7 [Nelson, Dennis R])

Comment: I am concerned about how we store our most hazardous waste, the radioactive fuel rods from nuclear reactors. We should not license or re-license any reactor until it has been proven that we can successfully isolate this waste. (0198-1 [Cerrito, Robert])

Comment: Just because nuclear energy doesn't contribute to CO2 and is considered clean doesn't mean that there isn't waist involved, when there is waist involved it's not a clean source of energy. (0200-1 [Individual, Anonymous])

Comment: Enough already. Let's move forward, leave the hazardous waste of old fuels behind. If we spent 1/2 the energy on new development that is spent foolishly haggling over who has the right to poison who (for handsome profits, of course) then we'd be light-years

ahead in our energy and conservation efforts evolution by now! It's a no-brainer, close that old nuclear plant NOW and move on to clean, safe renewables. (0216-1 [Bird, Melissa])

Comment: [I ask that the Nuclear Regulatory Commission] not consider the renewal of nuclear plant licensing nor the continue accumulation of spent nuclear waste until an "End Game" is proven and in place. (0219-13 [Olmstead, Stan])

Comment: We should never subsidize nuclear power at any point. Better to shut all the reactors down and work on safer storage. (0226-3 [Garden, Claire])

Comment: It is obvious to me that nuclear power is not sustainable. It's the stupidest way anyone ever invented to boil water! And then have to cool the rods with whole rivers of water. (0226-4 [Garden, Claire])

Comment: Please stop the use of nuclear materials forever! We must be insane to think that this is a useful alternative for generating energy. Think of the consequences of what you are doing now and to future generations. (0229-1 [Eckert, Rose])

Comment: All relicenses issued to date should be rescinded pending compliance with realistic new standards. No new licenses to generate additional radioactive waste should be allowed. And no additional radioactive waste should be generated. It is immoral to create deadly toxins that will remain a threat for so long when we have no real plan for safekeeping them over their hazardous 'lifespan'. (0230-7 [Garb, James])

Comment: The only way to solve this problem for future generations is to stop making nuclear waste. (0232-5 [Hall, Caroline])

Comment: Then phase out nuclear power because we have no foolproof plan how to safely dispose of the waste. . In 300 years our land will be littered with high level waste that is no longer theft proof as the shorter lived isotopes disappear leaving purer and purer plutonium waste(3) This is a nightmare for those of us who are concerned with the growing nuclear weapons proliferation risk we leave a world that we don't even know who will be left to govern. We imperil the future of our planet and our descendents, my god, in order to boil water. We need you NRC to sheppard us out of the nuclear waste mess as responsibly as possible. Spent fuel into hardened on site casks. Stop making new waste as soon as possible. Transition out of nuclear and coal and into efficiency, solar and wind. (0233-7 [Dubois, Gwen LJ])

Comment: My first point is the most important: There is simply no safe storage of nuclear waste. The latest technology that was being used in 1991 was in France, a huge and ugly blight on the countryside. We in Connecticut were told at that time that this new nuclear waste dump technology would be entirely safe in our water-rich and population-intense state. The nuclear storage facility in France was leaking within six months of being built and used. I repeat: There is no safe storage of nuclear waste. (0237-1 [Cullen, Noreen])

Comment: Thirdly, radionuclides are unstable by definition. It would not take much of an explosive to set off a chain reaction within a nuclear dump site, or indeed, at a nuclear plant. The question we should grapple with first is: how we do we go about permanently shutting down our surviving nuclear plants? Then we must find places we will destroy as close to forever as the human brain can imagine, as nuclear dump sites. There will be no restoring them, since the half-life of "low-level" nuclear waste was changed in the 1980s to include nuclear waste with a toxic, deadly half-life of a million years. Any intelligent person has to ask, "What are we thinking

to be producing this nuclear waste in the first place?" Our careless and prolific use of human-made toxins such as Plutonium 244 shows how unconcerned we are about human health and the health of our home, Planet Earth. We have shown ourselves to be undeserving of our place here and have compromised every natural resource at will. Let us first make the obvious admission that we do not know how to safely store the nuclear waste we continue to manufacture. Then let us get serious about solving the problems that we ourselves have thrust upon all life on our planet. (0237-3 [Cullen, Noreen])

Comment: I think no new nuclear power plant should be approved as long as storage is not solved. We cannot assume that long-term geologic storage will be secured, we cannot assume that indefinite storage onsite will be safe. (0238-1 [Greene, David])

Comment: Living between two nuclear energy plants is a constant reminder of the hazards of nuclear energy and the inevitable radioactive waste produced. This is no joke. (0240-1 [Remein, Warren])

Comment: As a member of a local zero waste effort the concept of zero waste is critically important to long term sustainability on this planet and for personal safety in my town. (0240-3 [Remein, Warren])

Comment: Nuclear is not the power source of the future. It is a source of potential catastrophe, depending on: human error, lack of proper safeguards, maintenance, and oversight, natural disasters such as earthquakes, floods and typhoons, and terrorism plots. Any and all of these are possibilities that should absolutely not be overlooked or dismissed. For the good of our country, our citizens, and future generations, we must decommission and safely shutdown aging nuclear plants that pose the highest risks in all of the afore mentioned scenarios, and work to clean up and stop any leaks or environmental damages caused by the plants and their use. (0241-2 [Nixon, Kerry])

Comment: Nuclear power is an extreme example of when private risk-taking is publicly funded, and any ensuing damages or disasters would likewise fall on the shoulders of the communities immediately affected and the larger public coffers funding any damage control. This is absolutely unacceptable. (0241-3 [Nixon, Kerry])

Comment: The first thing to do to protect our communities from radioactive waste is to STOP MAKING MORE OF IT. All nuclear power plants should have their licenses suspended until it has been proven that we can successfully isolate the waste. (0243-2 [Hoch, Susan])

Comment: I'd like to talk about -- first of all today's a really, really important day, which is the reason -- one of the reasons why I'm here. Today is Amchitka Day. Forty-two years ago today the United States had the largest underground nuclear test in the island of Amchitka in Alaska. It was 380 times -- 85 times the yield of the bomb that was dropped on Hiroshima. My father was one of the people that dug a cavity a mile deep in the earth's crust to put that bomb. He was also one of the people that went back and cleaned up the place afterwards. He was also one of the people that died as result of nuclear contamination. I've been active in this field for a long time because I feel that I think it's time to change the conversation about other sources that we can use besides nuclear power. I think there is a -- first of all let me just get to the point here. I think -- I'm not an expert, I'm not educated in the field of nuclear radiation, but I feel it from the standpoint that what happened to my father. As a result of that I run a nonprofit organization that is involved with the abolition of nuclear weapons. We have gotten the city of Orlando to sign onto the Mayors for Peace, there are almost 7,000 cities throughout the world that have signed

to be members of Mayors for Peace, calling for the abolition of nuclear weapons by the year 2020. (0244-10-1 [Betancourt, Nelson])

Comment: For people to continue to insist that we're going to have as an alternative that the other alternative that we have is nuclear power, is no longer a question of ignorance or a question of incompetence, it's insanity. The potential for what is going on right now, what could happen if we don't deal safely with spent rods, fuel rods, in generator No. 4 at Fukushima could have a devastating effect to this country. Yet my whole point here is that I think we need to change the conversation about this. I realize that a lot of people make a lot of money from nuclear -- nuclear power. But it's also true that banks will not finance it, Wall Street will not finance it, and I'm sick and tired of our government having to finance it and the citizens having to pay the price when these events happened. So to the gentleman that just spoke, I happen to be from Columbia, South America. I don't know who wrote that article about why nuclear power would be so fine for Latinos. That's baloney. Personally, that has not been the case in my family. (0244-10-3 [Betancourt, Nelson])

Comment: I would like to leave you with a couple of things. We run a film festival in this town for the past nine years, and one of the people that we invited to our festival was Dr. Rosalie Bertell. Some of you know who she is. She passed away recently. One of the world's most well-known nuclear scientists. She was also a Catholic nun, by the way. And she wrote this. And this is where I feel in my heart that's really going on if we continue to push the idea of nuclear power much longer. She says, she wrote, "The probable fate of our species is extermination by poisoning." So we've got all kinds of environmental poisoning and now we're poisoning the seas with nuclear -- with the toxic waste from Fukushima, and God knows what else some of the other folks have talked about here. But I wanted to leave you with one last quote by the poet Anne Sexton. And she says, "Live and die, but don't poison everything." (0244-10-4 [Betancourt, Nelson])

Comment: Currently, 2000 metric tons of commercial high-level nuclear waste is being produced each year by nuclear power reactors. Nuclear industry is not currently able to safely dispose of these 70,000 metric tons of commercial high-level nuclear waste already generated. Unless and until permanent isolation of the existing radioactive waste from the biosphere has been demonstrated, there should be no confidence in licensing waste production regarding nuclear. (0244-14-10 [Prescott, Lisa Marie])

Comment: Then another thing that I wanted to say was that -- a gentleman before was saying that he was very concerned with having this project go through because of public interest and bringing power to the poor. However, you know, as Mr. Rossin said, there are other types of energies. There was not a section on here addressing alternatives or the effects of not having this thing go through. And also, you know, if the poor really need power, sunlight's always free. I, myself, come from a Third World country, I come from Peru. I lived there for 12 years and I did not have an iPad or a cell phone or computers. So I really just, you know, had enough power for a TV and a radio and I was happy. So there's really not a lot of high demand for nuclear for the poor. I'm pretty sure they're more concerned about food and clothing and housing. (0244-15-3 [Zuccarini, Ana])

Comment: You know what I can't get over, and I didn't hear it from any of the cheerleaders, that statement back from when I was a young tyke that nuclear power was going to be too cheap to meter. Didn't turn out to be true. And right now that plant over in Finland they can't finish, and the cost is way beyond what is supposed to be, and the same thing for the one in Georgia. And what it was supposed to be was; we have it all figured out now, it's not going to be

like it was in the past, there aren't going to be cost overruns, and we're going to finish them on time. (0244-5-2 [Klutho, Mark])

Comment: Here's Popular Science from this past summer, "American Energy Independence, Five Clean Technologies That Will Set Us Free," they don't mention nuclear. And Non-Nuclear Futures: The Case for an Ethical Energy Strategy from Amory Lovins, copyright 1975. I brought out the old old shirt, it's about ready to disintegrate, but, you know, these are what I had back when I was on that energy -- that nuclear weapons assembly team down in Fort Hood, Texas in 1970. And here's the newsletter from the Rocky Mountain Institute and Amory Lovins says, "New nuclear reactors, same old story." And this word, "confidence," it's not to be used by the NRC. It's like when I'm up at the hearing just recently that the PSC had, and over and over and over again I hear the word, "prudent." No. No. Not hardly. Not hardly. (0244-5-4 [Klutho, Mark])

Comment: Yet after the NRC makes that statement on the same page you contradict -- you contradict yourself. Now, you're going to use the word "confidence"? It can't come from you. That's impossible. It's a fraud and a farce. A joke. Too cheap to meter. And, we have a handle on it now. The plants will be on time, there won't be cost overruns. Is that plant in Finland working? And have you seen what's happening in Georgia? No. (0244-5-5 [Klutho, Mark])

Comment: I just want to say thank goodness the Court threw out the Waste Confidence Rule, because the radioactive waste produced by nuclear power is dangerous, toxic, and deadly. That is indisputable. The industry, governments, and the NRC have already imposed the dangers and costs on hundreds of future generations. Hundreds of generations. There is no solution, period. There is no solution on the horizon. The lie of a possible future solution has been told so long and so many times that you have fooled many people into believing it. I was told -- it was told 50 years ago, 40 years ago, and every year and every day for decades. It is still a pipe dream and a lie. (0244-6-1 [Steorts, Tim])

Comment: Nuclear power is so extremely dangerous there are no words to even come close to expressing the dangers. You know, I don't know if you people ever hear what we try to tell you sometimes. The NRC should focus on trying to keep the existing plants from completely destroying our planet and continually searching long-term storage solutions. (0244-6-4 [Steorts, Tim])

Comment: As you know, if it weren't for the enormous taxpayer subsidies in numerous ways; Federally imposed limits on owner/operator liability; exemption of nuclear accidents from virtually all home and business insurance coverages; a decades-long conspiracy by governments, industry, academia, the scientific community, and the press to lie about the cost and problems and to brainwash the public into believing there were benefits; none of these abominations would ever have been built. There is no need for nuclear power and it's extremely expensive -- enormously expensive. You know, extremely, enormous, there's no words. The cost is virtually infinite as even in the best-case scenarios we're using power now that will be paid for for thousands of years. It's my opinion that nuclear power is insane, if you hadn't noticed or already guessed that, and must be phased out even if sacrifices must be made. The people in this industry have no right to continue creating additional risks to humanity to profit their stockholders. And I would just like my power company, based in North Carolina to know, that there are no words to express how much I resent them continuing to charge me to fund something that I pray to God will never be built. And if anyone here directly addresses my comments, I reserve the right to respond. (0244-6-7 [Steorts, Tim])

Comment: As my colleague Shirley Bain from California put it years ago, why would we ever support an energy source that had no plans and knew that there was no way to safely dispose of its deadly radioactive waste when it began, hidden this from the public, and we are now left with the creation of endless waste, endless economic and environmental cost, and endless risk to ourselves and to the plant? Why would we ever pick such an energy source in the first place? (0245-10-5 [Lewison, Linda])

Comment: I come before you today because I had serious concerns. Nuclear waste is toxic. Clean and safe are not terms that you can use to describe nuclear waste or its production. And yet members of the Nuclear Regulatory Commission and their staff are repeatedly trying to sell to the public those falsehoods. Therefore, one wonders how the members of the NRC could determine an environmental assessment finding of no significant impact regarding nuclear waste and its storage resulting in the recommendation of a generic treatment with no further oversight for a hundred years. While reviewing the documents for comment, the term 'adequate' repeatedly appears regarding the steps currently used to store toxic nuclear waste. Whenever I hear the term used by NRC staff to describe any of the nuclear plants across the country, excuse me, whenever I hear the term used by NRC staff to describe any of the nuclear plants across the country, but in particular Entergy's Palisades Nuclear Plant, I cringe. I am not sure how the use of this term is supposed to be reassuring to the public since it means 'good enough.' The connotation connected with 'good enough' is mediocre. So, I ask you, how safe would you feel with an 'adequate' pilot on a turbulent transcontinental flight? Or how quickly would you employ an 'adequate' heart surgeon if you required surgery? Yet you throw the word 'adequate' around to the public like that is supposed to reassure us about the safety of these aging, decrepit, nuclear power plants in this country and what you propose as the generic treatment of high-level radioactive waste storage for a number of years far into the future (0245-11-1 [Pierman, Bette])

Comment: Supposedly you studied what happened at Fukushima Daiichi, and yet I see no evidence that you have learned anything from your study. If you had, you would be shutting down all of the nuclear plants in this country to halt future production of toxic nuclear waste, and would be devoting your full attention to resolving the problem of current toxic nuclear waste accumulation. Okay. I have a lot more to say and I'll submit my written comments, but I'm going to finish with this paragraph. As stewards of this planet, it is time for the members of the Nuclear Regulatory Commission to begin to act responsibly and stop all further toxic nuclear waste production. Your job is not to represent the greedy, reckless, and irresponsible nuclear industry. (0245-11-3 [Pierman, Bette])

Comment: I'm concerned about the safety of nuclear energy. It does not have a reliable safety history. There have been 26 accidents in the U.S. since 1961, some with fatalities. That's one every two years, the most notable being with the Three Mile Island. (0245-14-1 [Kurz, Carol])

Comment: Aging nuclear power plant licenses should not be extended nor new ones built until a permanent repository is built. (0245-14-8 [Kurz, Carol])

Comment: I guarantee you that if the public knew exactly what was going on at all these facilities, they would say no to this. How many people do you know have died from radiation, or excuse me, exposure to solar panels? How about wind? Think if they had solar and wind backup rather than diesel and that was only a limited amount of time, what would have happened in Japan? I do have friends and family in Japan, and what they're living through is a living hell. What these communities are living in in Braidwood and Dresden, which by the way do, you know, on occasion shut their emergency alarm systems off but it doesn't get reported,

it's just wrong for you to even consider this and call it something that is safe. It's not safe. It was designed to be a bomb. It was designed to kill, and kill it does. I don't want it in my state, I don't want it in my country. And there's better alternatives than that. We are smarter than this. We are Americans and we can do better. (0245-17-3 [Thompson, Tammy])

Comment: I have a question. Why can't insurance companies insure these sites? If the nuclear power plants are so safe, then there should be a way for insurance companies to insure them. But that doesn't happen because the consequences of accidents at nuclear power plants run into millions. I thought it very interesting that the last speaker said, well, we've got \$26 billion to take care of nuclear waste. I believe that the cost of Chernobyl has exceeded a trillion at this point. And nobody ever mentions the first responders there at Chernobyl that are now all dead and the effects of the whole nuclear power project is having in the world. We're very, very much against having Iran developing nuclear power of their own because we know that the byproduct of a nuclear reactor is plutonium that is used in atomic bombs. And this is the most dangerous element or it's the most dangerous isotope in the world. And it had to be gone from the earth before the biosphere could develop. Now that the biosphere has developed, and we're bringing the plutonium back to our enormous risk. (0245-21-2 [Boudart, Jan])

Comment: And can you believe it? Can you really believe it? Sometimes listening to the comments here tonight of the proponents of nuclear power, I think they're from another planet. (0245-22-1 [Headington, Vince])

Comment: I refuse to bear that kind of a risk. What needs to happen, we need to stop producing the waste. We need to stop licensing nuclear power plants and their relicensing. We need to stop this insanity. (0245-22-4 [Headington, Vince])

Comment: Years ago, I read a phrase that startled me, and I mentioned it to a friend who was also actively concerned about nuclear waste and the reactors which made it. I was equally startled by my friend's reaction which was don't even say that. That phrase was "nuclear waste tends to remain where it's first placed." Now a dozen years later, I'm getting the exact words from NRC. As my friend may have then foreseen that it is being offered as a foundation for licensing decisions - - so don't say that at this time. (0245-24-2 [Conn, Corey])

Comment: I'm a resident of Zion, Illinois and it was mentioned earlier that Zion Nuclear Plant is permitting the decommission and actually fuel transfer should be starting at any time. So, Zion is going to have 65 casks of high-level waste sitting there for a total amount of at least a minimum 35 years. That's if they can open a storage facility now, it would be 35 years from now for that fuel to be moved out of Zion. So, that's the best-case scenario. It just to me makes no sense to continue producing more waste when we don't have storage facilities. So, I don't think there should be any licenses or license renewals until a permanent repository is established. (0245-27-1 [Ower, Douglas])

Comment: Nuclear power needs to be phased out. (0245-29-7 [Shineflug, Marilyn])

Comment: We believe that the moratorium on licensing of new and the licensing of the currently operating reactors should remain in place until such time as a permanent geological, high-level radioactive waste disposal facility is designed, licensed, built and in operation, not just a theory. We ask the NRC to maintain its moratorium until this condition is reached and ask that the moratorium be extended to include the siting and licensing of any temporary away-from-reactor storage facilities such as those referred to as centralized interim storage facilities. It's

irresponsible to continue the production of such waste without a demonstrated and operational means of disposal. (0245-3-3 [Kraft, David])

Comment: I believe that we are making a lot of choices here that are not only endangering us but also putting off better choices that we could be making. For every dollar that a taxpayer has to sink into nuclear power in dealing with its waste and dealing with its risks is a dollar that we can be spending on renewables and things that will really move us forward. (0245-31-7 [Fox, Tracy])

Comment: I believe it's because when we look at the truth, the real truth of what we've created, we are terrified. Terrified of the magnitude of dumping radioactive waste that we have created and are continuing to create. We are terrified of the certainty of contamination that's already happening and the destruction of life. The USGS is already finding polar bears and seals with skin rashes and diseases and open sores. Our fish are contaminated with nuclear radiation from Fukushima. And so, we need to face the scary and embrace it, because then you can take off the blinders that are keeping us in denial of the truth. We need to pay attention to the boy in the stable. He speaks the truth we are afraid to see. The emperor has no clothes. We do not know how to protect ourselves from radioactive waste. We need to stop making it now. Germany has already done this two years ago. They are now supporting energy generated from solar power and other sources. So, we need to stop pretending that this is safe and that we know what we are doing. Knowing when we embrace this difficult truth we can really start to have an honest discussion that will find some solutions. The emperor has no clothes. (0245-32-2 [Rude, Kathleen])

Comment: Nuclear is not the way to go while we have geothermal, solar, and wind, and who knows what else? (0245-35-2 [Seastrom, Tina])

Comment: I'm going to tell you for a second about my breast cancer book. Two elements - nuclear and treating breast cancer. I won't go into the first, the second is nuclear radiation. I can only quickly tell you that after ten years, the women in Nagasaki developed a mass of breast cancer. It's a long-term effect. It doesn't immediately pop up. You will see it eventually if you have been exposed over a period of time. Therefore, I'm going to start out by telling you this is an issue of madness dealing with a dangerous technology, dangerous, notwithstanding the word safe, it isn't. It's a dangerous technology that costs way too much; that threatens the lives of thousands of people; that generates poisons even in low-level emissions; that generates lies and false statements to lull the public into their sense of safety, as a clean technology and nuclear power is not; that we lull ourselves into denial to justify our cool homes, while corporate executives take home their salaries, and while millions and millions of dollars are invested in this technology, while PR firms promote this technology and frankly it's become a mad world. Any time we think it's okay to allow some exposure to radiation through accidents, which are many, or any releases, and any time someone is harmed, that's evil. Let's deal with facts. After Chernobyl, I heard the Russian equivalent of the EPA come to America to warn us about the dangers of nuclear radiation. He talked about the thousands of people who were harmed and died, thousands. He finally actually admitted that there were millions, and he also admitted the Russian government lied. They didn't want to admit this, they were avoiding it, and he died two years later. He was involved with the cleanup. No human life is expendable or collateral damage. No one. Accidents will happen. No one must deny this. How can anyone justify harming just one human being when less toxic and more sustainable technology is available? This whole mindset is morally indefensible. If I take a gun and randomly shoot bullets into a crowd, I'd be called insane, criminal, and evil. This technology is no less. Let's just stop making the waste. (0245-36-1 [Casten, Liane])

Comment: For my children's future, no more nuclear power. These are my grandchildren. (0245-37-6 [Bilenko, Stephanie])

Comment: I'd like to say 60 years from now we're going to have a repository? That is totally irresponsible. A repository should be now. And the other part that should be now, to reiterate what my good friends have said, is to stop producing this highly dangerous waste. We are people, we want to live, give us a chance! (0245-38-3 [Good, Joyce])

Comment: I'm here as a mother and a grandmother, and someone who is really very concerned about the actions that are taken by our government. We want to believe that you all represent us and represent our interests, but the history of the nuclear age is not like that. It started off with a bomb, and that was more than 60 years ago. And then it was sold as a peaceful way of getting, you know, nuclear energy, that it was a peaceful thing. Well, it's still a horrible, toxic, dangerous process. And if we haven't found a solution to the waste out of 60 years, what confidence do you have that we would have the notion to solve it now. No, we don't. It's just like the government, once it starts on one direction, it's so difficult to change it. And all the subsidies that you're getting for it, why can't we put those subsidies into good, renewable energy? All that money, we could be free and we could be healthy and we could be safe, and so would our children. And for you young people there working, I would implore you to read this book, "Full Body Burden" by Kristen Iversen who worked in the 60s and 70s in Rocky Mountain Flats or whatever you call that dump. And the number of commissions and the secrecy and the illnesses and the coverup, and all of the hearings that were heard and that went nowhere, and her life is a testimony. And all the people who are sick and who got ill, you've got to wake up and read those. And let us be courageous and do what we need to do, and it's move away from nuclear forever. It's dead. (0245-39-1 [Tobin, Clare])

Comment: Enough! Stop making nuclear waste! There are better, safer, cheaper ways to supply our energy needs. (0245-42-3 [Rorem, Bridget])

Comment: I often remark it's interesting that every major world religion has some form of the golden rule. Every single major world group has some form of "don't do unto others that you wouldn't want done unto you." There is something about that that just resonates with our humanity. That we're called to care for others. That we're called to care beyond short-term economics. That we're called to care for our future. So, I'm here to speak for our future. And I'm here to tell you it's unethical to require future generations to handle the waste that we're generating. It's unethical to put this burden on the future generations. We wouldn't have wanted it done to us. Where do we get off thinking that we have the right to do it to others? So, the short-term approach to handling nuclear waste is unethical. If we're going to have nuclear power, then we need to be honest and face it and handle it within our generation. The answer is we haven't found a way to do that here. So, until we do, we need to stop. It's unethical to put our generation to the future generation. It's in our humanity. We're addicted to cheap fossil fuel and cheap power. We need to look beyond short-term economics. We need to think about what is truly human and what we would want future generations to have to bear because we wanted the lights on. There's other ways. (0245-44-2 [Gallagher, Dr. Terry])

Comment: I remember adults telling me in 4th Grade that I should hide under my desk and to protect myself from nuclear fallout. In 8th Grade, I didn't understand yet and I built a model of a nuclear reactor as a science fair project. It wasn't until I started to build a working model that the dangers of nuclear energy became clear to me. While earning my engineering degree, I worked at no accelerated test without data from a non-accelerated test. I'm concerned that life test data for existing plants in Illinois is not available, and that this data is only now being generated as

the licenses for these plants are extended. Without it, we're guessing. In the late 80s, I worked for a company that designed control valves. The valves designed by my older colleagues for the nuclear industry were already antiquated. And the redundancy in the designs struck me as Rube Goldberg embarrassments to satisfy bureaucratic requirements to make a fundamentally dangerous process appear safe. Perhaps the most alarming evidence I have seen convincing me to oppose this GEIS is the excessive confidence demonstrated by the comments of some of the enthusiastic employees here tonight. 'None have broken yet' is an unsafe approach to terrestrial nuclear power and it ignores basic engineering discipline. I'd be less concerned if more had a healthy fear. (0245-46-1 [Craig, Evan])

Comment: I'm a citizen of this planet. And there has been a lot said and the longer I listen the more absurd all of it sounds. I can't believe that we even have this discussion. Why are we even having this discussion? I invite everyone that works at Exelon and any other nuclear regulation commission to go off, plop themselves down right now in Fukushima. I want you to be first responders there right now. I want your bill to be paid off so that you can live there. I want your wives who are pregnant to be brought back there so that they can have a free house. I want you all to have a Geiger counter and have all your processed. I want you to start eating the tuna off the West Coast that is now highly radioactive. I want you to be involved because what you do, you do with great care. You take safety to the fact that you've got like plagues into your buildings because what you have, I don't care what the cask looks like, how well it's built, within it is death! Chicago originated this and in 70 years they haven't been able to figure out how to neutralize or put this back into the bottle. I don't need this about facts. I don't need to hear either side's facts. It's true that it's death. And I don't care if someone said, well, people are going to have to do without their TVs. You're darn right we may have to do without some stuff. It's either that or the planet. I don't know about you, I don't have kids. You have kids, you have grandchildren. I have me and I've lived a good life and I'm grateful for that. But we are depriving the future. When the Pacific is already trashed, it's not a bathtub. Who is going to be drinking that water? Who is going to surf in it? Who is going to fish in it? I want the safety to go right to the heart of it. Go back and live in Chernobyl. Go back in Three Mile Island and see that damage. There is moral integrity that is missing and there shouldn't even be a conversation because this shouldn't even have to be on the forum for a discussion. The water resources that are going to be so very terribly at risk that it takes to keep anything cool, all right, is it going to be let's cool the plant or let's have some water to drink? All you have to do is, look at what happens in the Philippines when you have people without water. And you can be smug and laugh, then I want you to sign up right now and go to Fukushima. Those of you who have been sitting here laughing and just chortling at this need to be doing some soul-searching while you still have a soul left, while there is a planet for us to inhabit. There isn't a plan B, and you can only go underground for so many years if you think you've got that kind of self-repository built with food. You come up and there won't be anything. (0245-47-1 [Grace, Karli])

Comment: And let us remind ourselves that this technology, which is being so touted by some of the members and so say as demonstrably and too that some say, and in addition to that it's old technology, isn't it? Isn't it time we really look and say, hey, let's move into the 21st century. Let's decrease our consumption. Let's not be pigs about how much energy we use or waste. Let's turn to renewables because we can. And all of the engineers and all of the safety people, you can have a marvelous career, a green career in solar and geothermal and all the kinds of cold fusion, all these kind of incredible discoveries that have been suppressed. We have a future to look for. Let's turn our back on technology that is dangerous and is poisoning people and the planet. And let's move to the future. And nuclear industry has got millions, billions of dollars from the U.S. taxpayers. Let's put that into renewables. Let's look to the future. (0245-48-3 [Walter, Beverly])

Comment: You know, I'd rather be home doing other things, enjoying my family. I feel for the last year I have been in places where I didn't want to be. I'm involved with -- Green I'd rather not be dealing with energy issues. I guess it would be a fairy tale to me if we would proceed with clean green energy, I'm talking about wind, solar, geothermal. For my children, I would be out there every day working for free. These are the words I've heard tonight, stepping stone, that was from Jeff Dunlap, a stepping stone is fair. We wouldn't have a plan or proposal except for college. Well, that's the same thing with fracking. It's a stepping stone and it's -- politics, we would have better regulations. Let's talk about regulation. Jerry Peck said, he's from the Illinois Manufacturers Association, and considered the impact of regulations on the economy. Well, I don't know that much about this except it's poison. That's what I know and that's why I'm here tonight. We have very weak regulations for fracking, that I do know. And we call them the best in the country. Well, this is the same. We might have the best in the world but it's still poison. We're dealing with a toxic waste that has to be carefully dealt with. And Mr. Gallagher is right, we're giving it to children. (0245-49-1 [Paulus, Jill])

Comment: Tom Wolf said nuclear gives us a quality of life and economic well-being. I would like to think that the quality of my life was not hurting other people, not causing climate change, and that my economic well-being was just part of a world where I live in and we're nice people and we're not at each other's, you know, throats. I mean we're -- we don't need to do this. We just don't. And it's all the same, the same things that we talk about, our food, our water, this is all the same thing, and I'm very sorry for it. (0245-49-2 [Paulus, Jill])

Comment: I've been reading about energy and nuclear for a while but I'm certainly no authority on it. But I can't give any confidence on this idea NRC has, mainly for the reason that even though people work really hard and do a good job, human beings aren't infallible. And it doesn't seem like it's all up to us, we don't have everything under control what we think we have under control. And it's getting less likely to be able to do that in the future. So, I think the only thing this would do is perpetuate something that we can't live with anymore, never could live with it, but I don't want the effects -- have on people who are relying on it but I think there's no other choice. So, that's pretty much all. I think we have to stop doing it and I don't know of a solution to all that. The only non-detrimental source of energy that we have, I think, is photosynthesis and we seem to have moved beyond that for some reason. (0245-50-1 [Costanza, Frank])

Comment: I hope I never get a call to respond to a nuclear accident, a radiological incident. I hope that I will never have to go, I hope that I will never be woken or called at any time to go to talk to people who have been through a disaster. I can only imagine how horrible it is to the people that lived through that experience in Fukushima. My heart goes out to them. I wish there was more I could do for the people living that suffered. And I hope that there is never another incident like this. But I know there is one if we continue to develop this technology, it's going to be a possibility. We have to take responsibility for the mess we already have. I'm sure there are many, many jobs for all you bright young people who are working in the industry to take care of what's already been created. And I ask that we all put our heads together to search for better solutions for the rest of us, for all of us, and for all time. And I hope that God helps us to solve the problems that we've already created and I hope we find better solutions while working together. (0245-51-1 [Bluestein, Bonnie])

Comment: I'd like to say that I think it's a bad idea. We can't put this burden on other generations. We can't put a burden for people 250,000 years down the line. That's just totally irresponsible, immoral, unethical, you know, for people to sort of really believe that. You know, for one generation's worth of energy consumption, we're creating a life-long problem for hundreds of thousands of years. Human civilization is not that long. I believe Debra mentioned

it, what if the Egyptians were using nuclear waste? Would you want to be responsible for maintaining that waste disposal in modern times and for generations and generations to come? I think if you do the math, you'll realize that it's not economically efficient, it's not safe, it's not wise. We need to take that money and we need to reinvest it into renewable energy, renewable resources. That's the way to go for the future. (0245-52-3 [Kalas, Mike])

Comment: I thank the Federal District Court for throwing us a lifeline. The nuclear power industry puts us at risk, our families at risk, our communities at risk. Their claims of infinitesimal risk do not reconcile with the major nuclear accident happening every ten years. Go back and do the math. You need not be scientist for that. I taught Chicago Center City schools for 20 years and my third graders could do that now. (0245-6-5 [Headington, Maureen])

Comment: The NRC has stated they have a mandate to ensure the protection of the people and the environment. And I want to state here in argument to some of the statements earlier by some of the industry folks, that nuclear power is neither safe, clean, affordable, or cost effective. On the safety issue, I merely have to mention Three Mile Island, Chernobyl, and Fukushima. And that's all that needs to be said about the safety issue of nuclear power. The clean tag on nuclear power is absolutely ridiculous when you factor in the carbon-intensive and toxicity of uranium in our, for stations, areas across the country. And affordable and cost competitive is a joke. As Ms. Headington just said, the loan guarantees and the taxpayer subsidies of nuclear power should certainly be factored in to every kilowatt hour that we think we're getting from the nuclear power plant. And I assure you that all economists agree that nuclear power without Federal subsidies is neither cost competitive nor affordable. (0245-7-1 [Chamberlain, Lora])

Comment: I want to just ask the audience right now, who here right this moment feels terrorized, terrorized of what's happening in Fukushima with the spent fuel -- exactly! There we go. So, nuclear power is really a terrorist organization. We all feel terrorized by this. Any accident, a disaster can occur at every nuclear power plant. (0245-7-3 [Chamberlain, Lora])

Comment: Our group has, as long as we've existed for the last two years, focused on finding things to address global warming on a local basis. We come out and strongly oppose the nuclear power in general because we feel, despite some of the carbon arguments, that this is not the argument to justify the issue really we're here to talk about tonight, which is our confidence in how you deal with the spent fuel and the hazards that we face with the nuclear energy. (0245-8-1 [Fox, Rick])

Comment: [W]e need to phase out nuclear power because we have no fool-proof plan to safely dispose of the waste. (0246-11-2 [Dubois, Gwen L])

Comment: We imperil the future of our planet and our descendants and we do this, my God, in order to boil water. (0246-11-4 [Dubois, Gwen L])

Comment: Stop making new waste as soon as possible. Transition out of nuclear and out of coal and into efficiency, efficiency, efficiency: solar and wind. (0246-11-7 [Dubois, Gwen L])

Comment: As the earth is being re-shifted, humans have not adjusted to the new extremes upon us. With climate change inside our front door, the problems of nuclear energy will be augmented. It is great news that no new license or no new renewal of existing license will receive final approval until the waste issue is addressed. (0246-15-2 [Minniss, Regina])

Comment: As a first step towards dealing with this waste, this decision showed real leadership. But at least 12,000 tons of nuclear waste per year keeps accumulating from existing operating plants. The second step to dealing with the waste is to make the amount of nuclear waste finite. This is a time to show more leadership. The reality is if a solution is found, we will still have it, and generation after generation will have to deal with the continued problem. (0246-15-3 [Minniss, Regina])

Comment: If we continue business as usual, we are truly on the path to total destruction. This highly toxic energy destroys our air, water, food, soil, and gene pool of all living plants and animals. You will see children with tumors -- sorry. A look on the internet of the children of Belarus will verify the long-term effects of nuclear energy. This is a site where parents cannot deal with their children from the Chernobyl accident. You will see children with tumors beyond imagination, tumors that are bigger than beach balls showing up anywhere on their small bodies, deformities so grotesque that you think you are looking at a horror film but these are innocent children. Let's at least make the nuclear waste finite and begin aggressively pursuing truly green energy sources. (0246-15-5 [Minniss, Regina])

Comment: Therefore, we shouldn't be creating it. Therefore, we shouldn't be relicensing and we should make licensing a permanent moratorium on all licensing because we do not have anything, any safe place to put this waste. No industry should be allowed to make and manufacture and create waste that is unsafe and that there is no place to put it. The NRC should not be allowed to issue any new licenses from this point forward or to grant any license extension because there is no safe way to deal with the waste. (0246-16-3 [Michetti, Susan])

Comment: There are technical shortcomings everywhere we look throughout the entire nuclear process. Those technical shortcomings need to be addressed and closed up, too. (0246-16-7 [Michetti, Susan])

Comment: We stop making this deadly radioactive waste for which there is no safe solution. The NRC should move to repurpose plants such as Limerick and encourage electricity generation by improving efficiency and investing in renewable sources of energy such as solar and wind. (0246-17-7 [Dugdale, Jane])

Comment: So how anyone in their right mind could continue to promote nuclear power as safe and could promote building more nuclear plants is just beyond my comprehension. I mean denial can be a wonderful thing but I just think this is total insanity. Nuclear power has caused continued massive destruction in the past and it is still continuing today. And by the looks of it, it always will. There is no safe solution for radioactive fuel rods. They can remain radioactive for a million years the EPA states. So, I just believe nuclear power is dirty and deadly from cradle to the grave. (0246-23-2 [Ruppe, Lorraine])

Comment: Now, Fukushima has been spewing tons of radioactive water into the ocean continually for the past two years. Future generations of every form of life is in jeopardy now. So please, no more relicensing or no new nukes. (0246-23-3 [Ruppe, Lorraine])

Comment: And I just think we need to change to renewables. The other countries are doing it, China, India, Germany, Japan, they are now generating more power from renewables than nuclear, according to the nuclearreport.org. So this is what we need as soon as possible. (0246-23-5 [Ruppe, Lorraine])

Comment: I am calling because I do live in a nuclear-surrounded city. So, I am very concerned about that. It is nice to have confidence that we don't have any problems, but I don't share that confidence. (0246-27-1 [Gerleman, Doug])

Comment: It seems rather absurd to me because I am hearing forecasts that we could go into wind and into water and solar and replace not only nuclear but fossil fuel, too. If we just put in like ten percent of the investment that we have put in already in the nuclear power, we might have something that is really sustainable. (0246-27-2 [Gerleman, Doug])

Comment: Let's try to make something that will be sustainable for our kids and grandkids. So, those are my concerns. It just makes no sense to continue throwing so much taxpayer money into the nuclear industry when it is not the wave of the future. (0246-27-4 [Gerleman, Doug])

Comment: [W]hat we need is a permanent solution to permanently close nuclear power plants. And we can't come up with any other solutions anywhere, so close them all. (0246-29-12 [Hoffman, Ace])

Comment: And that is where we are right now. We have got 100 reactors producing waste and we are down four this year with nowhere to put it. Four isn't good enough; 25 years it would take to close all the other 100, if we are going to close them at the rate of four a year. So, I think we are going to have to do better than that. I think just corrosion and old age is going to cause us -- these things to be closed down at a more rapid pace in the future. (0246-29-6 [Hoffman, Ace])

Comment: And we don't need nuclear power as an interim for climate change[.] (0246-29-9 [Hoffman, Ace])

Comment: [Y]ou all need to focus on securing the waste, not producing more of it. There is no confidence in making more of it. (0246-3-5 [Gray, Erica])

Comment: I am also very surprised that nobody has apparently studied the book by Dr. Arjun Makhijani who laid out for us a path to nuclear free, carbon-free future. I recommend you all read it. Then we don't need to worry about more expansion of nuclear power. We go to wind and other energies that are truly sustainable and do not endanger life. This is the real goal. (0246-30-2 [Fabihrn, Dagmar])

Comment: What we want are new policies to eventually close all those nuclear power plants down, start with decommissioning. It is very costly, as we all know. And then think of life beyond nuclear power, as has been laid out many times and calculated to be feasible. And there are plenty of states that are existing without nuclear power. This will be our goal and preserving life is the upper most goal. (0246-30-4 [Fabihrn, Dagmar])

Comment: I am wanting to focus on the big picture. The point of having this GEIS approved is to continue with the NRC licensing process. And when we think about what has been happening with nuclear power since its inception, I think we can only look at all the close calls we have had in this country and look at the accident in Chernobyl and Fukushima and see how those accidents have not only affected the nation when the accident occurred, but how any nuclear accident is really a worldwide problem. I think we need to look at that and apply the common sense that we all have inside and say enough is enough. It is only by God's grace, God helping the NRC to do its job to protect the U.S. public from accidents. And we haven't had a major disaster in this country. And if we keep testing this, we will. (0246-31-1 [Sunderland, Mary Brooke])

Comment: We have to take a step back and just look at this. It is not okay. It is not okay to keep continuing with nuclear energy. We don't have a safe place to store it. What kind of home or nation or anything runs efficiently when we don't have a place to clean up the waste? No city runs like that. How can we expect a type of energy to run like that? We can't. It is not okay. (0246-31-3 [Sunderland, Mary Brooke])

Comment: We need to stop any possible new licenses and we need to phase out nuclear energy with all the plants when they become 40-years-old, they need to be shut down. (0246-31-4 [Sunderland, Mary Brooke])

Comment: Hyman Rickover put it very clearly, "Why then, you might ask why do I have nuclear powered ships? That is a necessary evil. I would sink them all. Have I given you an answer to your question?" That is Admiral Hyman Rickover. He would have sunk every nuclear sub if he had a chance. (0246-6-5 [Lewis, Marvin])

Comment: Finally, we must stop making this deadly radioactive waste for which there is no safe solution. The NRC should move to re-purpose plants such as Limerick and encourage electricity generation by improving efficiency and investing in renewable sources of energy such as solar and wind. For more information, contact Dr. Lewis Cuthbert, ACE President, aceactivists@comcast.net. Documentation for all issues except high-burn fuel are on NRC's public record from ACE in testimony for Limerick's Environmental Impact Statement. (0249-15 [Dugdale, Jane])

Comment: I have planned for weeks to be here to do this. It's hard for me to drive here and to stand up here and speak out against nuclear hazards. But I do it. I must do it. I'm protecting my home, my state, and my country. That's what veterans do. (0250-11-1 [Kerr, Julius])

Comment: Safe containment for eternity must be the objective of a mission of your containment work. With half-lives for radioactive nuclear waste ranging from 30 years for strontium and cesium, to some 24,000 years for plutonium-239, and time 'til permissible view and exposure, which is ten times half-life, it follows with those kinds of times that a necessary corollary is the making of toxic nuclear waste must be reduced to zero. In our physical world, we sometimes cannot achieve the ideal, but often we can and do approach it very closely. There are some good uses for nuclear energy; for example, in medicine and in astronautics. But we know that bombs and weapons are not included on the short list. Neither are nuclear power plants. There are better means than these to provide the needs for life on our shared earth. (0250-12-1 [Howarth, Robert])

Comment: I beg you to put aside the profit that can be made from building more nuclear facilities and think more carefully of the real risk involved in the legacy that we'll leave behind. (0250-17-3 [Kneidel, Ken])

Comment: This plan definitely makes sense when I read that Duke Energy, for example, is guaranteed a profit greater than 10 percent on all its construction projects. We should be directing our money, resources, and research towards developing sun, wind, and geothermal technology. They're clean, they'll never run out, and they won't leave a shameful legacy for our descendants. (0250-17-4 [Kneidel, Ken])

Comment: In my childhood, I heard about nuclear madness. Maybe it was mutually assured destruction madness, or maybe it was Helen Caldicott having the courage to stand up ahead of many of us and say making this waste on a daily basis that we don't know what to do with is madness. But here I am in the fifth decade of my life, and I'm here to celebrate some sanity. I

can't call it nuclear sanity, because that's an oxymoron for me. But I'm going to name a few names and then I'll be done. But we have a federal judge, a panel of three guys, who said "I don't buy this scam." That's why we're here tonight. He said I don't buy this scam, and then Fukushima happened and he said now I really don't know that we have a solution, so I'm vacating the Rule, thank you very much.; Sanity, wow. We have a President who said that dump's no good, and had the courage, unlike previous presidents, to say Yucca Mountain's off the table. Amazing. A geological level event from the White House. You have a Senate Majority Leader who's sticking up for democracy. The people of Nevada don't want that waste. We have a Prime Minister who was in charge when the tsunami and earthquake and tsunami hit, and he's now brave enough to stand up as Prime Minister can and say "nuclear is not the answer. We have to phase it out." We have Prime Minister Merkel, who said the same thing. By 2022, Germany will be nuclear free. Finally, we have former NRC Chair Greg Jaczko, someone I've worked with in various capacities for many years, who now has the courage and the sanity to stand up and agree with me, and many of us in this room, that the only solution for radioactive waste is to stop making any more of it, and that darn little vacation that your rule has should become a nice, permanent little chalet, and no more nuclear licenses. (0250-2-3 [Olson, Mary])

Comment: Are nuclear power plants safe? No, that's a big no. (0250-20-2 [Cooper, Elaine])

Comment: [H]owever long nuclear radioactive waste might be around for us, for the next 20,000 years, 200,000 years. I don't know. It's a problem, isn't it? Oh, there's so many things I'd like to say. One thing I want to get out right now is that I think the big push for why we -- the nuclear power industry keeps gripping, keeps pushing on and on, it's a centralized way of producing electricity. It is easily controlled, dominated by a small group of people. To decentralize the electric grid through solar and wind power would be to give power to the common man, to democratize our electrical system, and that's the last thing that the rule oligarchy wants is to democratize the system. (0250-23-1 [Ashe, Kenneth])

Comment: And it concerns me a great deal that we are creating waste that lasts for, I don't know, thousands of years. I'm not technical, but it is very -- I mean, you know, suppose we could store it safely for 160 years. Well, you know, I won't be around but my grandchildren will be, and my great-grandchildren will be, and I'm concerned about them. (0250-26-1 [Maphet, Sheila])

Comment: Cleaner and cheaper energy is the future. This includes solar and wind. I'm glad to hear that Duke Energy is also investing in them, but would love to see more than 3 percent in the Carolinas in the next 30 years. (0250-28-9 [Embrey, Monica])

Comment: We need to stop making the waste, and stop licensing and relicensing nuclear plants to make more waste. (0250-29-5 [Rivard, Betsey])

Comment: Do not precautionary principles call for rapidly phasing out of nuclear power? Our nation should be accelerating maximum development of ending wasteful energy practices, improving energy efficiency, and putting resources planned for the very excessive and escalating costs of nuclear power into truly renewable energy resources, especially solar, wind, and geothermal. Ending the generation of radioactive waste would be the most effective single step toward addressing our radioactive waste dilemma. (0250-30-4 [Patrie, Lewis E.])

Comment: Are we not all downwinders with achieved -- with unknown manmade radionuclides in our bodies? Are we C-- do we have the human intellect to find a way to determine how much of these nuclides are in our bodies at the present time? (0250-30-7 [Patrie, Lewis E.])

Comment: Has the human intellect the capacity to discern if there is a human burden which will ultimately threaten human existence? I think not. Precautionary principles direct us to stop making radioactive waste. (0250-30-8 [Patrie, Lewis E.]

Comment: We have to stop making this poison. (0250-31-6 [Clark, Terry])

Comment: Well, for the record, I care. I care about my children, my grandchildren, and the welfare of all future generations, and I consider it my responsibility not to willingly do them harm through my actions today, especially through a totally unnecessary activity such as boiling water through the use of nuclear chain reaction to create steam that runs a 19th century technology turbine in an inefficient, dirty, and environmentally irresponsible and obsolete method of generating electricity. We don't have to do this because we can dramatically reduce energy consumption through public policies that drive conservation and energy efficiency, as well as the deployment of clean, safe, and renewable technologies that harvest the sunlight, the wind, geothermal heat, the ocean waves and tides. (0250-33-3 [Friedman, Avram])

Comment: For more than 25 years, I was a plumbing contractor. On occasion, I'd be called by a frantic person who had a flooded basement because a water main had broken. Water was everywhere, knee deep or higher, damaging the structure of the building, ruining the contents, undermining foundation. When that happens, I could tell you with expert certainty that the first thing you do to address the problem is to shut off the water supply. Then you begin to deal with the water that is already accumulated. If you don't shut off the water first, all subsequent efforts solving the problem are more or less futile. Any sane, thoughtful, and intelligent person understands this. There's no difference in the logic of dealing with our current conundrum on high-level nuclear waste. The first thing we have to do is stop making more nuclear waste. (0250-33-4 [Friedman, Avram])

Comment: It was a dark and stormy night of the nuclear powers when the people fought the radiation showers, and in spite of its friendly atom, it had made absolutely no peace on the planet, and hardly anyone could muster flower powers. But then the NRC came finally and had a great vision, and gathered their courage with much greater mission. They swallowed their pride, they took it in great stride, and declared that now is the end of nuclear fission. Now, I'm back here today to raise my voice to be heard and to speak against mankind's greatest folly. I'm again showing up like a bad penny, but with all the sense this penny can muster. Making sense of nuclear power is something that I have never been able to do. No matter what I read, how I turn it, I always end up shaking my head and wonder how did we come up with such a pea-brained idea. (0250-34-1 [Sorenson, Ole])

Comment: I promise you, the NRC, that the time has come when you will begin to feel the ire of us who has commonsense, and who realize how stupid this whole nuclear circus always has been. I have absolutely no confidence in any solution dealing with any more nuclear waste than to stop making the darned stuff. And don't even consider some desperate idea that the waste can be used as fuel in a new generation. Give me a break. At this point, you still have a small chance to redeem yourself and maybe get a decent review in the future history books. Otherwise, I can promise you that the next 6,000 generations will look back at your misguided activities with much disdain, anger, and disbelief. So, to close, stop being an embarrassment to the human race and show us the courage that will make us all smile and let out a big sigh of relief. It's time to get out of the diapers and grow into responsible human beings. Putting a stop to the nuclear power generation will definitely show real leadership and true concern for the quality of life in the generations to come. (0250-34-4 [Sorenson, Ole])

Comment: I'm in education because children are the hope of the future. I'm here because radioactive nuclear waste opposes that hope. (0250-39-1 [Richards, Kitty Katherine])

Comment: [N]or make any more waste either. Let's remember the children. What we do will be their reality for generations to come. (0250-39-6 [Richards, Kitty Katherine])

Comment: After Fukushima and in the light of Yucca Mountain not being licensed, which I think is a good thing, I am unwilling to add nuclear fuel to the radioactive fires by permitting either; one, more costly nuclear power plants generating more nuclear waste; or, two, any vague rules being applied to the centuries long storage of hazardous nuclear waste. Personally, I believe the current waste must be safely stored in place and hardened, and that no new waste be generated until and unless there is a reliable way to deal with the existing waste. (0250-42-4 [Arnason, Deb])

Comment: Solar, wind, and geothermal energy are quite feasible to become our primary energy sources according to the Federal Energy Regulatory Commissioner, John Wellinghoff. We should be following Germany's lead to convert to renewable sources by 2020. Okay. All NRC licensing, planning, and permitting should be directed towards the phase out of nuclear energy, and existing nuclear waste storage safety. Then you can change your name to the Renewables Regulatory Commission, the RRC, and you can all keep your jobs. Okay. I was going to stop with that, but I have to add a joke. I can't leave it on such a heavy, depressing spot. So, what do you call a solar energy spill? A sunrise. And what do you call a solar energy waste? A sunset, gone in half a day, not half a millennium. (0250-42-5 [Arnason, Deb])

Comment: I live in Sandy Mush, North Carolina. It's a mountain farming community with rich soil, woods; pristine beauty. We live by the seasons; we plant, we harvest, we return nutrients to the earth to insure an ongoing abundance. We know the fields, the woods; we know the wild animals that live there and where they live. Some families have been living in this and farming in Sandy Mush continuously from the time that their ancestors got a land grant from the king in the 1700s. We know our neighbors. We watch out for each other. We help each other in the fields during storms, when someone is sick. We share when we have an abundance of fruit or vegetables. We are a community; a generous and a happy community. Imagine our surprise, or bewilderment to learn in the 1980s of a proposal to turn this pristine community into a nuclear waste depository. Not surprisingly, people who passionately love their home and know how to work hard together were able to save Sandy Mush, but I have some questions for you today on deciding what to do with the accumulated nuclear waste. Who is your neighbor? Do you know your neighbors? We do not dump on our neighbors in Sandy Mush. Why is more nuclear waste being created when we do not know what to do with what we already have? We do not make a mess for our neighbors in Sandy Mush. We do not use toxic materials that can run off into other's fields. It is not neighborly. How are you protecting your neighbors? Are you prepared to handle a situation like the one now in Fukushima? If you are not, who is? Who is protecting our neighbors, your neighbors, all neighbors? (0250-44-1 [Larson, Jean])

Comment: We want you to have the same logic as the court and say we're not going to license this plant. We don't want any more nuclear power. So, for the sake of timing, my point is our waters; they're not going to keep up with this. (0250-45-2 [Sorenson, Laura])

Comment: The faithful adherence of nuclear power and weaponry in myopic and self-serving fashion expect us to embrace this deadly and unforgiving technology with the same cultish enthusiasm that they have lavished on it at taxpayers' expense for four generations now. We're expected to ignore its history of destruction, deceit, and death and accept a legacy of future

horrors that nearly defy comprehension. Stuck with a waste product that is practically infinite in its toxicity to all living things, the industry continues to dodge accountability for its internal storage and has manipulated legislation to avoid liability. (0250-46-2 [Stein, Ed])

Comment: Negligence and hubris are components of the human condition. These are red flags to rational people and indicate a level of cult-like faith and perverted altruism, perhaps not seen since national socialism and eugenics marched across Europe, an offense comparison to some, but adherence of both faiths are firm in the conviction that they are on a near sacred mission, ultimately benefitting humanity. We defeated the first, and we can defeat the second. We can't undo the Pandora's box of nuclear fusion, but we have the right to not subsidize keeping its lid propped open. (0250-46-3 [Stein, Ed])

Comment: No confidence. No more permits. No more faith-based science. Let the high priest of the nuclear temples go live in the steel and concrete vaults with the existing waste so as to commune with their god. Every dollar they seek to extract from us to propagate their faith is a dollar taken from non-lethal energy development. Every step they force our societies to take on their march to a nuclear future is a step to the obliteration of a living world. They don't have the right. (0250-46-4 [Stein, Ed])

Comment: I am here to represent all the anomalous creatures out there that support and thrive off of nuclear waste. If our nation was ever to abandon the nuclear power that has so faithfully supplied us with the precious energy that nourishes our comforts and warms our microwaveable dinners, we might be allowing the one-eyed, one-horned, flying purple people eaters to slip into extinction forever. There have also been claims amongst world renowned cryptozoologists that the endangered and extremely rare chupacabra may also perish without nuclear waste, along with our heroic population of mutant vigilante superheroes. Oh, the tragedy. Of course, these creatures will most likely be able to survive at a dwindling rate for the next millennium off our current radioactive waste, but we have to think ahead for future generations of mutants and vigilante superheroes. Increasing our demand for nuclear energy is perhaps the only viable solution to their dwindling population and the rapidly increasing humanoid population. Now, I understand there is some concern for the health of non-mutant normies out there. I believe the repetitive exposure of radiation in smaller doses has extremely protective benefits. So, remember, visit your dentist, radiologist, and local airport scanner as much as possible. And for the nuclear family with lower income, who would not be able to afford such frequent visits to a professional administrator of small-scale radiation, a trip to the ocean would be an apt substitute. (0250-47-1 [Diem, Larkin])

Comment: I live in Asheville, North Carolina at the nuclear crossroads, in the western mountains, in atomic Appalachia, where the deadly twins of nuclear weapons and nuclear power collide. I was raised in Tennessee, a nuclear waste sacrifice zone, where it is buried in landfills, burned in incinerators. The South is a sacrifice zone. I am here to raise my voice as an elder, a grandmother, and a conscious person, a part of this sacred Earth. (0250-48-1 [Hanrahan, Carol])

Comment: There is no safe level of radiation. We know this. It's more waste and less protection. So stop producing this waste, hardened onsite storage for those 70,000 tons. An industry, this industry, is itself one that continues to produce poisons. You perhaps are the real terrorists. (0250-48-4 [Hanrahan, Carol])

Comment: I am deeply concerned that our community is continuing to create more toxic high-level nuclear waste every day. When we have no means to dispose of it in a safe and functional way, it is so toxic that exposure for a short period of time can kill. (0250-49-1 [Gantt, Carol])

Comment: I cannot see the reason we are continuing to create this waste when we have viable, renewable alternatives. Nuclear energy cannot be called clean energy with its waste issues. Consider the dangers of Fukushima with no solution in sight and for over two and a half years, radioactive elements have been polluting the air and the ocean and affecting many people, animals, plants, and this Earth. There are so many problems with nuclear waste I cannot address all of them in the time I have to speak. (0250-49-2 [Gantt, Carol])

Comment: With all the talent and expertise in our country, we could be looking for ways to protect the people and the environment by focusing on renewable energy sources, rather than continuing with an energy source that creates toxic waste that kills and destroys. (0250-49-5 [Gantt, Carol])

Comment: I want to start by dedicating my words to the victims of this energy, this nuclear power and nuclear weapons, that of the past, the present, and the future. This is a technology that kills, maims, and creates birth defects. Those are the facts. (0250-5-1 [Safer, Don])

Comment: We need to stop making this waste. We need to deal with the 70,000 metric tons already made. (0250-5-5 [Safer, Don])

Comment: And there's no safe way to store this. Obviously, there is radioactive material that gets out in any way that they store it. So it needs to stop being made. (0250-50-2 [Blevins, Eric])

Comment: And, according to the NRC, the EPA, and the National Academy of Sciences, there is no safe dose of radiation. So we need to stop making it since we don't know how to store it without getting it in the environment. (0250-50-4 [Blevins, Eric])

Comment: And I don't think the Environmental Impact Statement -- I haven't read the whole thing, obviously, but I am sure it addresses uranium mining and how that is related to this. And a lot of that has gone on indigenous land in this country, and they want to do more of that. And folks have been talking about what a good record the industry has, but I don't know if folks remember Three Mile Island or the largest release of radioactive material in the country's history, which also was in '79 in the Puerco River on indigenous territory. (0250-50-7 [Blevins, Eric])

Comment: Whether you are pretending to be confident that you know how to safely deal with this stuff or you really feel confident, you just need to stop it. (0250-50-8 [Blevins, Eric])

Comment: We agree with those who ask the Nuclear Regulatory Commission to stop building new nuclear facilities, stop extending the licenses of existing nuclear power plants, don't expose the nuclear workers and the public by transporting nuclear waste until and unless there is a final resting place. (0250-51-1 [Thomas, Ellen])

Comment: This seems to indicate that the only sane approach would be to stop producing nuclear waste. In 70 years of producing nuclear weapons and nuclear energy, we have found no way to dispose of the radioactive waste created that will not continue to threaten life on Earth. (0250-51-3 [Thomas, Ellen])

Comment: Yes, we need energy, but at what cost? We are asking future generations to store the unstorable for thousands of years. We are asking for our children's children to bear this burden. What will they think of us? I am asking that our hubris not put our children at risk. (0250-52-5 [Amos, T.J.])

Comment: The nuclear industry both created my hometown, inspired my high school. We were the Bombers with a mushroom cloud coming up. But, fortunately for me, the cleanup, the continuous cleanup, the billions of dollars coming in to clean up that mess, is what put food on my table growing up. And I have to say I am concerned about our collective future, and I am concerned about people being blinded by dollar signs because there is a lot of money in ignorance and waste and toxics. I stand here in opposition along with many from around the country, though I will say we are a bit less coordinated than the industry folks, who seek to profit from the continuation of this. I also stand here in Charlotte, the home of Duke Energy, the world's largest utility and a big purveyor of nuclear power that costs billions and billions of dollars of ratepayer money, of which every dollar of which is not invested in renewables that are the way to the future. The nuclear industry is a dinosaur. (0250-55-1 [Wood, Nick])

Comment: I call this into question for a variety of reasons. Granted, a highly marketed belief is what we have heard tonight from the nuclear industry. I have not heard a single citizen say, "I want nuclear power. I think nuclear power is safe." This is all industry speak. And it's disturbing. I would like the record to note that there were no citizens here supporting nuclear power other than those who are inuring to a financial benefit from nuclear power. We have known since the '80s that the cost to decommission nuclear power plants is astronomical. However, the industry compartmentalizes safety. They are looking at the technical process as safety when, in reality, the toxic waste is not safe. It can never be safe. (0250-59-2 [Krotz, Susan])

Comment: I would like the Nuclear Regulatory Commission to listen to the physicians and scientists who spoke here tonight and take their views into consideration. They are not inuring to a financial benefit. They don't have a stake in this other than for humanity. Other costs that are not considered. For example, Rev. Utley, who spoke here tonight, helped a community relocate from Savannah with federal HUD dollars. The people got new homes because they couldn't live there anymore. These costs are not being calculated into nuclear power. (0250-59-4 [Krotz, Susan])

Comment: I think that there is sufficient controversy to stop producing nuclear waste and rule against this proposal. (0250-59-5 [Krotz, Susan])

Comment: I can't believe after the accident at Fukushima that we are even considering this. Shame on you. This is awful. Shame on anybody that believes that making future generations have to pay for our stupidity ** that's a shame. We should all be ashamed. You know, homeland security needs to add another terrorist to their list. It is called the nuclear regulatory industry. They are terrorists. They are forcing us to accept something that is going to destroy our environment, our home, and our generations. The only answer for energy is safe, renewable energy sources and conservation. Everything that is being done for this industry is because of greed. That is what is running this. It is greed. Shame on you. It's oxymoron to even put "nuclear" and the word "safe" in the same sentence. It's ridiculous. (0250-60-1 [Lee, Denise])

Comment: We should not license any more nuclear power plants. We need to stop any relicensing. And if we don't, it is your fault. It is your fault. Our children are going to pay for this. We should be ashamed if this goes through. (0250-60-2 [Lee, Denise])

Comment: I will at least say that I tried. And many other good people did, too. You know, I can't wait until the next commercial from the coal industry. Tonight all you kept hearing was "Oh, we're carbon-free." The new commercial for the coal industry is going to be "We're nuclear-free." It's the same dirty industrial gimmick. Go to something that's safe, reliable, and nonpolluting. (0250-60-3 [Lee, Denise])

Comment: What does it take? Another Fukushima? If this industry continues on the road that they're on, we will have an accident. We will have an accident. Please stop this process. (0250-60-4 [Lee, Denise])

Comment: The abundance of alternative energy sources available today, including but not limited to wind, solar, and hydrogen, enhance the United States' ability to compete globally while not imposing nuclear waste burdens on our progeny. The United States should be a global leader shifting resources away from the existing nuclear infrastructure and moving forward together, leading industry to cleaner, safer energy potentials, creating jobs for those brilliant people in the industry along the way. (0250-63-2 [Kasher, Brian])

Comment: I also would like to say that we are very supportive of the cessation of licensing of new nuclear power plants until this waste issue is resolved in an acceptable manner. We are opposed to the relicensing or the licensing of Lee Nuclear Power Plant proposed in Gaffney, South Carolina. We are opposed to the Construction Work in Progress regulations which would give Duke Energy an interest-free loan to build their nuclear power plants. (0250-64-5 [Gupton, William])

Comment: We [Georgia WAND] know that the only thing we can really have confidence in, unfortunately, is that nuclear waste is a threat to public health. And it will remain a threat to public health for thousands of years. We know that there is no safe dose of radiation for human beings. (0250-66-2 [Hanson, Courtney])

Comment: So the best thing we can do now is to stop producing nuclear waste by halting new reactor licenses and construction of nuclear reactors. (0250-66-3 [Hanson, Courtney])

Comment: So we advocate that the NRC obey the court's order to not license any new reactors, not just now but indefinitely. (0250-66-7 [Hanson, Courtney])

Comment: And, you know, ultimately what I would like to see is a move to a cleaner, safer technology in the long run because, you know, if a terrorist shoots out the solar panels on my neighbor's house, you know, it is only affecting my neighbor, but, you know, if they undermine a major high-technology, you know, pool, you know, we're all in trouble. (0250-69-6 [Rundle, Steve])

Comment: You know, South Carolina is heavily involved in nuclear, from all ends of the spectrum. From fuel enrichment, to manufacturing, to waste disposal. However, we have found that it's not very clean, it's not very safe, and it certainly is not very affordable. South Carolina now has the highest utility rates from Washington, D.C. to Texas. I want to say a little bit about the National Sierra Club Nuclear-Free Campaign. The Sierra Club has been on record for many decades questioning the need for nuclear power. Tomorrow morning on CNN, National Sierra Club Director Michael Brune will be debating the director of Pandora's Promise, to expose the propaganda, the mistruths, half-truths, and lies about the future and the need for the future of nuclear power in our country. (0250-7-1 [Corbett, Susan])

Comment: My brothers and sisters, it just won't work. Let us deal with the facts and as they are, and what they stand for. You and I both know that our future cannot afford 60 or 160 in one container. I don't think so, and you know it doesn't. So let us be real with ourselves and go back and do what we've been asked to do. Take it away from the table. (0250-8-2 [Utley, Charles])

Comment: [B]ecause three major things, and I want you to listen to them. One is they leak constantly. They shut down when they have the will or want to, and the cost is astronomical. (0250-8-4 [Utley, Charles])

Comment: What I'm saying to you tonight, I don't want my 18 month old or that eight month old grandchild of mine to pick up this waste. So let's end it now. I know I've used my time, but I want to make sure you hear me loud and clear. Take it back from where it came from. (0250-8-6 [Utley, Charles])

Comment: As we all we know, of the 104 reactors there are in the country, 60 of those are from the south. Many of them have been there since the 50's, and they are under strain, for the simple reason as you all recognize, that those of us --, that you don't exist long on the planet before change comes. The same thing is true with everything that God has created. Change does come. So therefore, with these aged reactors, we need to come up with a better way, or totally delete the method that we're using to produce electricity. (0250-9-1 [Tomlin, Willie])

Comment: I'm one of those who believe that in this age in which we live, that our technology most definitely can exceed something that we came up with two centuries ago. I am one of those who believe that if we would put our minds to it, give some dedication to it, that we will not only change our method of producing electricity for the citizens of this country, give some consideration to the health and hazard that, as Reverend Utley has mentioned, our grandchildren and our great-grandchildren are potentially going to have to deal with. Whatever method we come up with is a threat to the future generation, particularly if it pertains to -- particularly if it pertains to nuclear. I will simply -- my last statement is this, and that is I wish we would sincerely give some consideration to the generations to come, and not so much based on what the technology is now. Because when the next generation comes, they will most definitely have other ideas and other methods, just as we have come from the kerosene lanterns to where we are now. We have no idea what method the next generation will do. (0250-9-2 [Tomlin, Willie])

Comment: Equally important is the SLO MFP [San Luis Obispo Mothers for Peace] call to cease relicensing of existing nuclear power plants including the licensing of Diablo Canyon. Making more waste is senseless and dangerous for existing generations and those yet to be born. (0251-3 [Baker, Sheila])

Comment: Thus, it is imperative that the production of more and more of these potentially disastrous spent fuel cells must stop. First and foremost, the NRC should not re-license existing nuclear plants, primarily the Diablo Canyon nuclear plant; nor should the NRC license any new nuclear power plants. (0252-6 [Golden, Leon] [Goldin, Martha])

Comment: Nuclear power facilities must be shut down as soon as possible, to assure the safety and health of the American people. (0252-7 [Golden, Leon] [Goldin, Martha])

Comment: The nuclear power plant at Diablo was originally proposed for the dunes near Oso Flaco Lake. As a responsible Biologist in 1977 I felt radioactive nuclear waste should NOT be produced as it modifies DNA. (0254-1 [Denneen, Bill])

Comment: Stop making nuclear wastes. Without a scientifically proven solution for safely disposing of nuclear waste, we must stop making it. Clean, renewable sources of electricity are readily available and affordable, so there is no excuse for continuing to rely on nuclear power. (0256-4 [Harkins, Lynne])

Comment: Additionally we need to stop making nuclear waste, as we really don't have a solution to its permanent and safe storage (0257-2 [Abbott, Dana])

Comment: In addition, we should migrate our country's future energy generation investments towards non-nuclear options and not extend any future licenses of nuclear power plants. There should be a permanent moratorium on licensing any future reactors. (0259-3 [Katz, Shari])

Comment: Nuclear power has a dirty supply chain in uranium mining that leaves a toxic waste trail as soon as it is mined from the ground until eternity while eons of generations have to safeguard it from threatening human existence. Nuclear power is not "green", and its ongoing operational "normal releases" of radiation are an unacceptable pollutant that is toxic. Humans are imperfect beings, and even when they do their upmost best to mitigate risks, errors happen. Tritium leaks occur. Unexpected "releases" of radioactive steam are emitted from plants. Radiation bio-accumulates, and there is no safe dose. Attempts to downplay the risks of this type of radiation and compare it to airplane flights miss the point that man made radiation stays with us for our lifetimes. Studies have proven this. (Dr. Jay Gould's 1996 book, The Enemy Within, subtitled "The High Cost of Living Near Nuclear Reactors,") Gould and his associates in the New York City based Radiation and Public Health Project showed that US counties within 100 miles of a nuclear reactor had statistically significant higher rates of age-adjusted white female breast cancer deaths than counties located more than 100 miles from a nuclear reactor. The book breaks down this information into specific counties, in relation to specific reactors, as well. No wonder breast cancer rates aren't decreasing after all of the fund raising and treatment and detection programs! Dr. Gould also found that in the time that it took overall breast cancer rates to double in the US, in the 14 US counties in which nuclear power plants had been in operation the longest, the breast cancer rate quintupled (a 500% increase, compared to the national average of a 100% increase)! Your job as the regulator of this industry is to protect the American public, not the utilities. Stand up for the health and safety of Americans. (0259-4 [Katz, Shari])

Comment: In the wake of Fukushima, it is clearly the time to end the nuclear madness that could destroy the earth. It is time to stop creating nuclear waste. Shut them down! (0261-1 [Sweeney, Jay])

Comment: STOP MAKING NUCLEAR WASTE IMMEDIATELY. THE TIME HAS COME!!! (0263-1 [Pavlik, Rayena])

Comment: The best solution is stop making nuclear waste and spend this money on alternative safe solutions. This would be the best gift that we can give to our future generation. I am already contemplating leaving my accumulations as a burden for my kids to deal with just as what I dealt with my parents possessions. We can make this easier. (0264-3 [Gutierrez, Ruth])

Comment: I don't want to have my grandchildren have to clean up my generations screw ups. (0265-1 [Gall, Gary])

Comment: Immediately stop making more nuclear waste. (0266-1 [Kutcher, Celia])

Comment: We appreciate your efforts to rid our world of the the ridiculous (if it weren't so insane) production of heat to boil water using nuclear fission. It's quite apparent to any reasonable person that human beings have no business playing with such a potentially harmful technology on such a large scale with our current inability to foresee our errors and even behave civilly towards one another. On behalf of our 7 year old daughter who has no real idea what horrors humans have and continue to unleash on one another we thank you. (0270-1 [Jouet, Lisa] [Jouet, Tim])

Comment: I urge the Nuclear Regulatory Commission to stop the making nuclear waste immediately. There is no way to ensure the safety of a nuclear reactor or it's waste. Fukushima and it's ongoing safety concerns should give us more than pause. (0271-1 [Affonso, Jane])

Comment: I must say that I have no confidence in the NRC Waste plans. No industry should be allowed to create deadly wastes that it cannot possibly dispose of. Neither the nuclear industry nor the Federal Government has a functioning radioactive waste disposal facility, so no more of these deadly wastes should be produced. (0272-1 [Leighton, Taigen])

Comment: The deadly peril from these radioactive wastes and the difficulty of managing them is evident now at Fukushima, Japan. (0272-2 [Leighton, Taigen])

Comment: The NRC should not be allowed to issue new reactor licenses nor grant license extensions to old reactors until we have the technology to create permanent high-level waste disposal facilities, and then have them in operation. (0272-3 [Leighton, Taigen])

Comment: We believe that the moratorium on licensing of new and re-licensing of currently operating reactors should remain in place until such time as a permanent, deep-geological high-level radioactive disposal facility is designed, licensed, built and in operation. We ask NRC to maintain this moratorium until this condition is reached; and ask that the moratorium be extended to include the siting and licensing of any temporary, away-from-reactor "storage" facilities, such as those referred to as "centralized interim storage" facilities. It is irresponsible to continue the production of such wastes without a demonstrated and operational means of disposal. (0274-3 [Kraft, David])

Comment: Aging nuclear power plant licenses should not be extended nor new ones built until a permanent repository is built. (0276-9 [Kurz, Carol])

Comment: Supposedly, you studied what happened at Fukushima-Daiichi, and yet, I have seen no evidence that you have learned anything from your study. If you had, you would be shutting down all of the nuclear power plants in this country to halt future production of toxic nuclear waste and be devoting your full attention to resolving the problem of the current toxic nuclear waste accumulation. (0277-5 [Pierman, Bette])

Comment: It is time that you face the reality that it is insane to continue the charade of re-licensing these aging nuclear plants and that the continued production of toxic nuclear waste is not positive for the health of our planet, our habitats, our ecosystems, and the health and welfare of future generations. As stewards of this planet, it is time for the members of the Nuclear Regulatory Commission to begin to act responsibly and stop all further toxic nuclear waste production. Your job is not to represent the greedy, reckless and irresponsible nuclear industry. (0277-9 [Pierman, Bette])

Comment: It is irresponsible to continue nuclear energy and weapons production because of the intractable, even insoluble, problem of long-term hazard of the waste. (0282-1 [Haber, Jim])

Comment: The moratorium on new reactors should be continued indefinitely. (0288-4 [Wickham, Wendelyn])

Comment: I am able and do produce all the energy I use for my home and that is needed for my transportation by solar panels on my roof. Why risk the future of my beloved world. (0289-3 [Curren, Elizabeth])

Comment: Better yet, shut the plant down-stop producing nuclear waste and let PG&E stand behind what they claim is their mission to use sustainable, clean energy, of which, nukes are not. Diablo is the last nuclear energy, radioactive waste producing plant in California. It's an old plant that will be over 60 at the end of licensing period. We don't miss Humboldt (1976) or Rancho Seco (1989) or San Onofre (2013). The lights are still on. The nuclear waste left behind is a grim reminder they were there. (0290-4 [Brown, Marty])

Comment: Waste must not be produced if the safety of storage is in question. (0291-5 [Mauter, Nancy])

Comment: Why discuss how to make it safe for a catastrophic event? What about those who have already paid the price for this unnecessary energy. It is not safe NOW. (0292-3 [Comer, Gail])

Comment: Some of it, like Cesium and Strontium, take three hundred years to become safe. And that's the short end. Other elements, and there are many kinds created in the fission process, (not just the three I mentioned) take hundreds of thousands of years to decay into safety, and some even a million years. So we create these new elements now, in the nuclear fission of uranium, in order to use the extra release of energy to heat up the water to power the generators with steam. And the result of all this is centuries and millennia of dangerous, toxic elements that must be kept out of the environment. When you take all of that into account, it doesn't sound very cost effective to me. (0293-5 [Lewis, Sherry])

Comment: I live a few miles from Indian point. And this is a constant concern for us. If we must use nuclear power instead of safer methods such as wind and solar in the short term it's imperative we come up with a safe plan, made public to all, that will illuminate the risks of environmental damage including our physical health. (0295-1 [Collier, Grant])

Comment: Gais' Plea to the NRC 2014; I am your one, beautiful green earth; A spinning ball of soil and sea; And you are my voice; Appointed by man; To pass sentence over me.; Over all beings, creatures; animals, babies who cannot speak for themselves.; Do not turn away from us now; Don't condemn us to danger and destruction And my eventual demise; Do I not give you all that I have?; The beauty and bounty of the sea; The thrill of the mountain top; The fragrance of the Redwood; Why would you now turn your back on me?; We need your protection now more than ever.; Keep California safe; Keep the world safe; Get all nuclear power and storage of nuclear materials Off of my soil and out of my ocean; Do the wise thing, The hard thing, The right thing; For all of us Now -- and for the future of this planet; I beg you. (0296-1 [Silberstein, Mary])

Comment: I think it's time to move on from a failed approach to generating energy for today that leaves waste forever. (0297-2 [Fishman, Zelma])

Comment: Please put a stop to nuclear waste being made TODAY. It is time. (0299-1 [Smith, Diane])

Comment: Please do not allow any more nuclear reactors. No one has figured out a safe way to store the radioactive waste, which is bound to occur. Fukushima is an illustration of what is likely to occur. (0300-1 [Reichardt, Dorothy])

Comment: Furthermore the security and ability of our society to continue functioning is not dependent on nuclear energy. We are perfectly capable of creating energy from renewable and clean sources, namely wind, water, and sun. The only reason we don't get on with it is the influence, power, and wealth of the nuclear and fossil fuel interests. (0301-2 [Hayati, Sally])

Comment: In light of the Fukushima dangers, please shut down the Diablo Canyon Nuclear Plant. Think of the horrors that will occur if there is an earthquake In the area! (0302-1 [Light, Lillian])

Comment: [I urge that] the Court's moratorium on licensing or re-licensing of reactors be kept in place...[and] the eminent wisdom of not continuing a problem for which no solution exists be followed, i.e. that the generation of toxic and infinitely radioactive waste, through nuclear-power generation, be terminated as soon as possible. (0303-15 [Lamberts, Frances])

Comment: The Rule reviews various efforts, internationally, in the quest for final repositories that are hoped to quarantine the deadly waste, without fail, for tens or hundreds of thousands of years into the future. It acknowledges the nearly five decade-long experience in Germany – so far still unsuccessful except for having gotten to a new public-hearings phase – toward a final repository there. I suggest that the German government has drawn conclusion, largely as a democracy-honoring response to safety concerns, and demands by the citizenry, for a transition to non-polluting and non-risky, renewable energy sources. It is shutting down the electricity generating plants that leave dangerous SNF waste behind. It is a model for energy policy I would like to see followed in the US, for many sensible reasons. As a start, therefore, keep the current, court-ordered moratorium in place. I urge the Commission to move from licensing or re-licensing nuclear-power generation to promotion of truly safe electricity from renewable sources. (0303-5 [Lamberts, Frances])

Comment: Reactor licensing moratorium must be made permanent. (0304-1 [Young, Roberta])

Comment: Reactor license moratorium must be made permanent. (0305-2 [Norman, M. Jean])

Comment: NRC should continue the moratorium on licensing and re-licensing of nuclear plants until a safe national disposal site is up and running. (0309-5 [Green, Jeanne])

Comment: These vulnerabilities have been ongoing for too long. We must not wait until it's too late. The public must be protected from the grave dangers of possible nuclear waste dispersion, an untenable situation brought on by for-profit nuclear corporations. (0309-7 [Green, Jeanne])

Comment: We must stop generating nuclear waste by closing all existing nuclear power plants in the country. We are creating the most deadly environmental hazard, waste which will be harmful to living matter for tens of thousands of years. (0310-1 [Oster, Phyllis])

Comment: I would like to start with a little poem: It was a dark and stormy night of the nuclear powers; When the people fought the radiation showers; And in spite of its friendly atom; It had made no peace on the planet; And hardly anyone could muster flower powers.; But then the

NRC finally had a great vision; And gathered their courage for a much greater mission; They swallowed their pride,; They took it in great stride; And declared that NOW is the end of nuclear fission. I'm here today raising my voice to be heard and to speak against mankind's greatest folly. I'm here AGAIN-showing up like a bad penny, but with all the cents that this little penny can muster. Making sense of nuclear power is something that I NEVER have been able to do. No matter how I turn it around, I always end up with shaking my head and wondering how we came up with such a pea-brained idea. We have had 50 years of wasted confidence and it is time for a real solution. (0314-1 [Sorensen, Ole])

Comment: I promise you, the NRC, that the time has come when you will begin to feel the ire of us who has common sense and who realize how stupid this whole nuclear circus always has been. I have absolutely NO CONFIDENCE in any solution to dealing with any more nuclear waste than to STOP making the darn stuff. And don't even consider some desperate ideas that the waste can be used as fuel in a new generation reactor. Give me a Break!!! At this point you still have a small chance to redeem yourselves and MAYBE get a decent review in the future history books. Otherwise I can promise you that the next 6,000 generations will look back at your misguided activities with much disdain, anger and disbelief. So stop being an embarrassment to the human race and show us the courage that will make us all smile and let out a big sigh of relief. It is time to get out of the diapers and grow into responsible human beings. Putting a stop to the nuclear power generation will definitely show real leadership and true concern for the quality of life in the generations to come. (0314-4 [Sorensen, Ole])

Comment: In general, I have great concerns about both our high level of electric-energy consumption and the manner of its production. Our policy should be focused on greatly reducing consumption, as my household has done, and on moving to electricity from renewable sources like solar and wind, rather than from coal and nuclear energy. (0322-1 [Baker, Hannelore])

Comment: I was glad to learn, therefore, regarding nuclear power, of the Court decision placing a moratorium on your agency's permitting authority for the building of new (nuclear) plants or extending the operations of existing plants. My first recommendation is that this moratorium be kept in place. (0322-2 [Baker, Hannelore])

Comment: The extraordinary and long lasting damage to people and land which nuclear accidents can cause and have caused makes it far better that this method to produce electricity be wound down, in favor of safe methods like solar energy. (0322-3 [Baker, Hannelore])

Comment: Since the waste from nuclear power production is and remains extremely dangerous, four thousands of years hence, we shouldn't be burdening future generations by continuing to produce it. My third recommendation (related to and extending the first): Stop making more of this waste while we have no safe place to "sequester" it, in fail safe manner, from our environment and our children's. Help our country, as quickly as can be, to move on to safe, renewable energy. (0322-6 [Baker, Hannelore])

Comment: The current nuclear regulatory structure must stop stifling innovation and not license any new type of reactor for commercial use since they inherited the pressurized water reactor. (0325-15-2 [Robinson, Eric])

Comment: Nuclear energy is not clean even though you hear that here from people. Fuels that come in from the industry. It is not reliable, the thing has been shut down. They go out all the time. We had a blackout in San Diego partly because of San Onofre. It is not needed in

California. We have 156 percent of the energy that we need, and 20 percent is nuclear. You can just get rid of it, and we're fine. (0325-19-3 [Lutz, Ray])

Comment: I just have to say, you know, climate change is a very big concern, but I think using nuclear as a way to solve that is the most expensive, and the most reckless path we could go and follow. (0325-27-3 [Davis, Patti])

Comment: I challenge nuclear industry, the NRC, clean it up. Don't spend any more money on promotion, on new nuclear stuff that is not proven. Clean up what we have now, the stuff that is threatening and putting risk at our community and to my children. (0325-27-4 [Davis, Patti])

Comment: I just want to say that yes, we do need a diversified energy portfolio, and highly recommend wind, hydro, and a very wonderful nuclear reactor that we can all depend upon that's safely located 93 million miles away. It's called our sun. (0325-27-5 [Davis, Patti])

Comment: We have a surplus of energy supply here in California without our nuclear reactors putting us even more at risk. (0325-28-4 [Branigan, Mary Beth])

Comment: The nuclear industry has destroyed our DNA, of not only the humans but the whole planet, all the creatures. I am so upset with the nuclear industry and the NRC for its cooperation with them. (0325-28-7 [Branigan, Mary Beth])

Comment: In the meanwhile, the NRC should learn from their mistakes and shut down the remainder of operating nuclear power plants in this country until you can find a reasonable and safe way to deal with deadly radioactive waste. (0325-29-7 [Feathers, Jösan])

Comment: The system is not working. It's not either/or, we're going to have global warming or we're going to have nuclear energy. That's a false question. I'm for jobs, but we should have jobs doing the right thing, making energy that is safe and that doesn't cause harm to the next seven generations. Global warming is serious. There's no denying. Nobody that's against radioactive waste is for global warming. It's a very serious thing, but so is nuclear radioactive poisoning. It's very serious. We cannot just live by hope and faith. (0325-33-6 [Zigler, Randy])

Comment: Years ago, the eminent scientist, John Gofman, led 40 health physicists under him at Lawrence Livermore Labs and they were asked to disprove the work of Dr. Ernest Sternglass, who said that there was no safe level of radiation, that even the lowest dose was harmful to human health. But what Gofman came up with when he worked on this problem was he found that, in fact, there is no safe dose, and that Sternglass was right. So, Gofman famously said that licensing a nuclear power plant is de facto licensing premeditated murder, because we know that the doses that are regularly released from nuclear power plants do, in fact, kill people, especially the most vulnerable members of our society, the children and pregnant women are the most vulnerable. And even if they don't develop cancer and die, they suffer serious health consequences. (0325-9-3 [Reson, Myla])

Comment: So, we've got to stop making this nuclear waste, and we have to stop allowing this high-burnup practice to continue because it's nothing short of the reckless endangerment of the American people. So, let's stop the nuclear waste con job and let's stop the high-burnup waste experiment. (0325-9-4 [Reson, Myla])

Comment: One, nuclear power is obsolete. It's expensive, it's dirty, it's dangerous, and it's not sustainable, so we must abandon this technology. Two, safe storage of high-level radioactive waste is a myth, and Fukushima is our proof. (0326-10-1 [ZamEk, Jill])

Comment: [S]top being the generation of more of this dangerous material by closing all nuclear facilities. (0326-10-4 [ZamEk, Jill])

Comment: We are here to direct the Nuclear Regulatory Commission to change their name to the Nuclear Removal Commission, and we just want to say that it's our feeling that no one has the right, or ever had the right, to light matches that they couldn't put out for 250,000 years. Unfortunately, one of those little boys now sits on the Supreme Court of the United States. I would say, with Fukushima, no one can explain that, so instead of buying your kid an iPod, now you have to buy him a Geiger counter. (0326-12-1 [Racano, Joey])

Comment: "Better yet, shut the plant down. Stop producing nuclear waste and let PG&E stand behind what they claim is their mission; to use sustainable, clean energy, which nukes are not. Diablo is the last nuclear energy active waste-producing plant in California. It's an old plant that will be over 60 at the end of licensing period. We don't miss Humboldt, which shutdown in '76, or Rancho Seco, which shutdown in '89, or San Onofre, which shutdown earlier this year. The lights are still on. The nuclear waste left behind is a grim reminder that they were there." (0326-14-4 [Brown, Marti])

Comment: Remarkably, at Fukushima, dry cask remained intact, while the pools still present enormous problems two and a half years later. Clearly, cessation of further production of spent fuel is the safest way for the future. The less highly-radioactive waste is produced, the less future generations will be burdened. Common sense dictates, if you're in a hole, stop digging. (0326-15-5 [Schumann, Klaus])

Comment: [T]he production of more spent fuel must cease[.] (0326-15-8 [Schumann, Klaus])

Comment: I'd like to also, just off-the-cuff, say to claim that nuclear power does not contribute to global warming and is carbon free is preposterous. If you look at mining uranium and following the whole process, there's tremendous energy that's used and contributes to global warming. (0326-19-1 [Carrigan, Milton])

Comment: I have no confidence in the NRC's radioactive waste policy. Make the current licensing moratorium permanent. (0326-20-1 [Caulfield, Lee])

Comment: It's painful to study the nuclear industry. You know, I'm standing here. I'm going, what can I say to the NRC, or to PG&E, or to my friends and neighbors that can make your heart or your mind, kind of really, honestly grapple with this, because, you know, we're supposed to clean up our mess, and I know this is kind of a sore subject in this areas, but we don't even know how to keep the poop out of our groundwater and our ocean, much less deal with radioactive waste. We don't know what we're doing and we're leaving a horrible legacy. Hanford's one example of how we don't know what to do with nuclear waste. Humboldt-- took them 20 years for PG&E to put the radioactive waste into dry casks and now they're supposedly decommissioning it, but some would say it's just sinking into the wetlands, which it'll continue to contaminate the area. The NRC made us a promise that if we allow the nuclear industry to move forward, they would protect us and our interests, and our safety, and you're not doing it. If you were, and if the nuclear industry had to adhere to the rules like I do every day as an individual, there would be no operating power plants. None. (0326-21-2 [Conn, Diane])

Comment: Waste needs to not be produced unless there's a place for it to go, and there is not a safe place for nuclear waste to be permanently stored. That doesn't add up to me. And there's an interesting echo on my voice, but you get the point. Let's stop producing it and what we have, let's get into permanently safe storage that is not water-based. (0326-22-2 [Davies, Phyllis])

Comment: When we mine uranium, we deplete a non-renewable resource that eventually will be unavailable for future generations. Spent fuel rods create extremely toxic waste that cannot be safely disposed of. From an inter-generational justice point of view, nuclear power plants are inherently unethical. The total cost of electricity from nuclear power plants cannot honestly be calculated. It includes many unknowns left out of the equations, including, but not limited to, the cost of storing spent fuel rods for at least 1000 years, lifelong medical care for people harmed by the nuclear industry, irrevocable damage to the environment. When all this is added together it is clear that the real total cost of nuclear power is incalculable and morally unacceptable. This is not inter-generational justice. Instead, we need to explore other technologies that can provide needed power and allow us to meet our obligations to future generations. Nuclear energy has been imposed on the human race as an ongoing social experiment for long enough. The jury is no longer out. If Fukushima has not taught us that, then what will? (0326-23-1 [Malboeuf, Simone])

Comment: I believe it's time for the experiments with nuclear power on the inhabitants of the Earth to cease. We already know the answers. The costs are too high; the risks are too great. There are now proven ways to create electrical power that are different than this and don't leave the risk. Let's now step up to the plate. Let's become the world leader in developing safe electrical power. If not now, then when? (0326-23-4 [Malboeuf, Simone])

Comment: To object to the ongoing use of nuclear energy in our community under the illusion that it is somehow safe for us, our children, and all future generations, under the illusion that, somehow, it is less expensive than clean alternative energies, which actually do mitigate climate change. What they've neglected to mention, what CASE has neglected to mention, is that nuclear energy does not have a zero-carbon footprint. It has a very significant carbon footprint. According to some of the NRC spokespeople and physicists out here, there's quite a bit of energy that goes into the embodied energy of the materials, that go into the plant, the construction of the plant, the management of the plant, it is not a zero-carbon footprint energy by any means. (0326-26-1 [Severance, Bruce])

Comment: [T]here is no waste confidence, there is only waste incontinence. As exemplified by the currents, which are projected to increase the radioactivity of our waters off the California coast tenfold over what they are off the coast of Japan right now. (0326-26-3 [Severance, Bruce])

Comment: I want to give you a quote from John Adams. Remember him? The second President of the United States. One of our founders. He liked to say, "In everything, one must consider the end." In everything, one must consider the end. Now, that has not been done in the whole nuclear industry; that is not being done by the NRC. I think we ought to shuttle that, as Klaus suggested, and maybe fire all of you guys (0326-29-2 [Groot, Henriette])

Comment: I'm a retired teacher from Lucia Mar District. And I wanted to speak to the staff of the NRC about perspective. There's a world of difference between theory and reality. We who live in the evacuation zone, we live with the reality of the risk of an accident. We're reminded day in and day out when we drive on the highway, drive in our communities, the speaker boxes on the tall poles, if that siren goes off, we run. And when we saw the Japanese people running, we saw ourselves. That is us. And so it's a real issue for us. The NRC perspective is one of theory. They don't live here. They don't have to worry about what the heck they would do if the

siren goes off. So it's not a real perspective. And my message to the NRC Commissioners would be, you have a lot of power, you have the authority to make decisions that affect our lives. And when you make those decisions, make it from your higher consciousness. These are real people that live here. We already receive more contamination, as everyone does, who lives within 50 miles of a nuclear power plant. That's fact-checked online. So we're already more at risk. And as far as the supposition that we have -- we need nuclear power to put a stop to global warming, I recently came home from Germany on a rainy day, I was riding through the country, I was blown away by all the solar collectors on the roofs, far more than I see in California. And then I remembered, after Fukushima, the Germans were marching in mass and they got Merkel to take a stand. All their nukes will be shut down by 2024. Twenty-four percent of their energy comes from nukes, so thank you. (0326-31-1 [Highfill, Debbie])

Comment: I agree that I believe most of the employees at PG&E are good, responsible employees, and they love their jobs, and that's all fine and dandy, but they are dealing with the most toxic item on the planet. And we could have an environmental disaster, we could have a terrorist event, or we could have human error, and all three of those are very possible in this world. I just wonder if everybody remembers that great old phrase: safe, clean, and too cheap to meter. I don't think that. I think it's proven incorrect. We were also told that we could put the waste someplace safe. That's also incorrect. So there really isn't a whole lot to look forward to with nuclear energy production, except for potentials like the Fukushima even. I believe that we're all wishing for something safer and I agree that it's a difficult task to figure out how we will produce enough energy to take nuclear energy out of our lives and store that stuff for eternity someplace. But I've spent 16 years of my life in third-world countries, and they have the challenge of having energy production that is not as well-funded as ours is, and it's a lifestyle that I think I would be more than willing to go back to if I could feel that I wasn't going to be in the midst of a radiation event that could possibly happen just ten miles from my home. (0326-35-2 [Owen, Linde])

Comment: I'm baffled by the fact that we're still coming to these meetings. I don't know how many I've attended and all the wise, articulate people that have spoken about the harmful effects of nuclear power, and the waste that goes with it. This is why I'm here. And I hope that a picture is as strong as a thousand, a million, words. These are my grandchildren. They live with their parents in Morro Bay. (0326-38-1 [Waddell, Duane])

Comment: PG&E, and the CEOs, and the stockholders, they get -- I mean, they get the profits and we get the power, even though the rates have gone up; continue. And they get to deal with the waste and everything that goes with it for who knows how long. How many generations? How can we morally justify passing this on to them because of power that we're using in such a short period of time? Doesn't make sense. (0326-38-2 [Waddell, Duane])

Comment: I live near Santa Barbara, down the coast, and since before the inception of Diablo Canyon, I've paid a lot of attention to nuclear energy issues and risks. I've read many, many reports, so my comments, probably, they'll reflect what a lot of people have said, but I'm thinking not only about Diablo Canyon, but about all the other sites across the United States, places like Vermont Yankee and Brown's Ferry come to mind, as well as reports about all the near misses that are reported, and the problems that happen, despite everybody's efforts not to have them happen over and over again. You can read those in the Union of Concerned Scientists reports. (0326-39-2 [Weissglass, Theresa])

Comment: My granddaughter helped me make this poster. It says, "The safest distance from a nuclear reactor is 93,000,000 miles." And that's because the spent fuel that comes out is a

million times more radioactive than when it went into Chernobyl, Fukushima, Diablo. (0326-40-1 [Wilvert, Rosemary])

Comment: Now, instead of government subsidizing the nuclear industry or the fossil fuel industry, if they subsidized clean energy like solar, and wind, and wave, plus the job training, our whole economy would be a lot healthier, as we would be as individuals. (0326-40-3 [Wilvert, Rosemary])

Comment: Some of it, like cesium and strontium, take 300 years to become safe, and that's the short end. Other elements, and there are many kinds created in the fission process, not just the three I mentioned, take hundreds of thousands of years to decay into safety, and some, even a million years. So we create these new elements now in the nuclear fission of uranium in order to use the extra release of energy to heat up the water to power the generators with steam. And the result of all this is centuries and millennia of dangerous toxic elements that must be kept out of the environment. When you take all of that into account, it doesn't sound very cost effective to me. (0326-44-4 [Lewis, Sherry])

Comment: I am one of the indigenous peoples that meet down in San Diego and we come together. It's indigenous peoples of Canada and the United States. We had a very long discussion on nuclear waste, so I'm coming to you as a messenger of them. Today we are speaking on behalf of all life. We recommend that Diablo Canyon Nuclear Power Plant be decommissioned immediately and halt any further production of spent fuel. (0326-45-1 [Baker, Crystal])

Comment: We are in a hole. We've been in a hole for quite some time. Americans are very pragmatic dreamers. We keep thinking nuclear power is clean. It's cheap. It's safe. It won't leave a fossil imprint, not like coal, not like oil, nuclear is safe. So here we are tonight, hundreds of us, thinking about this very issue. What has really brought it to our attention is Fukushima, and Jerry just referred to the possibility of earthquake in case -- during the time that they're removing the rods off the ceiling of Reactor 4. Well, just Monday night, about 11 o'clock, I'm looking at my computer and there's the announcement that there's been a 5.8 earthquake off the coast of Fukushima on the very day that they've started removing. Now, the scientist David Suzuki, says that if the earthquake reaches 7 point, that's when we head for the hills, because that will result in an evacuation of the West Coast and the destruction of Japan. So this is not something to fool around. I know that the people in the NRC are making a wonderful income, most of us here tonight are retired, and we're not making that income. We're here because we care. We want out of this hole. (0326-5-1 [Brousse, Elizabeth])

Comment: I'd like to say that when this room was full I would have said that many of you, 35 years ago, went to jail protesting the building and the licensing of this plant with the very fear that we are addressing tonight. Didn't we all say back then, what are you going to do with the waste? We were told that something would be figured out. Thirty-five years, energy too cheap to meter. What, do we have the most expensive electricity in the nation now? (0326-50-1 [Evans, Pete])

Comment: This is why I stand here today, to demand that there is no new nuclear power licenses granted, that all existing power plants are decommissioned and that the spent fuel is transferred from the pools to the dry casks. (0326-51-3 [Gutierrez, Ingrid])

Comment: People talk about what are we going to do without nuclear power. Well I think most of us here remember the oil embargo in the early 70s. Jimmy Carter had a national conservation

plan going. We saved 15 percent of our energy needs at that time. That was more than nuclear power was putting out. We don't talk about conservation. We can do this. Nuclear power is only putting out 19 percent right now. If we had a national conservation plan we could save more than that. We do not need nuclear power. We do not need Diablo Canyon. I have lived 7 miles, for the last four years, from the Diablo site. And you ask about confidence. How much confidence do we have in the NRC judgment? We were lied to when we were told that nuclear power would be so cheap that it would cost a penny per kilowatt. We were lied to when we were told plutonium was safe enough to sprinkle on your breakfast cereal, you know, how like putting Brewer's yeast or a handful of almonds over your Cream of Wheat or something. (0326-53-2 [McGibney, Patrick])

Comment: Two things I'd like to say is stop making nuclear waste... (0326-53-5 [McGibney, Patrick])

Comment: I just heard that radioactive water entering the Pacific Ocean at the Fukushima site in Japan is expected to reach the West Coast of the United States sometime around March of next year, 2014. Nuclear power and the waste that it creates is deadly to most living things. I also feel it's the most deadliest form of pollution man has ever created. I feel we must phase out all nuclear power plants as soon as possible. (0326-54-2 [Crimmel, Steve])

Comment: As a graduate of the Natural Resources Management Department I look at the nuclear industry with a "is this sustainable" aspect. And it's pretty clear that there is no solution to nuclear waste. And I'd implore you all to consider that when you make these decisions for the future. Transporting nuclear waste, nobody wants this in their backyard. Nobody's comfortable with it. I hear corporate shills say that it's carbon-free and safe. Safe? You know what's happening in Fukushima, right? Or Three Mile Island or Chernobyl? Imagine, say, feeling if you hear those alarms. I'm not 30. I have concerns for my little brother who has to deal with this waste and that potential of danger. (0326-55-1 [Krist, Mark])

Comment: We can't blame the Federal government for not yet making a repository. We're still creating the nuclear waste. That's not --let's just throw the blame to the Federal government because they haven't given us a solution. We have not stopped making the waste. (0326-55-3 [Krist, Mark])

Comment: Please look in the mirror. Ask yourself, are you comfortable with nuclear energy and what the potential for future generations having to deal with this mess is. And if you are, look into a child's eyes and tell them that you are supportive of nuclear energy. (0326-55-4 [Krist, Mark])

Comment: Sustainable energy sources, photovoltaics, wind turbines, wave action turbines, et cetera, are no longer simply experimental sources of energy, as you would like to make us think. You know that and so do we. The site at Diablo Canyon offers a perfect opportunity for a conversion to safe, renewable energy sources, sources that could provide economic possibilities that are staggering. By the way, terms like generic and feasible do not inspire confidence. Political will and greed are holding us hostage. You are holding us hostage. The utilities are holding us hostage. Nuclear energy makes C-E-N-T-S to you and no S-E-N-S-E to the safe perpetuation of life on earth. The nuclear energy has turned our beloved planet Earth into a ticking time bomb. Don't let NRC be translated as Not Really Caring, Not Really Concerned, Not Really Conscious. (0326-57-2 [Livingston, Rosanne])

Comment: This plant must be shut down and buried, all those plants around us must be. (0326-58-4 [Davis, Adrienne])

Comment: I feel like Rachel Carson when she tried to tell people that when you have pesticides and you have reactor emissions, then you have really high rates of cancer, and the press, the corporate press, castigated her and called her conspiracy theorist. And she talked about the enemy within. I don't know how many of you have read this book, but I wish you would. It's an old book, but it tells about what happens around nuclear power plants and how many cancers occur all the time. And I want to -- my father is sitting here on my shoulder. My father, the War Department, after the war, sent him to Fukushima -- or no, to Nagasaki, sent the soldiers to clean up. They called it mopping up. They gave them no protective gear. He came back and he had a 16-year post traumatic stress syndrome, they called it shell shock, and he lived 16 miserable years, and he died of lymphosarcoma at age 51. I had a real early awakening of the diabolical effects of ionizing radiation. And I want to leave you with this statement: you can't play a song of freedom on an instrument of oppression, and that's what I see as ionizing radiation. It remained an instrument of oppression. (0326-6-2 [Walking Turtle, Willow])

Comment: And, oh, I also recommend that Diablo nuclear power plant not be allowed to apply for re-licensing unless they have a permanent offsite storage solution. And I actually, thank you, I don't think they should re-license Diablo, period, but that's just my opinion. I think that it makes the most sense that they should have a plan for that. (0326-60-4 [Spooner, Rena])

Comment: And I had one more comment because I live in Los Osos. They've had a moratorium on building more toilets, in other words, having more poop, because they don't have a sewer. And I think there should be a moratorium on nuclear, which is way worse than poop. (0326-60-7 [Spooner, Rena])

Comment: I also agree that there should be no-- they shouldn't be able to apply for re-licensing without the storage issue being addressed. We all know it can't be addressed. That's why they're allowed to reapply. And the burden in our community isn't the lack of a Federal repository. The burden on our community is the continued creation of nuclear waste. We keep doing it and we don't have to. (0326-61-3 [Henry, Anita])

Comment: When I was arrested 34 years ago for protesting, I'm almost 60 now, I was 25 years old when I was arrested. They asked me why I did it. Three reasons. We don't need nuclear power, it's not cost-effective, there's nowhere to put the waste. I repeat, we don't need nuclear power, it's not cost-effective, not without the nuclear welfare program that we have going in our country. The taxpayers pay for most of it and will continue thanks to the Price Anderson Act that limits corporate liability to \$12.5 billion. Fukushima's already up to hundreds of billions of dollars. That's not going to change. (0326-61-4 [Henry, Anita])

Comment: I moved here in 1979. And I was honored to go to some protests over at Diablo Canyon, voicing my disapproval of what was going on back then. Yet, and you've heard it before, other people have stood here saying the same thing. We asked backed then, and I was here. I talked to the NRC back then and I said well, what are you going to do with the waste. Oh, we're going to take care of the waste. We're talking about, I mean, this is half my lifetime ago and we still have nothing for the waste. We keep making the waste. (0326-64-3 [Nelson, David])

Comment: The NRC must finally act responsibly and phase out nuclear power as quickly as possible, and manage the mess you've enabled as diligently, as possible. (0327-11-9 [Kline, Connie])

Comment: Nuclearism is corrosive to democratic forms of human governance and, in fact, the mere existence of high-level radioactive waste provides the only rational justification for the

permanent imposition of martial law that exists. If there's any doubt about this, it was only the falsified mention of yellowcake that allowed the government to go into Iraq and be in this interminable war that is still affecting the people of Iraq, the Middle East, and the rest of the world. The Patriot Act was a result of this, the NSA spying is a result of this. This is nuclearism, and it's the denial of democratic forms of human governance. (0327-14-3 [Ellison, David])

Comment: But as a mother, I just want to say that I'm scared. I'm scared for my children. I'm scared for my potential grandchildren. I'm going to be dead, and I'm looking at all of you and so are you, 160 years. What are you thinking? Let's stop while we're ahead. Let's not put this on our grandchildren and our great-grandchildren any more than we already have. I want you to stop now. I don't want to have my great-grandchildren, or my grandchild, or my son say well, there went the Great Lakes. People, human beings, operate these plants, and you all make the rules. And humans, I've got to tell you, we are not infallible. We make mistakes. This is dangerous stuff to be making mistakes with. I just want to have future generations. Please, stop making the waste and turn attention to safely isolating it, because that's the problem that we've already created. (0327-15-1 [Miller, Susan])

Comment: Stop making it period. (0327-2-7 [Keegan, Michael])

Comment: This requirement [rolling stewardship] is best stopped by stopping production of nuclear waste, and the second would be hardened onsite storage. (0327-20-5 [Clemons, Victoria])

Comment: For the many generations to come, I am angry that I get to inherit along with my future children, grandchildren, great-grandchildren, and so on, and so on, and so on, and so on the problem of deadly permanent nuclear waste. Nuclear waste, as we all know, comes from reactors. This is an unnatural type of energy. The further we move away from natural types of energy, like wind, solar, geothermal, hydro the more consequences that we are going to have. The enormous consequence of the most deadly manmade material on the planet is what we are faced with when we have nuclear energy. (0327-21-1 [Miskena, Jessice])

Comment: We cannot relicense or license any more reactors. We don't know what to do with the 76,000 plus tons in this country alone. We have nowhere to put this. (0327-21-2 [Miskena, Jessice])

Comment: If you hold up to your mission statement then you would see that nuclear energy is immoral. We are killing people with this type of energy. We are causing DNA mutations, we are causing horrific birth defects. Please research them. We are causing infertility, heart problems, immune deficiencies, and cancer especially among the youngest of our population. That is immoral. Nuclear energy is an incalculable danger to the whole of creation for historic and geological ages. It is a transgression against life itself. It is infinitely more serious than any crime perpetrated by man. Nuclear energy is an ethical, spiritual, and metaphysical monstrosity. It means conducting economic affairs as if people didn't matter, and you will be seeing me again, I'm sure. (0327-21-5 [Miskena, Jessice])

Comment: I'm just going to touch on the subject of nuclear power plants are huge plutonium factories. Electricity is a byproduct. It's not the other way around. (0327-22-3 [Muser, Mary Jo])

Comment: So this is also a product of this industry. And it goes into the war machine. No more war. Let's stop this crap. We don't want it. (0327-22-6 [Muser, Mary Jo])

Comment: It's got to stop. We are at a period in world history where we are ruining the water, between the fracking industry going into our water tables all over this country and all over the world and now this, on the largest body of fresh water, you are talking about more? Really? Really? We're done if it continues, and you all will be to blame, not me. But I'll be equally as dead, as will my son and my children and my grandchildren and everyone else's, because this stuff, it needs to be contained and you need to stop producing it. (0327-23-3 [Tolls, Leatrice])

Comment: We need to come up with better sustainable energy solutions that will provide jobs, that will ensure our children's future into seven generations, that will stop this stupid mental masturbation of these hearings in perpetuity, to bring about a change of good news because when there is a solar spill, we just have a nice day. And I want you all to have nice days ahead of you. (0327-23-5 [Tolls, Leatrice])

Comment: This is the Pandora who was fashioned by Greek gods who wanted to punish humans for having discovered fire and made good use of it. And what Pandora made the mistake of doing was opening the bottle of the gifts that the gods had given her, which were really to be punishments for humankind. We seem to have found one of those gifts in nuclear energy, and we seem to be reaping the consequences as punishment. But not all of us realize that it is punishment yet. It's happening slowly to our species, as our genes are damaged, as we find ourselves afflicted with diseases that, you know, they can't quite put their fingers on the causes of. Those are the kinds of consequences, I would use that word, today for what we are undergoing as a result of these gifts of nuclear energy. (0327-24-1 [Rivers, Alicia])

Comment: In our American Indian ways, we were taught that any important decision affecting community must take into consideration how it will impact the next seven generations coming behind us. It's our responsibility to protect the earth, and we take that responsibility very seriously. Obviously, that consideration was not taken, or we wouldn't be here tonight, because we would never have started nuclear energy projects in the first place until the subject, until the subject of waste and safety were satisfied. Consequently, nuclear waste is now going to be impacting many more than those seven generations, given that some components of nuclear waste will remain dangerously radioactive for tens of thousands of years into the future. (0327-25-1 [Crow, Valerie])

Comment: My objection is the same now as it was back in the early 70s: what are you going to do with the nuclear waste? How ironic that 71 years ago today Enrico Fermi split the atom, creating the first nuclear waste. No waste has moved anywhere for those 71 years, yet you want us to believe that something is now magically changing and we should keep going along the same path we've been on for 71 years? Ridiculous. I give the NRC a no real confidence vote and demand that no new or extended licensing be granted, which seems to be the very same finding that the courts had. The NRC has an obligation to citizens first and not the nuclear industry. When you don't know what to do with the waste, stop making more. (0327-25-5 [Crow, Valerie])

Comment: And more owners of aging plants just may decide that these stations aren't worth continuing to operate. The 2005 Energy Policy Act provided a whopping \$18.5 billion in loan guarantees to the nuclear industry. But perhaps we should consider Germany, an economic powerhouse. Haven't they decided that the prudent way to get energy is to stop using nuclear and instead support the use of solar and wind? (0327-26-2 [Myers, Dan])

Comment: There's a consensus between the U.S. government and the nuclear industry for about 70 years now that withdrawn fuel rods are lethal unless shielded. To continue to produce

them and intent to abandon them into the biosphere is profoundly immoral and a burden and a curse on future generations into eternity. It is premeditated murder. (0327-27-2 [Macks, Vic])

Comment: I went to the Rochester Institute of Technology where there was a symposium on nuclear energy. There was a pro-nuke person and an environmentalist, an anti-nuke person. They were having a debate. At one point, the environmentalist brought up the problem of nuclear waste. The pro-nuke position, the man up there, got up there on the stage and he said, "We have a solution now for the nuclear waste." And the environmentalist said, "Well, what is it?" and he said, "I can't tell you right now, but we have one." And at 18, I felt compelled to stand up and say it's obvious he's lying. The whole industry is built on a lie, and the fundamental lie is that you know what you're doing. (0327-29-1 [DeMare, Joseph])

Comment: Instead, we will address the morality of passing on our responsibilities to future generations. The NRC is overseeing the production of deadly poisons that will affect so large a number of generations in the future that the human mind has not evolved to comprehend the magnitude of the figures. All of this to boil water in the last half of the 20th century. How outdated will the technology appear in a couple of generations, let alone hundreds of generations, and who will want to pay to get rid of the waste? We offer a plea to the members of the NRC to take a step back from the life of the everyday, and look at the bigger picture that humanity is now facing. You are all interested in having a nice home, putting your children through college, having social dignity. If the jobs that you and many of the most of the rest of us are taking are increasingly controlled by a small percentage of individuals and corporations which has been referred to as the 1 percent. The jobs they offer us are rarely about fairness to the 99 percent. The 1 percent are stealing the natural resources that should belong to all of humanity. They are selling our own resources back to us, exploiting them, and depleting them for short-lived personal gain. Extractive processes, including uranium mining and milling are occurring at the expense of clean air, clean water, and healthy food. Decisions about resources of energy, about sources of energy and wars to control them are being made outside the democratic process. (0327-3-2 [Todd, Doug])

Comment: A major portion of the U.S. economy goes into making weapons of war, including nuclear technology whose destructive power the human mind can scarcely comprehend. Technology and whether or not it serves humanity is out of the control of our democratic process. If World War II were reenacted today, all of Europe would be uninhabitable due to the presence of nuclear reactors and their waste pools. And what happened to the democratic process when it was decided that the public would take responsibility for the waste and take it off the hands of the industry? (0327-3-3 [Todd, Doug])

Comment: There are alternative methods to produce non-greenhouse-emitting energy that are already being developed now. Remember, first do no harm. Do not continue to produce more nuclear waste, hoping for a solution. The Nuclear Regulatory Commission should not assume that proper nuclear waste facilities will be developed. Instead, you should stop the construction of new nuclear plants unless and until we have a failsafe containment system. (0327-30-4 [Parker, Bob])

Comment: We're [Radioactive Waste Alert] a grassroots organization who does not believe that any amount of radioactive contamination is safe for anybody. And our society, our society is moving in a dark direction. But rather than using our resources to make our mechanized industrial complex of energy and manufacturing safer for all of us, we are all following a path to the bottom. Profit and mediocrity take the place of commonsense and safety for all of our lives. The easiest road seems to be to maintain the status quo, even when common sense tells us

that it will not lead to the best results in the long term. This road is supported and fed by those who are most vested in the shorter-term outcomes without concern for the long-term outcomes. The more difficult road is that which takes the most short-term resources to form because it looks at the long-term outcome and forms its basis therein. The easy road is the road to oblivion over time. We are now seeing the consequences of taking the easy road for generations, and skyrocketing cancer and disease rates in our country, super storms that are just beginning to reveal the onset of symptoms of climate change. The scientific consensus is overwhelming that it is manmade. And investing our collective focus on economic profit motives over protection and safety considerations that result in all of the aforementioned consequences. (0327-32-1 [Pace, Greg])

Comment: It is time that our mode of corporate, legislative, regulatory, and social behavior and priorities put priorities where we all know that they must preside: safety of human life, safety of human social interaction next, safety of human economics next. In other words, all the money in the world will not accommodate a wish for millions of unhealthy lives into healthy lives. The direction the NRC is taking with lowballing regulatory considerations for dealing with high level of radioactive waste is shamefully remiss in terms of priority number one. Nuclear energy is not a viable option to continue to supply our vast energy needs in today's civilization because we cannot do it safely. (0327-32-2 [Pace, Greg])

Comment: The issue of high-level radioactive waste, so dangerous that we cannot even figure out how to dispose of what place it has in our society. We can't even dispose of it. We can't figure it out. If we reach into our hearts, transcended to the place where we have created vested interests in maintaining status quo on this issue, we all can see that really there is no place for more radioactive waste in our society where human safety is the number-one priority. Therefore, we must focus our energy and efforts on shutting down the nuclear power industry and putting resources we have been using to support this industry into fully renewable energy methodologies now. Germany is doing it, Denmark is doing it, as are other countries. The dinosaurs were killed off by an outside force. We do not want to become the dinosaurs who killed themselves off. (0327-32-4 [Pace, Greg])

Comment: I am concerned, though, with the nuclear industry custom of twisting the words. They use the term spent fuel. Spent is not spent. Most of us think of the word spent in a common fashion, meaning it is no longer any useful, any good. And, yet, that's not exactly what this means at all. It means just the opposite. Spent fuel is so highly irradiated that it cannot be used any further in a nuclear fashion. So what happens to it? It sits around for quite a while. For instance, we've had a lot of talk about the long time and that tritium is rather, in fact we know that tritium is being released by every nuclear plant in this country, and we're always being told, oh, but it hasn't gone offsite. And what kind of a half-life does it have? Twelve-and-a-quarter years. That's the half-life. In order to figure a full life from a half-life, you have to multiply it by at least 10, which would be 120 years, okay? But we've got other ones, too. For instance, radium has a half-life of 1600 years, but you have to multiply, put another zero on that one, and you've got 16,000 years. And that's radium. But the one that's the real topper that I know of that -- oh, this list was made out from some, the technology, safety, and cost of decommissioning a referenced low-level nuclear plant. But it does say uranium, which is, oh, let's see, uranium-235 is 710 million years and uranium-238 is 4.5 billion years. Now, I know even my sweet little granddaughter isn't going to be around that long. So it's something that we all have to be considering all the time. How the supposed greatest minds of our nation and the world ever got into this kind of a mess, you know, I have trouble believing it. So do most of the people I know. (0327-33-1 [Carey, Corinne])

Comment: Remember that great American story, the Wizard of Oz? Remember when we said that big scary fiery talking head scared me? Pay no attention to that man behind the curtain. The Great Oz has spoken. Think yourself lucky I'm giving you audience tomorrow instead of 20 years from now. The Great Oz has spoken. To that, Dorothy says, "If you were really great and powerful, you'd keep your promises in the end, Oz." In the end, Oz finds alternative solutions to his promises and admits his scary energy. I mean, scary tactics were wrong. Be great and powerful. Come out from behind the curtain and reveal the scary reality of what to do with nuclear waste. (0327-35-1 [Poprafsky, Nancy])

Comment: And, again, famous words from the Wizard of Oz to the NRC: use your brain, find a heart, love your home, and use your courage to abolish nuclear power forever. (0327-35-3 [Poprafsky, Nancy])

Comment: In fact, what we are gathered here together today is to sort of hold up yet another ruse that's been designed to deflect the real issue at hand, and the real issue is, of course, why are we continuing to make this stuff? The ultimate answer to the dilemma of radioactive waste is not to make any more of it. This has been repeated many times this evening. So let's stop digging ourselves in deeper and deeper into a hole that we can't possibly dig ourselves out of. (0327-39-2 [Izant, Carol])

Comment: And if it hasn't become perfectly clear from the recent, still-unfolding disaster at Fukushima that nuclear power is simply too deadly, too dangerous, not to mention unneeded, uncompetitive, and obsolete, to be considered as a likely component of the 21st century energy policy. (0327-39-4 [Izant, Carol])

Comment: They say truth is stranger than fiction. And when it comes to the matter of radioactive waste, I couldn't agree more. Let's face it: we built the mansion. We forgot to put in the toilet. You know what? If I was a builder and it got out there that I was building McMansions without a toilet, my reputation would go down the toilet. (0327-39-7 [Izant, Carol])

Comment: Now is not the time for business as usual. We are all in this together. Whether or not we realize it, we are all on the same side here. There is no such thing as something that is bad for one person and good for another. If something is harmful for even one person, we are all connected and, ultimately, it harms humanity. So, I make a plea that the NRC stop for a minute and take responsibility along with the rest of us for standing up to the 1 percent that controls our paychecks. We have a responsibility to protect, not endanger, future generations. We have confidence that the first solution to nuclear waste is to stop generating it. Continuing to generate poisons that must be isolated from the biosphere forever is not in the interest of our progeny. We cannot pretend that future generations will somehow invent alchemy to turn lead into gold. As the song goes, "Plutonium is forever," but I won't sing it here. (0327-4-3 [Marida, Patricia])

Comment: I don't think that most people realize they [nuclear power plants] are nuclear waste dumps. I mean, they think they're a power plant. They don't even take into account where all that waste is going and how it's building up. The attitudes towards people as far as health issues, you know, it won't happen to me or, if it does, it's just an unfortunate thing that happens. You need to connect the dots. And maybe if you were 38 years old and diagnosed with cancer from an environment that is killing people, you would realize you have to do something beyond just as you've been doing, as you've been doing, and dealing with it at some future point. Our generations cannot do this. I'm an oncology nurse, and I see the people that are affected by these environments and I deal with them year after year, day after day. I've been out in Oregon

for 22 years as an oncology nurse. I see the people that come from Oak Harbor, that come from Davis-Besse. It's heartbreaking to see a mother, 35 years old, with three small children dying. (0327-40-1 [Berlincourt, Kerry])

Comment: And people have to do something not only about the waste but stop producing it. While you're worrying about what you're going to do with the waste, you're continuing to produce more and more and more. You need to realize that this is not a problem that you're just going to try to solve now, and the NRC needs to think not as a government agency, really you're for the people. You're supposed to be helping, just like the EPA is supposed to be helping and there for us instead of being there for big business. (0327-40-2 [Berlincourt, Kerry])

Comment: I attended a number of meetings prior to the construction of the Davis-Besse Nuclear Power Plant. During these meetings, two things were stressed: nuclear power is safe and electricity from nuclear power will be cheap, so cheap, in fact, one expert said that electric meters will become a thing of the past and residents will be just charged a flat rate. They were wrong on both points. Nuclear power is not cheap, and nuclear power is not safe. (0327-42-2 [Faris, Kelly])

Comment: A former prime minister of Japan has called for the end of all nuclear power generation in Japan. There's nothing more costly than nuclear power, he said. In Germany, all nuclear power plants will be shut down by 2022. (0327-42-4 [Faris, Kelly])

Comment: So here's my solution. You want our input? Close down all nuclear power plants, place all radioactive waste in the reactor building, and cover it with tons and tons of concrete, as was done in Chernobyl, and hope for the best for the next 20,000 years. (0327-42-7 [Faris, Kelly])

Comment: I can think about 50 years ago how happy a room like this would have been when they were announcing they were going to build Davis-Besse. Electricity was going to be free, jobs were going to be abound everywhere on all different levels of the community. And, you know, I can see there was probably a lot of rejoicing on that end. A lot of people got hired, the plant got made, electricity was sold. And then we started having our problems on it. So as far as what everybody spoke out here tonight is -- I pretty much agree with almost every single speaker that was here. There is some benefit in nuclear energy, like as far as, like, in the medical field. And then there's the, and then, on top of that, it is probably the most dangerous type of energy we could ever, ever take on. I mean, when you get down to it, there really is no safe way to mine it. I know that from New Mexico because that's where I'm from. The Navajos got sick. There's no way to mill it. I know that from my wife because she worked at the uranium mines in Grants, New Mexico and she ended up with thyroid disease. There's no way to enrich it because people over there in Piketon, they're all sick. No way to be able to use it for energy because of all the people that, just the safety and the incidents that have happened which we're talking about: Fukushima, Three Mile Island, and all the other places people have been affected. And that's not just with nuclear plants, it's with the way they enrich it and the mines -- everything that they're doing -- which turns out, like in Grants, New Mexico and Piketon. The biggest industry there right now is the healthcare industry. And to have an industry that compensates people that work in the industry is, like, insane. I mean, they're getting sick and they're compensating, and they're saying it's safe. So how could it be that way? (0327-44-2 [Chavez, Tim])

Comment: So, really, the happy face on nuclear industry, on the nuclear industry, the happy face is, the happy face is energy. Really, you know, this fuel goes into weapons, and that's what's fueling the whole industry. If I had \$500 million in order to be able to, or a billion dollars

like it is, it's not \$500 billion. When you take the health aspects on it, it's trillions of dollars. We could throw that into something that's safe. And you know what? You're right, we are Americans. And, yes, we can come up with better ideas. But there's a lot of other alternatives we could take as far as producing energy. (0327-44-4 [Chavez, Tim])

Comment: Fermi 2 is the largest Mark I reactor in the world, and it has accumulated a lot of deadly waste in its years of operation. And without any plan for the waste, removing the waste, Detroit Edison seeks a license for another reactor, Fermi 3. We already have too many reactors and radioactive dumps at every operating reactor in the country. More than that, if a truck driver told me the truth when he said he had hauled radioactive waste and dumped it in the former Cold War missile silos and dumped it. (0327-5-1 [Collins, Jessie Pauline])

Comment: Each reactor continues to endanger an entire bio region. In our modern world, nuclear produced electricity is totally unnecessary other than to extract the plutonium for powering nuclear triggers which I'm told need to be pepped up each year. (0327-5-4 [Collins, Jessie Pauline])

Comment: I urge the officials here to uphold the law, not to renew an existing license, and not to license any new reactors, and shut down all operating reactors for the sake of humanity. We have passed through the deadly nuclear age, and found it wanting. (0327-5-5 [Collins, Jessie Pauline])

Comment: It's quite clear that we're at this point again because there is no solution to disposing or maintaining nuclear waste safely for an eternity, and it's absurd to think so. So, we can say over and over again as the public does, that we need to stop producing it, we need to stop relicensing nuclear power plants, and we need to shut down the existing ones now. And that's what people say over, and over, and over again like a broken record to the NRC. (0327-6-2 [Leonardi, Michael])

Comment: I would like to take note that \$500 billion or more of U.S. tax payer subsidy has helped to create a nuclear industry, a fantasy world where nuclear power is too cheap to meter, where nuclear accidents are literally impossible, and where nuclear waste is not only not a problem, but is considered a resource and an inexhaustible source for future power. (0327-7-1 [Gunter, Keith])

Comment: I say to you tonight that after over a half century we, the public, have seen too much to be fooled any longer. Fukushima Daiichi epitomizes the hazards of GE Mark I irradiated fuel storage, and any loss of onsite and offsite power could lead to a very bad day. You don't need a earthquake or a tsunami. In closing, I will say this. We are long past due in banishing somehow, some way, the nuclear power fantasy to the dust bin of history in favor of truly clean, renewable, and affordable forms of power, and that finally placing human health and public safety above the interests and profits of gigantic corporations. The time has come. (0327-7-4 [Gunter, Keith])

Comment: I think the best answer is to keep working on solutions, but stop making it. (0327-8-4 [Barnes, Kathryn])

Comment: The most obvious and moral solution is not to make more waste in the first place since, especially now, it is unnecessary. Nuclear electrical generation comprises only 20 percent of our power supply, and there are now less expensive and safer alternatives. We should not as a civilization endanger generations far into the future because nuclear waste is forever. (0327-9-5 [McArdle, Ed])

Comment: It's responding or submitting comments to the President that aren't factual in many cases. The lying needs to stop. These nuclear power plants need to be decommissioned. I don't see any safe nuclear alternative from my perspective, which admittedly is very limited. (0328-13-2 [Wagner, Sam])

Comment: I've always been afraid of radiation and nuclear power. I remember as a child during the second World War, I was in elementary school, and one of the things that I was allowed to do was help paint the lines in the halls that we would run to in the event of an air raid and sit between the wall on those particular lines. And I carried that concern with me all my life. So, lo and behold, they bombed the Japanese in 1945 when I was still in elementary school, and we read the horror stories about the radiation and all that. And then it became part of my makeup. (0328-15-1 [Davis, Leslie])

Comment: So, I formed together with Dr. Charles Hoover and Steve Chapman, and Patrick Reagan, and Steve Gadler, and I'm the only survivor. We formed together in 1979 and 1980 to fight certain environmental issues, and expose this whole nuclear power thing, and then you'd think people would rise up if they knew what was going on about it. So, I survived them and go on today, and I say well, let's see what we can do about this radioactive waste problem, this nuclear problem, because they talk about we want to be carbon-free, but they don't talk about conservation and efficiency that can automatically reduce your carbon footprint by 30 or 40 percent cost-effectively. That's probably a better way to reduce the carbon footprint than mining, milling, transporting, enriching, processing uranium and winding up with this problem today. (0328-15-2 [Davis, Leslie])

Comment: So, I don't think there's really any hope for us as we immerse more and more as the wave of problems from Fukushima, Japan comes over. It wasn't enough of a lesson for Chernobyl, or Three Mile Island, and now Fukushima is not enough because you're talking about licensing more nuclear plants. (0328-15-3 [Davis, Leslie])

Comment: So, I'd go with my sign to a small college in Minneapolis, and one kid comes over to me and he says what are nukies? I said well, I said nukies are something we all probably need a little more of. But these are not nukies, these are nukes, and nobody needs any of them. And if you continue licensing them, and permitting them, and giving them a chance to get out of it, you're dooming the society. (0328-15-5 [Davis, Leslie])

Comment: All of industry can't turn it off. Fukushima, these are human beings. You are defying human rights. You are in default against all of nature. You've heard it before. Tesla told you ones who want to want to fix it, you ones who think you can do something about this, I would encourage you, I would encourage you at this late hour. All directions, all the elements, sacred elements, plutonium is the first manmade element, and it's changed the whole course of humanity through time forever. And all life waits, waits for the human beings to come forward in the best of their nature to fulfill their purpose here, to protect all life, to participate with all life. I don't know how to recover it for the human beings, for the people. I've heard you. I heard you say that society is sick, granted the society is sick, we're all human beings here. What are we going to do with the best of our nature? How are we going to turn this around? What are we going to do? Why aren't we helping Fukushima? Why aren't we helping? Russia went. They offered it. There's nothing they can do. And we can sit here and act like the profits are going to continue? There is no profit. True cost has never been considered because true cost means all life, all the future. (0328-16-2 [Bonniwell, Colleen])

Comment: I would also propose that the NRC begin to adjust to the concept of an international uranium mining moratorium, and an international nuclear waste moratorium. (0328-16-5 [Bonniwell, Colleen])

Comment: Colonial oppression, colonial domination by corporation Fukushima, the today people with the mining, the mining that's gone on in Northern Saskatchewan, and the nuclear waste dumping threat in Minnesota, Wisconsin, Michigan, Ontario, and Manitoba. As we speak, they're planning to put a nuke dump right on Lake Huron. The Pacific Ocean, is it going to support life, questionable, very questionable. And then the two oil spills, the Gulf is dead. I came here tonight to make a plea for Lake Superior, to make a plea for the children, to make a plea for the future. That's why I kept going through the whole way down here through the blizzard because the blizzard is nothing compared to what threatens. And I would come here to you today and say kill me now because your politics behind this industry is so corrupted, and so vile. And I would say kill me now and spare the future. But guess what, where's our future? Where are we going? The water is sacred. NRC focus on the water, the children, and the future. (0328-16-6 [Bonniwell, Colleen])

Comment: You know, I was going to come up here and say I'm going to have a three-minute meditation and have everybody just meditate on the children, the children that are here, the children that are coming, just meditate on them. What do you want to do about this situation for them? Brainstorm, pray, whatever you can do to come up with a solution to the hopelessness that they're going to feel when people wake up and realize what has happened. No more nukes, no more nukes in Siberia, no more nukes anywhere. (0328-16-7 [Bonniwell, Colleen])

Comment: And I want to thank our children for their forgiveness because all they have to hope for is us, all they have. And this, this is what we have, a nuclear police state. That's what we get, that's what they inherit unless we get real, every one of us. There is no profit in nuclear power. There is absolutely no profit, but if you can come up with a way to deal with it in a compassionate -- with a compassionate understanding toward life, do it. I challenge you to do that. I will pray for that myself. I haven't seen a way to shut down Fukushima. It's like little bitty suns burning themselves through the earth, and you might live in some kind of bubble, but people out there know, they know what they're facing. (0328-16-9 [Bonniwell, Colleen])

Comment: To even be talking about this issue of nuclear power given what's going on in Fukushima right now as we speak, is beyond insanity. It's beyond insanity. (0328-17-2 [Cavlan, Michael])

Comment: The Sierra Club opposes nuclear power because its fuel cycle from uranium mining to spent radioactive fuel poses grave dangers to the environment. In addition, reliance on nuclear power unjustifiably delays the beneficial transition to clean and renewable energy. (0328-4-1 [Taylor, Wallace])

Comment: In discussing the alternative of discontinuing production of spent fuel, the EIS should consider how renewable energy can replace whatever current or future energy needs would have been supplied by nuclear power if nuclear power is discontinued as an energy source. Numerous studies have shown that renewable energy sources combined with a comprehensive transmission and distribution grid will provide all the power that we need in this country if we just put our minds to it. The electric utilities and energy companies assert that in order to provide baseload power, they have to use coal, natural gas, or nuclear power. But baseload as viewed by the utilities and power companies is an outdated concept. They are stuck with a narrow view of the electric power coming from power plants, but rather than

referring to the term baseload we're really talking about energy and capacity. Energy is the total amount of electricity that is being supplied to consumers. Capacity is the highest level of electricity that can be supplied at any one time to meet peak demand. Renewable energy can meet the energy and capacity demands of this country if we supply a transmission grid that will allow the energy to be transferred and consumed when and where it is needed. Those steps are being taken already. Many companies and utilities are installing wind and solar, they're installing transmission lines, and that's ongoing right now sooner than any new nuclear plant could be online and at a much lower cost. (0328-4-9 [Taylor, Wallace])

Comment: We're always worried about the money, but do we ever really think about the children; the animals; the plants; the birds; the water, sacred water without which we cannot live. If we poison the water at the head of the Mississippi River with our nuclear insanity we will, in fact, poison this continent. We will poison the continent. And I have no confidence whatsoever that the Nuclear Regulatory Commission or Xcel Energy, or any of the other multiple nuclear industries in the corporate reich have any concern for the sacred water because they dump their poison in it on a routine basis every single day, every single day. And we know what to do with the waste, we do it all the time. We kill people with it, our adversaries, our enemies. We put it in their bodies and we watch them die. And then we track them all over the world after we've killed them with it, so we know what to do with nuclear waste. We do it very nicely. (0328-6-2 [Foushee, Lea])

Comment: Ending the generation of radioactive waste is the essential first step that we can take to reduce the risks of its storage. The Nuclear Regulatory Commission should revise its Waste Confidence document to insure the speediest possible end to waste production, a phase-out of nuclear reactor operations. (0328-9-6 [LaForge, John])

Comment: Another thing I would like to say is that we are creating this waste or, actually, the NRC, and the NRC, in my mind, is nothing but a PR arm for the corporations that run the nuclear energy industry, and we don't have proper storage for what has already been created, which will not be resolved in any of our lifetimes, and we're continually, you are continually or the corporations, the energy corporations are continually creating more waste. We don't even have any proper way to store the waste that has already been created, and we're creating more. (0329-1-2 [Dorsey, Chris])

Comment: Now, I always ask why is this continual reckless endangerment of the entire population of the United States continuing when it's very clear that this is a danger to all of humanity. I would love to hear somebody disagree and explain how this is not reckless endangerment and this is not a high crime against the American people. I oppose everything you do. I oppose every aspect of nuclear energy. I think it's too dangerous to exist, and I have never heard anyone tell me how it's not too dangerous to exist. I would love to hear you tell me how this is not reckless endangerment and how nuclear energy is not too dangerous to exist. (0329-1-3 [Dorsey, Chris])

Comment: And I don't believe that we should allow the industry to continue making more of this highly toxic-forever nuclear waste that obviously, at this point, we have nowhere to store and no idea what to do with it. (0329-17-2 [Gray, Erica])

Comment: I would like to focus on in these three minutes is the important service done to our country by nuclear whistleblowers, in both industry and the NRC, that have brought problems to light that show that that false confidence, that technological arrogance is just that. (0329-20-2 [Kamps, Kevin])

Comment: Many nuclear reactors have closed down their operations or have made the decision to close down in the near future, Vermont Yankee, Zion, Kewaunee, San Onofre to name a few. Several more are in the pipeline to close also: Clinton and Palisades. Given the high-risk levels there, it can't happen fast enough, as Kevin [Kamps] mentioned some of the problems just now. (0329-23-2 [Lewison, Linda])

Comment: I have been living with the threat of nuclear energy for my whole life, as long as I can remember. Although the dropping of the atomic bombs on Hiroshima and Nagasaki were unspeakable, I personally believe the ongoing nuclear catastrophe at Fukushima poses the greatest threat to the future of life on Earth that we have ever seen. After Fukushima, it is clear that nuclear energy is just way too dangerous. And it's impossible to prevent or to clean up nuclear accidents. The very future of life on Earth is threatened by use of this form of energy. And accident and equipment malfunction, operator error, or terrorist attack at a nuclear plant literally could mean the end of life on Earth. And if you're not convinced by Fukushima and you still think that that can't happen, think about the O-ring on the Challenger. You know, I live in Florida. And these things loom very big here, as they do with everyone. There is no way to guarantee 100 percent safety using this technology. (0329-28-1 [Wilansky, Laura])

Comment: This technology is so dangerous that even Wall Street won't invest in it, and Wall Street will invest in anything. So all of this leads me to the conclusion that the halt on licensing new plants should be made permanent. (0329-28-3 [Wilansky, Laura])

Comment: There are so many truly clean, safe, renewable, and sustainable technologies that are available and in development. We don't need more nuclear plants. They'll just drain resources from the full development of other technologies, like solar, wind, geothermal, and maybe something that is in development that we don't know about yet that needs funding. (0329-28-4 [Wilansky, Laura])

Comment: And we should not be making more nuclear waste. I urge you to end the licensing and relicensing of all nuclear plants, end it now, and shut down all currently licensed nuclear plants. I believe that the future of life on Earth depends on this. You know, as I said, I live in Florida. And people have already addressed Turkey Point, the dangers of Turkey Point. That's my local nuclear plant. And those plants and the new plants that are proposed and the nuclear waste are going to be underwater in the time that we can foresee. We should not be making new nuclear waste. And we need to do everything we can to assure the safety as best we can as fallible humans of the nuclear waste that we already have. (0329-28-7 [Wilansky, Laura])

Comment: I also want to make a point, stress that we are wasting valuable time and resources in fiddling around with how are we going to make safe something that isn't safe and cannot be safe when we should be putting our best minds and efforts into getting us off of nuclear energy? There is no future for it. (0329-29-1 [Messer, Diane])

Comment: We can't keep doing this. We have to get smart. We have to work for long-term future. We have to get ourselves onto clean energy and reduce demand. That's the hugest issue. We are gluttons for energy. It's affluenza. Bigger and more is not better. We can do with less. We have to be much more efficient. There are superb building methods, are new inventions coming down all the time that allow us for transportation, for industry. All of this should have the best minds working on accomplishing this transformation and not wasting our, pardon me the pun with waste that we're dealing with now, but not wasting our valuable assets and time in trying to deal with something that is undoable. (0329-29-5 [Messer, Diane])

Comment: I will say that we think that nuclear energy is now constituted. It is a dead end. And it is a very dangerous dead end. And we think we would be much better served as a nation and as a community and throughout the world to turn away from nuclear energy as a power source and, instead, invest our time and our effort into clean and renewable energy. I am occasionally told by people in the industry that nuclear energy is clean, is safe, is renewable. And I have to say it is none of those things. So we think that this is a boondoggle and deeply troubling. (0329-30-2 [Price, Scott])

Comment: I would like to address a few comments, really, about confidence and what confidence means. I'm looking at a dictionary definition. And one of them says, "trust or faith in a person or thing." And then a second definition is "a trusting relationship." Well, I have faith in that nuclear power is dirty, dangerous, and expensive and that the waste is a serious, serious issue that is not being adequately dealt with. (0329-31-1 [Carberry, Mike])

Comment: And I feel that this is pretty much an exercise in futility. However, because I am persistent and dogged, like many of my allies in this work, to shut down nuclear energy, I will keep at it. (0329-32-2 [Seeley, Linda])

Comment: Is there a good solution? No. But I think steering away from any kind of nuclear power, nuclear waste would be advantageous for us. (0329-34-4 [Myers, Susan])

Comment: But investigating solar energy options, everywhere from passive gain to actually photovoltaics, which was merely a dream in the late '70s. There's a lot of other options that we can do before we go further with the nukes and start permitting more and more. I just wanted to give you guys a little bit of feedback that I am still here, I am still fighting the fight, and I know there are solutions out there that don't involve nuclear power and nuclear waste. (0329-34-5 [Myers, Susan])

Comment: I really would like to see this industry focus on waste, securing the waste, and stop making more of it. (0329-35-2 [Gray, Susan])

Comment: We had the dream in the late 50s into the 60s of building this very inexpensive infrastructure, nuclear power, the choice of the future. But it has cost us a tremendous amount both in money and lives and safety and security[.] (0329-4-4 [Messer, Diane])

Comment: I am very much against going further with any nuclear plants that are either planned or on the drawing board and in the beginning of construction now. (0329-4-5 [Messer, Diane])

Comment: Therefore, I personally give the NRC a no-confidence vote, and I propose instead, in order to avoid further costly legal action in Federal court, the NRC should make the current licensing moratorium permanent or at least indefinitely extended until such time as a mined geologic repository becomes available. Anything less would be appallingly irresponsible. (0329-7-6 [Schonberger, David])

Comment: I just hope it helps. I'm not for nuclear energy. I hope that they all get shut down until we figure out what to do with them. There are hopes of being able to reprocess that fuel at some point. And it should be stored where it could be opened up and reprocessed at some point. (0329-8-9 [Wilson, Greg])

Comment: Please, no more licensing nuclear reactors. Fukushima has taught us that nothing is "safe." (0332-1 [Parks, Eric])

Comment: Make the licensing moratorium permanent. (0332-3 [Parks, Eric])

Comment: It is only by making licensing of new plants contingent on actually solving this problem that it will be addressed. (0333-4 [Balke, Karl])

Comment: Please move beyond this idea of "confidence" and make the moratorium on new leasing and renewal of previous leases of nuclear power facilities in the U.S. permanent. We quite literally have no place for the creation of more nuclear waste, even if it is only from power plants and not from weapons production. (0334-2 [Nuccio, Theresa])

Comment: Please do not allow this moratorium to be a temporary stop gap measure when other types of energy development are needed and wanted by the public. Nuclear energy is not carbon neutral given the amount of concrete and other resources needed to build, repair, or maintain these facilities. Their cost in dollars and to the environment and to future generations is too high; without adequate benefit to justify continuing their use. (0334-4 [Nuccio, Theresa])

Comment: The only solution to the HLRW problem is to not generate irradiated nuclear fuel in the first place. Our society's "preferred alternative" to nuclear power and the long-term deadly radioactive waste it inevitably generates is efficiency and renewables, such as wind and solar power. As Dr. Arjun Makhijani, President of the Institute for Energy and Environmental Research, showed in his 2007 book Carbon-Free, Nuclear-Free: A Roadmap to U.S. Energy Policy, both fossil fuels and nuclear power can be completely phased out of the U.S. economy by 2040, and replaced by efficiency and renewables, without any further technological breakthroughs required, and for the same percentage of our Gross Domestic Product as we currently spend on dirty, dangerous, and expensive fossil fuels and nuclear power. (0336-14 [Lish, Christopher])

Comment: We should not license or re-license any reactor until it has been proven that we can successfully isolate this waste. (0336-4 [Lish, Christopher])

Comment: Nuclear waste is among the most hazardous materials on the planet. A man exposed to a spent fuel rod which has come out of a reactor will be delivered a fatal dose of radiation within a matter of seconds. Nuclear waste remains highly toxic for hundreds of thousands of years.² [footnote 2 text Certain radioactive isotopes like Iodine 129 (I-129) have half-lives of millions of years. Both Cesium 137 (Cs-137) and Strontium 90 (Sr-90) remain radioactive for hundreds of years, with half-lives of approximately 30 years. After a few half-lives of Cs-137 and Sr-90, the heat load in spent nuclear fuel is dominated for over 50 years by Americium 241 (Am-241), with a half-life of approximately 432 years. Am-241 is a precursor to Neptunium 237 (Np-237) which has a half-life of over 2 million years and is highly mobile in water.] Since the very inception of the nuclear age - our democracy has struggled, unsuccessfully, to reach consensus on how to dispose of nuclear waste. (0341-1-8 [Mermelstein, Richard])

Comment: Corporations Always Clean Up their Messes. Really? Gee, if that's the case how come the industry is so intent on wrapping itself up in multiple protection layers of LLCs? (Schlissel) And why do we have so many statutes like the Price-Anderson Act of 1957 and the Nuclear Waste Policy Act of 1982, which shift the financial risk burden from the nuclear industry onto the shoulders of the public (i.e., taxpayers)? And how come corporate giants like Entergy seem to forever be seeking to "optimize" the value for shareholders? (King; Hakim) Prioritization of profit and shareholder value is, of course, what corporations seek. Corporations are not biological beings with heart and soul, they are legal constructs devised to promote profit and

reduce liability. That is actually what corporate law and corporate tax law allows. What the NRC has allowed, is for the behemoth nuclear corporations to wrap themselves in additional layers of "protection" that enable the parent corporations to cut loose at risk subsidiaries, should they pose a substantial threat to profitability. The primary responsibility is to corporate bond holders and stock holders, not to the citizens of a community where a reactor is shut, and waste is seeping from spent fuel pools into the groundwater. (Cooper; Schlissel; Tidmore) (0341-2-10 [Mermelstein, Richard])

Comment: We agree with those who ask the NRC to stop building new nuclear facilities, stop extending the licenses of existing nuclear power plants, to not expose the nuclear workers and the public by transporting nuclear waste. (0348-13 [Agnew, David] [Roscoe, Lee])

Comment: Rather than generating more waste, we believe that the prudent approach is to stop producing nuclear waste. (0348-15 [Agnew, David] [Roscoe, Lee])

Comment: Fermi 2, being the largest Mark 1 reactor in the world, has accumulated a lot of deadly waste in its years of operation. And without any real plan of removing the waste, the Detroit Edison Company seeks a license for another reactor, Fermi 3. We already have too many radioactive dumps, at every operating reactor in the country. More than that if a truck driver told me the truth when he said that he had hauled nuclear waste to former Cold-War missile silos and dumped it. (0349-1 [Collins, Jessie Pauline])

Comment: I defer to my esteemed colleagues' impeccable research, while I rely on common sense. Each reactor continues to endanger an entire bio-region. In our modern world, nuclear produced electricity is totally unnecessary, other than to extract the plutonium for powering nuclear triggers, which I am told need pepping up yearly. (0349-4 [Collins, Jessie Pauline])

Comment: I urge the officials here to uphold the law; not to renew any existing licenses: not license any new reactors, and shut down all operating reactors - for the sake of humanity. We have passed through the deadly nuclear-age, and found it wanting. Moving the world to renewable energy sources is the right thing to do. Tonight, you have the opportunity to choose between right and wrong. Choose right - even if you risk losing your well-paying jobs. (0349-5 [Collins, Jessie Pauline])

Comment: We agree with those who ask the NRC to stop building new nuclear facilities, stop extending the licenses of existing nuclear power plants, to not expose the nuclear workers and the public by transporting nuclear waste. (0352-13 [Roscoe, Lee])

Comment: Rather than generating more waste, we believe that the prudent approach is to stop producing nuclear waste. (0352-15 [Roscoe, Lee])

Comment: Having watched and listened to that meeting on nuclear energy. I thought the environmental impact regarding the safety of its waste would outweigh the benefits. At the same time, I agree the fact that nuclear energy is one of the cheapest source of energy available to mankind today. Having said that, it seems to me that we could be much better off on investing in more natural sources, like wind power or solar. These are natural resources that occur around us daily and we should take advantage of them and properly give them a chance to help make a difference. (0353-1 [Yusuf, Hassan])

Comment: The production of more "spent fuel" must cease. (0358-12 [Schumann, Klaus])

Comment: Clearly, cessation of further production of "spent fuel" is the safest way for the future. Common sense dictates: if you are in a hole, stop digging. For the already existing "spent fuel", dry casks are far safer than the crowded pools. (0358-9 [Schumann, Klaus])

Comment: Production of such waste by nuclear power plants must be discontinued, and the plants closed down. Then the best of an array of bad alternatives must be identified for the storage of the waste already produced. (0359-2 [Kushigian, Elizabeth])

Comment: I am a 71-year-old Minnesotan who is becoming more appalled every day that our upcoming children & grandchildren are being asked to pay the price for nuclear waste gone crazy. (0361-1 [Greenfield, Jan])

Comment: YOU -- NRC -- are charged with protecting the public. Please be HONEST & FORTHRIGHT & admit there is no safe way to continue to operate nuclear power plants. Fukushima has given us "the writing on the wall"; nuclear mishaps are POISONING our delicate globe & all of the living creatures on it! (0361-3 [Greenfield, Jan])

Comment: I don't buy your assertion that nuclear waste can EVER be "scientifically-defensible, environmentally-responsible and publicly-acceptable." All processes that generate radioactive waste should be terminated immediately, in the interest of public safety, if nothing else. (0362-1 [Schietinger, Helen])

Comment: I am amazed that the NRC, with all its expertise, has not learned from Fukushima, Chernobyl, Bhopal and Love Canal that ending radioactive waste generation is the single most important step we can take to minimize the risks surrounding its storage. (0362-3 [Schietinger, Helen])

Comment: As you can see, it is important to stop generating this waste because a worst case disaster is in the trillions of dollars and would ruin large areas for generations. No known economic model exists that can put a value on the loss of say, the State of California after worst case nuclear meltdown and fuel pool fire. (0366-2 [Frey, Paul])

Comment: Please discontinue the use of these dangerous and dirty energy generators - we can no longer afford the high costs (in health, environment and dollars) of these antiquated power plants. Let's put our efforts and resources into renewable solutions! (0367-1 [Bird, Melissa])

Comment: I strongly ask that the moratorium on new nuclear power plant licenses continue. (0368-1 [Mattox, Judy])

Comment: Renewable energy options are increasingly affordable; therefore, don't use nuclear power. (0368-5 [Mattox, Judy])

Comment: We agree with those who ask the NRC to stop building new nuclear facilities, stop extending the licenses of existing nuclear power plants, to not expose the nuclear workers and the public by transporting nuclear waste. (0373-14 [O'Malley, Brian])

Comment: In concluding, one elephant in the room stands: the NRC's failure to understand the very real, and well documented science, of radioactive substances in this waste. A fingernail of plutonium could kill off, conservatively a large city. Cesium, strontium, and other radionuclides contained in waste, are some of the most toxic substances on earth, creating cancer and genetic injuries. The NRC has a duty to protect children and grandchildren for generations to come from substances which contaminate human beings, the biosphere and the environment

and which can create lasting, adverse, multi-generational changes in the genome. We believe the DWG GEIS shows that the NRC does not take that duty seriously. Rather than generating more waste, we believe that the prudent approach- when there is no solution to the storage problem-is to stop producing nuclear waste. (0373-15 [O'Malley, Brian])

Comment: ACE calls on NRC to protect the public's long-term health and financial interests by acknowledging reality - There Is NO SAFE SOLUTION. 1. Stop allowing lethal radioactive wastes for which there is no safe solution to be produced (0377-1-11 [Cuthbert, Lewis])

Comment: 4. Stop the production of deadly nuclear waste for which there is no actual safe solution, based on astronomical endless costs to the public for transport, storage, and security. (0377-1-9 [Cuthbert, Lewis])

Comment: The only real solution to the problem of lethally radioactive waste that remains a hazard for more than a million years is to stop generating more. NRC must stop allowing nuclear plants to produce deadly radioactive wastes for which there is no safe solution. The only solution to the high-level radioactive waste (HLRW) problem is to not generate irradiated nuclear fuel in the first place (0377-5-14 [Cuthbert, Lewis])

Comment: Nuclear power can be completely phased out of the U.S. economy by 2040, and replaced by efficiency and renewables, without any further technological breakthroughs required, and for the same percentage of our Gross Domestic Product (GDP) as we currently spend on dirty, dangerous, and expensive fossil fuels and nuclear power (0377-5-15 [Cuthbert, Lewis])

Comment: A BODY OF EVIDENCE SHOWS THAT THERE IS NO SAFE SOLUTION. THE ONLY LOGICAL THING TO DO IS STOP MAKING RADIOACTIVE WASTE AT LIMERICK AND OTHER NUCLEAR PLANTS. (0377-6-7 [Cuthbert, Lewis])

Comment: The only really safety guarantee would have been to not produce this waste in the first place. Since that measure wasn't taken seriously, the next most effective measure would be to stop producing any more high-level radioactive waste. Nuclear waste is far more dangerous than, say, DDT which, once recognized as dangerous, was banned. There is no conceivable method for safeguarding spent nuclear fuel virtually forever, as it must be, so our priority should be to end its production. (0380-1 [Holt, Joan])

Comment: The only really safety guarantee would have been to not produce this waste in the first place. Since that measure wasn't taken seriously, the next most effective measure would be to stop producing any more high-level radioactive waste. Nuclear waste is far more dangerous than, say, DDT which, once recognized as dangerous, was banned. There is no conceivable method for safeguarding spent nuclear fuel virtually forever, as it must be, so our priority should be to end its production. Until we do that, we have not solved the problem. We're stuck with the waste we've already produced, and dry cask storage is better than overcrowded spent fuel pools so obviously that must be pushed. (0380-2 [Holt, Joan])

Comment: 2.The only reasonable first step to deal with the unsolvable problem of nuclear waste is to stop producing any more ASAP! (0381-6 [Fasten, Susan])

Comment: Please do not renew the license for Diablo because of the inherent dangers, and please help make arrangements to close Diablo as soon as possible. (0389-2 [Atlee, Susan])

Comment: Your "Nuclear Waste Confidence" is false! we have a mountain of c....[word is illegible] of radioactive waste that we don't know what to do with. Stop making it! (0392-1 [Owl, Griffin])

Comment: Your "Nuclear Waste Confidence" is false and a con game. We already have more commercial radioactive waste than we know what to do with! STOP MAKING IT!! (0393-1 [Schmidt, Peg])

Comment: Your "Nuclear Waste Confidence" is false and a con game. We already have a mountain of commercial radiological waste 56 years high and we don't even know what to do with the capful. Stop making it. (0394-1 [Mullens, Mark])

Comment: The programs now in place are inadequate for public safety, and the generation of radioactive waste should not and never should have been allowed. (0403-2 [Brown, Deborah])

Comment: Reactors must be phased out - quickly. No one has the right - they are glorified nuclear weapons..... (0403-3 [Brown, Deborah])

Comment: There are better cleaner healthier, more efficient ways to produce power... Why are you so resistant?? Have you not learned from Fukushima to Chernobyl to Bhopal and Love Canal..... It is past time to improve safety, security, and respect. (0403-4 [Brown, Deborah])

Comment: No no reactors should be permitted while we have growing stores of waste to deal with. (0404-2 [Smith, Roger])

Comment: Three reactors at Fukushima have not been capped and reactor four has damaged fuel rods which have to be removed from the spent waste pool above the reactor. Chernobyl is being recapped and three of Fukushima's cores have not even been located. The fuel rods from Fukushima's reactor pool no. 4 can explode giving the northern hemisphere many Chernobyl sized doses of radiation. Does this sound like nuclear plants and nuclear waste is safe? The Pacific is being dosed with Fukushima plutonium found in tuna off of the California coast. The food chain is being polluted. Greater risks of cancer and genetic damage, and immune system degradation will be faced by future generations of humans and animal life. Plant life will be effected. Nuclear waste is leaking from water used to cool the reactors in Fukushima. WHY SHOULD ANYONE IN THE WORLD ALLOW MORE NUCLEAR POLLUTION? (0405-1 [Dugan, Pat])

Comment: The nuclear plant licensing moratorium needs to remain in place. Please do humanity the great gracious favor of pausing to learn more about and to consider the incredibly long term effects of nuclear power and armaments. Please keep the nuclear plant licensing moratorium in place. (0405-2 [Dugan, Pat])

Comment: Do not forward a vote of confidence for what is happening to the planet. The more one learns about nuclear pollution the less confidence one has about containment. (0405-3 [Dugan, Pat])

Comment: Finally, Mark Jacobson, Director, Atmosphere/Energy Program at Stanford University and many others calculate that all America's energy can be generated by sustainable and cheap wind, water and solar energy. It makes no sense to continue spending so much tax payer money on nuclear energy with its never ending deadly radioactive contamination. (0406-6 [Gerleman, Douglas])

Comment: Because nuclear storage is a 250,000 year issue, we should not produce any more nuclear fuel, which means shutting down current reactors and replacing the power that is currently produced with nuclear through conservation and renewable energy, which should be given preferred tax status, especially for conservation and distributed energy production. (0411-1 [Krumm, Paul])

Comment: I fail to see how the NRC can continue to license plants when there is no central place to store nuclear waste other than onsite. Many of the fuel pools are already filled to overcapacity, yet we continue to produce more fuel rods. It makes no sense. (0413-1 [Palaia, Joyce])

Comment: We should consider closing Diablo as well all nuclear plants. (0413-3 [Palaia, Joyce])

Comment: The time is upon us now to realize that life is more important than economics. Please do not allow more life threatening nuclear waste to be generated or stored. It is not safe and it threatens all of life (as the nuclear fallout from Fukushima is currently a testament to.) It is time for us to realize our true values. And the truth is that life is more important than economics. (0415-1 [Laing, Josephine])

Comment: All nuclear reactors should be shut down so no more nuclear waste is created. Nuclear waste should not be transported, barged, recycled, buried, or placed in untested, unlicensed casks. Nuclear waste has no where to go. It should not be stored near bodies of water or areas of population density. It is a problem that will have to be continually dealt with. Currently there is no solution. However, there is a start to a better plan. Stop making it. That should be your rule. Stop making it. (0416-5 [Barnes, Kathryn])

Comment: We do not have a scientifically proven solution for safely disposing of nuclear waste. There is no good reason to continue to rely on nuclear power. Clean, renewable sources of electricity are readily available and affordable. (0417-13 [Clark, Terrence])

Comment: The soundest solution to management of nuclear waste is: STOP Making Nuclear Waste. (0417-14 [Clark, Terrence])

Comment: All relicenses issued to date should be rescinded pending compliance with realistic new standards. No new licenses to generate additional EXPLETIVE radwaste should be allowed. And no additional radwaste should be generated - it is immoral to create deadly toxins that will remain a threat for so long when we have no real plan for safekeeping them over their hazardous 'lifespan'. (0419-12 [Agnew, David])

Comment: You have allowed the owners to operate with insufficient funds to properly decommission their EXPLETIVE cancer-factories until such time as the financial climate MAY allow it. The NRC colludes with the industry to enable all of this, and for what? For industry profits and little else. We don't need nuclear power - it is completely unnecessary in Massachusetts, and the nation can convert to renewable energy for the same money now spent on nuclear and fossil fuels. (0419-14 [Agnew, David])

Comment: The nuclear industry promised safe, cheap, electricity from reactors which would operate for 40 years during which time its hellishly godawful wastes would be safely removed. The industry has delivered on none of that, instead leaving its EXPLETIVE waste scattered across the country, a gift to accompany increased cancer rates for yet-unborn generations. (0419-6 [Agnew, David])

Comment: We are seven decades into 'too cheap to meter' and no one knows what to do with the industry's toxic waste. Whether the problem is NIMBY or scientific, the result is the same: no one knows what to do with the industry's EXPLETIVE toxic waste. (0419-8 [Agnew, David])

Comment: This message betrays the inadequacy of the NRC to cope responsibly with the measured rises in background radiation due to our irresponsible handling of nuclear waste. It says to me that the NRC is another bureaucracy more concerned with covering its ass than addressing the real issue. We continue to produce more nuclear waste with every act of fissioning. (0428-1 [Seitz, Tim])

Comment: This is another reason me to call for the ABOLITION OF ALL NUCLEAR FISSIONING APPLICATIONS ASAP! (0428-2 [Seitz, Tim])

Comment: Waste Confidence is an outrageous euphemism for the disposal of our nation's most toxic and long-lived materials! In my view, there can be no confidence in the treatment of such waste unless the production of more waste has already stopped. But nuclear power plants continue to produce radioactive waste. In the event of an accident such as occurred at Fukushima, there will be tons and tons MORE waste and no feasible place to put it. In view of such danger, generating more waste merely in order to power our shopping malls and electronic devices seems to me to be madness. Re-licensing old power plants is also questionable and should not be approved. It's time we stopped taking gigantic risks with the future safety of the planet and began to make the health of the environment and the well being of our human populations our highest priority. (0429-1 [Hiller, Stephanie])

Comment: We continue to create waste that is not manageable or safe instead of working from the bottom up by providing alternative energy and changing the paradigm of consumption. (0435-3 [Coor, Kristen])

Comment: I would like to express my concern with the amount and critical radioactivity of reactor waste and how and where it is stored. In my perfect world, it wouldn't exist at all. Since it is too late for that, I urge you to consider stop issuing and extending permits to create more waste. To think of the amount sitting about around reactors in my state and neighboring states is frosting. (0436-1 [Patrick, Kay])

Comment: Stop rubber stamping permits to keep this nuclear folly limping along. Shut these reactors down and find a permanent secure repository for this eternal waste. (0436-5 [Patrick, Kay])

Comment: I write to urge the commission to reject the licensing of any more nuclear power plants in the United States. (0437-1 [Kinnaird, Eleanor])

Comment: It is currently being stored on-site at each facility. This is not a safe solution since accidents could jeopardize the storage casks, terrorists could gain access to the casks, and especially since the radioactive material will last in some cases, thousands of years. At some point in time, the waste will have to be dealt with. Solar power is becoming more feasible as to cost and siting, especially distributive solar installations on roof-tops throughout the country. Please continue the moratorium on the approval of any new nuclear power plants. The price of natural gas also makes nuclear power no longer competitive as a source for electricity. (0437-3 [Kinnaird, Eleanor])

Comment: It is way past the time when the world should have been made clean of these disgusting abominations and those who have profited from their creation and use should now pay for their neutralization. Anything less is hopelessly immoral and tantamount to mass murder. The days of "too cheap to meter" have never come. It is time to stop suppressing the myriad of ways to make free clean electricity any time any place any quantity and to decommission EACH and EVERY nuclear reactor. The People are aware. You shall be judged accordingly. It would be better for you to "straighten up and fly right" before you are "brought down in flames". (0441-3 [Baker, Helen])

Comment: Look, all reasonable people recognize that meeting the energy needs of this country is of vital importance. The place that nuclear power has in any United States energy policy, however, must be based on truth and science not on hope and luck. All energy proposals must be scientifically-defensible, environmentally-responsible and publicly-acceptable. Nuclear energy, however, is in a class by itself since no other energy source leaves such a toxic waste that lasts so long and whose potential for destruction is so extreme. (0443-5 [Sabo, Betty])

Comment: Acknowledge that there are no real solutions to the problems posed by the nuclear industry. After the half century that nuclear power has been around there is still no solution for nuclear waste or for everything from the supposedly minor mishaps to the major tragic devastating catastrophes we have been subjected to. SHOW SOME HUMILITY! The "Trust us. We're the experts" attitude doesn't work. (0445-3 [Fasten, Susan])

Comment: Do your job. Regulate the nuclear industry because it is the most dangerous, enduring, destructive threat to all of humanity and to the earth. (0445-5 [Fasten, Susan])

Comment: Americans DEMAND MORE than hope for the future. We DEMAND solutions that are technologically sound & healthy for humans & our planet. Until the NRC may PROVE they have a viable, healthy solution for storing nuclear reactor waste, we STRONGLY SUGGEST that the nuclear reactor across America be shut down soonest. (0446-2 [Krause, Laurel])

Comment: Hope is not enough to offer Americans. We want proven solutions or turn the nuclear reactors off now! (0446-4 [Krause, Laurel])

Comment: the entire nuclear technology and industry was fatally and irretrievably flawed, inseparably linked to weapons proliferation, and not capable of being operated safely or even sanely given the extreme catastrophic consequences to human health and the environment. In subsequent years, my only involvement with nuclear technology has been to engage in efforts to discontinue it, and on occasion to technically support means to safely dispose of the wastes and to accelerate closure of facilities. (0447-1-1 [Andrews, Richard])

Comment: Discontinue any new licensing or license renewals of any nuclear waste generating plant or facility, including all stages of the fuel cycle. In other words stop permitting additional nuclear waste generation. (0447-2-15 [Andrews, Richard])

Comment: This all points to the necessity and urgency for much more prompt solutions to the disposal of these wastes and the cessation of generation of additional nuclear wastes. The NRC should simply declare NO SNF WASTE CONFIDENCE and speak the truth about the extreme hazards from nuclear power and nuclear wastes. It should curtail any and all existing and new licensing, except licenses for prompt closure and final disposal of nuclear materials. (0447-2-5 [Andrews, Richard])

Comment: The ONLY rational solution is to STOP PRODUCING DEADLY WASTE (0450-7 [Bast, Nancy])

Comment: I just want to express my viewpoint that nuclear energy is the most dangerous option we have. So much so that it needs to be eliminated as soon as possible and no further development should occur. It is far, far too dangerous. (0452-1 [Frances, Esther])

Comment: [T]he remainder of operating U.S. nuclear power plants should be shut down until a reasonable and safe procedure to deal with the deadly radioactive waste is developed. (0453-6 [Feathers, Jösan])

Comment: In any event, without the establishment of a permanent National Storage site, the NRC will be pursuing an irrational and dangerous policy if it persists in granting new licenses or extending old ones in an environment where an increase in the total quantity of Nuclear Waste Fuel only compounds an already intractable problem. (0454-10 [Waldstein, Joe])

Comment: Your "Nuclear Waste Confidence" is false, and a con game. We already have a mountain of commercial radioactive waste 56 years high, and we don't even know what to do with the 1st cupful! Stop making it! (0460-1 [Qian, Dorothy] [Scott, Emily Elizabeth])

Comment: PLEASE bring nuclear power to a halt! PLEASE stop poisoning our planet and our people and threatening our health and very existence! WAKE UP!! (0462-1 [Windsong, Debra])

Comment: This is TOO dangerous- we must use alternative sources of energy!! (0468-1 [Gill, Susan])

Comment: We need to use safe renewable energy like wind and solar. (0469-2 [Joslyn, Celia])

Comment: Nuclear power plants and their waste are not safe. There can be far better solar and wind power options than are now available, to produce better quality and lower cost electric power than existing equipment. Please see <http://rpm2.8k.com/> and its links, for detailed descriptions and analysis of building-integral solar and wind power installations, and electric vehicles with onboard solar power. (0471-1 [Fradella, Richard])

Comment: The future is that we need to stop supporting and generating these deadly earth killing wastes, has chernobyl and fukashima taught us anything? (0474-2 [Bucklin, Christine])

Comment: Since we have no disposal facilities in operation, we need to stop creating spent-fuel/high-level radioactive waste! (0475-2 [Graham, Candace])

Comment: No new reactor licenses should be issued until there is an operating facility to permanently house deep-geological high-level radioactive waste. (0475-3 [Graham, Candace])

Comment: The NRC has been playing "kick the can down the road" regarding nuclear waste for years and years. It must not be stored in California with the earthquake threats. It must not be stored anywhere near where I live. It is pure poison. My husband was raised in Richmond near the Hanford plant, and he is all too familiar with radioactive waste storage. There used to be two-headed jackrabbits around there and all manner of malformations from all the leaks. And there were several on-purpose releases of radioactivity over the years. Most of his school friends are dead from cancer. Human beings are too fallible to handle the excessive danger of nuclear radiation. Witness all the human errors over the years---those that we found out about the hard way. (0477-3 [Tache, Jan])

Comment: If the NRC and the nuclear industry insist on giving us dangerous, high priced, government subsidized nuclear energy, I believe those in favor of it should be required to live near the power plants and near the storage facilities. This country doesn't want nuclear power. The risks are too high for our planet---as we have amply seen in Japan, in the Ukraine, at three Mile Island, and other problem facilities that haven't been publicized. (0477-5 [Tache, Jan])

Comment: Why is it that we as citizens are told by fastfood restaurants that certain fats are not healthy for us? Because they are bad for us. If there are guidelines for fastfood restaurants then why is there no regulations for Nuclear Power stations? They release radiation into the air each month "Batch releases" yet the general public has no idea on how much radiations is being released. Why? We should know how radiation affects us as citizens. We should have monthly reports on the radiations levels being released each month this is especially true for individuals such as myself who live directly down wind from a nuclear facility. (0478-1 [Higgins, Kevin])

Comment: The planet has been contaminated enough already and future generations have already been subjected to poisoning, we need to stop. (0480-2 [Arnold, James])

Comment: Shut down San Onofre (CA) & All (toxic) nuke plants! (0483-1 [Garvey, Lydia])

Comment: Go Totally sustainable, renewable energy! Your attention to this most urgent matter would be much appreciated by all present & future generations of all species! (0483-4 [Garvey, Lydia])

Comment: The GEIS fails to consider the need to: Cease production of new nuclear waste until safe and secure storage exists. (0490-7 [Chin, Rebecca])

Comment: Anything to do with nuclear waste scares me. (0492-1 [Maghakian, Carol])

Comment: Rule # 1 must be: Make it illegal to produce any more waste. (0493-2 [Davis, Suzanne] [Davis, Tom])

Comment: Now we have proven that the nuclear industry is a huge risk and liability to humanity's survival, instead of the opposite, which is what they claim to be. Where is the nuclear industry solution for nuclear waste? They have none. Where is their solution for preventing a nuclear war? They have none. Where is their solution for preventing meltdowns from whatever reason and then paying to clean up the 25,000 square miles of resulting radioactive wasteland that results? They have nothing. What is your politician doing to protect your family from a major nuclear disaster? Ask them. Send them a link to this article. (Send them a copy of this article, with title and link information included, please.) What is your local emergency planning and disaster preparation official doing to prevent this? Ask them. Send them the article. What is your environmental or animal loving group doing to prevent this from happening? Ask them. Send them the article. What is your legislator doing to prevent this from happening? Ask them. Send them the article. These people all have children and families. They are not safe either, no matter what bomb shelter that they think will save them. Some of these government officials may believe that this disaster will not affect them, as they have a nuclear bomb shelter ready for them. (0498-12 [AGreen Road Project, Anonymous])

Comment: Now we have proven that the nuclear industry is a huge risk and liability to humanity's survival, instead of the opposite, which is what they claim to be. Where is the nuclear industry solution for nuclear waste? They have none. Where is their solution for preventing a nuclear war? They have none. Where is their solution for preventing meltdowns from whatever

reason and then paying to clean up the 25,000 square miles of resulting radioactive wasteland that results? They have nothing. What is your politician doing to protect your family from a major nuclear disaster? Ask them. Send them a link to this article. (Send them a copy of this article, with title and link information included, please.) What is your local emergency planning and disaster preparation official doing to prevent this? Ask them. Send them the article. What is your environmental or animal loving group doing to prevent this from happening? Ask them. Send them the article. What is your legislator doing to prevent this from happening? Ask them. Send them the article. These people all have children and families. They are not safe either, no matter what bomb shelter that they think will save them. Some of these government officials may believe that this disaster will not affect them, as they have a nuclear bomb shelter ready for them. There is only one small problem. This super mega nuclear disaster of 800 nuclear plants and spent fuel pools melting down will go on for tens of thousands of years, with no end. Unless they are willing to live underground PERMANENTLY and forever, they better make some changes happen above ground. No life can survive above ground if all of these plants and spent fuel pools melt down. Very little has changed since Chernobyl blew up and radiated everyone, except that many more nuclear accidents, meltdowns, melt throughs and accidental radiation releases happened, plus way more radioactive substances are now in the air, on the ground and in the ocean as well as inside all of us. (0498-14 [AGreen Road Project, Anonymous])

Comment: We can get ready. Nuclear energy only supplies around 8-9% of the total power required in the U.S. If the nuclear plants can be shut down and the fuel cooled off so that it does not take any power, this 'loss' can be made up by other fuel sources that will keep on working and not blow up or melt down if the power goes out for awhile. Let's fill that small nuclear hole with conservation, clean carbon renewables, grid efficiency, or gas fired plants, which are currently the cleanest of the fossil fuel energy generating plants. https://en.wikipedia.org/wiki/Energy_in_the_United_States; <http://needtoknow.nas.edu/energy/energy-sources/nuclear.php> (0498-4 [AGreen Road Project, Anonymous])

Comment: Today we rely on electricity and technology for everything. We also rely on nuclear power plants, which need to have electricity going to them 24 hours a day, or they melt down. Bottom line, we need to have all nuclear plants turned off and all nuclear material cooled down to the point where there is no power needed to keep the nuclear fuel material cool, or we are all toast. Why is this? (0498-6 [AGreen Road Project, Anonymous])

Comment: They are lying about the risks of nuclear radiation, and making humanity less and less safe, while multiplying risks exponentially through the use of MOX fuel, and lack of preparation for a Carrington Event. (0498-9 [AGreen Road Project, Anonymous])

Comment: I am one of many who strongly believe that drastic measures need to be taken NOW to shut down and end all things nuclear. (0503-1 [Fitch-Johnson, Janet])

Comment: [W]hy are we using this very dirty material to make electricity? It is the most expensive way to generate electricity! It is the most dangerous way to make electricity! We don't have a clue what to do with the Nuclear Waste (Spent Rods) except to pour water on it for the next 100,000 years? Would you want a Nuclear Power Plant in your back yard? You can put Solar Cells and Wind Turbines in my back yard and on my roof! (0504-1 [Howard, Gordon])

Comment: Nuclear materials, radioactive elements kill and cause great suffering Please end extraction and manipulation of radioactive materials, and get rid of all and the wastes safely. There are horrendous deformities, cancers, illnesses, deaths, contamination that has occurred

already and the future looks to be promising more of the same. We can not project into the future how long we can run energy plants, store weapons, etc and contain this radioactivity, some types of which have an alarmingly long half life. Why are we still developing this evil killer? Get rid of all waste and make certain that all of Indian Country soils and waters are cleaned up immediately and all who are suffering from cancers and other radiation effects are compensated and treated. Creating dark karma while in a human body on Earth is in opposition to our true purpose here, which is to walk the harm-free path of the Spirit and meditate upon the light within us. We are always to help, never to create suffering and damage, go against Nature. (0506-1 [Tapp, Yvette])

Comment: Do not build any more nuclear power plants. (0508-2 [Marsh, Kathryn])

Comment: Start closing down all the old nuclear plants (they are all old). (0511-2 [O'Brien, Patricia])

Comment: The damages can be minimized by shutting down all reactors until such time as there is a safe way to dispose of nuclear waste. (0512-7 [Bibb, William])

Comment: Dry casking. Dumping it into the ocean, storing it in nuclear weapons, or just waiting for more Fukus to just let the biosphere suck it up hasn't worked out so well so far has it? Don't all you people have children that you love? Of course you do. Do the right thing, for them. Tell the truth. (0516-1 [Shelton, Matt])

Comment: I am horrified and terrified by the lack of oversight and omissions of the Nuclear industry of contamination of our air, land and waters of nuclear releases and 'leaks'-'controlled' and otherwise. Furthermore, I am extremely concerned about the nuclear waste produced with no viable storage solution. Earth is no place for any nuclear product. Our world has been pillaged and plundered enough! Nuclear is not clean when its byproducts last for many thousands of years and truly never disappears. (0518-1 [Individual, Anonymous])

Comment: All nuclear must end for the sake of our children and theirs and so on who will inherit this disgusting legacy! This includes yours! Nuclear is not cost effective and regardless, be damn the cost. it is time to embrace renewable energy and decommission every nuke reactor in the WORLD. (0518-3 [Individual, Anonymous])

Comment: Until such time that there is a bona fide solution to this difficult problem, it is IMPERATIVE that we do whatever is necessary to eliminate further production of these catastrophically toxic substances. All existing sources of commercial nuclear power must be shut down[.] (0522-2 [Rogers, William])

Comment: The entire nuke industry is terrorism against the world. You are nothing but organised crime. It all needs to stop, immediately. (0523-1 [Hamilton, Richard])

Comment: Consider that any continued leaks of nuke products in the environment is an act of war against all life forms on Earth. There will be no mercy (except for those that help with decommissioning all of the poisonous monsters your industry has created). You and your industry are the most despicable and evil creatures to have ever walked the Earth, by far. Your evil actions will cause the poisoning of planet Earth, nothing in history has ever been so foul and corrupt. The nuke industry is considered the enemy (0523-3 [Hamilton, Richard])

Comment: I feel we have no right to decide that future generations of people will have to take care of our nuclear waste. How is it fair to leave casks of poison for our children's children and their children's children etc to pay for and make sure this poison stays safely contained? (0524-1 [Individual, Anonymous])

Comment: I don't know how anyone in the pro-nuke community can sleep at night knowing how many thousands/millions of suffering children and women you're responsible for. Nukes need to be done with, all together. You've proven you have no clue what you're doing with the energy, no clue how to keep it remotely "clean." You can't manufacture, use, and then store it safely. Get the F out of here. Anything nuke has got to go. Including pro nukers. (0525-1 [Jacobson, Janet])

Comment: Nuclear must be abolished! Think of your own children and grandchildren. All the money in the world cannot save them from this. (0526-1 [Arnott, Melissa])

Comment: Please, enough is enough. Humans have so much potential, this can't be what we were put here to do. Please think of all the innocent people who are suffering tremendously who do not deserve the agony you inflict on them. Please end your insanity. Put something before power, greed and money for a change. Please, we all beg you to do the right thing. Think of the children. (0526-3 [Arnott, Melissa])

Comment: Please do not authorize any new nuclear plants or extend any who's license time is up until you have a safe solution to the storage of nuclear waste! (0528-3 [Brown, Susan])

Comment: Clean Water for North Carolina opposes the licensing of any new reactors based on the Waste Confidence policy[.] (0531-1-17 [Morgan, Sally])

Comment: [Clean Water for North Carolina] calls for a rapid reduction in all nuclear waste being produced, as well as replacement by safe, non-hazardous, non-water intensive, non-carbon sources. (0531-1-18 [Morgan, Sally])

Comment: [W]e urge the NRC to consider a permanent cessation of licensing activities, which would halt the future generation of spent fuel. (0531-1-2 [Morgan, Sally])

Comment: The continued production of nuclear waste, with no safe way to contain or dispose of it, is not an environmentally, economically, or socially acceptable practice. We must stop more from produced. (0531-2-13 [Morgan, Sally])

Comment: [W]e urge the NRC to consider a permanent cessation of licensing activities, which would halt the future generation of spent fuel. (0531-2-2 [Morgan, Sally])

Comment: Clean Water for North Carolina opposes the licensing of any new reactors based on the Waste Confidence policy[.] (0531-2-27 [Morgan, Sally])

Comment: [Clean Water for North Carolina] calls for a rapid reduction in all nuclear waste being produced, as well as replacement by safe, non-hazardous, non-water intensive, non-carbon sources. (0531-2-28 [Morgan, Sally])

Comment: Please discontinue all nuclear power plants and developments. (0536-1 [Jackson, Carol])

Comment: There has been NO PROGRESS IN STORING NUCLEAR WASTES SAFELY in the over 60 years I have been concerned. You have not managed a single safe storage site or disposal program throughout your existence. Cease deceiving yourselves and the public. Since the Fukushima meltdown began, the most serious threat comes from the nuclear storage rods kept at the site because there is no place else. What a stupid program! You must finalize nuclear power production in this country, wind it down successfully at the 100 remaining plants, and continue trying to resolve the waste storage problem. That will keep you in your jobs the rest of your life--if the human species and Earth survive the idiocy you created with your nuclear power delusion. (0536-2 [Jackson, Carol])

Comment: The GEIS fails to consider the need to [c]ease production of new nuclear waste , unless safe, secure & affordable storage exists[.] (0537-7 [Commenters, Multiple])

Comment: The GEIS fails to consider the need to [I]mmediately stop production of HIGH BURN UP waste[.] (0537-8 [Commenters, Multiple])

Comment: Nuclear facilities should be shut down, and stop creating waste for which there is NO SAFE DISPOSAL POSSIBLE. (0539-2 [Luttinger, Lionel])

Comment: Nuclear energy is entirely counterproductive, because the multibillion dollar disassembling of this most dangerous and filthy form of energy, is never figured into the cost, and disposal is a huge problem and an expensive one. NUCLEAR ENERGY CANNOT BE MADE SAFE IN THE AGE OF EXTREME WEATHER AND SUPER STORMS. The shoreline plants are in grave danger of releasing their very extremely lethal poisons and toxins. We need clean renewable energy now to survive on our planet. There is NO SUCH THING AS SAFE NUCLEAR ENERGY, except in very small nuclear generators that if they fail or drown will not send out huge lethal amounts of radioactive materials. The large plants are obsolete and insane ideas and the NRC is too full of people in the industry to be truly objective. The NRC is full of special interest minded regulators, and we the people all know it. It has been all over the press, as well. (0539-5 [Luttinger, Lionel])

Comment: Second, no industry should be allowed to continue creating waste that it has no ability to dispose of. The waste generated by nuclear power are the most toxic known to humankind, and remain that way forever. The NRC therefore must insist that all nuclear reactors stop operations, and deal with the waste that has already been created. Third, the NRC should not issue new reactor licenses, nor grant license extensions to old operating reactors. (0543-3 [Senkiw, Sheryl])

Comment: Furthermore, the NRC should be empowered and expanded to protect the citizens of the USA from the radioactive nuclear waste that already exists, and to do everything possible to keep more from being created. (0543-5 [Senkiw, Sheryl])

Comment: The direction the NRC is taking with low-balling regulatory considerations for "dealing with" high-level radioactive waste is shamefully remiss in terms of priority number one. Nuclear energy is NOT a viable option to continue to supply our vast energy needs in today's civilization because it cannot be done safely. The organization who I represent is now in an effort to stop what is considered to be low-level radioactive waste to be ignored (through recent regulation that has deregulated shale waste stream TENORM materials to NORM) and dumped in open landfills in the state of Ohio. This issue is dwarfed by the issue we are here for tonight...the issue of high-level radioactive waste, so dangerous that we cannot even figure out how to dispose of it, and what place it has in our society. (0546-2 [Pace, Gregory])

Comment: If we reach into our hearts, transcendent to the place where our everyday dealings have created vested interests in maintaining status quo on this issue, we all can see that there really is no place for more radioactive waste in our society where human safety is the number one priority. Therefore, we must focus our energy and efforts on shutting down the nuclear power industry and putting the resources we have been using to support this industry into fully renewable energy methodologies now. Germany is doing it, Denmark is doing it, as are other countries. The dinosaurs were killed off by an outside force...we do not want to become the dinosaurs who killed themselves off. (0546-3 [Pace, Gregory])

Comment: There is a consensus among the U.S. government and the nuclear industry for more than 60 years that withdrawn spent fuel rods are lethal unless shielded. To continue to produce them and intend to abandon them into the biosphere (deep underground dump) is profoundly immoral and a burden and a curse on future generations into eternity. It is premeditated murder. (0552-1-2 [Macks, Vic])

Comment: There is a consensus nationally and internationally among government agencies, the nuclear industry, and those who opposes it that spent reactor fuel rods are lethal if not adequately shielded and that that risk continues up to millions of years. The opposition is to the government/industry continuing to produce spent fuel; not adequately and safely managing it; deferring to the financial interest of the nuclear industry, not the safety of the public; and intending to abandon spent fuel into the biosphere instead of shielding it and monitoring it forever. The struggle is also over who pays for this debacle: the public not the industry. Humans are the only species that would fatally soil its own nest and seems determined to do so for the right short term profit. (0552-3-6 [Macks, Vic])

Comment: Get a clue from Germany. Shut down nuclear power reactors and stop building more. (0559-3 [McCoy, Dave])

Comment: And then stop making it! (0563-2 [Songchild, Stephanie])

Comment: How could anyone support nest pooping ? Using nuclear power with all its consequences is nest pooping. The fact that I have to take this action is obscene in itself. How dare that men are playing their retarded, life hostile greed and dominance game even with an energy form that is lethal and uncontrollable, once released ?! How dare and insane ! And now - like the wizards student - they don't know what to do with the deadly demons they have created. If I would have been asked in the first place, never would I have agreed to create and use nuclear power !!! (0564-1 [Meincke, Doro])

Comment: No, I don't want its waste in my backyard. I want all reactors being shut down, all nuclear systems being dismantled... (0564-2 [Meincke, Doro])

Comment: This is a global issue. We only have this wonderful planet to sustain us. Nuclear energy and its handling is an issue of Life or Death for the whole planet, for all life. My heart is broken into a mangled mass to witness the catastrophe happening in Fukushima, especially the coma when it comes to applying solutions. How dare I have to write this letter ! How dare you let it come to this point ! (0564-4 [Meincke, Doro])

Comment: Please put me in the camp of favoring immediate shut down of all nuclear facilities, other than waste handling and warhead decommissioning. Yes, even if this causes brownouts or workplace changes, or shared housing during cold snaps. It is too perilous, and always has

been. What a scary mess that is sure to catch up to us, that all of the profiteers and sparkly eyed physicists have created. (0565-1 [Saxon, Craig])

Comment: In the U.S. reactors have been granted extensions to operate far beyond their useful lives, and beyond design capacity. Our air and aquifers are being contaminated; billions of gallons of water containing dangerous tritium are allowed to enter waterways and our coastal areas. (0566-3 [Tocornal, John])

Comment: Nuclear generated energy as it is currently implemented is dangerous, to say the least. In the best of times neglect and malfeasance have led to many radioactive releases. In a disaster---e.g., Three Mile Island, Hanford, Chernobyl, Fukushima---the effects are deadly and long-term, industry and government coverups notwithstanding. In a worst case scenario---a repeat of the major solar storm that produced the Carrington Event of 1859, which is inevitable in our dynamic universe---it will be an ELE (extinction level event), because there will be NO way to maintain hundreds of nuclear power plants worldwide in cold shutdown with continued cooling of the fuel rods. To continue with nuclear fission folly is genocidal and suicidal. There are alternatives to energy production and we must go ahead with research and development while sparing no expense to secure the byproducts of our dangerous flirtation with atom splitting. (0570-1 [Boosinger, Marilyn])

Comment: We need the actual location for the deep repository NOW as we have actual waste NOW.. and until we find the actual location...then we need to STOP creating more waste and using nuclear fuel. (0571-3 [Young, Jane])

Comment: The risks associated with nuclear power are too great to continue. Here in the Downwinder state of Utah we have first-hand experience of fallout on human health. It would be in the best interest of the health and safety of all people of the United States and the world to follow the leadership of Germany's Angela Merkel and begin the process of decommissioning all U.S. nuclear reactors. Obviously the Fukushima disaster sets a new high for the devastating consequences of nuclear power and the need to responsibly dismantle the nuclear industry. (0573-3 [Gerhart, Dan])

Comment: Please, Think you can't clean it up!! Just Stop Now ! I am a victim I had Thyroid Surgery Please Think This stuff will end the world if you keep going Oh and how old are they would you drive a 40 year old car ? We are to take care of the Earth not Kill Her ! What did 3/11/2011 show us we may be all done anyway Think ? Yes many KNOW.... Thank You..... Great Job So Far.....NOT !!! What is that 104 Dirty Bombs man made or other wise ? Just saying we could have a9.0 or other something or other same as Japan get Smart Be For Its Too LATE Dam IT (0575-1 [Duke, George])

Comment: I prefer a full life for the future children of the world, and all that is offered are agendas of disease and death. PTB, why is this? The only sane course for people that prefer life over the status quo is to shut all npp's down and begin an Apollo Project into alternative means of energy production and remediation. Doesn't anybody love their children anymore? (0577-1 [Beane, Gary])

Comment: NRC documents released under FOIA dated March through May of 2011 clearly indicate the severity of the Fukushima Daichi disaster. This event was supposedly was mathematically impossible; it nonetheless occurred. It could occur in the U.S. Please stop creating nuclear waste. We cannot store waste without signing our death warrant, if it is not already too late due to Fukushima. (0581-1 [Rohl, T.])

Comment: NO NUKES. (0581-3 [Rohl, T.])

Comment: I think we, as a nation, should reconsider nuclear power. There are many lessons to be learned from Fukushima and I'm very concerned that it appears that the NRC is a captive of the nuclear power industry. The NRC should be working for the people who depend on their overseeing of the corrupt power companies, who are in business to make money and for no other reason than that. The whole concept of nuclear power is flawed as it will lead to the extinction of most complex living animals including humans. What a legacy to leave your Grand Children, if they survive. In ten (10) years every family will be fighting cancer in multiple family members, and that is just from the nuclear disaster in Japan that has spread radiation all over the world. (0582-1 [Sugas, Zick])

Comment: Please, shut down this whole nuclear industry that is poisoning our planet. An "I told you so" moment in the future will be too late. Please. Please, do the right thing now on this issue. (0582-2 [Sugas, Zick])

Comment: Nuclear power is touted as a clean, efficient alternative to fossil fuels and other alternatives (wind, solar). The problem with nuclear power is that the issue of accidents, the regular releases of radioactive isotopes during a plants operation, and nuclear waste is handled as if the public and taxpayers are elementary children. Accidents are regularly covered up: eg. Santa Susana http://en.wikipedia.org/wiki/Sodium_Reactor_Experiment. Investors won't touch nuclear plant construction and insurance because the liabilities are so massive Cleanup is either socialized, or in the case of Fukushima, doesn't happen at all because TEPCO-the operator-is too concerned with profits. So instead of looking for the nuclear fuel melting through the reactor right after the accident on March 11, 2011, instead the core is permitted to melt down and poison the entire world. <http://enenews.com/iaea-expert-molten-core-is-suspected-to-have-penetrated-containment-no-water-was-injected-for-28-hours> The press doesn't cover the largest industrial accident in mankind's history because they are told not to. That is the only explanation for the sparse coverage. Radiation testing stations are shut down after the Fukushima accident because the governments don't want to protect their people. Yet, prospective recycling technologies by scientists like RM Santelli is swept under the rug using heavy handed tactics: <http://nuclearwasterecycling.com/> (0586-1 [Taylor, David])

Comment: Why? So it is as if our 'leaders' have been given a choice of nuclear power or life on earth, and have chosen nuclear power without consent of the people. Cancer rates are skyrocketing, background radiation has increased significantly the last 30 years. Tritium is regularly released by plants and is linked to diabetes. Downwinders have higher cancer incidences. If nuclear power was truly cheap then the profits from cheap power would easily pay for cleanups. Instead Somalia has radioactive tides, Hanford is contaminating aquifers and the DOE wants to put nuclear waste in silverware. Only an insane person could reasonably continue to pursue this strategy. A small number of people are triggering genocide. The end of the human race is possible with the bioaccumulation of all the nuclear waste that is already released into the environment. (0586-2 [Taylor, David])

Comment: The lessons still to be learned from the ongoing Fukushima catastrophe should shockingly awaken us all to the fact that there is no such thing as "safe nuclear power". We have no control over the heaving of the tectonic plates, not to mention our vulnerability to unpredictable "terrorist" attacks. I have heard that the super hot fuel rod waste is too hot to handle and does not have a known responsible safe method of long term storage. What are we going to do with this exaggerated outcome of that which was marketed to us so long ago as "cheap" and "safe" power generation? Local building officials require that we anticipate the 100

year flood zones before we can build a barn. What is the 1/2 life of this radioactive waste? How long will it be before we are assuredly safe in our own neighborhood? (0589-2 [Broska, Robert])

Comment: Just remember, this was all sold to the American taxpayers as 'TOO CHEAP TO METER'. Not to mention how safe Nuclear would be. Just go ask the people of Japan how safe they feel! (0590-2 [Anonymous, Scott])

Comment: Eventually, such waste is disposed of in unconventional ways for lack of better words and common people suffer the consequences unknowingly. We are destroying the planet, and mutations are forever. Every single nuclear plant is a sitting duck, an easy target for terrorists and prone to too many failures that are quietly reported. We are not ready to harness such power and even less capable of managing the waste it generates. If you love life, your family, your children, your brother, your neighbor, your land, you would consider a less dangerous and more costly efficient source of energy. (0596-2 [Shima, Tetsuo])

Comment: I have been a committed anti-nuclear weapons activist for over 31 years and only recently have included anti-nuclear power activities. I understand many connections between nuclear weapons and nuclear power plants and none of them are good or healthy. (0597-1 [Bergier, Kim])

Comment: No nuclear power plant should be operating another day until the highly toxic waste can be dealt with truly safely for the rest of time. (0597-3 [Bergier, Kim])

Comment: I have been a committed anti-nuclear weapons activists for over 31 years and only recently have included anti-nuclear power activities. I understand many connections between nuclear weapons and nuclear power plans and none of them are good or healthy. (0599-1 [Bergier, Kim])

Comment: No nuclear power plant should be operating another day until the highly toxic waste can be dealt with truly safely for the rest of time. (0599-3 [Bergier, Kim])

Comment: In lieu of the recent nuclear disasters locally and globally suggestions regarding the concerns of the storage of past, current and future waste bi-product from these facilities can no longer be tolerated in "Except-able" measure and exit strategy from nuclear energy must be designed and an alternative in to action. This is life. With out life, you have no current life or a future. (0600-1 [Riddle, William])

Comment: All nuclear power plants are crimes against humanity and planet Earth and so is all the waste from these plants. Here are my recommendations for where nuclear waste should be buried with confidence: - On the lawns of the White House. - In the yards of all the Congresspeople, past and present, who voted for nuclear power plants. - In the yards of all the owners, past and present, of nuclear power plants. - In the yards of all the lobbyists past and present, for nuclear power plants. - In the yards of the entire NRC, past and present. I hope some day we will have Nuremberg Trials for all the people who are responsible, past and present, for nuclear power plants, nuclear waste from these plants, and those talking about the waste of nuclear power plants as if it were something you could safely deal with and dispose of with confidence - instead of noting that it is a crime against humanity and planet earth. Nuclear power plants and their waste are murdering generations of our children. Their blood is on your hands. (0602-2 [Parks, Sheila])

Comment: I endorse the overall official positions and sentiments of ATHF3, NIRS (Nuclear Information and Resource Service), and Beyond Nuclear. (0603-1 [Schonberger, David])

Comment: Re: "shift in consciousness;" I currently live in Ann Arbor, Michigan -- home of the University of Michigan Department of Nuclear Engineering, which, much like the NRC, desperately needs a fundamental shift in consciousness and an existential redefinition of mission and purpose. It is abundantly clear to me that our whole society needs a new perspective as we proceed with determining how to meet our electricity needs. With a renewed ecological connection and sense of humility, gratitude and reverence for the web of life on Earth, we would certainly see nuclear energy in a different way. We would notice and care that there are much safer, cleaner, more efficient and more economical ways to meet our energy needs than the egregiously irresponsible and highly unethical, so-called "nuclear option." In fact, energy production is a clear example of the disproportionality and unsustainability of resorting to the "nuclear option." (0603-24 [Schonberger, David])

Comment: Furthermore, significant advances in energy efficiency technologies (accomplished with relatively limited investment resources), renewable energy systems, and innovations in energy transmission, storage and distribution make it completely unnecessary and strategically-flawed to continue to pursue nuclear fission as a part of our energy portfolio. It is a travesty that anyone would perceive nuclear power as a solution to global climate change, and even the so-called "baseload" argument for pursuing nuclear power is now outdated. Therefore, the so-called "all of the above" strategy for energy sourcing represents a grave and historic mistake and an undeserved gift to the nuclear industry -- a gift that is grossly inconsistent with the most recent and best available science as well as best-practices rules of accounting and long-term planning. Ominously, on a national level, the best thinking seems to have been disregarded for the sake of political expediency. Thus, my "active hope" (read Joanna Macy) is that a People's Movement will emerge from a grassroots process of listening to each other, and, together, we will act responsibly and forthrightly for the sake of the future of all life on this planet. (0603-26 [Schonberger, David])

Comment: Given the recent overwhelming rebuke of the NRC by the Federal Court of Appeals of the DC Circuit (New York v. NRC, June 2012), I believe that a thorough reexamination is warranted of the viability and sensibility of perpetuating a lawful existential role for nuclear fission in this society. (0603-4 [Schonberger, David])

Comment: In the meantime, the NRC should indefinitely extend the current moratorium on all major licensing actions and relicensing decisions. In good faith, the NRC should defer to the anticipated and pending legal challenges initiated through the Federal Court system by multiple states and organizations representing millions of U.S. persons, American citizens and residents. Anything less than all of the above would be appallingly irresponsible. (0603-7 [Schonberger, David])

Comment: Your fixation on commercial nuclear power apparently prevents you from learning the most important lessons. Since the dawn of the Nuclear Age the long list of nuclear accidents and events that either released, or came very close to releasing massive amounts of radiological contamination into the biosphere has continued growing. Without being encompassing, among the events on this list that should be teaching people to reduce and phase out nuclear power instead of embracing it are: Chalk River in Canada in 1952; Kyshtym in the Soviet Union in 1957; Windscale in the UK in 1957; Enrico Fermi near Detroit in 1966; Lucens in Switzerland in 1969; Surry Unit 2 in Virginia in 1972 and in 1986; Browns Ferry in Alabama in 1975 and in 1983; Three-Mile Island in Pennsylvania in 1979; Saint Laurent des

Eaux in France in 1980; Chernobyl near Kiev in 1986; Sosnovy Bor near St. Petersburg in 1992; Tokaimura in Japan in 1997 and in 1999; Davis-Besse in Ohio in 2002; Mihama in Japan in 2004; Fleurus in Belgium in 2006; Fukushima Daiichi in Japan in 2011. (0608-1 [Crocker, George])

Comment: Now, almost three years after the catastrophe at Fukushima began and still continues unabated, destroying ever widening ecosystems throughout the Pacific and spewing ever increasing amounts of radiation into global ecosystems, disrupting food-chains and eroding in multiple dimensions the very institutional controls that NRC staff blithely assume will be in place into the dimmest distant future, you have still learned nothing. Instead, with unmitigated gall you present this Draft Report, as though the malignant belief-system that possesses the commercial nuclear industry is absolutely true, lofty, and unassailable. Your madness has unleashed Hell on Earth, and your firm intent is to license and permit more activities that visit radiological damnation upon every ecosystem on the planet. (0608-4 [Crocker, George])

Comment: Immediately stop production of High Burn Up Waste. (0611-52 [Shapiro, Susan])

Comment: The answer from the nuclear industry and the NRC is always the same, it will be different next time. But the only reliability the nuclear industry has to offer is continually break promises and bust budgets. It is time for the NRC and the nation to acknowledge nuclear power is a science experiment that has gone very wrong. (0611-59 [Shapiro, Susan])

Comment: Since there is not solution for the nuclear waste already produce we must stop making more unmanageable high level radioactive waste. Only a fool keeps repeating a mistake over and over again. (0611-60 [Shapiro, Susan])

Comment: Even with more humane character, disasters happen, even with great minds. The Challenger and Columbia spacecrafts come to mind. These are huge undertakings that were engineered by the best minds of the world. The best scientists failed. The young engineers of Exelon, I assure you, are NOT the best minds of the world, since the best minds are working at Apple or at Caltech or some other interesting place. Were they the best minds around, they would not be running nuclear power plants, because truly, who the hell wants to do that. And given that they are NOT the best minds in the world, I fear what judgments they will make with regard to nuclear safety. (0612-6 [Takarabe, Tamae])

Comment: I wholeheartedly support the stand taken by Mother's for Peace members at the recent meeting in San Luis Obispo. I also, believe the person who recommended using the land for safer forms of sustainable energy, such as: wind machines, using the ocean for hydro power, etc. was on the right track. We need to be moving away from dangerous nuclear power plants and their volatile waste material and using all of our creativity to provide clean, sustainable energy. Our country's focus needs to be on providing a safe, pollution free environment -helping to halt global warming as quickly as possible for the welfare of the peoples of our planet. (0613-2 [Blake, Elisabeth])

Comment: Once the economic and environmental realities are acknowledged, it becomes possible to assess whether the "intractable" problem of storing ever-increasing quantities of spent nuclear fuel is best solved by not making any more in the first place. (0616-3 [Hoffman, Ace])

Comment: The reality is, there is no reason on earth to continue with a "technology" that threatens life itself; the definition of "technology" should be "tools, created by humans to make their lives more livable." In reality, the nuclear "industry" and nuclear "technology" is destroying

life. This is not a helpful industry, this is destructive industry based on false science. (0617-2 [Zure, Lisa])

Comment: I firmly believe that no industry should be allowed to continue creating wastes it has no ability to dispose of. In fact, I do not believe in any industry that creates more toxic waste. As stated before, this is destructive industry based on false (or incomplete) science. The truth is, neither the nuclear industry nor the Federal Government has an operating spent-fuel/high-level radioactive waste disposal facility in operation. Further, there is no "safe" method for disposing of nuclear waste. Therefore, it should not be allowed to manufacture any more of these wastes. NRC should not be allowed to issue new reactor licenses, nor grant license extensions to old operating reactors ever. (0617-3 [Zure, Lisa])

Comment: Some have suggested that a permanent, deep-geological high-level radioactive waste disposal facility be built and fully operational to deal with existing waste. But in any case, there is no justification to continue to create more nuclear waste. Ever. (0617-5 [Zure, Lisa])

Comment: The nuclear "industry" and US government and other governments clearly do not know how to deal with the fallout of disasters, much less the ongoing waste product of an overpriced and inefficient energy industry that has proven itself, time and time again, to be ill-conceived. (0617-7 [Zure, Lisa])

Comment: As a U.S. citizen, mother and professional, I am appalled that my government is involved in such a dangerous, unmanageable and out-of-control industry. Nuclear was a bad idea from the start, and now the waste problem will haunt us for generations. We can do better. (0617-9 [Zure, Lisa])

Comment: The reality is, there is no reason on earth to continue with a "technology" that threatens life itself; the definition of "technology" should be "tools, created by humans to make their lives more livable." In reality, the nuclear "industry" and nuclear "technology" is destroying life. This is not a helpful industry, this is destructive industry based on false science. Nuclear technology is not compatible earthly biology. Nuclear waste can be made safe, It can not be stored safely. (0621-2 [Casebier, William])

Comment: All nuke activity must cease, and full disclosure of all the health dangers that REALLY occur need to be disclosed. (0623-1 [Individual, Anonymous])

Comment: Then Three Mile Island happened in 1979, I believe. I began reading and writing letters about the insanity of nuclear power. I read many of Dr.Caldicott's articles. She became one of my heroes. Along with Louis Leakey and Jane Goodall. I heard Dr. Leakey speak at the University of Colorado in 1972. He said he was only speaking to college audiences any more because the way he saw it was that the future of mankind was solely in our hands. What we did with protecting and caring for our earth would mean either man and other life forms lived or we very likely would see the end of the human species. (0625-2 [Mandrell, Rebecca])

Comment: I believe every single nuclear power plant needs to be immediately shut down. (0625-6 [Mandrell, Rebecca])

Comment: Dry cask all spent fuel and close all nuclear plants, as they are old. (0626-1 [Individual, Anonymous])

Comment: Consequently, the only solution that one can contemplate is the closing of all nuclear power plants in the U.S.A. and an absolute prohibition on building any new ones. (0628-6 [Perkins, V.E.])

Comment: If Fukushima-Daiichi does not clearly show that nuclear energy is too dangerous for human beings to manage (and the utterly inept behavior of Tepco after the tsunami illustrates this), then it is entirely likely that we should give the human race the Darwin Award. (0628-7 [Perkins, V.E.])

Comment: We are too arrogant and stupid to survive on a fragile planet that is already under considerable stress from the depredations of globalized capitalism. Last, what gives the present generation of humans the right to poison this planet hundreds of thousands of years into the future for all future generations of human beings and creatures to come. Unethical is far too weak a word for our current selfishness, arrogance, and stupidity. (0628-8 [Perkins, V.E.])

Comment: Preferably you would shut down all reactors in the United States, most are very old and the risk of melt becomes higher each year. If real data on Fukushima were made available to Americans, these reactors would be shuttered immediately. Do you people have a soul? (0630-2 [Anonymous, Jeff])

Comment: Nuclear energy is a 20th century product. We need 21st century ideas. Warren Buffet just spent 1 billion on wind in Iowa. It made economic sense. Wind is a safe, clean energy that does not leave harmful waste for 10's of 1000's of years. Is there a message here?? (0633-7 [Kurz, Carol])

Comment: Albert Einstein observed that nuclear fission is a hell of a way to boil water. Even he could not have imagined the hell about to wreak havoc on the northern hemisphere from Fukushima (actually, it already is). (0635-1 [Bernhoff, Eric])

Comment: Let it be recognized that if there is no informed confidence as to handling of nuclear waste it is insane and immoral to continue making nuclear waste. The intractable problem of storing ever-increasing quantities of spent nuclear fuel is best approached by not making any more of it. (0640-2 [Geary, B.])

Comment: If the costs associated with disposal of nuclear waste are so great as to make nuclear power inefficient, we must find another source of power. I favor renewables. To these inefficiencies we must add physical health consequences in the (unavoidable, because they will happen!) accidents. (0643-1 [Schulte, Karen])

Comment: You see we have reached a critical point....it IS in your back yard too now! It IS going to be your children dying! Just like the rest of the world, if you continue to allow production it IS going to effect you and all of the world. IT ALREADY HAS AND YOU HAVE SEEN THIS! Now are you going to be part of the problem that continues or are you going to be part of the solution that says no more! We can no longer afford to utilize this Nuclear Waste and we certainly can not afford to store it because there is no man made container that can isolate and keep any isotope from doing harm. Since the containers will eventually leak there WILL BE MORE HARM and instead of continuing in such way I use my vote to find another better way! Each one of you have this option. How do you think your children would want you to vote? (0645-2 [Britz, Joan])

Comment: ANA supports limiting future nuclear waste generation, including a phased closure of commercial nuclear power plants. As long as the amount of commercial SNF continues to

increase, storage capacity must continue to expand in tandem, and the final amount of waste requiring disposal is unknown. Without knowing the scope of the problem, effective solutions cannot be fully implemented. (0646-14 [Hanson, Courtney])

Comment: Frankly, as high as the stakes are in regard to nuclear waste storage, we do not feel we can trust the industry, nor do we feel we can trust the regulators. And at its heart, we do not trust the technology itself. We are making a deadly mess that will last so far into the future that it can scarcely be imagined and leaving it for generations whose technological skills and societal framework, we cannot hope to predict. We have already gone too far. (0648-14 [Price, Scott])

Comment: We must stop now and begin to seriously come to grips with the damage we have already done. (0648-15 [Price, Scott])

Comment: APV [Alliance for Progressive Values] believes that as currently established the nuclear industry in America and elsewhere constitutes a technological dead-end and a very dangerous one at that. Our first and best option as a society should be to transition as quickly as possible away from nuclear fission based energy production and towards clean and renewable sources like wind, tidal and solar. We believe that these resources coupled with gains in efficiency and conservation can eventually solve our dependence on fossil fuels and dangerous nuclear power. Fission reactors generate high-level, deadly waste as a necessary part of their operation, the sooner we begin the process of decommissioning old reactors and replacing them with clean renewable energy sources, the better. The technology to replace nuclear and fossil fuels exists today; it is merely a matter of defying the culture of entropy and greed that currently guides our energy policy. (0648-2 [Price, Scott])

Comment: We already have an enormous radioactive waste storage problem; we do not need to make it worse by adding more. (0648-3 [Price, Scott])

Comment: The only thing we can do to reduce the harm caused by so much production and storage of nuclear waste is to stop producing it. (0653-1 [Kraskian, Jessica])

Comment: Despite how much profit is involved for your self-regulating business, nuclear power is obsolete and the risks greatly outweigh the benefits. Better technology for clean energy is improving every day. We could easily power the world with wind and solar if industries like yours would stop suppressing their development and deployment. Stop creating a toxic wasteland out of the only planet we have, the only planet your children and their children will be growing up on. (0653-2 [Kraskian, Jessica])

Comment: The problem with nuclear energy is the disposal of waste. That has not and will not change. We need to stop producing nuclear energy and focus on clean energy with waste products that can be safely disposed of. (0656-2 [Bonney, Mary])

Comment: Kathy C posted on the internet important ideas to consider: [The commenter posted remarks found on articles at <http://guymcpherson.com/2013/01/climate-change-summary-and-update/> and <http://guymcpherson.com/2013/06/savanna-louise-rose-omalley-mcpherson/#comment-79334>] (0657-1 [McClintock, Francene])

Comment: I don't care if the industry goes bankrupt. Though this would be an economic crisis it pales in comparison to the humanitarian crisis that would rest on your shoulders! Have some guts! (0658-2 [Jennings, Stephanie])

Comment: Cease production of all nuclear waste. (0660-10 [Headrick, Gary])

Comment: Close down all nuclear power plants starting with Mark I and Mark II's and all plants using salt-water. (0662-1 [McClintock, Francene])

Comment: Close down the nuclear industry. (0662-12 [McClintock, Francene])

Comment: Plants should be closed to allow for fuel to start cooling. (0662-3 [McClintock, Francene])

Comment: Nuke plants during normal operation release radionuclides into the air, water and land and we, as a race, are dying because of it. Nuke plants are not "green energy". Sorry Senator Alexander but you are wrong. Please read Dr. Helen Caldicott's book, Nuclear Power Is Not The Answer and educate yourself. To power our 21st century we need renewables. (0662-6 [McClintock, Francene])

Comment: There is no solution to containing nuclear waste. Stop making it now. (0663-2 [McClintock, Francene])

Comment: A nuclear power plant, on the other hand, is a very different type of "bridge." When they fail, as we have seen in Chernobyl and Fukushima, they cause massive devastation for decades, possibly centuries, with an ever-increasing number of dead and suffering. From my understanding, we build nuclear power plants for only two reasons: to generate electricity, or to build nuclear weapons. Proponents of nuclear power will argue that they are less harmful to the environment than coal plants. This argument is ridiculous, and anyone suggesting this simply needs to look at the mining operations where uranium is gathered, or the island of Japan, to see what can happen when things go terribly wrong. (0670-1 [Anonymous, Brian])

Comment: The bottom line is that if we want to contain the situation as best we can, it is imperative that we shut down and dismantle the remaining nuclear power stations immediately. What's worse than one nuclear power plant spewing radiation into the environment? Two nuclear power plants spewing radiation into the environment! (0670-3 [Anonymous, Brian])

Comment: And who's idea was it to build a nuclear power plant on fault lines along the ring of fire, anyway? One day I may have to explain to my grandchildren why greedy politicians and power companies built toxic power plants that have the capacity to destroy all life on earth, and I'm not looking forward to that day. (0670-4 [Anonymous, Brian])

Comment: Shut them down! Shut them all down! End this ridiculous idea that we can somehow control what cannot be controlled. Yes, all nuclear power plants are "safe," until they fail and rapidly become "unsafe." (0670-5 [Anonymous, Brian])

Comment: Nuclear plants should be immediately shut down & decommissioned since we lack the knowledge, honesty, & resources to handle them safely. The on going disaster at Fukushima & our own problems with Hanford plus the TMI accident should be enough evidence to move us in this direction (decommissioning). (0671-3 [Conley, Pam])

Comment: No more additional waste should be created until existing on-site stored waste is all safely transported to a permanent storage location. The threat of a spent fuel pool losing coolant and/or power for pumping is just too great to allow the current practice to continue. No additional operating licenses should be issued or renewed until this problem is solved. If we need to pay higher electrical rates because of this so be it. (0676-1 [Individual, Anonymous])

Comment: Nuclear fuel, spent and otherwise is antithetical to life. The human race and the companies responsible must stop producing this toxic poison. There is no way to store it safely, though all in our power must be done to do so, while we research ways to "deactivate" it. Stop all production NOW this is the only sane and reasonable answer for the future. (0677-1 [Individual, Anonymous])

Comment: In the meantime, know that geologic, atmospheric and many geopolitical conditions are changing rapidly and there is no way to responsibly think that projections based on past relatively stable conditions can apply to the future... just notice big earth quakes, intensifying storms, geopolitical unrest, economic collapses, all around the world. The time is now or never. STOP NUCLEAR. It is not the answer, it is the lid on the coffin. (0677-2 [Individual, Anonymous])

Comment: Taking a cold, hard look at the economic and environmental realities, it becomes quite clear that the "intractable" problem of storing ever-increasing quantities of spent nuclear fuel is best solved by refraining from producing any more of these toxins. (0679-4 [Sorgen, Phoebe])

Comment: Fukushima proves what will happen if we continue running nuclear reactors until they break. Loss of lives, land, income. If there are more Fukushima-scale calamities, which is quite likely, perhaps our entire habitat will be lost. I recall learning in 6th grade biology class that survival of the species is the most basic of instincts. The human species' most basic instinct and common sense have been usurped by blind greed. The NEI's bias in favor of the nuclear industry which funds it is egregious. Public safety must come first! If you do not yet understand this, Nuclear Regulatory Commissioners, I beg you to come to your senses. (0679-5 [Sorgen, Phoebe])

Comment: Instead, we need to explore which scientifically feasible future technologies have the potential to provide needed power and that help us comply with our obligations to protect our home, the earth, and to future generations better than nuclear power. Traditional approaches to cost analysis and risk assessment should include the moral non-acceptability of nuclear technology and the risks it poses. Intergenerational justice should be included in this analysis. The fact is that nuclear energy has been imposed on the human race as an ongoing social experiment. Moral issues such as the long term risks and feelings of responsibility for future generations need to be taken seriously and not dismissed from the debate in denial. (0686-10 [Malboeuf, Simone])

Comment: High-level nuclear waste is the inevitable end result of nuclear energy production. The waste will remain radioactive and/or radiotoxic for at least 100,000 years. It is estimated that the total amount of high-level nuclear waste in the world today is between 250,000 and 300,000 tons. The amount of waste increases daily. This needs to stop. This is not intergenerational justice. (0686-11 [Malboeuf, Simone])

Comment: Radioactive waste is hazardous to all living organisms and exposure to radiation may result in death, incurable disease, as well as mutation of the genetic code. The security standards are based on theoretical assumptions, as humanity has no previous experience to build on with regards to radioactive waste. In Europe there is a security standard of 100,000 years for the min. period that the waste must remain isolated from all living organisms. In the US it is 1,000,000 years. Is it moral for our generation to leave this legacy for our children, their children and all future generations? I THINK NOT! (0686-13 [Malboeuf, Simone])

Comment: I believe it's time for the experiments with nuclear power on the human race and inhabitants of earth to cease. We already know the answer - it costs too much, the risks are too great. How much should be sacrificed for the profits of the share holders of the corporation? (0686-15 [Malboeuf, Simone])

Comment: At the November 20 NRC meeting in San Luis Obispo, the NRC representative openly expressed the idea that the radioactive waste generated at Diablo would need to stay there until the Federal government established a repository in the US. This is a big lie. At this time, there is no such place and no concrete plans to build one. The standard of the nuclear power industry is to keep the waste on site. There are no completed repositories for radioactive waste in China, Japan, the United States, France, Germany, Canada or anywhere else in the world. How much waste does PG&E expect to store there over the lifetime of this plant? I am greatly concerned that the NRC representative at this meeting was blatantly perpetuating this lie. As a representative of NRC, he appeared to have no scruples. How can the public trust the NRC with representatives like this? The NRC knows this and is perpetuating the LIE that there will someday, in the near future, be a place for radioactive waste to be shipped to and "safely stored" for eternity. This is done to placate the audience into not objecting more strongly than they already are, so the NRC representative can get through the meeting and pretend the audience is in agreement with the plans to continue operating Diablo Canyon Nuclear Power Plant as usual. Even if there was such a place, or many of them in the world, the concept of storing unlimited amounts of radioactive waste for unconceivable lengths of time is absurd and irresponsible. It is morally wrong for the nuclear power corporations to create this highly toxic and destructive waste and plan to "dispose" of it in the earth. It is also wrong for the corporations to reap the financial profits and give them to stock shareholders who keep them for their own families while subjecting the families of 99.9% of the population on the earth to the negative affects of the waste of their business. It is wrong to leave the problem of what to do with the radioactive waste to future unborn generations. They will not have use of the electricity (it has already been used). They will not share in the profits made from its generation. They should not be forced to bear the burden of dealing with the waste products produced and the effects they have on the environment of their homes. (0686-16 [Malboeuf, Simone])

Comment: When we produce nuclear power, we are depleting a non-renewable resource (uranium) taken from the earth, that will eventually not be available for future generations. When we turn it into fuel rods that are spent, we create non-disposable waste that needs to be dealt with as it is highly radioactive and dangerous. Therefore, from an intergenerational justice point of view, the process of building and operating nuclear power plants is inherently unethical. (0686-8 [Malboeuf, Simone])

Comment: In addition to these comments, I would like to add to the record the following resources: My Nuclear Free Zone: <http://www.SilverNightingale.com/nuclear.html>: Nuclear Free Music: My "No Nukes Swing", "Sakura", "Salute to the Sun" and more: <http://www.cdbaby.com/Artist/LauraSuetheSilverNightingale>. I have free download cards and song sheets available for "No Nukes Swing", for those who would like to share or perform this song. I hope you will take the time to listen to "No Nukes Swing", as it is a thoughtful and sincere statement in song of my views on the use of nuclear technology, whether in the form of nuclear plants or weapons. (0687-1 [Wilansky, Laura])

Comment: I was born in 1952, so have been living with the threat of nuclear energy for my whole life, for as long as I can remember. Although the dropping of atomic bombs on Hiroshima and Nagasaki was unspeakable, I believe the ongoing nuclear catastrophe at Fukushima poses the greatest threat to the future of life on Earth that we have ever seen. After Fukushima, it is

clear that nuclear energy is just way too dangerous, and it's impossible to either prevent, or clean up nuclear accidents. The very future of life on Earth is threatened by use of this form of energy! One accident, equipment malfunction, operator error, or terrorist attack at a nuclear plant could literally mean the end of life on Earth. If Fukushima did not convince you, and you still think it can't happen, just think about that little O-Ring on the Challenger. I live in Florida and these things are very present with us here, as they are with us all. (0687-2 [Wilansky, Laura])

Comment: Nuclear plants are so dangerous even Wall Street won't invest in them, and they'll invest in almost anything, no matter how risky! The halt on licensing new plants should be made permanent. (0687-4 [Wilansky, Laura])

Comment: With so many truly clean, safe, renewable and sustainable technologies now available and in development, there is no reason to build new nuclear plants, which will only drain much-needed resources from full development of better, safer technologies. We will get much better value and results from investing in solar, wind, geothermal, and other truly safe and renewable technologies. (0687-5 [Wilansky, Laura])

Comment: And we should not be making more nuclear waste. I urge you to end licensing and relicensing of all nuclear plants, and shut down all currently-licensed nuclear plants. As I mentioned, I live in Florida. Others have spoken about Turkey Point - that's my local nuclear plant - and the current and proposed plants, and nuclear waste at Turkey Point WILL be underwater in the foreseeable future. It's time to end the use of all nuclear power, and as discouraging as it may seem at times, we must keep working to find better ways to keep nuclear waste safe. (0687-9 [Wilansky, Laura])

Comment: The Sierra Club supports sustainable energy alternatives that do not harm the environment. The Sierra Club opposes nuclear power because its fuel cycle from uranium mining to spent radioactive fuel poses grave dangers to the environment. In addition, reliance on nuclear power unjustifiably delays the beneficial transition to clean and renewable energy sources. (0688-1 [Taylor, Wallace])

Comment: Furthermore, our old nuclear plants have outlived their lives and parts and also endanger our nation and should be shut down. The problem is there is no safe depository. We don't even run fuel efficient plants in this country. (0690-4 [Eisman, Val])

Comment: France is now grappling with nuclear waste removal and the ocean has become a dump site and repository which is destroying it and endangering a needed source of food. (0690-5 [Eisman, Val])

Comment: More than a half century ago, our government sold the public on the promise of "atoms for peace" and electricity that would be "too cheap to meter." At the time, there was fascination with our technological capability and as a result the government assured the public that nuclear waste would be a very simple problem to solve. Today we have created approximately 70,000 tons of highly radioactive used nuclear fuel, and there is nowhere to dispose of it. By 2050 we will have twice that amount if we continue to operate our existing nuclear reactors, even if we build no new nuclear reactors. This quantity does not even include all the high level nuclear waste that is being handled by government agencies, especially the Dept. of Energy, at hundreds of sites across the country. Nuclear Waste is the "Achilles Heel" of the Nuclear Industry. Each plant produces tons of extremely radioactive fuel. After 40 years of operation, a reactor can have 1,200 tons or more of this relatively useless, but lethal fuel stored on site. The long term management of nuclear waste is costly. It must be isolated from humans,

their water and food supply, animals and the natural environment. A few decades of power creates waste that is hazardous for more than a million years. This situation is clearly unsustainable over the long term. There is no safe dose of radiation. Radiation causes cancer and mutations in DNA, thus having the potential to impact the viability of future generations. (0693-1-2 [Warren, Barbara])

Comment: The truth is that Nuclear Energy is unconscionably dangerous. Remember the fairy tale about the Emperor's Fabulous New Clothes--and the fact that he was really nude. We'll that the story of nuclear power--except that usually nudity does not kill. (0695-2 [Fast, Wendy])

Comment: Please do not give licenses to anymore Nuclear Reactor Power Plants. (0696-1 [Becker, Joanna])

Comment: The only solution to the problem of nuclear waste is to stop making more. The Waste Confidence rule doesn't move national policy toward that solution, quite the opposite, it strives to find a waste policy that will allow the NRC to license new reactors and create more of the same problem. Putting communities at risk. (0700-2 [Women's Action for New Direction, Georgia])

Comment: The radioactive material must be rendered into a low radioactive safe material. Every effort must be made to advance making Radioactive Material a low level radioactive material and safe for all life on the planet. I do not have any confidence in the ability of any nuclear scientist to be able to make nuclear material safe. The NRC and the Nuclear Industry must stop making any more enriched uranium material for nuclear power on the planet. That includes weapon grade nuclear material. (0701-19 [Wilson, Greg])

Comment: The NRC has many years of work to do mothballing the nuclear power industry. (0701-20 [Wilson, Greg])

Comment: It is unethical and immoral for our government to allow the continued creation of deadly wastes, some of which will be dangerous for nearly a million years. We have no technology for making these wastes safe; indeed, such a technology may well prove impossible. If so, these wastes must be isolated from the biosphere virtually in perpetuity. This is an impossible task for fallible humans, so we can only expect more and more radioactive poisoning of the earth. "Hope" is not a strategy! We already have more radioactive waste than we can deal with, and our nuclear reactors keep creating more. Therefore, NRC must shut down all reactors soon as possible, and not license or build any more. The electricity we currently generate by nuclear power can be replaced by the existing technology of efficiency and renewables, without the risks of relying on dirty, dangerous, and expensive nuclear power. (0702-2 [Scarff, Steve])

Comment: The safe storage and perpetual vigilance of high level nuclear waste is a grave matter that must be addressed seriously with a care for the distant future, and not by people with the attitude of "You'll be gone and I'll be gone." (0702-5 [Scarff, Steve])

Comment: AND THEN, further answering, I read that the NRC is involved in developing yet untested nuclear material and ... oh, boy, where will this expansion take, except, once again, we have the problem with the present reality, Fukushima is STILL at an emergency state with no solution in sight, and all of our existing projects have serious ecological issues that this Waste Confidence Rule taps dances around by saying all the wonderful things developing in the nuclear industry. AND YES, wonderful ideas and projects, absolutely fascinating!!! BUT, NO! This Industry is GROUNDED! Until someone cleans their room, they are not able to work on that new science project. Common defense, common sense, common goals. "SAFETY FIRST"

with any and all science projects, and most definitely with the nuclear facilities within the regulation of the government. The Court's have said that, right?! That's what I thought was the Court's reason in this whole rethinking idea we are doing, right?! But, maybe I'm wrong. I've been wrong before! (0703-12 [Vandel, Nikohl] [Vandenberg Clermont, Elaine])

Comment: Stop all the nuclear power plants, which is what it seems like we are doing; Stop the mining, looks like that is also being restored (at least in our nation), Just STOP! Now breathe. Again. Breathe. Again. Breathe. We do not know how to contain nuclear waste. We do not know how to store it so it does not harm our natural environment because every environment we put it into it irreparably alters and changes that environment. We have plenty of #spentnuclearwaste to practice on, to reclaim, to recycle, to use up, to facilitate the rest of our learning curve. A moratorium on the #GlobalNuclearIndustry should be called for UNTIL full #fukushimacontainment.**#commondefense#Fukushima#NuclearFirstResponseTeam#DiabloC anyonNuclearFacility#spentnuclearwaste#GlobalNuclearIndustry#fukushimacontainment *in working on this problem, and being so new in this nuReg game and now jumping back into dialogue having left it for a while, I found that there was no common ground except the one that I saw. (0703-7 [Vandel, Nikohl] [Vandenberg Clermont, Elaine])

Comment: If there is no "waste confidence" it is inappropriate to continue running nuclear power plants and creating nuclear waste. (0705-2 [Spring, Janet])

Comment: Once the economic environmental realities are acknowledged, it becomes possible to assess whether the "intractable" problem of storing ever-increasing quantities of spent nuclear fuel is best solved by not making any more in the first place. (0709-3 [Wythe Elnagar, Romij])

Comment: Does NRC as an institution, and the NRC staff as an individual recognize the very real situation that it has created: material that would not be on this planet but for the licenses to engage in atomic fission that will persist as a hazard for hundreds of thousands of years, capable of causing cancers, deformities and other genetically--regulated malfunctions? (0711-25 [Olson, Mary])

Comment: They need to focus on securing the waste, NOT making more of it! (0712-2 [Schimmelpfennig, Pamela Y.])

Comment: We must evaluate phasing out nuclear reactors in the near future[.] (0712-3 [Schimmelpfennig, Pamela Y.])

Comment: 70,000 metric tons of commercial high level nuclear waste have been created thus far, with no long-term storage solution in sight. This is an unacceptable failure in safety for the public and environment. It's high time to stop adding to this waste. (0712-5 [Schimmelpfennig, Pamela Y.])

Comment: Albert Einstein also informs us "To the village square we must carry the facts of atomic energy. From there must come America's voice." The people have spoken. Stop making it! Cease and desist. Stop making it period. Do not relicense, do not license new ones. You don't know what to do with what you have. (0713-11 [Keegan, Michael J.])

Comment: To continue to generate high level nuclear waste among the most toxic and lethal poisons known to mankind are crimes against humanity and crimes against the future. (0713-6 [Keegan, Michael J.])

Comment: Please enter into the record this testimony by Dr. John Gofman which further articulates how the generation of nuclear power and waste constitute violations of the Nuremberg Principles. Dr. John Gofman (Ph.D. in nuclear-physical chemistry and M.D.) Nuclear Power: A Simple Question[.] Many people think nuclear power is so complicated it requires discussion at a high level of technicality. That's pure nonsense. Because the issue is simple and straightforward. There are only two things about nuclear power that you need to know. One, why do you want nuclear power? So you can boil water. That's all it does. It boils water. And any way of boiling water will give you steam to turn turbines. That's the useful part. The other thing to know is, it creates a mountain of radioactivity, and I mean a mountain: astronomical quantities of strontium-90 and cesium-137 and plutonium—toxic substances that will last—strontium-90 and cesium for 300 to 600 years, plutonium for 250,000 to 500,000 years—and still be deadly toxic. And the whole thing about nuclear power is this simple: can you or can't you keep it all contained? If you can't, then you're creating a human disaster. You not only need to control it from the public, you also need to control it from the workers. Because the dose that federal regulations allow workers to get is sufficient to create a genetic hazard to the whole human species. You see, those workers are allowed to procreate, and if you damage their genes by radiation, and they intermarry with the rest of the population, for genetic purposes it's just the same as if you irradiate the population directly.[27] So I find nuclear power this simple: do you believe they're going to do the miracle of containment that they predict? The answer is they're not going to accomplish it. It's outside the realm of human prospects. You don't need to discuss each valve and each transportation cask and each burial site. The point is, if you lose a little bit of it—a terribly little bit of it—you're going to contaminate the earth, and people are going to suffer for thousands of generations. You have two choices: either you believe that engineers are going to achieve a perfection that's never been achieved, and you go ahead; or you believe with common sense that such a containment is never going to be achieved, and you give it up. If people really understood how simple a problem it is—that they've got to accomplish a miracle—no puffs like Three Mile Island—can't afford those puffs of radioactivity, or the squirts and the spills that they always tell you won't harm the public—if people understood that, they'd say, "This is ridiculous. You don't create this astronomical quantity of garbage and pray that somehow a miracle will happen to contain it. You just don't do such stupid things!" (0713-7 [Keegan, Michael J.]

Comment: Licensing a nuclear power plant is in my view, licensing random premeditated murder. First of all, when you license a plant, you know what you're doing—so it's premeditated. You can't say, "I didn't know." Second, the evidence on radiation-producing cancer is beyond doubt. I've worked fifteen years on it, and so have many others. It is not a question any more: radiation produces cancer, and the evidence is good all the way down to the lowest doses. The only way you could license nuclear power plants and not have murder is if you could guarantee perfect containment. But they admit that they're not going to contain it perfectly. They allow workers to get irradiated, and they have an allowable dose for the population.[28] So in essence I can figure out from their allowable amounts how many they are willing to kill per year. I view this as a disgrace, as a public health disgrace. The idea of anyone saying that it's all right to murder so many in exchange for profits from electricity—or what they call "benefits" from electricity—the idea that it's all right to do that is a new advance in depravity, particularly since it will affect future generations. You must decide what your views are on this: is it all right to murder people knowingly? If so, why do you worry about homicide? But if you say, "The number won't be too large. We might only kill fifty thousand—and that's like automobiles"—is that all right? . . . (0713-8 [Keegan, Michael J.]

Comment: People like myself and a lot of the atomic energy scientists in the late fifties deserve Nuremberg trials. At Nuremberg we said those who participate in human experimentation are

committing a crime. Scientists like myself who said in 1957, "Maybe Linus Pauling is right about radiation causing cancer, but we don't really know, and therefore we shouldn't stop progress," were saying in essence that it's all right to experiment. Since we don't know, let's go ahead. So we were experimenting on humans, weren't we? But once you know that your nuclear power plants are going to release radioactivity and kill a certain number of people, you are no longer committing the crime of experimentation—you are committing a higher crime. Scientists who support these nuclear plants—knowing the effects of radiation—don't deserve trials for experimentation; they deserve trials for murder.....The only solution is, you must stop all efforts to develop first-strike force solutions everywhere—whether they be nuclear or other—and move toward a more just society. Even if you made an agreement to abolish all nuclear weapons, but you left established power structure in the U.S. and the USSR, they'd go on to research mind control or some chemical or biological thing. My view is, there exists a group of people in the world that have a disease. I call it the "power disease." They want to rule and control other people. They are a more important plague than cancer, pneumonia, bubonic plague, tuberculosis, and heart disease put together. They can only think how to obliterate, control, and use each other. They use people as nothing more than instruments to cast aside when they don't need them any more. There are fifty million people a year being consumed in a nutritional holocaust around the world; nobody gives a damn about starvation. If fifty million white Westerners were dying, affluent Western society would worry, but as long as it's fifty million Third World people dying every year, it doesn't matter. In my opinion, what we need is to move toward being nauseated by people who want to be at the top, in power. Can you think of anything more ridiculous than that the Chinese, Russian, and American people let their governments play with superlethal toys and subject all of us to these hazards? The solution is not to replace one leader with another or to have more government. Society has to reorganize itself. The structure we have now is, the sicker you are socially, the more likely it is that you'll come out at the top of the heap. (0713-9 [Keegan, Michael J.]

Comment: I, for one, do not have confidence that currently existing nuclear waste poses no threat to public health and safety. (0719-4 [Hibbard, Angela])

Comment: I insist that ending radioactive waste generation is the single most important step we can take to minimize the risks surrounding its storage, and the NRC should revise its Waste "Confidence" document to ensure the speediest possible end to that generation. (0719-6 [Hibbard, Angela])

Comment: Stop this insanity of licensing nuclear power plants when there is no safe way to dispose of radioactive nuclear waste! (0721-1 [Headington, Vince])

Comment: I live in Illinois, which is home to more nuclear reactors than in any other state. The more I learn about reactors, their operation, their impact on communities, the more I realize the sacrifice that my family and community are being asked to make for the enrichment of an industry that is dishonest, and sadly by government officials that are pawns of a hugely powerful lobby. This is an industry that is propped up by loan guarantees and taxpayer subsidies, not by Wall Street. Any decisions being made by DOE, the NRC, Congress, and even the President are compromised by limitless dollars infused by the nuclear power industry. This is about politics, not science. If science were paramount, there is no way on earth that nuclear power would prevail over truly clean energy development like wind and solar. (Apparently, not enough campaign contributions being made by those folks.) The public has been lied to since the get-go on the most basic question of safety. It is as though Fukushima never happened. But it did. And 4 of the same model reactors are the reality for my state. Mishaps at Illinois' reactors are

commonplace occurrences. We are repeatedly told that tritium leaks are benign. They are not. (0722-1 [Headington, Maureen])

Comment: The fact is that there is no safe level of radiation. Stop making it. Stop licensing it. Stop relicensing it. STOP! (0722-7 [Headington, Maureen])

Comment: More modern technologies and methods such as solar, wind and energy conservation all offer utility scale environmentally preferable alternatives. The price of solar power plants continues to fall. Already solar power plants on a utility scale have fallen to just above \$1 per watt, making them cheaper to build and operate than nuclear facilities – so much cheaper, in fact, that the cost savings covers the grid scale storage infrastructure necessary to accommodate such improvements. Advances in battery efficiency, reliability and life cycle, most notably sodium-sulfur and zinc-air batteries, can make a solar power plant into a 24/7 base load solution. The same applies to wind energy sources. Reliable grid-scale storage solutions are now offered by reputable companies using proven technologies. These companies include GE, NGK and Fluidic Energy. Even more accessible than new sources of generation is the single most affordable source of untapped energy in the nation: conservation. If every building in the country were improved with even the simplest of efficiency measures, then the whole fleet of existing nuclear power plants could be taken offline. Why are we even considering building new nuclear power plants? Let us spend our money, time, and intellect more constructively. (0724-6 [Gamble, Dan])

Comment: Cease production of all nuclear waste. (0728-8 [Anonymous, Anonymous])

Comment: At least please shut down the producers of this waste so we will not create any more. (0729-2 [Wolpoff, Deborah])

Comment: No industry should be allowed to continue creating wastes it has no ability to dispose of. If you have no place to dispose of radioactive spent fuel, STOP MAKING IT! The NRC should not be allowed to issue new reactor licenses, nor grant license extensions to old operating reactors. (0730-2 [Lawhorn, Larry])

Comment: The cost to the American taxpayers for solar energy is one fifth that of nuclear energy. No American state is a waste dump! (0730-3 [Lawhorn, Larry])

Comment: Waste needs to be dealt with and if you can't, you have to stop making it. Perhaps in the future there will be a scientific rather than geologic solution in which man can neutralize the deadly by-products of nuclear fission. Until that time, you need to suspend all nuclear power plant operations and stop creating more waste. Nobody really has a clue as to what to do with it other than hope, pray, believe that nothing will happen to start a radiological release. (0734-3 [Hisasue, Carole])

Comment: You've asked everyone to have "confidence" that you'll find a permanent solution to the nuclear waste problem when the first power plant went into operation in the mid-50's. Decades later, you are asking us again to believe that you will find one in 60 years. What faith do we have? None. Yet without a solution in place, you continue to allow power plants to remain in operation, creating more waste. The TEMPORARY answer to this problem is to stop making more waste! And then, we need to find a permanent solution to the radioactive waste that has already been created. (0734-4 [Hisasue, Carole])

Comment: Beyond the waste issue, the nuclear industry is fraught with too many hazards that have the potential of an enormous catastrophic disaster. We need to phase out not only nuclear power but the entire industry and I realize this goes against what the NRC is here to do, but it seems like you are coming up with inadequate solutions to keep the industry (including yourselves) going. You keep talking about the "lessons from Fukushima" but are you paying attention? The real lesson is that we cannot afford nuclear power -- it will be our undoing. The only reason why the entire world is not in a panic over the continuing catastrophe in Fukushima is that we cannot "see" radiation. There are no photos or videos like those of an oil spill so it's easy for some to ignore. What we have is a whole lot worse and if one could see it, the nuclear power industry would be dead by now -- nearly 3 years of the ongoing situation at Fukushima. It's just not worth it. Invest in renewable, clean energy. Conserve. Be smart. And, most importantly, keep the planet viable for humanity. (0734-7 [Hisasue, Carole])

Comment: If there is to be a hope for our children and by the power of all that is loving and good help now to free the planet and our children from a nuclear death sentence. Reject all permits unless they are for shutting down nukes permanently. No state or country or sea or outerspace is a dump for toxic waste. Lets all end the waste. (0735-2 [Velazquez, Lisette])

Comment: "Eternal vigilance" seems quite outside of any reasonable expectation for human institutions and the hazardous lives of high level radioactive wastes. Perhaps the more important question is whether it is morally appropriate to produce more of such wastes, dangerous for hundreds of millennia, if one cannot reasonably expect such eternal vigilance. At the end of the day, that is what is at issue in NRC's proposed Waste Confidence Rule and associated environmental review. (0738-20 [Hirsch, Daniel])

Comment: Our society reaps the benefits of these atomic power plants: roughly fifty years of electricity. But thousands of generations to come may pay the price if even a small fraction of the radioactive waste contaminates water, soil, or air over the time period for which it is dangerous. We get fifty years of power; they get 500,000 years of radioactive waste. Yet those who may bear the burden of our mistakes neither will have benefited from the power nor had any say in the decisions that may so severely impact their environment. Those who will be adversely affected have not yet been born. They cannot submit comments on draft environmental impact statements or proposed rulemakings; they cannot vote for elected officials who set policy and appoint or confirm key decision-makers; they cannot file suit in an effort to defend their interests. The choices we make today can harm in grievous ways many, many generations to come who will have had no voice in those hugely impactful decisions. (0738-3 [Hirsch, Daniel])

Comment: No nuclear waste stored in California - the earthquake state. No Fukushima. Please think about the future of our children and our planet. Don't you have grandchildren? (0740-1 [Gordon, Michelle])

Comment: Cease production of all nuclear waste. (0741-5 [Giese, Mark M.])

Comment: We ! Demand the shut down of all 104 nuclear plants and facilities and all 1000 globally. Begin with a plan with this focus for the sake of ALL Life on Earth. (0744-11 [Bonniwell, Colleen])

Comment: Keep minds and Hearts open to all life. These truths are age-prepared. Give direction to the future! Make good use of CONSCIENCE. (Emoto's Science on Water is a good study for pre science nuclear physics-for HOPE!) Protect the Water! (The Great Lakes)!!!! and

all water sheds - Recover the waters from all poisons! Protect the Air and Lands! Protect All Life! I am an anti nuclear activist who, on the front line - suffered a Hit! and will not be detered as Life Precious Life of Earth is Extremely Challenged! Consider the True Cost of Nuclear Power! (0744-12 [Bonniwell, Colleen])

Comment: No new nukes, no uranium process or mining, no interim waste sited, no transport of nuclear waste, secure nuclear waste, no nuclear waste from other countries. No more nukes. Shut all down. Plan NOW! NO NUKES! (0744-13 [Bonniwell, Colleen])

Comment: Protect the Children and their future, our future! Do not let us become Slaves to this POISON! Protect the land, water and the future - our safety and future! And Freedoms. There is your example. I admitted and corrected my mistake in this testimony. (humbly). Please know LOVE is the mindbomb! Nuclear waste - the only "enclosure" we can secure! Remember what got us all here and gave us everything we all have ever had - have- or will have, and that takes us back....."Our Common Mother Earth! is Sacred." "In art work, native people sometimes make 1 mistake and it is that mistake, a proff of authentisity, and where the spirit comes through the work!" ! NO FREE PASSAGE ! of WASTE! STOP MAKING MORE WASTE! NO STATE IS A NUCLEAR WASTE DUMP. (0744-15 [Bonniwell, Colleen])

Comment: STOP making nuclear waste. Set a NEW CLEAR example to the International Community. Approach an International Uranium Mining Moritorium. No new licenses for nuclear plants (?). SECURE the waste. Protect the land and water, all life and the Future. (0744-5 [Bonniwell, Colleen])

Comment: My mother told me not to eat the snow when I was 3 1/2. I loved to eat the snow. So I asked why can't I eat the snow? She said "because its radioactive." I asked whats radioactive. She said "it comes from the big boom!" This was my first memory. Now at 62, I remember 3MI (79) and PI (79) and Chernobyl (86) and have researched Hanford. (And the MOVIES...."The China Syndrome," "Godzilla," "Chernobyl Hearts", and "Into Eternity," AND TRIVE the Movie! (And I am Mohican!) (0744-8 [Bonniwell, Colleen])

Comment: Immediate Total Conversion Now ! Ca IOUs are bankrupt just like 10 years ago with Enron. This is because of the full costs of nuclear waste. To hell with them Solar Cal now Immediate Total Solar Conversion by 2020 of California..... (0746-1 [Eder, Harvey])

Comment: Our children's safety must be a priority over industry profit. There is no place for grossly inadequate storage of lethal nuclear waste in our children's future. Do not put our children, our families, our future at risk! It is time for truly clean energy. Cut your losses and change your tack. (0747-1 [Olson, K.])

Comment: Shut down nuclear reactors[.] (0748-1 [DeLano, Harry])

Comment: The existence of nuclear power generation plants and their nuclear weapons and all of their deadly associated waste must be pulled out of production. All nuclear power plants in these United States according to former NRC Chairman, Gregory Jaczko should be closed and DE-commissioned. (0750-1 [August, Bernard])

Comment: As a Japanese origin, I know the lie of propaganda: "Nuclear energy is safe and clean." From uranium mining to nuclear waste, all the process will spread radioactive nucleus into environment and to all the creatures. (0751-1 [Temlock, Ayumi])

Comment: Immediately decommission all the nuclear power sites and fund for sustainable energy. (0751-3 [Temlock, Ayumi])

Comment: People do not believe that the NRC Radioactive Waste Policy is sufficient to assure safety; therefore, the reactor licensing moratorium must be made permanent. (0752-1 [Abdro, Ann])

Comment: 70 years into the Atomic Age, and 55 years into commercial nuclear power, and still no deep geologic repository; no permanent, safe location or technology has yet been found to isolate this radioactive waste from the biosphere; it's high time you stop making it! (0757-1 [Lynch, Laura])

Comment: [I believe the NRC must:] Cease production of all nuclear waste! (0757-16 [Lynch, Laura])

Comment: I believe no industry should be allowed to continue creating high level radioactive waste (HLRW) that it has no ability to dispose of. Since neither the nuclear industry nor the Federal Government has an operating spent-fuel/high-level radioactive waste disposal facility in operation, it should not be allowed to manufacture any more of these wastes. Since you have no place to dispose of radioactive spent fuel why are you still allowing 100 atomic reactors across the U.S. to continue churning out 2,000-3,000 metric tons (2,200 to 3,300 tons) of HLRW yearly? This is in direct contradiction to your obligation of safety first for the wellbeing of people and the environment. (0757-17 [Lynch, Laura])

Comment: There is no safe nuclear power! Please stop this madness! Government intervention is very much needed to contain what we can and shut down all the rest of the nuclear industry! (0760-1 [Brefeld, James])

Comment: I believe that no industry should be allowed to continue creating wastes it has no ability to dispose of. Since neither the nuclear industry nor the Federal Government has an operating spent-fuel/high-level radioactive waste disposal facility in operation, it should not be allowed to manufacture any more of these wastes. The first Rule of Holes is: when you find yourself in the bottom of a hole, STOP DIGGING! If you have no place to dispose of radioactive spent fuel, STOP MAKING IT! (0763-2 [Freeman, Susan])

Comment: In California we need bomb-proof, earthquake-proof, environmentally sound nuclear waste disposal sites in remote locations far from populous cities. Otherwise, we need to decommission nuclear power plants until we have the technology to create such storage facilities. (0767-2 [Harris, Kate])

Comment: Fukushima is poisoning the world as we speak, so I wish you would dismantle all of your nuclear plants today and make the world a safer place. We can live with blackouts while solar comes online, but we will die from cancer if we continue to use nuclear. It's just not worth the risk. Didn't your mother ever teach you not to take unnecessary risks? Come on and do the right thing for a change!!! You owe it to yourself and to your children. It's the ultimate no-brainer. (0768-1 [Mazzocco, Kevin])

Comment: If there is no such facility existing, the waste should never have been created in the first place. The benefit of electricity generation was small, considering that there is no shortage now without the plant running. The risk should something go wrong is devastating. (0770-3 [Maher, Ed])

Comment: And why are you still approving new nuclear plants when you have not been able to find permanent safe storage for spent fuels from over 100 nuclear plants. (0771-2 [Carlton, Paul])

Comment: I feel bad when I think about all the risks for our health and all life on earth because of the nuke plants and their long lived and toxic waste. (0773-1 [Dupont, Alice])

Comment: I think it's better to stop all the nukes on earth as soon as possible and store the waste in several places, in small amounts and not too far deep in the ground. Mox should be forbidden immediately ! (0773-3 [Dupont, Alice])

Comment: Cease production of all nuclear waste. (0774-10 [Revilla, Oscar])

Comment: The reality is, there is no reason on earth to continue with a "technology" that threatens life itself; the definition of "technology" should be "tools, created by humans to make their lives more livable." In reality, the nuclear "industry" and nuclear "technology" is destroying life. This is not a helpful industry, this is destructive industry based on false science. (0775-2 [Zure, Lisa])

Comment: I firmly believe that no industry should be allowed to continue creating wastes it has no ability to dispose of. In fact, I do not believe in any industry that creates more toxic waste. As stated before, this is destructive industry based on false (or incomplete) science. The truth is, neither the nuclear industry nor the Federal Government has an operating spent-fuel/high-level radioactive waste disposal facility in operation. Further, there is no "safe" method for disposing of nuclear waste. Therefore, it should not be allowed to manufacture any more of these wastes. NRC should not be allowed to issue new reactor licenses, nor grant license extensions to old operating reactors ever. (0775-3 [Zure, Lisa])

Comment: As a U.S. citizen, mother and professional, I am appalled that my government is involved in such a dangerous, unmanageable and out-of-control industry. Nuclear was a bad idea from the start, and now the waste problem will haunt us for generations. We can do better. (0775-5 [Zure, Lisa])

Comment: We'd all do best to put away every nuke facility. We found out it isn't worth the risk. Please act and vote accordingly, in the public interest. This is why you have your job. (0777-1 [Individual, Anonymous])

Comment: The conflicted NRC has become a lackey of the industry it is supposed to regulate. Nuclear power only exists as a spinoff from the bomb makers, bombs being a product the world is trying to get rid of and cannot live with. So, the NRC is putting short term profits and long term extinction before the health of 7.2 billion people including their own families! What does that say about priorities? Nearly 40% of new energy now comes from clean, cheaper, more quickly deployed and safe, decentralized renewables. Nukes are soon to be history as that cannot compete even if they were non-lethal, which they aren't. The market, common sense and morality all rage against the monster that is the split atom. (0779-1 [Richardson, Don])

Comment: Do your job: stop nukes now, no more wastes which have contaminated the world forever, no more terrorist threats of instant death by bullies like the US who want the world NOW, against all reason and sanity. (0779-2 [Richardson, Don])

Comment: When I was a child I heard on TV that the nuclear waste would be shot out to space or to a dead planet, no problem. Being a child I believed it. Now to my horror I find out just how many nuclear plants there are and that the fuel is just stored nearby and piling up over the

years, just waiting for some natural disaster or human trip up to bring us all deadly radionuclides to our back doors, in our kids sandboxes and to breathe in construction areas, when lawn mowing and a plethora of other activities that might stir up dust. Not to mention getting in our food and water. Let us not go down in history, providing someone is left alive to read it, as the civilization that destroyed themselves for greed. These are death machines and their excreta, their waste, will contaminate the earth for thousands of years. (0780-1 [De Lacey, Carol])

Comment: Please build no more of these and get the greatest scientific minds to come up with a solution to make this waste safely stored away until such time as we know how to safely dispose of it. It is unconscionable to continue running the plants creating more waste, increasing the probability of mass annihilation. (0780-2 [De Lacey, Carol])

Comment: Enough Already ! Shut them down !! (0784-1 [Earl, David])

Comment: Cease production of all nuclear waste. Make it so! (0789-5 [Salto, Don])

Comment: I believe that no industry should be allowed to continue creating wastes it has no ability to dispose of. Since neither the nuclear industry nor the Federal Government has an operating spent-fuel/high-level radioactive waste disposal facility in operation, it should not be allowed to manufacture any more of these wastes. (0791-2 [Mierzwicki, Tony])

Comment: It is time for the world to move toward renewal sources of energy and to stop using the most dangerous source-nuclear power. The ongoing, uncontrolled disaster in Fukushima is convincing evidence of this. (0792-1 [Soto, Carol])

Comment: It is time for the Nuclear Regulatory Commission to shut-down and decommission all operating nuclear plants in the United States. (0792-2 [Soto, Carol])

Comment: If we are looking for confidence in our nuclear waste management, then we should consider the above historical lesson as we plan our escape from the nuclear waste quagmire. We should do the right thing. We cannot allow a repeat of Fukushima on our own soil. (0801-2 [Magyar, Michael])

Comment: I support the Washington DC court of Appeals for speaking the truth, I support the moratorium on licensing and re-licensing of all nuclear power plants in the United States. You have no right to create this burden for our future generations. You have no right to threaten our health and safety and the health and safety of the Pacific Ocean. Stop producing waste immediately. (0811-5 [Paulsen, Carol])

Comment: It is shocking that this has been going on for 60 or more years and that nuclear energy project continue to be designed, and built and new designs are being developed, new experiments worked on. Millions, billions and more being spent sometimes the facility never being operated, never producing any electricity with citizens, tax payers, paying for them. (0813-2 [Thomas, Ruth])

Comment: Rather than go on with more of the same type of examples of faulty decision-making, I'll close with the reminder of the Generic fact about nuclear materials of the nuclear industry. These sources of man-made radiation are and have been exposing human beings, animals, and plants for more than 60 years, and the released radioactivity remains here and its damaging effects are cumulative. (0813-4 [Thomas, Ruth])

Comment: Close Diablo Canyon and stop making any more toxic waste for future generations to have to deal with. (0814-2 [Foley, Nancy])

Comment: The logical conclusion is to stop making more spent fuel, remove as much as possible as soon as possible from storage in pools, and recognize that dry casks, while better than pool storage, are not an adequate plan. (0815-10 [Gunter, Keith] [Izant, Carol])

Comment: Continuing to create a waste stream which must be isolated for thousands of years, long after current institutions have disappeared, is irresponsible and should be stopped as quickly as feasible. (0821-13 [Paddock, Brian])

Comment: I am a citizen of the US, I come asking you to hear my words today and think upon your own families. How would you feel to see your child drink water contaminated with nuclear waste? How would you feel to know you set a plate of food before your child and it was contaminated with nuclear waste but you had nothing else to feed them even though you know they will surely get sick and possibly die. I want each one of you to think about this because you are educated people. You have been informed of how "we can safely store nuclear waste" yet each one of you read the news or watch it then turn your head. You know of the thousands of animals dead from this waste, the high rise of cancers in the areas of storage wherein your "safe nuclear waste storage facility" leaked or the nuclear plant that failed caused so much death and destruction to all people and animals, and the land is no longer safe to even walk upon. You see we have reached a critical point....it IS in your back yard too now! It IS going to be your children dying! Just like the rest of the world, if you continue to allow production it IS going to effect you and all of the world. IT ALREADY HAS AND YOU HAVE SEEN THIS! (0822-1 [Soldier, Wolf])

Comment: In retrospect, continuation of the creation of grave and lethal radioactive wastes without a specifically identified and known end-point where it would safely end was clearly irrational. It is time to stop this irrational behavior. It is time to stop sabotaging the survival of humanity itself. It is time to admit transparently the errors caused by lack of facts and faulty thinking in the past. It is time to admit the solution does not exist. It is time to stop wishful thinking. It is time to get out of irrational denial mode that is sabotaging the very survival potential of humanity itself. We must immediately implement the Precautionary Principle. (0823-12 [Michetti, Susan])

Comment: Using tools that continue to permit societal denial of reality is irrational. These adverse impacts to safety of humanity and environment are not only man-made, but unnecessary and extremely financially expensive when safe, economic alternatives for energy exist-solar and wind. It is not rationally feasible to continue generating the most lethal substances on earth without any way to permanently isolate and contain them for their full cumulative lifetimes. These dangerous radioactive isotopes must be kept away from exposure to the full environment and humanity. (0823-24 [Michetti, Susan])

Comment: By extension of this corollary, it is unacceptable to allow creation of nuclear waste's ionizing isotopes that can't be safely stored, disposed, discarded, or abandoned without unacceptably interfering with the environment we need to survive as well as our ability to reproduce with well-being and health. (0823-5 [Michetti, Susan])

Comment: No industry should be allowed to continue creating wastes when that industry has no ability and solution for which to dispose it. When we have no safe place to dispose of radioactive spent fuel, it is irrational and crazy to continue making it. A safe permanent, deep-

geological high-level radioactive waste disposal repository, or a safe solution to dispose safely of all the waste, should be required rationally before any new reactor licenses are issued or any license extensions are approved to old operating reactors. However, overwhelming evidence exists against the possibility for a safe place to contain the ionizing isotopes. No known solution has been found. (0823-59 [Michetti, Susan])

Comment: The irrationality occurred approving the first nuclear power plant license. This irrationality was continued through decades of unacceptable accumulation of extremely dangerous waste from 103 nuclear plants without any safe disposal. As the nuclear plants atrophy and operations close, we are now faced with dangerous piles of this lethal waste all over the USA without a safe solution anywhere. We must get out of denial, formally admit that we have a serious problem, and put that problem in its appropriate place at the top of the decision tree where it will become the top priority in terms of scientific investigation and study. (0823-63 [Michetti, Susan])

Comment: It is irrational, or insanity, to produce more and more waste without a physical solution that can safely isolate and contain that very lethal waste permanently to keep it away from humanity and the environment for thousands of years and more. Humanity has been put harms' way from irrational oversight and very flawed thinking, lacking is sufficient assessment of rational scientific principles. Without any safe storage method and location for the most lethal substances made on earth, rational thinking requires a rapid phase-out that systematically shuts down all nuclear power reactors. (0823-7 [Michetti, Susan])

Comment: The human inability to visibly see the presence of ionizing radiation allows our human awareness to forget and ignore its presence. This does not change the fact that ionizing radiation can be observed to have reliable and repetitive physical impacts on other physical matter and living organisms. The smallest exposure of ionizing radiation alters the membranes of the blood cells and alters the CBC fractions in animal and human medical tests. It alters the membranes of sap in plants. Ionizing radiation has a linear dose response pattern that is very repetitive. Ionizing radiation is not safe for humans, excepting perhaps in medical diagnoses where the advantages are gambled against the disadvantages in individualized and unique circumstances. Ionizing radiation is not safe for living organisms. (0823-74 [Michetti, Susan])

Comment: From this perspective, we ask that an immediate ban be imposed on the man-made manufacture of lethal nuclear fission products. It is irrational to continue to accumulate the most lethal substances on earth when they cannot be safely contained for their entire impact period. We can not control the variable of extremely long timeline with the variable of non-containable lethal waste with the variable of humanity's genetic reproduction with the variable of full environmental safety within our living space on earth required for our continued survival. (0823-78 [Michetti, Susan])

Comment: It seems logical to start with those that have the worst safety records and largest leakages, and those with past experience of electric brownout/blackout or flooding. It is not rationally feasible to continue generating the most lethal substances on earth without any way to permanently isolate and contain them for their full cumulative lifetimes from exposure to the full environment including all life forms. (0823-8 [Michetti, Susan])

Comment: Stop government subsidies to new and operational plants and repeal the Price Anderson Act[.] The downplay of financial and safety concerns associated with building nuclear reactors is unacceptable. In 1985, Forbes magazine called the US promotion of nuclear power "the largest managerial disaster in history." With renewable energy now safer, cheaper, faster,

more secure, lest wasteful, nuclear power does not meet the public trust and does not deserve scarce capital. The public cannot afford to subsidize the nuclear industry's predictable financial failure. The private insurance companies are the best experts in the world with financial risk analysis calculations. The private insurance industry refused to insure the nuclear power plants decades ago because the entire industry was too risky for environmental and human safety. It is totally irrational that the costs of an out-of-control nuclear catastrophe, perhaps like Fukushima, would have to be paid by US taxpayers who would also be the unfortunate victims of it. The Price Anderson Act irrationally makes the taxpayers pay for financial risks of a private for-profit industry inadequately regulated by the NRC with rampant unsafe situations, including radioactive leaks at nearly every nuclear plant location. (0823-83 [Michetti, Susan])

Comment: My only comment is to please stop making nuclear waste. (0824-2 [Ingram, Gwen])

Comment: This is all being done while the NRC does as little as possible to draw attention to itself or the nasty truth that nobody in the entire world has proven how to safely store spent nuclear fuel for the eons of time required to protect the biosphere from high concentrations of its radio nucleotides. (0826-4 [Morgal, Rick])

Comment: We need to stop nuclear NOW! The ongoing disaster at Fukushima has awakened me the fact that nuclear energy can never be safe. For the future of my children please end all support for this outdated farce of a technology. Instead, please put your energy into green energy like solar and wind. (0828-1 [Johnson, Troy])

Comment: No safe, permanent solution has yet been found anywhere in the world - and may never be found - for the nuclear waste problem. Let's end the production of nuclear waste[.] (0829-1 [Anonymous, Debra])

Comment: Hidden costs of reactor waste storage & disposal make nuclear power less attractive than wind and solar energy. Wind and solar energy are inherently safer than nuclear energy--let's support the earth now and in the future for our children. (0829-3 [Anonymous, Debra])

Comment: We simply don't have any real plan for storage and we have to admit that. We have to admit that the best possible plan, which would still fall far short of what is needed for public safety, would be exorbitantly expensive, possibly enough to damage our economy for the long term. And yet anything less than our utmost effort and expense will turn out to be a disaster, slowly unfolding. We can't leave it to future generations, for the rest of the lifespan of the earth, to pay for our power generation for a paltry 40 years. We need to face the truth and determine what is necessary to protect future generations no matter what the cost. And we need to stop making more waste, now. (0834-7 [Thabit, Nick])

Comment: It is unconscionable to continue operation nuclear reactors, producers of such highly-lethal material, when there are other alternatives for creating energy. Localizing energy production will eliminate 40% of the need (lost in transmission) at one stroke. We can't continue to protect an industry that does nothing to protect us. (0834-8 [Thabit, Nick])

Comment: It's time to stop making high level nuclear waste period! (0835-1 [Bettega, Gayle])

Comment: Alternative forms of energy DO exist. In California, we have 156% of the power requirements of the state, and according to a presentation at the California Energy Commission, SONGS would have been cost effective for only 16 16-hour periods in the entirety of 2012, when the plant was already shut down. The dirty secret is that these plants are NOT COST

EFFECTIVE and DO NOT COMPETE WITH OTHER FORMS OF ENERGY, and HAVE A SEVERE DEFECT IN THAT THEY PRODUCE VAST QUANTITIES OF WASTE THAT IS EXTREMELY DANGEROUS FOR LONGER THAN RECORDED HISTORY. (0836-31 [Davis, Anonymous])

Comment: The continuation of the nuclear program must require industry to rise to a level it has never been called to do before, and it is up to the NRC to raise the calling of the industry players to more fully be responsible for their participation in that industry. If the NRC cannot do that, then likely Fukushima will be our last opportunity to learn a lesson about nuclear power here on earth. Maintaining or diminishing current regulatory levels that created the present on-going nuclear waste confidence issue will produce more of the same. (0838-4 [Clermont, Elaine])

Comment: Stop all the nuclear power plants, which is what it seems like we are doing; Stop the mining, looks like that is also being restored (at least in our nation), Just STOP! We have plenty of Spent Nuclear Waste to expand the industry for years bringing together a safe industry the achieves our highest potential, saving humankind in the process. (0838-8 [Clermont, Elaine])

Comment: For the duration of the nuclear energy promotin as a clean energy, the one prohibitive factor in the true safety of the process is that there does not exist, nor has there ever existed the capacity to safely eliminate or even store nuclear waste. Nuclear waste is continuously toxic and there is NO safe way to dispose of th spent rods nor radioactive water. FOr many generations now, the proponents of this technology have assumed that through technology they will find a way to destroy the waste that they also artificially created. However, it has proven an impossible task and I am NOT Confident that htere is any way now or at any point in the future. For that sake, and the sake of future generations, clean, safe water for drining, bathing, farming, wildlife, etc... I support the complete elimination of all nuclear activities, both production and waste. (0839-1 [Kemp, Karla])

Comment: Any product that creates such a negative externality throughout its lifecycle and particular in the waste disposal /grave phase, should not be allowed to produce. Such actions are irresponsible and foolish. There is no way to "pay" for any damages sustained in the nuclear industry, and the public shold not be the ones to foot the bill for either production, nor any form of cleanup. The precautionary principle is the correct and appropriate way to go. Solar alone in a very small footprint can supply us with adequate power. We need to focus on truly sustainable green energy, like solar or wind, as opposed to creating more poison for the world in which there is no antidote! (0839-2 [Kemp, Karla])

Comment: By virtue of waste toxicity and longevity, a management and financial burden which cannot be ignored is being passed to future generations. No level of confidence will result in the financial or management risks, or exposure consequences, diminishing. Radioactive waste is not safe, clean or green. It lasts for more than 240,000 years and it irradiates cells and damages DNA, causing cancer, birth defects, heart problems, kidney problems, infertility, immune deficiencies, and more. There is no safe dose of radiation. (0840-2 [Taylor, Tom])

Comment: There are clean, reliable, renewable, and lower cost energy alternatives to nuclear power. (0840-8 [Taylor, Tom])

Comment: It's quite simple, really. As you have been warned by many government & scientific agencies, the grid is vulnerable to outages from three possible threats; a solar event, an electromagnetic pulse from a nuke exploding at altitude or a cascading power outage. Any of these would be very, very bad. Look at Fukushima (wear shades). Risk "managers" always plan

for the disaster, "lessons learned" and all that nonsense. Would you recognize a Black Swan if it flew into your face? HARDEN THE GRID! SHUT DOWN THE GLOW TOMBS! (0842-1 [Thunder, Warren Storm])

Comment: To summarize: dry cask store the spent nuclear fuel now; create jobs; invest in alternative, safe energy; and shut-down all US nuclear power plants NOW. (0843-3 [Davis, Cherie])

Comment: The reality is, there is no reason on earth to continue with a "technology" that threatens life itself; the definition of "technology" should be "tools, created by humans to make their lives more livable." In reality, the nuclear "industry" and nuclear "technology" is destroying life. This is not an industry that instills confidence-quite the contrary. (0844-2 [Anonymous, Anonymous])

Comment: I will not support an industry that is allowed to create wastes that it has no ability to or sound place for storage. In fact, I do not believe in any industry that creates more toxic waste. There is no spent-fuel/high-level radioactive waste disposal facility in operation and storing on site has been demonstrated to be a frightening option-as seen in Japan. Further, there is no "safe" method for disposing of nuclear waste. Therefore, it should not be allowed to manufacture any more of these wastes. Already, we have an enormous problem with what to do about the existing reactor waste. NRC should not be allowed to issue new reactor licenses, nor grant license extensions to old operating reactors ever. (0844-3 [Anonymous, Anonymous])

Comment: The nuclear "industry" and US government and other governments clearly do not know how to deal with the fallout of disasters, much less the ongoing waste product of an overpriced and inefficient energy industry that has proven itself, time and time again, to be ill-conceived. (0844-7 [Anonymous, Anonymous])

Comment: As a U.S. citizen, mother and professional, I am appalled that my government is involved in such a dangerous, unmanageable and out-of-control industry. Nuclear was a bad idea from the start, and now the waste problem will haunt us for generations. We can do better. (0844-9 [Anonymous, Anonymous])

Comment: As a resident of San Luis Obispo County living near the Diablo Canyon Nuclear Power Plant, I am opposed to continuing to generate more spent nuclear fuel for which there is no known safe storage. Spent nuclear fuel will be hazardous for thousands of years to come, and I feel it is morally and ethically wrong to continue generating this waste with which our current and future generations will be burdened, both environmentally and financially, long after the energy is used. It is morally and ethically wrong for the utility company to continue making profits now which our future generations will be paying for, for years to come. Please do not renew the license for Diablo Canyon, or any other nuclear power plant. You have the moral responsibility now to shut down these plants and take care of our children who will inherit, and have to deal with, this mess. (0845-1 [Gibson, Julie])

Comment: The nuclear industry was ill conceived from the beginning. Stop producing more poison. Funnel resources to the most safe repositories possible, and promote transition to truly clean and renewable energy sources. (0846-3 [Wells, Gerald])

Comment: My personal attitude about Nuclear is that it is the most evil thing ever! It is not safe and it never will be safe! Millions will die and soon because of Fukushima. Hundreds of thousands of children will develop thyroid cancers. Enough already. It's time America woke up and set some examples. We are so behind in so many things. There's nuclear waste all over the

planet. It's a mess! Years of irresponsible regulation that is worthless! Shameful! Stop procrastinating and start protecting public safety! No more excuses! (0848-3 [Whiting-Broeder, Pamela])

Comment: Stop the making nuclear waste. Stop licensing new nuclear plants and renewing licenses for current nuclear plants until a valid, realistic assessment of the environmental impacts of nuclear waste is done by you . The licensing moratorium should be permanent. (0849-1 [Nichols, Susan])

Comment: Until this changes, we cannot responsibly license the production of any new nuclear waste. And we cannot responsibly move what we have created. Any other policy is irresponsible, criminally dishonest and savagely cruel. (0852-2 [Ein, Mark])

Comment: The Pacific ocean is dying from Fukushima, and you think we should add to this madness? There are alternatives. PLEASE, NO MORE NUKES.
<http://www.silverdoctors.com/fukushima-98-of-the-pacific-ocean-floor-covered-by-dead-sea-creatures/> (0853-1 [Milcarek, Thomas])

Comment: The problem of safely storing nuclear waste for hundreds if not thousands of years may never be solved. Yet until that day comes, no more nuclear plants should be built in this country. The economic, social, and environmental costs are far too high, especially now that safer technologies for generating power are available. (0855-4 [Holloway, Patricia])

Comment: Once the economic and environmental realities are acknowledged, it becomes possible to assess whether the "intractable" problem of storing ever-increasing quantities of spent nuclear fuel is best solved by not making any more in the first place. (0856-3 [Fritz, John])

Comment: As I recall, 104 of "our" nuclear power plants are inherently unsafe and, aside from shutting them down, the problems which afflict them, and by extension us, cannot be remedied. (0857-1 [Anonymous, Anonymous])

Comment: Cease production of all nuclear waste. (0860-10 [Headrick, Gary])

Comment: Here is my opinion of "waste confidence": It is clear that the creation of such language indicates a lack of confidence in how you, the Nuclear Regulatory Commission, will handle nuclear waste. All informed citizens know that it is dangerous. There is no safe level of nuclear radiation for humans, other animals, or the entire biosphere. The biosphere could not have developed until a highly radioactive planet became less radioactive with the decay of plutonium and the fissionable isotopes of uranium. Biota's original development could not have occurred until this danger was contained. But humans have restored the danger. (0861-1 [Boudart, Jan])

Comment: But cleaning up the explosions of the past is another thing. Our physicists should be working on this problem; but, instead, they are proudly (proudly! proudly??) at work developing another generation of nuclear waste creators, namely more nuclear power plants. Our tax dollars go to pay them high salaries at Argonne National Labs while they pursue activities that can only further harm us. (0861-3 [Boudart, Jan])

Comment: So, not only is there no confidence that the NRC can handle the waste already created, but also we must stop creating nuclear waste, whether from deliberate explosions, as in the past, or from the continued use of nuclear generated power today and in the future. (0861-4 [Boudart, Jan])

Comment: My emotional response to the nuclear problem as a mother, sister, aunt, cousin and grandmother is such that expressing myself on the issue is difficult. It beggars the imagination that anyone could seriously continue creating nuclear waste that will continue to cause harm on the earth for several hundred thousand years. Why would anyone do it? (0861-5 [Boudart, Jan])

Comment: You are proverbial serial killers giving out more licenses to spill & kill. (0862-6 [Thompson, Tammy])

Comment: To continue to create more is to ignore the very real dangers and to fall back on public relations as a panacea for the generally trusting public, which remains unaware of the potential for disaster lurking nearby. (0864-15 [Gellert, Sally Jane])

Comment: I heard some statements at the hearing that I feel obliged to refute. There were repeated references to nuclear power as "clean air" electricity. This might be true at the site (if one wants to simply ignore the ongoing leaks of radiation); it is clearly not at all accurate when considering the entire cycle, from mining of yellowcake, through enrichment, transportation, and processing. When the full cycle is considered, nuclear energy is highly intensive in its use of fossil fuels-and has perhaps the greatest impact on native Americans near uranium mines and other people living in environmental justice communities. (0864-16 [Gellert, Sally Jane])

Comment: Therefore, I request that we look toward minimizing the scope of local danger by shutting the reactors and generating no more radioactive waste. Until they are shut down, there are "routine" low-level releases of unknown impact on public health. (0864-8 [Gellert, Sally Jane])

Comment: Most comments during the Chelmsford meeting were not focused on just the subject of storage confidence. They feel, as I do, that shutting the plants down is the only option. No plant, no additional lethal waste to have to deal with. (0868-4 [Tilbury, Don])

Comment: Enough is enough! Nuclear for electricity has been tried but it is now evident that it is a "dead end street." To continue shows shameful lack of consideration to future generations. It's bad enough as things are today without making it worse by continuing. Do pro nuclear individuals fail to see that if we have so many problems that have to be resolved presently, it can only get worse by continuing? Stop now. Be an example to the world. Haven't they read about Fukushima? (0868-5 [Tilbury, Don])

Comment: The question to be discussed should be, how do we stop making nuclear waste? The answer is don't make it- we know that forty or fifty years ago-Why were we not listened to then? That is the question and in all this time NRC has learned how to run a meeting - Now that we are in this mess- (0870-1 [Anonymous, Anonymous])

Comment: Clean up this terrible mess we have created, conserve and enjoy-Don't relicense- this monstrosity- Help us! (0870-3 [Anonymous, Anonymous])

Comment: Nuclear power should NOT be promoted- solar power, wind energy, intertidal energy should be promoted. (0871-2 [Denneen, Bill])

Comment: STOP MAKING NUCLEAR WASTES! There can be no "confidence" about this unsolvable catastrophic hazard! You/we cannot create more sacrifice land! (0874-1 [Anonymous, Anonymous])

Comment: In that endeavor a lot of waste material was created and many lessons were learned. We will never be able to undiscover nuclear but we as a civilization cannot ignore our current charge of dealing with what we made. (0881-3 [Szymanowski, Jennifer])

Comment: The most obvious and moral solution is to not make more waste in the first place especially since it is now not necessary. Nuclear electrical generation comprises only 20% of our power supply and there are now less expensive and safer alternatives. We should not as a civilization endanger generations far into the future. Nuclear waste is forever. (0883-6 [McArdle, Ed])

Comment: They never acknowledged the burden we're creating for our children and future generations and that we should stop creating more spent fuel now! (0888-7 [Wilvert, Rosemary])

Comment: We should never have taken uranium out of the ground. But since we have, the only responsible thing is to stop doing in and invest in solar and wind and other clean energy sources. New Jobs and retraining will boost the economy. Our children will thank rather than curse us. (0888-8 [Wilvert, Rosemary])

Comment: Go Renewables by 2020! Become the RRC. Keep your jobs and end nuclear waste piling up! (0890-1 [Arnason, Deb])

Comment: Something wrong with this picture! End nuclear energy[.] (0890-3 [Arnason, Deb])

Comment: Do Not create more wastes we do not know what to do with! (0890-5 [Arnason, Deb])

Comment: Stop digging! End making more nuclear radioactive waste[.] (0890-7 [Arnason, Deb])

Comment: Renewables by 2020 and this relicensing will be unnecessary - follow Germany (not AREVA-France does not know what to do with wastes themselves!) Stop taking money from nuclear industry - prevent Fukushima America esp here in the 5-State "sacrifice zone" where we live! Thanks, Become RRC! (Renewables Regulatory Commission) (0890-9 [Arnason, Deb])

Comment: Best onward move - Stop all nuclear production and HOSS (hardened on site storage) for a million years. (0901-1 [Anderson, Janet M.])

Comment: Nuclear = insanity (0901-5 [Anderson, Janet M.])

Comment: It is not your job to "mollify the masses" by protecting the nuclear industry with claims that the environmental risks are "small to moderate" and that nuclear power is one solution to global warming. We are not stupid. We all understand that the damage and threat to humanity and the world by nuclear technology makes global warming look like child's play. (0902-6 [Fasten, Susan])

Comment: It is not your job to "mollify the masses" by protecting the nuclear industry with claims that the environmental risks are "SMALL to MODERATE" and that nuclear power is one solution to global warming. We are not stupid. We all understand that the damage and threat to the world and humanity by nuclear technology makes global warming look like child's play! (0903-3 [Fasten, Susan])

Comment: Don't relicense any more nuclear reactors. Don't renew any expiring licenses. (0904-2 [Collins, Jessie])

Comment: The NRC and PG&E claim that DCR provides clean (CO₂-free) power for 3 million homes. That's a big plus. It also produces dirty (radioactive) residues for millennia. That's a big minus. Which one is bigger? (0907-1 [Bethlenfalvay, Marina])

Comment: My Comment: STOP MAKING IT ! CLEAN UP [ALSO IMPOSSIBLE!] THE EXISTING AND DAILY PRODUCING NUCLEAR WASTE ! (0910-6 [Carey, Corinne])

Comment: My Comment: STOP MAKING IT! CLEAN UP [ALSO IMPOSSIBLE] THE EXISTING AND DAILY PRODUCING NUCLEAR WASTE! (0910-8 [Carey, Corinne])

Comment: The good news from all this, of course, is that those five reactors will no longer generate irradiated nuclear fuel - the only real solution to the problem is to not generate it in the first place. (0919-3-11 [Kamps, Kevin])

Comment: The overall radiological impact on people and environment, over time , should be included in the NEPA decision making on whether, or not, the use of nuclear power to generate electricity is a wise societal decision. (0919-4-13 [Kamps, Kevin])

Comment: On Dec. 2, 2012, a major event was held at the University of Chicago, sponsored by Beyond Nuclear, Friends of the Earth, and Nuclear Energy Information Service,. It marked the 70th year, to the day (Dec. 2, 1942), since Enrico Fermi created the first self-sustaining nuclear chain reaction, in the world's first prototype atomic reactor ,under the bleachers of the U. of Chicago football stadium. It came during the Manhattan Project race for the atomic bomb, eventually dropped on Hiroshima and Nagasaki, Japan. Thus was generated the world's first reactor-generated high-level radioactive waste. The mountain of commercial radioactive waste would begin to be generated some 15 years later, in 1957 at Shippingport, PA, site of the country's first "civilian" atomic reactor. But the same lessons apply ... The take home lesson, in a nutshell, from the conference? As reflected in the logo for the conference, and the pamphlet created for the occasion: The lethal legacy of the Atomic Age is a "Mountain of Radioactive Waste 70 Years High," and we don't even know what to do with the first cupful. It's time to stop making it. (0924-1 [Kamps, Kevin])

Comment: Given the costs, risks, and liabilities of irradiated nuclear fuel-as well as the ready alternatives to nuclear power of energy efficiency, energy conservation, and renewable sources such as wind power and solar power-NRC's current moratorium on approving new reactor combined construction and operating licenses and old reactor license extensions should be made permanent. (0924-2 [Kamps, Kevin])

Comment: A carbon-free, nuclear-free energy future is indeed doable. In fact, it is the only sane way out of the climate crisis. (0924-3 [Kamps, Kevin])

Comment: Alternative forms of energy DO exist. In California, we have 156% of the power requirements of the state, and according to a presentation at the California Energy Commission, SONGS would have been cost effective for only 16 16-hour periods in the entirety of 2012, when the plant was already shut down. The dirty secret is that these plants are NOT COST EFFECTIVE and DO NOT COMPETE WITH OTHER FORMS OF ENERGY, and HAVE A SEVERE DEFECT IN THAT THEY PRODUCE VAST QUANTITIES OF WASTE THAT IS EXTREMELY DANGEROUS FOR LONGER THAN RECORDED HISTORY. (0930-2-5 [Lutz, Ray])

Comment: Once the economic and environmental realities are acknowledged, it becomes possible to assess whether the "intractable" problem of storing ever-increasing quantities of spent nuclear fuel is best solved by not making any more in the first place. (0931-2 [Masullo, Ginny])

Comment: The moratorium on reactor licensing must be made permanent. (0932-1 [Bridgeman, Janis])

Comment: As my colleague Shirley Vaine from California put it years ago, why would we ever support an energy source that had no plans, knew that there was no way to safely dispose of its deadly radioactive waste when it began, hid this from the public, and now leaves us with the creation of endless waste, endless economic and environmental cost, and endless risk to ourselves and to the plant? Why would we ever pick such an energy source in the first place? (0934-5 [Lewison, Linda])

Comment: Without a waste and fuel storage solution, there should be absolutely NO PUBLIC FUNDING for this form of energy. (0935-5 [Uhls, Agnes])

Comment: We need to focus on cleaning up the sites already contaminating Americans every day, before we allow more of the same 70 years after the Manhattan Project. Robert Oppenheimer recriminated himself for Pandora's box, and the U.S. court system remembers and demands accountability before even more widespread contamination become part of the innumerable and many unaccounted for "Legacy" sites on both U.S. and Native American soil. (0935-7 [Uhls, Agnes])

Comment: Nuclear technologies are the most harmful, toxic and long-lasting practices that humans have ever engaged in. Nuclear activities should have been halted generations ago - there is nothing safe about nuclear at any stage of the nuclear fuel cycle. Now we are faced with the nuclear waste issue - one of the many monsters in the closet - that will last for millions of years, killing much of life on our Earth in it's wake. (0936-1 [Laney, Nan S.])

Comment: The nuclear industry in it's entirety - from mining to processing to "power" to reprocessing to weapons should be shut down completely due to the extreme risks it poses to life itself on our planet Earth. Why are we making extremely toxic waste that we have no capacity to safely transport, store and contain for the next few million years? (0936-3 [Laney, Nan S.])

Comment: No new reactor licenses should be issued due to the extreme risks to public and environmental health. (0936-4 [Laney, Nan S.])

Comment: Nuclear technologies never should have been. I demand that you stop the insanity now. No more nuclear anything - halt the entire cycle before you put an end to life on Earth. (0936-7 [Laney, Nan S.])

Comment: I believe that no industry should be allowed to continue creating wastes it has no ability to dispose of. Since neither the nuclear industry nor the Federal Government has an operating spent-fuel/high-level radioactive waste disposal facility in operation, it should not be allowed to manufacture any more of these wastes. (0939-2 [Marschak, Cheryl])

Comment: I have no confidence in the use of nuclear power. Period. (0941-2 [Scott, Sabra])

Comment: Albert Einstein also informs us "To the village square we must carry the facts of atomic energy. From there must come America's voice." The people have spoken. Stop making it! Cease and desist. Stop making it period. Do not relicense, do not license new ones. (0945-9 [Keegan, Michael J.]

Comment: The largest concentration of radioactivity on the planet, nuclear waste, is stored at nuclear power plants near populated towns and cities across America. After more than 50 years, the quest for safe, permanent nuclear waste disposal remains incomplete; therefore it is irresponsible to keep producing more spent nuclear fuel. (0946-1 [Commenters, Multiple])

Comment: We must stop making nuclear waste, Keep the ban on licensing new nuclear plants! Our future generations are depending on us. (0946-5 [Commenters, Multiple])

Comment: Just look at Fukushima. Are you willing to risk that ? You are dealing with some of the most dangerous materials know to mankind. A mistake or accident will be far worst than a terrorist attack not to mention the possibility of a terrorist attack using our own spent fuel as a weapon against us. Nuclear energy is not worth the risk. (0962-1 [Schneider, Howard])

Comment: Nuclear waste can cause tremendous harm to thousands, even millions of people if it is not disposed of safely. And we need th think of safety not in terms of decades, but in terms of millenia. This silent, invisible killer can contaminate our water, kill our wildlife, and even get into our oceans. There is no cure for sustained radiation poisoning, and even if we develop one, our diagnosis and treatment are likely to be too late. (0964-1 [Glime, Janice])

Comment: If you look at how Fukushima has been handled by Tepco two things become obvious: one, corporations are too irresponsible to run something as risky as nuclear power plants and two, the human species has no business using nuclear power. (0974-1 [Conley, Patrick])

Comment: As a consequence of perhaps the worst decision our primate species has ever made we have 400 delayed fuse nuclear catastrophes waiting to happen (not to speak of the fool hardiness that has been going on with nuclear weapons). So here we are, an absurd and delusional species that is about to go extinct either through nuclear poisoning or global warming. Good decision making in political leadership is virtually nil on things that really matter. (0974-3 [Conley, Patrick])

Comment: [S]outh Africa stopped its nuclear program because the true cost to health made it unacceptable. (0987-1 [Kansas, Sharon])

Comment: There is *NO* proven means to render a significant amount of this waste "inert" on a large scale and the vast majority of it will remain at dangerous levels for thousands of years. Nuclear power is an infected bandage on a problem requiring major surgery. Its proponents care more about their own economic convenience than future generations and the current health of this planet. (0990-2 [Schilling, Francis])

Comment: I am a concerned citizen and a lifelong voter. I have closely followed the nuclear power issue since 1970, and have witnessed the Three Mile Island, Chernobyl and Fukushima "accidents." Nuclear power has been a boondoggle from it's inception, when the public was told that electricity would be generated so cheaply it would not be metered. That was just the first of many lies about the cost and safety of nuclear power. (0998-1 [Rosanelli, Donald])

Comment: THE NRC's Draft NUREG-2157 MAKES CLEAR, IN NO UNCERTAIN TERMS, THAT THE TIME IS OVERDUE FOR YOU LAZY, UNCARING, DELUSIONAL, SELF AGGRANDIZING PSYCOPATHS TO STEP DOWN AND LET QUALIFIED AND ENVIRONMENTAL AND HUMANITY LOVING SCIENTISTS TO DECOMMISSION ALL YOUR NAZI NUCLEAR EXPERIMENTING. (1004-8 [Dimondstein, Carla])

Comment: We as a society should also think of the bigger picture. Alternative to nuclear energy are cheaper and safer. Thank you for attention to my views, which I hope can nudge policy toward safer alternatives. (1007-6 [Diamond, Jim])

55. Out-of-Scope Comments – Support for Nuclear Power

Comment: It's important that we make sure that nuclear energy facilities across the country are allowed to do what they've been doing, and that is producing much needed clean, safe, and efficient electricity. I am here to express my personal support and confidence in the storage of spent nuclear fuel onsite at nuclear facilities. (0030-18-2 [Curtin, Kenneth])

Comment: Nuclear energy provides 19 percent of our electricity, but more than two-thirds of our emissions-free technology. This means that nuclear energy provides more clean air energy than every other source of emissions-free technology we have right now. At a time when we're looking at how we can address the threat of climate change, nuclear energy is already our best ally in this fight. Not only is it the largest source of clean-air energy, it's an extremely reliable form of baseload, always-on power. As the NRC continues these series of public hearings I would just like to reiterate my support for an industry that has shown it can safely and securely store spent fuel onsite and has shown this for decades. While other sources of energy pump harmful greenhouse gases, sulfur oxide, nitrogen oxide, and mercury into the air, nuclear energy doesn't emit any of these. Rather, the nuclear energy industry has shown that it can safely, securely, and cleanly store spent fuel onsite. As the NRC considers this and future issues, I would encourage them to think about what it can do to strengthen our nation's commitment to clean-air technology. (0030-18-5 [Curtin, Kenneth])

Comment: As has been mentioned, the reality is that two-thirds of all the clean electricity produced in the United States comes from nuclear energy. Combined nuclear and hydroelectricity provide 87 percent of non-greenhouse-emitting electricity in the United States, and yet of the past 30 years neither of these sources has seen any real meaningful new construction. And a lot of that is due to the fact that hydroelectricity has been hindered by a lack of viable new capacity and the fact that nuclear has been hindered by obstinate opposition. What has been so completely obscured is the simple truth that nuclear energy is the greatest energy technology for environmental stewardship. There's no source of energy with less impact on human health or less impact on the environment, and that's borne out in this Waste Confidence GEIS. And I would encourage anybody to compare the supply chains and the mining techniques required for the construction of wind turbines and solar panels and the amount of materials consumed to those used in a nuclear power plant. (0030-19-2 [Cohn, Jeremy])

Comment: The reality is that we are making choices every single day and all personally that I see are political leaders and activists taking the path of convenience, taking out loans against our planet to be paid in the health and welfare of my family and families around the world. I see people taking the feel-good path admiring their own handiwork while ignoring the livelihoods that they destroy and the burdens that impose on the poorest Americans in the form of higher

electricity prices and unreliable sources of electricity. Somewhere along the way it seems that we've decided that self-righteousness is more important than meaningful policy and we've lost all context behind this important discussion. Every one of us wants what's best for humanity and we all wish for health and prosperity for ourselves, our country and our species. As a student of science and history, I know that we all be best served if we can beyond the technology tribalism of the past that has plagued our energy industry for the past decades. The path to preventing and mitigating global climate change will be through a balance of economic competitiveness and environmental concerns. A costly energy policy might be successful in a single country, but it will not gain influence in other countries, especially among the emerging nations of the world. The American energy market will need to be a balanced and diversified portfolio of the most responsible, affordable and reliable generating technologies. If we can achieve it here and demonstrate to the world the effectiveness of a policy of environmental responsibility and robust economic health, then the United States will be the leader in supplying the human expertise, advanced technologies and materials to the hungry energy markets around the world. We are the ones who are going to have to pay for the shortsighted decisions of today. Global climate change is extremely dangerous and the decisions that we make today as a country will have global implications. I believe in nuclear energy because it is safe. I believe in nuclear energy because it can protect our planet from catastrophic climate change. I believe in nuclear energy because it can lift us to new levels of prosperity. (0030-19-4 [Cohn, Jeremy])

Comment: Nuclear energy has shown it is a responsible source of electricity and a valuable community partner. Nuclear energy safely and cleanly produces nearly 20 percent of the electric power and supports more than 100,000 high-paying jobs in this country. Because of nuclear energy's commitment to producing affordable clean power and its commitment to safely, cleanly, and securely storing spent fuel, it is no wonder our communities near nuclear energy facilities support nuclear energy and their local facility. (0030-20-3 [Lapiska, Evan])

Comment: As the Commission continues these public hearings, I would just like to reiterate that nuclear energy has shown the utmost commitment to safety and securely storing spent fuel. (0030-20-5 [Lapiska, Evan])

Comment: Thank you for your time today and I would like to reiterate my support for nuclear energy. (0030-20-6 [Lapiska, Evan])

Comment: Nuclear power is an important part of your country's energy infrastructure past, present, and future. Nuclear energy of course provides the majority of the country's emissions-free electricity 24 hours a day, even when the sun isn't shining and the wind isn't blowing. (0030-23-4 [Blee, David])

Comment: Nuclear power plays an important role in this nation's energy mix. Given that 63 percent of the nation's carbon-free electricity comes from nuclear generation, continuing to license safe, secure, reliable, and environmentally sound nuclear facilities is simply sound public policy. And, more particularly, the resumption of licensing activities is essential for long-term power-planning decisions. (0030-3-3 [Ginsberg, Ellen])

Comment: Some of the information gave out, that 63 percent of carbon-free energy in the country is provided by nuclear energy, we [Maryland State Pipe Trades Association] think it should be 90 percent. (0030-9-1 [Guido, Jeffry])

Comment: The economic growth, education for operating these systems, world population is expected to be seven billion by 2050 I believe. I don't think wind turbines and solar energy are

going to do it. I don't know of one wind farm that provides enough energy to manufacture a wind turbine. And that's pretty much the points I have to make. We [Maryland State Pipe Trades Association] support nuclear energy, and I hope the process continues. (0030-9-4 [Guido, Jeffry])

Comment: So I'd like to get on to a little bit of the economic impacts of this. Nuclear energy generates 63 percent of the carbon free electricity produced in the United States according to the U.S. Energy Information Administration. The operation of a nuclear plant requires hundreds of people to perform numerous and various responsibilities. The closing of San Onofre Nuclear Power Plant means 1100 workers will lose their jobs. The closing of the Vermont Yankee Nuclear plant will cost more than 600 workers their jobs. These numbers include only direct full-time jobs at these plants. Also lost will be hundreds of jobs involving maintenance completed during outages and hundreds of more for suppliers and vendor companies who rely on these plants for their survival. The Boston Globe newspaper reported on September 18 that 17 years since the Maine Yankee Nuclear Power Plant closed and 600 workers lost their jobs, property taxes have spiked more than ten times for the town of 3700 residents. The number living in poverty has more than doubled as many professionals left and the town's services and jobs have been cut. The town of Wiscasset lacks money to repair leaky windows and roofs in school buildings and the high school has fewer than half the students it had two decades ago and about 50 percent of them rely on subsidized lunches. On average a nuclear energy facility generates \$470 million dollars in sales of goods and services the local community and nearly \$40 million in total labor income annually. Each year it pays out about \$67 million in federal taxes and almost \$16 million in state and local taxes. (0045-13-4 [Allen, Rick])

Comment: CA [Consumer Energy Alliance] has long believed that nuclear energy must remain a part of a balanced and sensible national energy policy. And furthermore, the United States must find ways to thoughtfully expand the source of carbon-free electricity, in order to meet rising consumer demand, in an increasingly carbon-constrained world. Nuclear energy is historically provided one of the most consistently affordable sources of electricity. Since fuel cost typically account for less than one-third of a nuclear plant's production cost, nuclear energy consumers are less susceptible to fluctuations in price. (0045-4-1 [Martini, Shawn])

Comment: The United States was the first country to develop commercial nuclear power plant, and we have the largest nuclear program in the world, 100 reactors, and five more under construction. Having once being a leader in this technology, we're at risk of losing our competitive edge and our nation's credibility towards other nuclear powers. (0045-5-4 [Cannon, Tom])

Comment: Nuclear energy plays a vital role in meeting our nation's electricity needs, protecting the environment and preserving the fuel and technology diversity that is the strength of the U.S. electricity supply system. (0045-9-1 [Baker, Tammera])

Comment: The Energy Department projects that U.S. electricity demand will raise 28 percent by 2040, and that's even with very modest economic growth. That means the United States will need hundreds of new power plants of all types to meet the increased demand and replace older facilities that are being retired. Some of these new plants are going to have to be nuclear, like the five that are currently under construction in Georgia, South Carolina and Tennessee. Nuclear energy is the only emission-free source of electricity that can be widely expanded. (0045-9-2 [Baker, Tammera])

Comment: The president has set very ambitious goals for reducing carbon dioxide emissions, and the United States simply cannot get there without nuclear energy. (0045-9-3 [Baker, Tammera])

Comment: In addition to generating clean energy, nuclear plants strengthen state and local economies through jobs, taxes and secondary spending. (0045-9-4 [Baker, Tammera])

Comment: The presence of nuclear power, or nuclear plants and its employees filters throughout the local economy. Analysis shows that every dollar spent by the average nuclear plant results in the creation of \$1.04 in local economy, \$1.18 in the state economy, and \$1.87 in the U.S. economy. (0045-9-6 [Baker, Tammera])

Comment: I see the French model and believe there may be hope for nuclear power properly researched and well managed. It is safer and cheaper than fracking or pipelines, and has more potential for widespread use while wind and geothermal are being refined. (0057-6 [Lamont, Dana])

Comment: Our members [Clean and Safe Energy Coalition, or CASEnergy] support the increased use of nuclear energy to ensure an environmentally clean, safe, affordable and reliable supply of electricity. (0060-1 [Lapiska, Evan])

Comment: Nuclear energy has shown that it is a responsible source of electricity and a valuable community partner. Nuclear energy safely and cleanly provides nearly 20% of our electric power and supports more than 100,000 high-paying jobs. Because of nuclear energy's commitment to producing affordable, clean power, and its commitment to safely, cleanly and securely storing spent fuel, it is no wonder why communities near nuclear facilities strongly support nuclear energy. (0060-3 [Lapiska, Evan])

Comment: I would just like to reiterate that nuclear energy has shown the utmost commitment to safely and securely storing spent fuel. (0060-5 [Lapiska, Evan])

Comment: It is important that we make sure that nuclear energy facilities across the country are allowed to keep doing what they're doing -producing much-needed power, cleanly, safely, and efficiently. I am here to express my support and confidence in the storage of spent nuclear fuel on-site at nuclear facilities. (0061-2 [Kirton, Kenneth])

Comment: Nuclear energy provides 19% of our electricity but nearly two-thirds of our emissions free electricity. That means nuclear energy provides more clean-air energy than every other source of emissions free electricity combined . At a time when we are looking at how we can address the threat of climate change, nuclear energy is already our best ally in the fight. Not only is it the largest source of clean-air energy, it is an extremely reliable form of baseload, "always on", power. As the Commission continues this series of public hearings, I Would just like to reiterate my support for an industry that has shown it can safely and securely store spent fuel on-site for decades and is at the forefront of clean-air energy. Nuclear energy is not only a reliable and responsible source of power; it is our largest source of emissions free electricity. While other sources of energy pump harmful greenhouse gas emissions, sulfur dioxide, nitrogen oxide and mercury into the air, nuclear energy emits none of these. Rather, the nuclear energy has shown it can safely, securely, and cleanly store spent fuel on-site. As the Commission considers this and future issues, I would encourage them to think about what we can do to strengthen our nation's commitment to clean-air technology, like nuclear energy. (0061-5 [Kirton, Kenneth])

Comment: The Energy Department projects U.S. electricity demand will rise 28 percent by 2040, even with very modest growth. Put simply, as we take some of our older, fossil fuel plants off-line, the US will need many new plants of all varieties to meet the demand of clean and reliable energy. Nuclear should be part of the mix; it has proven itself as a viable option. An Associated Press story in October reports that Seabrook Station had the fewest maintenance problems of any nuclear plant in the country in a recent review. That performance must be recognized and allowed to continue. And do not overlook the basic dollars and cents of nuclear plants like Seabrook. Economic impacts of plants are significant and on-going. A typical nuclear plant generates \$470 million a year in economic output, including more than \$35 million in total labor income. Nuclear plant jobs are good-paying, community-sustaining jobs that cannot be replaced. In addition, the average nuclear plant pays millions in state and local taxes annually. These tax dollars benefit schools, roads and other state and local infrastructure. Nuclear energy must be a continued part of our region's energy grid. It is efficient, economically viable, and environmentally cleaner than any other option that can produce power that matches New England's energy demands. (0087-2 [Hinch, Richard])

Comment: Please note that all power derived on earth is nuclear. The sun operates on hydrogen fusion, which creates heat and light, which is responsible for all fossil fuels on earth. (0100-2 [Behling, Steve])

Comment: First of all the anti nuclear panic-mongers should get one thing straight from the beginning. The reason there is life on the planet Earth in the first place is because of nuclear energy. In other words, the Sun. The Sun is powered by hydrogen fusion. The waste products of this action, i.e. heat and other different spectrums of light, is what has created all of the fossil fuels on this planet, to say nothing of all the life. For whatever nutty reason, the eco-panic-mongers fail to see this issue. (0100-21 [Behling, Steve])

Comment: It occurs to me that legal action should be brought against anyone who knowingly manufactures false evidence, or makes false statements against any legal product. Including nuclear reactors. The constant calling of more studies on reactor safety is redundant to the extreme, and is costing the rest of us more capitol for no reason. What the legal system should do is have the eco-nuts prove that a certain aspect of reactor design is unsafe. As far as I know any corporation has the same rights as an individual human being, and is entitled to the same legal protections. Would it be incorrect to state that the eco-panic-mongers are costing the world untold trillions of dollars based on - Lost Wages - Phoney claims - Worthless lawsuits - and New ideas that are not pursued because of the fear of lawsuits by the eco-panic-mongers. Example: The panic over childhood vaccinations that were stopped by frightened parents because of A SINGLE QUACK PSUDO DOCTOR, that stated that the same vaccinations caused autism. It was discovered later that all the claims made by the fake doctor were false. Also, along the same lines a female panic monger clamed that DDT was killing human off life on this planet. Again the opposite turns out to be true. DDT is not harmful to humans or higher animals, just insects. The environmental movement is responsible for much of the mess that the world finds itself in today. (0100-22 [Behling, Steve])

Comment: Now here is an observation for you. Since the construction of the first nuclear reactor, millions of people have died of disease, war, auto accidents, and drug overdoses, and speaking of drug overdoses, this would be a big concern in the San Francisco bay area. Especially aids ridden homosexual drug dealing. As opposed to this Godless perversion, almost no one has died of radiation poisoning. There is one other thing. These same people who complain about nuclear power, use this same power to grow drugs! According to Lars Larson,

1% of all energy used in the United States, or five billion dollars a year, are used to grow and process illegal drugs. (0100-24 [Behling, Steve])

Comment: According to my accounting, we have now had our fourth meltdown. Chernobyl, Three Mile Island, and at least two reactors in Japan. According to the eco-panic-mongers, many thousands of us should be dead by now, and large sections of our planet should be a barren wasteland. Hey guess what? We're still here! (0100-25 [Behling, Steve])

Comment: According to the eco-panic-mongers, during a reactor melt down, internal parts of a reactor can be turned into missiles that can slam into other parts of the reactor, thus causing a greater runaway. As of our fourth melt down...Not one part in any reactor has turned into a missile, since the beginning of nuclear power plants. (0100-26 [Behling, Steve])

Comment: Keep in mind that the United States power grid is the worlds largest invention, employs over a million people, and is kept on line with billions of dollars in revenue on a yearly basis. This is also true of the natural gas supply system. Because of the new fracking technology, the supply of natural gas has increased to the point of bulk prices being driven down. This development has a negative price impact on the generation of nuclear energy. Low cost natural gas creates energy at a lower price than nuclear power. The concept that is missed however, is that all the new found natural gas, or any other form of nuclear created energy, can be used up in a century. After that, then what. The what is, nuclear energy. (0100-4 [Behling, Steve])

Comment: I'm here tonight to tell you as a city councilor that the reliability of the New England electrical grid must be maintained. And it is up to NRC to oversee that one of the major factors in maintaining a reliable electric grid is nuclear power. (0112-1-2 [Giunta, Tony])

Comment: Like it or not, part of the mix of a reliable system of electricity in New England is nuclear power. (0112-1-3 [Giunta, Tony])

Comment: And while it's not perfect, new generation of nuclear engineers like me are clearing regulatory hurdles to bring even safer and more reliable nuclear energy that is leaps and bounds from what we know today. And it keeps improving just like all the other technologies are improving. (0112-12-5 [Garcia, Diego])

Comment: Nuclear energy safely and cleanly provides nearly 20 percent of our electric power with absolutely zero GHG omissions and supports more than 100,000 high paying jobs. Nuclear energy has a crucial impact on America's energy portfolio[.] (0112-21-3 [Morris, Kelsi])

Comment: There is a lot of technical information already in the license applications. That's why NRC went from 20 years to 40 years on license renewals. Those licensing processes will work faster than global warming. (0112-25-5 [McCullum, Rod])

Comment: Now, I want to go back and close with something that Councilman Giunta said at the very beginning of this meeting and that is the importance of safe, reliable, clean electricity, affordable electricity to his community. Business is coming back into his community because they have confidence in our infrastructure. And what gives us that is a good mix of energy, including nuclear along with all the renewables. And it's great that natural gas is cheap. But what causes us to lose that, what causes us to fall behind France and maybe even some countries that are further behind is if we start devoting resources to things that aren't significant to reducing risk. So I'm glad we're having this discussion. (0112-25-8 [McCullum, Rod])

Comment: Now, we heard a lot about various frustrations and concerns about the length of time here. I can tell you people of my generation are also frustrated. This is a problem that is not yet solved. But it is one we're eager to solve. We're eager to make sure that these dry storage systems are reliable for as long as they're needed and we are eager to solve the geological waste disposal problem. (0112-27-3 [Curtis, Daniel])

Comment: Nuclear energy facilities play an important role across America by producing clean, reliable power for many communities - and it's necessary that they be allowed to continue their safe and efficient operations. (0122-1 [Bailey, Savannah])

Comment: Today there are many concerned and knowledgeable people here: young engineers, young couples, mothers, fathers, grandparents - people who like me are concerned about the future - and people who, like me, know nuclear energy can be a key contributor to that safe, environmentally successful future. (0138-10 [Cook, Dr. Andrew G.])

Comment: Maybe more importantly I know the used fuel can be safely stored since it was, by the earth 1.7B years ago. At one of our AREVA uranium mines in Oklo, Gabon Africa we discovered that 1.7B years ago 16 nuclear chain reactions, actual real natural nuclear reactors, ran on their own, underground, in the presence of water, long before humans even existed. The reason we know is that we found the "used fuel" by products of those reactors right there, less than one foot from the location of the reactors themselves. What happened? The reactors naturally shut down, some of the used fuel became entrained in the water, and then like all minerals do, it precipitated out of solution. And indeed the byproducts of the reactions were found, precipitated out and in crystalline form, less than one foot from their point origin. So the earth has shown us, in marvelous natural detail, that even in the direct presence of water, the used fuel can be safely stored for more than a billion years in underground geological formations. (0138-6 [Cook, Dr. Andrew G.])

Comment: But all of this has little bearing if there is no need for nuclear energy. So is it needed? I can assure you as a concerned parent and concerned environmentalists it is most assuredly needed. First let's consider that most one of us got here tonight by consuming at least a gallon of gasoline or diesel fuel. Where did the waste from that transportation go? Unlike the solid, safely stored nuclear fuel, all of the waste from our trips here went straight into the air, the air you and I are breathing right now. And this situation persists worldwide. 85% of all the energy consumed by humans today and into the future comes from carbon based fuels - fire wood, biomass, coal, oil, and natural gas. Accessibility to energy improves lives and increases standards of living. As the world population continues to grow this situation will persist, despite the fact that renewables - like nuclear energy - are desirable. It will occur because the worlds peoples' world hunger for energy is so huge and the population growth is so significant, that carbon based fuels will be the inexpensive, accessible energy source of choice for those in greatest need. We see this occurring in China where air pollution from carbon-based fuels is reaching near toxic levels. We are breathing the waste from those carbon based fuels, every minute, every breath. (0138-8 [Cook, Dr. Andrew G.])

Comment: In fact today, it is highly unlikely that the US, a leader in managing CO2, can achieve its climate goals without the CO2 free energy of nuclear energy. Nuclear energy will be a key component in providing a healthy, CO2 free relief valve. Nuclear energy is the CO2 free source that can serve as a stable and reliable back up for wind and solar energy. It is the CO2 free, environmentally friendly, renewable energy source that is here for us 24/7 365 days a year rain, or shine, wind or no wind, day and night regardless of the weather. And we see it doing this job for the US as it accommodates that electric energy fluctuations associated with other

renewables. Nuclear energy is the low cost, safe reliable soldier that has stood beside us through oil embargos, gas pipe line pressure drops, coal pile freezes and even system wide black outs. Our nuclear energy plants have been there as worthy and durable soldiers helping us with a diversified and secure CO2 free energy mix. It is for this reason that leading environmentalists like Patrick Moore, Steve Brand, James Lovelock and Greg Warren all strongly support nuclear energy. (0138-9 [Cook, Dr. Andrew G.]

Comment: The Nuclear Power Industry provides a clean, safe and reliable source of power for a large portion of the American consumer's electricity needs. This type of energy generation (nuclear) is carbon free power and economically beneficial to the American consumer as well. Stringent management programs of spent nuclear fuel, in dry storage containers and in pools, insure public safety and answer the environment concerns that the public might have. (0148-1 [Ryan, Paul])

Comment: The large amount of energy provided by nuclear power generation in the United States is a vital component of the entire American energy program. American energy requirements will only increase in the future and nuclear power generation is needed to keep America free from dependence on other sources of carbon based fuel for our energy needs. (0148-3 [Ryan, Paul])

Comment: Nuclear energy is an integral part of a national energy plan. It generates 98% of the carbon-free electricity produced in our state, according to the Energy Information Administration. Nuclear energy facilities also provide substantial economic benefits to the state and local community, including high-paying jobs and tax revenue that helps keep town services funded and property taxes are much lower than they otherwise would be. In fact, nuclear industry jobs pay substantially higher salaries than other jobs in the communities where nuclear power plants are located. On average, a nuclear energy facility generates \$470 million in economic output. (0150-1 [Rivera, Wendy])

Comment: The United States was the first country to develop commercial nuclear power plants, and we have the largest nuclear program in the world—100 reactors, with five more under construction. Having once been a leader in this technology, the United States is at risk of losing our competitive edge—and our nation's credibility among other nuclear powers. Nuclear energy plays a vital role in meeting our nation's electricity needs, protecting the environment, and preserving the fuel and technology diversity that is the strength of the U.S. electricity supply system. On behalf of the MEA [Multicultural Education Alliance], we implore you to take the steps necessary to ensure the United States does not lose its competitive edge. (0150-3 [Rivera, Wendy])

Comment: The Nuclear Power Generation Industry provides the American consumer with a reliable, clean(carbon free footprint) and safe source of power. (0153-1 [Capurso, Thomas])

Comment: In closing, I feel that as the American energy demands increase, and as concerns of global warming grow, the Nuclear Power Industry will be an important part of the American Energy Program, helping to providing Americans independence from carbon based fuel for their long term energy demands. (0153-4 [Capurso, Thomas])

Comment: Now a word about nuclear power. It's an undisputed truth that nuclear power plants produce about two-thirds of the emission-free electricity in this country. New York State's six reactors produce 30 percent of its electricity with Indian Point providing a large chunk for New York City. New Jersey's four reactors produce fully half of its electricity. These power plants do

not require the sun to shine or the wind to blow to keep the electricity flowing. They are there 24/7. They provide essential, reliable electricity to our homes, businesses, factories, and hospitals all over the country. But they also do something else. They provide jobs with good pay and benefits for our families, friends and neighbors. And that's not just the people who work at the facilities but the regulators, supplier, and local businesses that exist solely to cater to the people who work at the plants. Let's not forget all the taxes that are paid. (0163-11-5 [Gutherman, Brian])

Comment: NAYGN strongly believes that nuclear energy is an integral part of a national energy plan and must continue to generate an essential share of the nation's clean non-emitting zero-carbon baseload energy. Nuclear energy generates 59 percent of the carbon-free electricity produced in New York. This factor is according to the Energy Information Administration. Our nuclear energy facilities also provide substantial economic benefits to the state and local community including high-paying jobs and tax revenue that helps keep town services funded and property taxes much lower than they otherwise would be. (0163-17-1 [Schepperly, David])

Comment: Our members [CASEnergy] support the increased use of nuclear energy (interference) -- excuse me -- to ensure an environmentally clean, safe, affordable, and reliable supply of electricity. (0163-18-1 [Lapiska, Evan])

Comment: Nuclear energy has shown that it is a responsible source of electricity and a valuable community partner. Nuclear energy safely and cleanly provides nearly 20 percent of our electric power nationwide and nearly two-thirds of our carbon-free electricity, and supports more than 100,000 high-paying jobs. Because of nuclear energy's commitment to producing affordable clean power and its commitment to safely, cleanly, and securely storing spent fuel, it is no wonder why communities near nuclear facilities strongly support nuclear energy. (0163-18-4 [Lapiska, Evan])

Comment: I hope to hear a discussion of the facts and that is that nuclear energy has shown the utmost commitment to safely and securely storing spent fuel and that will never change. (0163-18-6 [Lapiska, Evan])

Comment: First of all, it's important I think that we all recognize that nuclear energy is safe. In the 50-year history of commercial operation there has not been a single death from nuclear energy. (0163-19-1 [Steidler, Paul])

Comment: The second thing -- the second thing I'd like to add, you know, there's been a lot of discussion today about Hurricane Sandy and the one year anniversary having been yesterday and that is a tragedy that we should not forget and it's something that we should look at and look to rigorously examine so we can prevent events like that from happening again. We believe that nuclear energy is essential to that. (0163-19-2 [Steidler, Paul])

Comment: President Obama and his Energy Secretary Ernest Moniz believe that nuclear energy is essential for addressing global warming and giving our kids a better world and with that as background, there is some good news. New York City today has the cleanest air it's had in 50 years and New York State has the lowest per capita carbon emissions rate of any state in the country in large part because of the fact that 30 percent of the state's electricity comes from nuclear power. (0163-19-3 [Steidler, Paul])

Comment: With that said, I would like to read the statement from our Chairman Mr. Kremer. "We have every confidence that the used fuel stored at New York's six nuclear power plants is

safe and secure in good part because it is already rigorously inspected by the U.S. Nuclear Regulatory Commission. We urge the NRC and other policy makers to find permanent solutions for this used fuel including the establishment of designated repositories to where it can be shipped and recycling options." (0163-19-4 [Kremer, Jerry])

Comment: Our members [CASEnergy] support the expanded use of clean-air nuclear energy to ensure an affordable and reliable supply of electricity for America. (0163-29-1 [Bailey, Savannah])

Comment: Nuclear energy facilities play an important role across America by producing clean reliable power for many and it's necessary that they be allowed to continue their safe and efficient operations. (0163-29-3 [Bailey, Savannah])

Comment: To end I would like to restate my support for an industry that continues to provide clean-air energy while storing spent fuel safely and securely on site for decades. Beyond being reliable and affordable, nuclear energy does not put harmful greenhouse gas emissions, sulphur dioxide, nitrogen oxide and mercury into our air making it our largest source of emissions free electricity. (0163-29-8 [Bailey, Savannah])

Comment: I would like to finish with what I would describe as the value proposition of nuclear energy. First, it provides large quantities of electricity around the clock, safely and reliably when needed, but the value proposition doesn't end there. Nuclear plants provide clean-air energy. They also provide voltage support to the grid, helping to maintain its stability. Nuclear plants provide forward price stability and are not subject to the price volatility that many in the northeast experienced with gas-fired generation being dominant. Finally, nuclear energy plants contribute to the fuel diversity and technology diversity that is one of the bedrock characteristics of a reliable and resilient electric sector. (0163-30-2 [Ginsberg, Ellen])

Comment: I have been in the nuclear industry for the past 2.5 years and have come to view it as one of the most safety conscious work environments that I have ever worked in. For example, in this industry the operator is recognized as part of the system and every task he performs is evaluated for its impact on the safety of the plant. This means that if a job is deemed to be "too risky," then the job itself will be redesigned. As a result, the nuclear industry has had a long history of proportionally safe human performance. (0176-1 [Stringfellow, Paris])

Comment: Third, nuclear power is a safe, carbon free and reliable form of energy that provides the foundation for our nation's electric grid. As expected in the Atomic Energy Act, the NRC should efficiently provide for the continued licensing of this safe and proven technology. (0180-8 [Merrifield, Jeffrey])

Comment: Nuclear power plants supply about 20% of the nation's electricity, and provide two thirds of the emission-free electricity in this country. These power plants do not require the sun to shine or the wind to blow to keep electricity flowing. They are available around the clock. They provide essential, reliable electricity to our homes, businesses, factories, and hospitals all over the country. They provide jobs with good pay and benefits for our families, friends and neighbors. (0181-4 [Waters, Christine])

Comment: Nuclear power plants supply about 20% of the nation's electricity, and provide two thirds of the emission-free electricity in this country. These power plants do not require the sun to shine or the wind to blow to keep electricity flowing. They are available around the clock. They provide essential, reliable electricity to our homes, businesses, factories, and hospitals all

over the country. They provide jobs with good pay and benefits for our families, friends and neighbors. (0183-4 [Green, Carlyn])

Comment: As stated before, nuclear waste is just spent nuclear fuel. What does this nuclear fuel do for us exactly? The amount of energy put out by even the smallest amount of nuclear fuel is incredible, and energy is beyond crucial to everyday life. Energy is what enables us to do everyday activities, such as sit in a room with light, do laundry, drive a car; energy is involved in about 99% of what we do everyday. Nuclear energy is a huge breakthrough in human technology, because we can get so much energy from so little fuel. The efficiency and relative ease of this process is truly amazing. Author Alvin Weinberg talks about how society today must correctly choose what is essential to human survival and what is not. "I would put nuclear energy and pesticides in the first category, supersonic transports in the second" (Weinberg, 1970). Weinberg means that category one is the one that holds the things that are essential to human survival. What I'm trying to say with all of this is that nuclear energy is so precious to us that to give it anything less than our full attention is not necessarily an illegal or evil act, but rather a very questionable move on our part. (0192-10 [Einhorn, Jeremy])

Comment: As I just explained, the power of nuclear energy is astonishing. Its ability to provide such massive amounts of energy with such little amount of fuel is truly a milestone for human existence. This amazing technology, however, as well as many other pieces of technology always has the potential to become "better." This means that we constantly are researching and testing new ways that the technology can be more productive and be more efficient. With this movement forward in technology, that means that new standards must be in place so that it is up to date with the updated technology. Nuclear waste disposal technology has most definitely moved forward in the past decade or so. (0192-12 [Einhorn, Jeremy])

Comment: Throughout this comment, I have shown how critical it is that we have nuclear energy as an option. Energy is beyond critical is all of our daily life activities; every last person in this country uses so much energy per day, that to have none would mean human existence ceases to exist. If we are going to readily use nuclear energy as a way to provide so much of said energy to us, then we also have a responsibility to uphold. We cannot assume that we can have such great power and get away with not having to upkeep anything dealing with it. I'm talking mostly about the waste it produces; it is highly toxic. Since it is the NRC's job to be the fixed point for any nuclear energy related activities, it is also their job to be in charge of the nuclear waste. (0192-14 [Einhorn, Jeremy])

Comment: I have worked in the US Nuclear Power Industry for over 30 years. I have worked in both the Utility and supplier sectors of this business. During that time I have witnessed our industry continue to be a safe, secure, and environmentally sound source of electricity supply to our nation. Nuclear energy provides an emissions free, domestic source of base load electricity generation, and creates thousands of jobs for our citizens. Nuclear Energy is a vital part of our energy portfolio in the US. (0201-2 [Fregonese, Vic])

Comment: Our members support the increased use of nuclear energy to ensure an environmentally clean, safe, affordable and reliable supply of electricity. (0212-1 [Lapiska, Evan])

Comment: Stepping back from spent fuel storage, the larger debate I have seen taking place at these meetings is on the future of nuclear energy in general. Plain and simple, if we are serious about addressing climate change and reducing carbon emissions, nuclear energy is a vital part of any viable plan. Nuclear energy currently provides electricity to one out of every five homes and businesses, yet it accounts for nearly two thirds of our clean air electricity. In

addition to being clean, it is reliable as a 24/7 baseload source of electricity, or put another way, a perfect complement to intermittent renewables like wind and solar. (0212-4 [Lapiska, Evan])

Comment: I hope to hear a discussion of the facts, and that is that nuclear energy has shown the utmost commitment to safely and securely storing spent fuel and that will never change, while providing us with clean, safe and reliable electricity around the clock. (0212-6 [Lapiska, Evan])

Comment: The CASEnergy Coalition is a national grassroots organization that supports the increased use of nuclear energy to ensure an environmentally clean, safe, affordable and reliable supply of electricity. (0213-1 [Coalition, Clean and Safe Energy])

Comment: The nuclear energy industry has built a comprehensive system using state-of-the-art technology to safely and securely contain the spent fuel it creates that keeps both the public and the environment safe. (0213-2 [Coalition, Clean and Safe Energy])

Comment: Nuclear energy is a safe, reliable source of electricity and a valuable community partner--it provides nearly 20% of our electric power and supports more than 100,000 high-paying jobs. Because of nuclear energy's commitment to producing affordable, clean power, and its commitment to safely and securely storing spent fuel, it is no wonder why communities near nuclear facilities strongly support nuclear energy. (0213-4 [Coalition, Clean and Safe Energy])

Comment: Nuclear energy is a vital component of the U.S. electrical generation family. (0244-1-4 [Tulenko, James])

Comment: But industry doesn't rest on that. Once again, we go beyond. You know, we are very confident at our plants we didn't overlook something as a high probability as the tsunami in Japan. But we're not going to say, "Okay, we're fine, we're stopping there." No. Not even close. We're saying, "Okay, in spite of all the work we've done over all the years to look at what can happen, what if something we didn't think could happen, happens?" We're putting in place flexible strategies that can be deployed from offsite and from areas where if everything is wiped out we could bring in the right stuff, and it's called flex, and it will be yet another innovation in nuclear safety. We always continue to get better and to get stronger. Yet, in this EIS the NRC has assumed we stay the way we are, and based on the facts they have concluded, and there are a lot of facts in there, that the impacts are small. We believe the impacts will be even smaller. (0244-11-12 [McCullum, Rod])

Comment: We're a national grassroots organization that supports the increased use of nuclear energy to ensure an affordable environment -- environmentally clean, reliable, and safe supply of electricity. As everyone knows, safety is the most important element of our focus in nuclear. Our priorities in Waste Confidence should be no different and protecting the public must be the top priority in what we do. (0244-12-1 [Ratchford, James])

Comment: The U.S. was the first country to develop commercial nuclear power plants, and we've the largest nuclear program in the world; 100 reactors with 5 more under construction. Having once been a leader in this technology, we are risking -- we are at risk of losing our competitive edge and our nation's credibility among other nuclear powers. (0244-12-5 [Ratchford, James])

Comment: I think this is important work you're doing because there is really no need that waste handling -- nuclear waste handling should be a barrier to future continued development of

nuclear power generation. AABE Florida strongly believes that nuclear energy is an integral part of our national energy plan and must continue to generate an essential share of the nation's clean, non-emitting, zero-carbon baseload electricity. According to the Department of Energy's Energy Information Administration, in Florida, nuclear generates 98 percent of zero carbon electricity. The state's nuclear facilities also provide substantial economic benefit to state and local economies, including high-paying jobs, tax revenue, which helps keep local taxes down, and also funds local services. Property taxes, for example, are much lower than they would otherwise be. On average a typical nuclear facility provides nearly \$500 million in annual economic output including more than \$35 million of employment income. Each year it pays about \$67 million in federal income taxes and nearly \$16 million in state and local taxes. (0244-2-1 [Knowles, Berdell])

Comment: As students in the state of Florida, we believe that current and continued use of zero-emission nuclear energy is vital to the state both economically and environmentally. (0244-7-2 [Kuntawala, Jitesh])

Comment: To finalize: the continued storage of spent nuclear fuel onsite is not a limiting factor of the operation of Florida zero-emission nuclear plants, nor is it an environmental or public safety issue. We, as nuclear engineering students, are studying every day so that we can be a part of our nation's clean, zero-emission future. (0244-7-5 [Kuntawala, Jitesh])

Comment: [T]he only source of zero-emission energy that we have is those nuclear power plants. It's been that way for five decades, it is going to be that way for a long, long time in the future. As to witness who spoke earlier ostensibly on behalf of an alliance for clean energy, a witness whose title I think was a high-risk energy advisor. I would just suggest that the high risk, the high risk is that we further delay licensing decisions for more clean energy, more zero-emission nuclear power. That's the real risk here. And although I know it's -- it's no fault of y'all's but the Waste Confidence Rule and the politics of it, some of which Dr. Rossin spoke about, really has only served to delay, delay the ability to provide cleaner air for more people. (0244-9-6 [Paul, Jerry])

Comment: So I know that some of that is slightly off-topic, but it is to say to you that this issue that you're wrestling with, the question of approving a generic EIS and moving forward so that Florida can get back on track with planning more clean energy. It's very important to the state, not just to the nuclear industry and people who work in the industry, but for the people who need the clean air that come from it. So, I hope you keep that in mind[.] (0244-9-8 [Paul, Jerry])

Comment: [T]hank you for allowing my office the opportunity to address this public meeting regarding Nuclear Regulatory Commission Rulemaking to address waste confidence. As many Illinois residents rely on nuclear clean and portable energy, this rulemaking will have an important impact to consumers across the state. In the 16th District alone, there are four nuclear power plants providing great price stability to consumers throughout our nation. Nuclear power provides half of our state's energy and generates almost 93 percent of the carbon-free electricity produced in Illinois. Without the availability of this baseload power, there is no doubt that prices would skyrocket and energy stability would plummet. In addition, the nuclear energy industry support thousands of high-paying jobs, which in turn supports the tax base of our local communities. (0245-1-1 [Wilson, Reed])

Comment: I want to talk to the fact that the Nuclear Regulatory Commission has suspended all final licensing decisions while this rulemaking process moves forward. I believe it's time to provide this industry that provides a clean source of energy to billions of consumers the ability to

move forward with a greater level of certainty for the long-term operations. (0245-1-3 [Wilson, Reed])

Comment: So, it comes down to this. I mean as nuclear engineers, the last thing we want to do is cause any harm to the environment. I mean I have a son, and a family, and a home, and I care about the environment as much as you. You know, many of us became nuclear engineers because we know it's a great technology and it's a workable technology today. (0245-12-5 [de Graaf, Brandon])

Comment: When it comes to the rhetoric of a lot of the activists who oppose nuclear energy, the story always remains the same. There is some hypothetical scenario or red herring issue concocted to represent the immediate peril supposedly created by nuclear power. But as always, upon closer examination, the story unravels. (0245-16-1 [O'Brien, Doug])

Comment: Now, of course the past is no guarantee of what's to come in the future. These are facts, plain and simple. To try and counter these facts in the overall safety record of nuclear energy with scenarios worthy of the most inventive Hollywood screenwriter is to irresponsibly distract from what should be a serious discussion of the important role of nuclear power in creating a diverse and independent energy supply for our country. These tactics also divert attention from the growing forest of support for nuclear energy from the environmental movement itself. Among those who realize that if we are going to reduce our carbon footprint in a meaningful way, we must rely on the single great source of carbon-free emission, nuclear. There are many examples in the recent media about the environmental leaders, about how the global warming and the leaders in the environmental community wisely embrace nuclear power, and the Energy Secretary who states that nuclear power will play a key role in the fight against climate change. Now, we can juxtapose the hypothetical scenarios that try to paint spent fuel storage as some impending doom with some very tangible data. According to NASA Climate Sciences James Hansen who is a leading voice in the battle against global warming, the use of nuclear power generation has globally prevented the emission of over 60 billion tons of greenhouse gases and has prevented as many as one million premature gas globally. This is quantifiable. It's not based on what ifs, maybes, theoreticals, or scenarios. The Illinois Clean Energy Coalition promotes the use of clean energy sources in a competitive and sustainable marketplace that will fuel our economy while benefitting our environment. (0245-16-3 [O'Brien, Doug])

Comment: I've worked in radiation protection for three years and to a lot of people it may not seem like a very long time to really gain a grasp on how serious it is to work in the nuclear industry. I've talked to a lot of you before the meeting and I appreciate all of those that did come up and talk to me about their opinions on the nuclear industry. I want to talk to you about my opinion on the nuclear industry and what I've worked with in the three and a half years. I have confidence in my plant. I have confidence in our safety. There are a lot of different examples I can give you, but one of them -- we were mentioning terrorist attacks. Every three years, the government comes up with a team of military individuals to break into our power plant called -- and every year since I've been, or for the last ten years, Braidwood has been successful in passing that. They, like, really try to break in, they break down wires, they shoot fake weapons at each other, kind of like really high-tech laser tag. But that's really safe. I mean we've come up with scenarios, we try to put it on ourselves against terrorist attacks. (0245-18-1 [Stenson, Amanda])

Comment: I also wanted to bring up operating experiences. We learn from our mistakes. TMI happened in 1979, and out of that INPO was created. And I don't know any other industry that is

open to other businesses talking to each other about their problems as the nuclear industry. We have forums set out across the country to discuss with each other whatever problems they might be having to kind of gain insight to all those. And that's unheard of in any other industry. That's why I have confidence. We're not afraid to say that we made a mistake and we fix it. (0245-18-2 [Stenson, Amanda])

Comment: First and foremost, I just want to say that I am extremely proud to be an Exelon Nuclear employee. I have a degree in nuclear engineering. I've worked in the industry for 25 years. And a side note, I have had three children, I had been pregnant. Through working at the plant, I have three healthy young adult women, so on the testimony that working in the plant and being pregnant has no impact on bearing healthy children. What I would like to tell you is I have worked for a long time in the industry and I can tell you that the folks that I work with throughout the organization from top to bottom have an appreciation that nuclear power is special. We get that. We understand it's special. And it's our priority every day in what we do to ensure that we operate these plants in a manner that protects the health and safety of the public. We do live in the vicinity of plants. We have family, we have friends, we have our colleagues we care about deeply. We would not put any of those people in harm's way. As an employee, we are committed to ensure that our plants run safely. Our plants operate 93 percent of the time, regardless of the weather or the time of day, providing a reliable baseload output greater than any other generation source. We understand that the decisions we make on a daily basis have a potential to impact the lives of our coworkers, our families, and the surrounding communities. Because of this, we hold each other accountable. We challenge, we train, and we continuously improve. You spend a day with us in our facilities, it would be apparent to you, we take nothing for granted. We get independent expert opinions on technical issues. You would see that our employees are encouraged to and are comfortable with challenging each other. You would hear every morning across our organization industry experience being shared and actions taken to ensure that we mitigate potential issues. (0245-23-1 [Korn, Susan])

Comment: I have been an Illinois resident my entire life. Everyone I know and love, including all of my family and my friends, live here in the Chicagoland area. My husband and I live near these plants and this is where we plan to raise our family. If this technology was not safe, I would not be here. (0245-26-2 [Kovacs, Ashley])

Comment: I'm a construction engineer out of Iowa State and I work at the Braidwood Station Nuclear Power Plant down southwest of Illinois. The comments that I want to bring forth here are just based on my experience with the safety culture at nuclear power. I know a lot of the criticism we've had has been based on some, to put it pointedly, lack of morality of some of the people in the nuclear industry. And I just really don't think that's true. Again, a lot of the folks sitting here can call us young and naive but I do represent part of the young generation in nuclear and actually NAYGN is exactly what it means, the North American Young Generation in Nuclear. And really, my perspective is just a shocking safety culture, especially considering what industry I was planning on going into, which was in construction industry. I understand that all the talk here is, in part, borne from the events in the past, but again I'd like to talk about the recent performance based on my experience of the nuclear industry. And I believe that it's safe to say that thinking that workers would value their own personal safety is really indicative of workers who also value safety culture and their perspective of the effect that it normally has on themselves while they're working, but the public when they meet that work environment. So, something I haven't heard a lot of is to throw out some actual facts and statistics. So, I'll try to give a little bit of that right now. So, earlier this year, I gave a speech to some high school kids who are looking at going into trades. And one of the things I tried to advertise to them when they were looking at what trades they wanted to pursue is to look into the nuclear industry because

really what they want to do is contribute to longevity and in order to do that you want to work in a safe environment. So, just pulling straight from the Bureau of Labor Statistics, looking at injuries per 100 full-time workers, the nuclear industry is, it's actually pretty shocking how much better we are as far as just personnel safety. Per 100 full-time workers, we get 0.3 injuries. To compare that to other generation really don't, the only next closest generation activity you can compare that to is fossil fuel and that's 2.1 injuries per 100 full-time workers. So, several times higher. The industry that I thought I was going to into, construction, 3.7, so even higher. And stepping up to another industry which is the industrial sector, manufacturing, at 4.3 injuries per 100 full-time workers. So, I really think anybody that, I really think that people who would value their own personal safety, it's just a cultural norm that they're going to also value the safety of the public. (0245-28-1 [Rosso, Chris])

Comment: And as a fairly new face to the nuclear power industry, I would just like to take a moment to speak the issue of culture shock that I had when I arrived. A shock at, you know, the seriousness that we take with every decision that we make, and at the attention that we continuously give to safety. The safety culture that's established at our plant and all the Exelon plants and all of the nuclear plants, at least in the U.S. and across the world, it's held to the highest standard. So, it is always on top of our mind in every decision we make and I never ever question my personal safety when I'm at work. (0245-33-1 [Schussele, Samantha])

Comment: I currently live within 50 miles of three nuclear power plants as I'm sure many of you do. I plan on remaining there. I plan to get married there. I plan to raise my family there. And I have the utmost confidence that my future family and I will live in a safe and happy community even with these nuclear power plants, enhanced by these nuclear power plants. (0245-33-3 [Schussele, Samantha])

Comment: Illinois leads the nation and has a chance to lead the world in reaping the benefits of this experience. 50 percent of your electricity, 5,000 jobs, \$400 million in annual payroll, and \$170 million in taxes. Most importantly though, the nitrogen oxide pollutions that are avoided by using all this nuclear energy is the equivalent of 4.3 million cars. A lot has been said here tonight, a lot of speculation, a lot of them are flat out untrue. But 4.3 million tons of nitrogen oxide in the air, we know what that does. A very real health situation about air pollution. (0245-34-2 [McCullum, Rod])

Comment: A lot of young people today are looking into facts about climate change. They are asking the hard questions. They're deciding to become nuclear engineers. If we were to turn our backs on nuclear energy, it is the best weapon we have against climate change. Yes, solar should play a role. Yes -- should play a role -- based on large-scale electricity generation. If we were to turn our backs on our biggest weapon against climate change, I would question the safety culture of our nation. But I know we won't do that. I'm heartened to see, when I come to Illinois, so many young people getting into this business and letting their safety culture drive our nation in the right direction. (0245-34-4 [McCullum, Rod])

Comment: The Will County Center for Economic Development is committed to creating a healthy business environment to attract businesses and jobs to Illinois. We know that having a competitive, safe energy infrastructure is a key part of the economic growth equation. We are fortunate to be home to one of Illinois' nuclear power generating stations at Braidwood. This facility employs nearly a thousand people and supports many thousands of additional jobs in the region. Braidwood Station pumps tens of thousands of millions of dollars directly into the area and economy and invests in many worthwhile community causes. (0245-4-1 [Fleming, Scott])

Comment: Manufacturers in Illinois employ more than 600,000 workers and contribute the single largest portion of the gross state product. Illinois manufacturers were responsible for over \$92 billion in economic output last year alone. Illinois residents benefit greatly from a quality energy policy. Our state's energy portfolio of coal, nuclear, natural gas, and renewable sources ensure that we have a strong, stable energy supply at relatively low cost. Reliable and affordable energy is a key factor that helps ensure that Illinois manufacturers can remain competitive in the world economy. Nuclear plants account for 48 percent of electric power generated in Illinois. (0245-9-1 [Peck, Jerry])

Comment: Illinois residents and manufacturers greatly benefit from reliable and affordable energy produced by nuclear power plants. Any efforts to cripple the industry through vexatious regulation is dangerous, not only for our state's economy, but to the long-term health and safety of Illinois residents. (0245-9-4 [Peck, Jerry])

Comment: NCSL [National Conference of State Legislators] believes that nuclear energy is an integral part of our national energy plan and must continue to generate an essential share of the nation's clean energy, zero carbon baseload electricity. (0246-1-1 [Husch, Ben])

Comment: I am very grateful, not only for the opportunity to speak here today but also for the work that the NRC does in ensuring that American reactors operate safely. The American public and the industry benefit tremendously from the work that you do. (0246-10-1 [Bennett, Nathan])

Comment: When I relocated to Maryland 15 years ago, I had no reservations about buying a house in that county that close to a nuclear power house. That is because of my first-hand knowledge from working on existing plants and new construction of nuclear power, both of which I have participated in. I know what stringent standard these plants are held to in construction, maintenance, and safety and security. (0246-18-1 [Karbowsky, Brad])

Comment: Couple this with the growing effects of greenhouse gas, we should be finding ways to help the nuclear industry, not hamper it. (0246-18-3 [Karbowsky, Brad])

Comment: Our members [of the Clean and Safe Energy Coalition] support the increased use of nuclear energy to ensure an environmentally clean, safe, affordable, and reliable source of electricity. (0246-20-1 [Lapiska, Evan])

Comment: Stepping back from spent fuel storage, the larger debate I have seen taking place at these meetings is on the future of nuclear energy in general. Plain and simple, if we are serious about addressing climate change and reducing carbon emissions, nuclear energy is a vital part of any viable plan. Nuclear energy currently provides electricity to one out of every five homes and businesses. Yet, it accounts for nearly two-thirds of our clean-air electricity. In addition to being clean, it is reliable as a 24/7 baseload source of electricity. Or put another way, a perfect complement to intermittent renewables like wind and solar. (0246-20-4 [Lapiska, Evan])

Comment: As the Commission continues these public hearings, I hope to hear a discussion of the facts. And that is that nuclear energy has shown the utmost commitment to safely and securely storing spent fuel and that will never change, while providing us with clean, safe, and reliable electricity around the clock. (0246-20-6 [Lapiska, Evan])

Comment: As a young engineer I am, however, sometimes frustrated with the safety issues in early generation reactors and I work hard to make sure that these reactors generating electricity for us are running like new, that their components are replaced, and that we can trust them. We

have learned over time that humans aren't infallible and I am part of a new generation of engineers that is working hard to make sure that reactors rely on the laws of gravity and natural laws that can fail and moving nuclear to a purely safety age. But these reactors, generation 1 and 2 and 3 were built in technologies from the '50s, '60s, and '70s. And computers of that age look ancient now. The technology for nuclear has not stayed the same either. We have new technology we are working hard to implement and getting it through the regulatory hurdles. And I do think that it is going to present a baseload and reliable form of cleaner energy for a future that we really need. (0246-21-3 [Garcia, Diego])

Comment: Nuclear energy is a safe, reliable source of electricity and a valuable community partner. It provides nearly 20 percent of our electric power and supports more than 100,000 high-paying jobs. Because of nuclear energy's commitment to producing affordable, clean power, and its commitment to safely and securely storing spent fuel, it is no wonder why communities near nuclear facilities strongly support nuclear energy. (0246-8-2 [Vince, Jenny])

Comment: The focus of nuclear power is always on protecting the health and safety of the public, and the safety of our employees. Our safety culture is like our personality, and thinking safety first is just how we are wired to respond. Every nuclear plant has subject matter experts in every area, to ensure that the choices and changes we make always reflect our commitment to safety. My group has over 100 years of combined expertise in nuclear technology. Nuclear is also a thriving industry. New graduates are entering the nuclear industry every year, and V.C. Summer Unit 1, 35 percent of our staff has been in the industry for less than five years. We have all committed to making nuclear energy a safe and abundant source of energy for the public, because in energy, diversity is the key. Nuclear is important to the energy security of the United States. I am personally passionate about my commitment to the nuclear industry. My goal is to educate. I want you to know my views, know all of the facts and make informed decisions regarding nuclear power. I have a great sense of pride for my projects at V.C. Summer Units 2 and 3, and for this reawakening of nuclear power. I encourage everyone in the audience to educate themselves on the benefits and challenges of nuclear power, along with other green technologies, and make the decision for themselves. (0250-10-1 [Tampas, Courtney])

Comment: Both of these are solutions that can be used to ensure the used fuel management security of the nuclear industry. (0250-10-4 [Tampas, Courtney])

Comment: But without an environmentally clean economical method to produce electricity, nuclear power, I fear that they will be living in caves, with nothing to do. So that's kind of my position on nuclear power. I think it's a clean method for the production of energy for the future. (0250-14-3 [Brookhart, Ryan])

Comment: I have worked my entire career in the nuclear industry on the design, the licensing and the manufacturing of nuclear fuel. I can personally attest to the high standards, the technical rigor, and the overriding commitment to safety in the U.S. nuclear industry. (0250-15-1 [Rodack, Tom])

Comment: As someone who is concerned about the environment, I am a strong supporter of nuclear energy. In fact, this is the reason I became a nuclear engineer. Nuclear energy is safe, it's reliable, and it does not emit greenhouse gases during operation. An advantage of nuclear energy over other sources of electricity generation is the concentrated manner of its waste. (0250-18-1 [Lang, Amanda])

Comment: Nuclear waste is a solid, and it's very compact, unlike gases, ash, particulate matter, or toxic chemicals from solar panel production. This waste or used fuel accumulated over 50 years of nuclear operation in the U.S. can fit in the area of one football field filled to a height of 20 feet. I feel much more confident handling this waste than I would other types. In addition to being compact, another advantage of nuclear waste is the fact that it's not really waste. (0250-18-2 [Lang, Amanda])

Comment: In the nuclear industry, the safety and health of the public and the environment are first and foremost in the minds of employees like myself, and I take that very seriously. (0250-18-6 [Lang, Amanda])

Comment: I support a diverse national energy portfolio, but believe we should use the resources where it makes sense. With respect to energy density, land usage, and air emissions, nuclear power is the best option for baseload power generation. I'm currently working with industry and wouldn't have continued down my career path in the past five years if I thought this was contributing to something that was inherently unsafe and dangerous. I've worked at several plants that were run very well. I've seen plant maintenance outages as well as the day-to-day operations. I've even talked to NRC inspectors who are very thorough operators; worked on several projects throughout my career and have shown that industry has continued to progress. (0250-19-1 [Howell, Adam])

Comment: Nuclear energy plays a vital role in meeting our nation's electricity needs. Protecting the environment, preserving the fuel, and technology diversity is a strength of the U.S. electricity system. One hundred nuclear power plants generate nearly 20 percent of our electricity, and in seven states nuclear plants generate more electricity than any other source. The Energy Department projects that the U.S. electricity demand will rise 28 percent by the year 2040 even with very modest economic growth. That means the United States will need hundreds of new power plants of all types to meet increased demand and replace older facilities that are retired. To help close that gap, we're in the process of constructing two new units right now and have them scheduled to go on line in 2017 and 2018. Some of these new power plants will have to be nuclear, like the two new units under construction now in Georgia at Vogtle, or the other three that are also under construction in South Carolina and Tennessee. Nuclear energy is the only emission-free source of electricity that can be widely expanded. The President has set ambitious goals for reducing carbon dioxide emissions, and the United States simply cannot get there without nuclear energy in the mix. In addition to generating clean air electricity, nuclear plants strengthen state and local economies through jobs, taxes, and direct and secondary spending. A typical nuclear reactor generates \$470 million a year in economic output, including more than \$35 million in total labor income. These figures include both direct output and secondary effects. The secondary effects at the local level include subsequent spending attributable to the presence of the plant and its employees, and plant expenditures filter through the local economy. The spending amounts to approximately \$17 million a year. That just shows that every dollar spent on the average nuclear plant results in the creation of \$1.04 in the local community, \$1.18 in the state economy, and \$1.87 in the U.S. economy. The average nuclear plant pays about \$16 million in state and local taxes annually. These tax dollars benefit schools, roads, and other state and local infrastructure. As a lifelong resident, I was born and raised in the area of the Plant Vogtle, and for many reasons nuclear energy has to be a vital part of our nation's energy plan. (0250-21-1 [Gunn, George])

Comment: Nuclear energy plays a crucial role in our nation's diversified energy portfolio, serves as a safe, reliable, clean air baseload energy source. Solar power and wind power are different parts of that diversified portfolio, and we fully believe in using those energy sources at

Duke Energy, but nuclear has to be a part of that portfolio as well. Nuclear energy makes up nearly 32 percent of the energy in North Carolina, and helps bring stable power prices and availability to all of the residents here. The Energy Department projects that U.S. electricity demand will rise roughly 28 percent by 2040, and the U.S. will need hundreds of new power plants to meet that increased demand over that time frame. Energy demand has grown roughly 2.4 percent per year over the past five years in North Carolina, and in order to meet this energy demand and reduce carbon dioxide emissions at the same time, nuclear energy will need to continue to be a major part of the electricity portfolio. The United States was the first country to develop nuclear power, and we have the largest nuclear program in the world. U.S. reactors have demonstrated over a long period of time their ability to maintain safe operation over their long life times. Stringent federal regulations from the Nuclear Regulatory Commission and an industry culture that has been built on principles for strong safety culture and the NRC's robust, independent oversight ensure that the nuclear industry reflects a safety first position in every decision that we make, including the safe management of used nuclear fuel. In addition, the NRC holds nuclear power plants to the highest security standards of any American industry to date. (0250-24-2 [Rogers, Tim])

Comment: Industry currently located in our state, as well as industry considering locating in our state, need to have confidence that not only we can satisfy their energy needs today, but we are also committed to having economical baseload energy generation to meet their long-term needs in the future. (0250-3-4 [Archie, Jeff])

Comment: Southern Nuclear strongly believes that nuclear energy is an integral part of the national energy plan and must continue to generate an essential share of the nation's clean, non-emitting, zero carbon baseload electricity. Nuclear energy generates 17 percent of the carbon-free electricity produced by Southern Company and that will increase with the completion of the construction of the two new units at Vogtle, currently underway. (0250-32-1 [Wesley, Ashleigh])

Comment: Southern Nuclear's top priority is the safety and health of the public and our employees. We are committed to the safe operation of our nuclear generating facilities with equipment and systems that meet strict NRC safety and design regulations. To that end, we urge the Nuclear Regulatory Commission to continue its strong independent oversight of commercial nuclear energy facilities, the operation of existing plants, licensing new reactors, renewing the operating licenses of existing reactors, and the management, transportation, and disposal of used nuclear fuel. (0250-32-2 [Wesley, Ashleigh])

Comment: I say it can be safely stored because my company, AREVA, will today take any nuclear fuel from any nuclear power plant in the United States, put it with the thousands of fuel assemblies we have at our La Hague reprocessing facility, and even recycle it today, extract the plutonium, and just like we burned plutonium for Russian nuclear weapons in U.S. nuclear reactors to take that plutonium off the street as a weapon and instead peacefully produce electricity, we can do the same today with U.S. nuclear fuel at our recycling facility and take the small amount of extra material and melt into glass logs this size to keep it protected from the environment. But I say again, it can be safely stored because for those who ask about the long timelines, in one of our mines in the Oklo Mine in Gabon we discovered there were no less than 60 nuclear reactors, nuclear fission reactors which ran 1.7 billion years ago, long before human beings existed. I encourage you to look it up. And how we know that they were there? Because by the grace of God that nuclear fuel was safely stored. And what happened, when the water got on it? It precipitated into the water and then moved as much as a foot, and then precipitated

out of solution as crystals. And we found those crystals so we know the fuel can be stored for 1.7 billion years. It, in fact, has actually happened. (0250-35-4 [Cook, Andrew])

Comment: One of the things that's kept me going in this sometimes frustrating end of the business for the last 15 years, is that it is a business where people don't get into the business unless they really believe in what they're doing, and they don't stay in the business unless they're really good at what they're doing. Charlotte, you are so very lucky to be a hub of this industry, to have so many of these companies located here, all of the jobs. They are doing good work for America. I'm proud to say that for my entire life millions of people have been getting the benefits of safe, clean, and reliable electricity from nuclear energy. The people I'm speaking out for today, the people who I work for, they don't just enrich America with the efforts they do, they have enriched your communities. They are an important part of the fabric of this part of the country. I'm jealous. I live in the Washington, D.C. area. I'm surrounded by a bunch of politicians. I think we have a lot of differing opinions but a lot of common grounds about what the politicians have done with this issue. Waste confidence is just one small piece of the regulatory puzzle that nuclear professionals must deal with every day, and these are professionals that don't just meet regulations, they exceed regulations. (0250-36-2 [McCullum, Rod])

Comment: I'm surprised that as a society we voiced all these concerns about nuclear energy, but we're very comfortable with commercial airlines. Both of these industries provide benefits to society by implementing complex and intricate technologies. Both of these industries are filled with dedicated professionals who have spent their life's work trying to understand how to harness the technology, and make it safe for the public. Let me say that again. Both of these industries are filled with dedicated professionals who have spent their life's work understanding how to harness the technology, and make it safe for the public. Both of these industries have independent regulatory structures to insure the public safety. Tonight's meeting is an example of the Nuclear Regulatory process in action. In addition to the NRC, the nuclear industry also has established the Institute for Nuclear Power Operations, which is an organization that the industry uses to help itself improve, in addition to the oversight provided by the NRC. Both the nuclear and airline industries have proven safety records. (0250-37-1 [Barilla, Frank])

Comment: I would also argue that the nuclear technology with a negligible environmental impact is actually a positive impact when compared with fossil fuels, because nuclear does not provide -- not generate carbon dioxide emissions. Even renewable technologies like solar and wind can increase carbon emissions, since they're often coupled with natural gas turbines to generate electricity when the sun isn't shining and the wind isn't blowing. (0250-37-5 [Barilla, Frank])

Comment: Third and finally, nuclear power is a safe, carbon-free and reliable form of energy that provides the foundation for our nation's electric grid. As expected in the Atomic Energy Act, the NRC should efficiently provide for the continuing licensing of a safe and proven technology. (0250-4-6 [Merrifield, Jeffrey])

Comment: My sophomore summer in college I was presented with the opportunity to intern at a nuclear power plant in Texas. I took that opportunity, and day in and day out I saw how people work at the nuclear power plant. They are so safety conscious, it's ingrained in their mind. You see, they have daughters, sons, mothers and fathers, grandfathers; they have grandchildren and great-grandchildren, and each day when I asked them what makes you work here? They said, you know, I'm concerned about the future of my kids and their kids. And by me working here, I can guarantee that things are done right, safely, efficiently, and that's why I'm here. And that is why I'm in the nuclear industry. I'm looking for my kids in the future. I want them to be

safe, and that's why I work in the industry. You know that 104 nuclear power plants have been running safely for the past 40 years? (0250-41-1 [Abendano, Juan])

Comment: You can take all that spent fuel or used fuel, if you will, and stack it end to end on a football field. From end to end about 20 feet high, that's all the waste we have. Now, we also have the technology to recycle. We can take that and diminish it down several times over, so we have that technology. So, do you think we can safely store now, in the past, now and in the future? You're darned right we can. And this is why I'm also in the industry. I'm looking to keep that new technology coming. As an electrical engineer, I want to contribute to that technology, to that safeness of our industry. (0250-41-3 [Abendano, Juan])

Comment: I implore you guys to go out and look at the facts, look at the facts of what is actually going on in the nuclear industry. I implore you to look for yourselves, look to other people who are in the industry, and you'll find out the real truth. We're a safe industry. We've safely stored our fuel in the past, today, and in the future. (0250-41-4 [Abendano, Juan])

Comment: As I mentioned earlier, I have complete confidence in the NRC. I have worked under the regulations for five years now, and really, it's a marvel in the same way that you -- I think that we should focus our energy on solving this large problem we have before us. I recommend to the NRC that they continue to review and take the insight of the Blue Ribbon Commission report, and I hope that you will continue to review and look into new nuclear technology as it develops new facilities, and pursue active licensing and active regulations to make sure we continue to operate things safely. I think both sides can agree that we need to solve this problem, and I think we need to look for solutions from industry, and I wish you the best of luck. I will continue to stay in this industry as long as I can under your guidance. (0250-43-3 [Causey, Lee])

Comment: Just one month after earning my mechanical engineering degree from Clemson University, I moved to Charlotte and began my career at Westinghouse Electric Company analyzing piping systems in our AP1000 pressurized water reactor. It was a significant shift from school. You see, previously, excelling in my senior design project when finding an ideal solution to a problem, guided by quantitative criteria based on things like material properties, process requirements, and economics; professionally, the first thing I had to learn was that in the nuclear industry safety takes ultimate importance over everything. This meant that quality was not a variable to be balanced against cost or schedule but, rather, an absolute that must always be maintained. Very quickly, this fundamental requirement of the overall nuclear safety culture became engrained in every decision I made, technical or not. This evolution is not unique to engineers beginning their careers in the nuclear industry. From accountants to human resource professionals to technical and craft labor, everyone is personally responsible for nuclear safety. And accepting direct accountability for such a monumental responsibility is the entry fee to work in the industry. Every generation of workers, from the men and women near the end of their careers to the millennials just starting hours, upholding the nuclear safety culture cultivates a tremendous sense of purpose, upon which we can all work together. After all, there is no other industry that depends so heavily on the success of everybody, direct competitors included. As a result, our professional and technical organizations enjoy remarkable participation from a diverse and intelligent labor pool. One such organization is the North American Young Generation Nuclear, a group of over 10,000 young professionals who are passionate about ensuring the myriad benefits of safe, responsible application of nuclear science and technology are enjoyed by generations to come. (0250-54-1 [Hennen, Jimmy])

Comment: Finally, I understand that there may still be lingering doubts about the viability of my industry's plans for long-term storage of spent nuclear fuel. So I want to close by reminding the Commission and members of the public that the future leaders of the nuclear industry have taken personal responsibility to guarantee that our society continues to enjoy incredible benefits of safe, responsible application of nuclear science and technology. And we will do whatever it takes to achieve this humanitarian goal. (0250-54-2 [Hennen, Jimmy])

Comment: I also recently moved from Lynchburg, Virginia to the Charlotte area and chose to live within the plant exclusion zone for McGuire Nuclear Power Plant. You may wonder why I did that. I grew up about 20 minutes away from Fermi Nuclear Power Plant and survived my entire life with no issue. And I really do love nuclear power and understand the science behind it. (0250-57-1 [Jones, Lauren])

Comment: Throughout my eight-year career in the nuclear industry, I have continued to gain respect for commercial nuclear power as a safe, clean, and reliable option for baseload electricity generation. The nation's operating nuclear power plants provide the majority of our nation's free electricity 24 hours a day, 7 days a week. You can't say that about solar, and you can't say that about wind. Overall, approximately 20 percent of the electricity produced in the United States comes from nuclear power, and about 32 percent of electricity produced in North Carolina comes from nuclear power. (0250-57-2 [Jones, Lauren])

Comment: Nuclear power is necessary for sustaining clean, affordable production of electricity in the United States. And I ask you today to support the continued licensing and relicensing of nuclear power plants and independent spent fuel storage and solutions. (0250-57-7 [Jones, Lauren])

Comment: And I have spent the last five years of my career as a technical professional in the nuclear industry as an advocate for nuclear power. I am an AREVA employee and a NAYGN chapter officer and chemical engineer. As you noticed already, I am here with several of my colleagues. Before me, my grandfather dedicated 50 years of his career as an engineer in the nuclear industry, a university dean, and a proponent of nuclear. We are just a few of the thousands of skilled employees of the industry that make sure that the lights in your homes go on and stay on every day. The fact remains that nuclear energy accounts for a fifth of the United States generating capability. And it is the most appropriate route to clean, safe, reliable, and carbon emission-free baseload energy with a proven track record of performance, despite the many misconceptions which abound, many of which I heard this evening. I assert that this country cannot sustain its energy needs, reduce its greenhouse gas emissions by any significant factor, and continue to secure the low cost of electricity that consumers and industries enjoy without drawing from nuclear power. The many available facts in my personal experience in regards to nuclear design, licensing, maintenance, research and development, and advocacy bolster my conclusions. (0250-58-2 [Cagnetta, Matt])

Comment: In sum, nuclear power is a viable, safe, clean, and reliable method for supplying America's renewable baseload energy needs for the foreseeable future and cannot be discounted from the nation's energy mix. (0250-58-5 [Cagnetta, Matt])

Comment: Nuclear power is an important source of safe, economical carbon emissions-free electricity, now and in the future. Our country needs the 24-7 baseload source of electricity. (0250-6-7 [Nesbit, Steve])

Comment: One of the things that we do in the nuclear business is we always focus on safety. And that's, first and foremost, the most important thing that we do. We have a tremendous responsibility. A lot of speakers have spoken about the responsibility that we have. We recognize that the nuclear energy industry is a socioeconomic organization. It provides benefit to people, safe, reliable energy supply that drives our economy, makes our lives safe, makes our economic well-being possible. (0250-61-1 [Little, Jim])

Comment: In my 40 years, I have worked in over 50 nuclear plants in 12 different countries around the world. I have been involved in not only design of reactors. I have lived near them. I have operated nuclear installations, treated high-level nuclear waste in a glass safely at the West Valley demonstration project, where I was the CEO of the company that did that very successfully with the Department of Energy. And I have lived near nuclear facilities. I lived less than 8 miles away from the Catawba nuclear plant, where I was the reactor designer for that facility over 40 years ago. So I have a lot of confidence in that technology and the ability to run safely. (0250-61-7 [Little, Jim])

Comment: And as part of getting the EIS approved, we also need to get the license application process for nuclear plants and spent fuel storage facilities moving again as well. In terms of I think the nuclear power industry and safety, it has been mentioned before, but I would just like to mention that over the past 30 years, I have lived in and around nuclear power plants. I, like some previous speakers, was involved in the design and construction startup operation and now on the service side, maintenance of nuclear plants. And there has been one thing I have noticed about all of the people I have worked with over the years. And that is a commitment to safety. It has been unwavering, and it has been a consistent theme with the nuclear professionals I have worked with. And if you look at the industry record with storing and transporting of spent fuel or used fuel, we have a demonstrated record of doing that not only here in the United States but also around the world. (0250-62-5 [Fregonese, Vic])

Comment: There are thousands of Americans that work in the nuclear industry. Each and every one of them work diligently to ensure that nuclear power and the mechanisms to transport and store spent nuclear fuel are designed to the highest quality to ensure the safety of the public. Of those thousands of people, many of which work at nuclear facilities, work at engineering firms like I do, even those that are regulating the industry, all of us have families. I am married with a three-month-old baby girl with the world ahead of her. And I have a very large extended family, probably larger than most. I can assure you that every action taken, every decision that is made is done so not only with the safety of our employees and the public at large in mind, but also the safety of our loved ones for generations to come. I guarantee that sincerely. Outside of the decisions that we carefully make, there are extensive quality requirements that we must meet. These requirements are heavily regulated to ensure a safe and accurate design. There is also a major emphasis on human performance, tools that we practice daily to prevent human error. Safety and human performance are how we at AREVA start every meeting. It is an essential part of how we do business. It is always a forethought. It is never an afterthought. From the regulators, to those who design and build, to those who operate the facilities, the safety culture of the nuclear industry is a fabric that is woven into each entity involved. Using operational experience from commercial reactors worldwide, our safety culture has been refined to provide safeguards that result in the safe and reliable use of the most efficient and CO2-free form of energy available: nuclear power. (0250-67-2 [DeVoe, Joe])

Comment: New U.S. plants and storage installations will rely on this Waste Confidence ruling. Right now worldwide there are about the equivalent of 35 plants the size of McGuire Station on

Lake Norman under construction. About five percent of that is going on domestically. We should lead the world in this technology. (0250-70-2 [James, Andrew])

Comment: Diversity of fuel supply is a very good thing. Regions have mixes of nuclear power, gas, coal, and appropriate levels of renewables are among the lowest cost in the country. That's a trend that has continued for years. Growth in renewable generation also is a good thing when it is done in a controlled fashion, but it is not a panacea. The error intermittency and the lack of reliability has been a Achilles' heel in places like Germany, Spain, and Ontario, where the dash to renewables has increased the power prices and also had really negligible impacts on CO2 there because of the backup fossil you need because of the non-dispatchability. In summary, my wife and I and our two children live about two miles from McGuire Nuclear Station on Lake Norman. And, as informed and educated citizens, we have no qualms about that. Nuclear power is essential to our power sector. (0250-70-5 [James, Andrew])

Comment: As an elected official, I believe that nuclear energy is an integral part of a balanced, national energy plan. Nuclear is a clean and reliable energy source that is producing electricity for millions across the nation and in my home state of California. According to the U.S. Energy Information Administration, nuclear energy generates 26.5% of the carbon-free electricity produced in California. And with this energy production comes employment opportunities for CA residents and economic growth for our local communities. The operation of a nuclear plant requires hundreds of people to perform numerous and varied responsibilities. (0253-1 [Avilla, Karen])

Comment: Nuclear energy facilities provide substantial economic benefits to the state and local community, including high-paying jobs and tax revenue that helps keep town services funded and property taxes much lower than they otherwise would be. (0253-3 [Avilla, Karen])

Comment: In the 16th district alone, there are four nuclear power plants providing grid and price stability to consumers throughout our region. Nuclear power provides half of our state's energy, and generates almost 93% of the carbon-free electricity produced in Illinois. Without the availability of this base load power, there is no doubt that prices would skyrocket and energy stability would plummet. In addition, the nuclear energy industry supports thousands of high-paying jobs, which in turn supports the tax base of our local communities. (0273-1 [Kinzinger, Adam])

Comment: Lastly, I want to touch on the fact that the Nuclear Regulatory Commission has suspended all final licensing decisions while this rulemaking process moves forward. I believe it is time to provide this industry, which provides a clean source of energy to millions of consumers, the ability to move forward with a greater level of certainty for their long-term operations. (0273-5 [Kinzinger, Adam])

Comment: The Will County Center for Economic Development is committed to creating a healthy business climate to attract businesses and jobs to Illinois. We know that having a competitive and safe energy infrastructure is a key part of the economic growth equation. We are fortunate to be home to one of Illinois' nuclear power generating stations at Braidwood. This facility employs nearly a thousand people and supports many thousands of additional jobs in the region. Braidwood station pumps tens of millions of dollars directly into the area economy and invests in many worthwhile community causes. (0278-1 [Fleming, Scott])

Comment: The FSHCC is a member of the Clean and Safe Energy Coalition and believes that nuclear energy is an important part of our national energy portfolio. And ensuring the continued

production of nuclear energy is critical to our nation's energy production and economic output. In Florida, nuclear energy generates 98 percent of the carbon-free electricity produced in the state, according to the U.S. Energy Information Administration. On average, a nuclear energy facility can generate nearly \$500 million in annual economic output, including more than \$35 million in labor income. Each year, it pays about \$67 million in federal taxes and nearly \$16 million in state and local taxes. It is clear that nuclear energy already plays a vital part of our electricity portfolio and economy. (0307-1 [Fuentes, Julio])

Comment: As a country that single-handedly commercialized the nuclear energy industry through the development of the world's first commercial nuclear power plants, the United States must ensure that it maintains a competitive edge and continues to build upon what is now the largest nuclear program in the world with 100 reactors. With nuclear energy being the most eco-efficient of all energy sources producing the most electricity in relation to its minimal environmental impact we must work to protect this. (0307-3 [Fuentes, Julio])

Comment: As an elected official, I believe that nuclear energy is an integral part of a balanced, national energy plan. Nuclear is a clean and reliable energy source that is producing electricity for millions across the nation. Ensuring its continued production is not only critical to our nation's economic outlook but to the well-being of our nation as a whole. The U.S. Department of Energy projects that U.S. electricity demands will rise 28% by the year 2040, even with just very modest economic growth. That means the United States will need hundreds of new power plants of all types to meet increased demand and replace older facilities that are retired. And some of these new power plants will have to be nuclear like the five reactors already under construction in Georgia, South Carolina and Tennessee. According to the U.S. Energy Information Administration, nuclear energy generates 98% of the carbon-free electricity produced in the state of Florida. And with this energy production come employment opportunities for Florida residents and economic growth for so many of our communities. One nuclear energy facility creates 1,400 to 1,800 high-paying jobs during construction, with peak employment estimated as high as 3,500 jobs during that period, yielding 400 to 700 jobs during the operation of the facility. Each year, a nuclear energy facility pays about \$67 million in federal taxes and nearly \$16 million in state and local taxes. (0308-1 [Weinberg, Luz])

Comment: This country needs Nuclear Power especially the the "New Technology" kind. The Green energy concepts that flourish and require tax subsidy will not produce the power we need. The tax subsidies must end. The US will need increasingly more power especially if the electric cars catch on. Electric cars with out Nuclear power bad for the enviroment. (0312-2 [Meyer, Charles])

Comment: I strongly believe that nuclear energy is an integral part of the national energy plan, and must continue to generate an essential share of our nation's clean, non-emitting, zero carbon baseload electricity. Nuclear energy generates approximately 26.5 percent of the carbon-free electricity reduced in our state according to the Energy Information Administration, and nearly 21 percent of our nation's electric output. (0325-13-2 [Wicks, Tonja])

Comment: [T]he one conclusion I have come to, our country, our state, our cities, they need a diverse portfolio of energy resources to meet our current and future energy needs, and to insure our energy security. It is imperative that we do not repeat the issues of the past and over-rely on a single source of generation resources which could lead to over-reliance, reliability issues, and price volatility. As a result, nuclear energy must, it must remain a vital part of a diverse energy resource mix. I believe we need to continue to find ways to utilize these resources and meet our

energy needs, and also keep our local communities viable and our residents employed. (0325-13-3 [Wicks, Tonja])

Comment: Our nuclear energy facilities provide substantial economic benefits to the state and local communities, including high-paying jobs, and tax revenues that help keep our town services funded and our property taxes lower than they otherwise would be. On average, a nuclear facility generates nearly \$500 million in annual economic output including more than \$35 million in labor income. Each year it pays approximately \$67 million in Federal taxes, and over \$16 million in local and state taxes alone. (0325-13-4 [Wicks, Tonja])

Comment: Our members support the expanded use of clean air nuclear energy to insure an affordable and reliable supply of electricity for America that also plays an active role in our fight against climate change, which stands as one of the most important issues of my generation. As a supplier of nearly two-thirds of our country's emission-free electricity, the use of clean nuclear energy has and must continue to play a role in reducing emission levels across the country. (0325-16-1 [Bailey, Savannah])

Comment: [T]he NRC is committed to insuring American nuclear facilities adhere to its strict regulations and operate in the best interest of the public. As such, operating facilities are subject to onsite inspections by NRC staff 24 hours a day, seven days a week, 365 days a year. Nuclear energy has shown that it is a responsible source of electricity and a valuable community partner. Safe, clean, and reliable nuclear energy provides nearly 20 percent of our country's electric power and supports more than 100,000 high-paying jobs that contribute to our growing economy. Because of nuclear energy's position as a producer of affordable clean power, its commitment to safely and securely storing spent fuel, and its role as an economic powerhouse at the local, state, and national level, it is no wonder why communities near nuclear facilities strongly support nuclear energy. (0325-16-3 [Bailey, Savannah])

Comment: My view is that nuclear energy is an important part of the national energy strategy in California, as well as in the East Coast. I was with the Secretary of Energy last week in a meeting and his speech was that all forms of energy are required to solve our energy security issues in the United States, and nuclear is certainly one of them. It provides 20 percent of the energy for the U.S. now. (0325-4-1 [Quinn, Ted])

Comment: We think it's important to make sure that nuclear energy facilities across the country are allowed to keep doing what they have been doing best, which is producing clean, reliable electricity. Now, I'm here to express my support and confidence in the storage of spent fuel onsite at nuclear facilities. (0325-5-2 [Kirton, Stratton])

Comment: Nuclear energy provides 19 percent of our electricity, but it provides 64 percent of our clean air carbon-free electricity. That's more than every other source of electricity in the United States combined right now. And, yes, that's measured over lifetime cycle analysis, as well. We should continue to invest in renewables like wind and solar, but if we're serious about climate change we shouldn't be so eager to attack our country's largest source of clean air electricity. We shouldn't cut off our nose to spite our face. As the NRC continues these public meetings, I would just like to reiterate my support for an industry that has shown it can and has safely stored spent fuel onsite. (0325-5-5 [Kirton, Stratton])

Comment: And during its rulemaking process I would encourage the NRC to support a process that continues to strengthen our nation's commitment to clean air technologies and improving nuclear energy. (0325-5-6 [Kirton, Stratton])

Comment: We are a pro-nuclear group that supports the use of nuclear power as a climate-friendly zero carbon emission source of electricity. We represent members all across the country in many of the states, if not all 50 states, and from all walks of life. So I'm here today on behalf of the Coalition, and I'd like to start by thanking the NRC for holding this meeting, and thank everybody for coming out here tonight for a spirited discussion. So we believe that it's important that the NRC make sure that nuclear energy facilities keep doing what they have done best, which is producing zero-carbon emission clean-air energy. (0326-16-1 [Kirton, Stratton])

Comment: Now, nuclear energy represents 19 percent of our country's electricity, but 64 percent of our carbon-free electricity; that means it's the number one source, by far, of carbon-free electricity in our country. Now, I understand concerns --- So we should continue to invest in renewables like wind and solar, but if we're serious about climate change, we shouldn't be so eager to attack our country's number one source of clean-air electricity. We shouldn't cutoff our nose just to spite our face. So as the NRC continues these series of public hearings, I would like to reiterate my support for an industry that's shown it can and has safely secured spent fuel onsite, and an industry that's at the forefront of clean-air electricity technology. During the NRC's rulemaking process, I would simply encourage it to support a process that strengthens our nation's commitment to clean-air technologies, including nuclear energy. (0326-16-4 [Kirton, Stratton])

Comment: I believe in nuclear energy as a means for providing our nation with clean, reliable-based load power, and in Diablo Canyon specifically, as a safe source of that power. (0326-17-1 [See, Daniel])

Comment: Nuclear energy is an important contributor to our nation's grid, providing 24/7 power. Also, nuclear energy, as was previously stated, our largest zero-carbon contributor to electricity right now, and it's key to reducing our greenhouse gas emissions in support of our U.S. clean energy goals. Also, I think we have a really good example of the impact of nuclear plants with the shutdown of San Onofre. California's CO2 emissions this year will go up above 35 percent. I'm personally not very happy about that. Also, the bills have went up about double for the people in that community, and happy that I'm not living there. (0326-18-4 [Schrader, Ken])

Comment: I am here on behalf of the Clean and Safe Energy Coalition, or CASEnergy Coalition, representing over 3300 individual and organization members in the business, environmental, academic, consumer, and labor communities across America. Our members support the expanded use of clean-air nuclear energy to ensure an affordable and reliable supply of electricity for America that also plays an active role in our fight against climate change, which stands as one of the most important issues faced by my generation. As a supplier of nearly 2/3 of our country's carbon-free electricity, the use of nuclear energy has and must continue to play a role in reducing potentially dangerous emission levels across the U.S. (0326-25-1 [Bailey, Savannah])

Comment: Nuclear energy has shown that it is a responsible source of electricity and a valuable community partner. Safe, clean, and reliable nuclear energy provides nearly 20 percent of our country's electric power and supports more than 100,000 high-paying jobs that contribute to our growing economy. (0326-25-3 [Bailey, Savannah])

Comment: Lastly, we are very proud of the safety record that we have accumulated over the years of operation and the clean energy that we provide to the State of California. (0326-3-4 [Strickland, Gerald])

Comment: On a personal note, I grew up with an acceptance of nuclear power. My father was an electronic engineer with a small manufacturing company, Time-Trol, Inc., located in Van Nuys, California, where he developed some of the first temperature control devices utilized in reactors early on as we were harnessing the force of nuclear energy. So for me, my trust in my dad and his understanding of the sciences nourished my level of comfort with the source of energy that brings us here this evening. Continuing on my journey through life, I ended up having a couple of not-so-comfortable experiences with nuclear reactors. In a previous career, I was part of a touring entourage where we were scheduled to appear on March 29, 1979 in Harrisburg, Pennsylvania, the day after the Three-Mile Island accident, and then I made several business trips to the Soviet Union shortly after the Chernobyl disaster. Those stories are for another time. (0326-33-2 [London, Rick])

Comment: The first is that, you know, as citizens we are all reliant upon energy, and I certainly believe that nuclear energy and its benefit should continue to be part of those different sources of energy that we utilize on a daily basis. (0326-37-2 [Rethmeier, Blain])

Comment: I'm a PG&E employee. I'm not here on behalf of the company. I'm not a company spokesperson. I'm definitely speaking for myself. I've been a resident of this area for many years. I was born here in San Luis Obispo and I also attended Cal Poly. I'm the past president of an organization in the United States, Canada, and Mexico called the North American Young Generation in Nuclear. We're 10,000 members who believe in nuclear science and technology and the benefits that it brings to all of our lives. I firmly believe in the benefits of nuclear science and technology, and specifically, in nuclear energy. I believe that nuclear energy in the United States is safe. (0326-41-1 [Zaitz, Kristin])

Comment: I live in Pismo Beach. I have two daughters that I've raised here. And I'm an environmentalist. I grew up in Wisconsin actually. I've been here since 1995. But as a child I spent almost all my time, almost all of it, sailing. I had a sticker on my car that said, "Split wood, not atoms" and in the end I became a nuclear engineer. And I work at the plant. I'm not a spokesperson. I guess I'm supposed to say that. But I do work there and I wanted to share some things. In college I studied all methods of creating power. I thought that getting into the energy industry would be a good, safe career. I studied everything. And really there are no perfect answers. We all have to live with the fact that nothing's perfect. You burn coal you're going to be dumping tons of radioactive crap in the air. You're going to be dumping tons of radioactive ash into the soil. You damn up rivers you're going to make people move, as the previous speaker said. You have wind turbines that are incredibly expensive. Solar, you're killing birds, you're wasting the land. There's nothing that's perfect, okay? All I can say is that I do trust the people I work with and I trust the company I work for. I think they're good people. I think they mean to do the right thing. I think we're all in a very, very difficult situation because of the government that we are all in. (0326-48-1 [Zawalick, Steven])

Comment: I just encourage everybody here to think about that, think about global warming. We've talked about all this radiation. Okay? But global warming could kill everybody on this planet in 100, 200, 300 years. And if we keep putting greenhouse gases into the atmosphere, and I'm not convinced that will happen, but it could, so you've got to look for clean power. Right now, I don't see any choice. And I want to commend the NRC for working with a very difficult problem, and I encourage the NRC in whatever is produced to produce something that allows for the responsible licensing, construction, and operation of nuclear power plants. (0327-16-2 [Border, Gary])

Comment: I am a pro-nuclear power person. It does not release CO₂. It does not result in radioactivity being emitted into the atmosphere like coal burning. It does not result in mountaintop removal, and I think it is a very good idea and it can be done safely, has been done safely. (0327-36-4 [Lamberger, Paul])

Comment: Let's just shut down all the nuclear power plants. What's going to happen then? What's happening in Germany? Germany, now they have to buy a lot of their electricity that's made by coal-fired power plants. What's in coal? It's got radioactive isotopes. It's being put all in the air all across the world. That's a problem. That's what causes cancer, causes diseases. It causes all kinds of problems when you do things like that. You have people that get cancer because of what the air is contaminated with. When you look at how many people nuclear power plants save? Has anybody ever considered that? How many medical diagnostic tests are run every year that help save people's lives, that tell us what's on the inside of you? That comes from isotopes created from a nuclear power plant. China has the world's worst coal pollution. Look at their longevity after birth. They're living longer because they have power, because they're prosperous and they can afford better healthcare. That's what nuclear energy brings to us. I myself have been affected very horrendously because of nuclear energy, not in very negative terms but not because of nuclear energy, because there was not a certain type of reactor that would produce a certain type of isotope that would have kept my fiancé from dying of brain cancer. Sentence her to death. That's what you happens when you go against nuclear energy. Does it have problems? Yes. Can they be overcome? Yes, they can be overcome. There are new technologies. We are not the old world. We are not the flat earth society. Americans can overcome. Americans do have ingenuity. We can do it if we're allowed to do it. There should not be something that's very negative. I've heard no, I've heard no, I've heard no tonight. Americans are, yes, we can, and we can solve this problem. And I think that we should be able to apply ourselves and we should be allowed to fix the problem. That's all. (0327-43-1 [Morrow, Jon])

Comment: I have been a passionate supporter of nuclear power since I began researching possible career paths in high school. That passion has drove my acquisition of a nuclear engineering degree, a career in the nuclear industry, and allowed me the opportunity to speak to you today as a member of the North American Young Generation in Nuclear, or NAYGN. NAYGN is a group of over 10,000 young professionals who are passionate about assuring that the myriad benefits of safe, responsible application of nuclear science and technology are enjoyed by generations to come. (0328-10-1 [Biersdorf, John])

Comment: Allowing for the NRC to complete this study will open the doors for the industry to grow and provide new, safer, and more efficient plants to be built that would help sustain this country's need for carbon-free electricity. Nuclear is just one answer to solving humanity's need to offset our carbon emissions, albeit an important one. And any delays in the implementation of well-rounded carbon-free portfolio could hinder this country's ability to adapt to our own energy needs, or even possibly cause irreparable damage to the environment in which we live. (0328-10-4 [Biersdorf, John])

Comment: It is important because nuclear energy plays a vital role in meeting the nation's and Minnesota's energy needs, electricity needs. With the diversity of supply providing balance, flexibility, and protection from price volatility, Xcel Energy is among the nation's leaders in delivering affordable, reliable, and clean energy to residents and businesses in Minnesota. Our Prairie Island and Monticello Nuclear Plants provide a steady baseload of carbon-free energy and play an important role in our ability to meet our customer's needs. In Xcel Energy's Upper Midwest Service Territory which includes customers in Minnesota, Wisconsin, North Dakota,

South Dakota, and Michigan, our nuclear generating plants have safely and reliably produced clean energy for our customers for more than 40 years. In 2012, they generated nearly 30 percent of the total electric energy used by our customers and produced 60 percent of the carbon-free energy that we provide our customers. (0328-5-1 [Pickens, Terry])

Comment: The United States was the first country to develop commercial nuclear power plants. We have the largest nuclear program in the world, 100 reactors with five more under construction. Having once been a leader in this technology, we're at risk of losing our competitive edge and our nation's credibility on commercial nuclear power issues. (0328-5-9 [Pickens, Terry])

Comment: I hear from the previous commenter, basically, a lot of lack of knowledge and unappreciation of where we would be in this world today if we did not have nuclear energy. So I would actually ask people like him to try to find the actual facts and not read conjecture, which is widely available on the internet to anyone who wants to. I have worked at nuclear power plants. I've worked with nuclear material, and the nuclear industry is much safer than many other activities that we have in our daily life. The risk that the previous caller accepts by getting in his car, flying in an airplane, taking medications, climbing a ladder, and doing many other activities are much worse. I also believe that people do accept risks of radiation everyday by living, by subjecting themselves to radiation on flying, and by medical procedures. (0329-2-2 [Mirsky, Steven])

Comment: So I applaud the NRC for proceeding forward on this, and I believe that, with sane, logical voices and people that understand the entire area of nuclear energy, that this is a positive step and an important asset in our energy mix that will improve our standard of living and the future of the world. (0329-2-3 [Mirsky, Steven])

Comment: The presence of abundant and affordable energy nearly always outweighs its negative effects it may cause. This can best be demonstrated by the coal-fired powered plants in China that are saving lives, not hundreds of lives, not thousands of lives, but millions of lives, every day in the most polluted cities in the world. Coal and nuclear energy has afforded a standard of living that decreases many of the societal factors that would shorten lifespans. Many Chinese in very polluted cities are now living as long or longer than Americans. (0347-10 [Morrow, Jon Paul])

Comment: Thousands of people are saved every year through non-invasive medical diagnostic testing with the use of medical isotopes that are derived from nuclear energy. Better yet, one of the best promises for a cure for cancer and AIDS lies in differing types of nuclear isotope therapies and treatments. There is a tremendous potential to save millions more lives every year with expanded research and development into new nuclear technology[.] I believe that the public cannot make good choices (decisions as a society) on nuclear energy, as they (the public) are primarily driven and motivated by fear and anger upon this topic and any topic of crises. (0347-11 [Morrow, Jon Paul])

Comment: Truth is not perception, truth is immutable, provable, auditable, and it is arrived at without the encumbrances of biases and preconceived notions. Using scientific principle and logic we can arrive at the truth of any issue. I am above all, a seeker of truth, and I think we should all be a seekers of truth...it is how we best interact with reality which is based upon a set of facts and truths that are immutable...as for passions, no matter how well intentioned, are still just passions, which are personal perceptions jaded by heart-felt emotion and they do not necessarily have to have any basis in reality. This is true no matter upon which side of the aisle

you stand. When I listen to the death count on Nuclear accidents like Chernobyl I hear one study that says 28 people died, another that says 100,000 and another that says 1,000,000. Clearly, someone is not being truthful and has an agenda. All three death toll claims are supposedly from reputable sources, but again, I am going to accept the one that makes their information public and it is auditable by the general public using scientific principles. Thank you NRC! (0347-4 [Morrow, Jon Paul])

Comment: I am glad nuclear power companies have a profit motive. Killing their customers is bad for business and accidents and leaks cost a ton of money. There is a financial incentive for nuclear utilities to be run well and waste stored well. I shudder to think how our nuclear industry would operate without a profit motive. (0347-6 [Morrow, Jon Paul])

Comment: Passionate speeches are made of how nuclear waste is killing and will kill thousands and millions of people, today, and in the future. Yet thousands and millions of people are killed everyday. You take a chance just crossing the road and getting hit by a car...should we ban cars? Every year thousands of people die in tragic car accidents, and using the same logic as the logic I have heard in these testimonies at the waste confidence hearings, I would surmise there would be those that advocate banning the automobile. That is illogical, as the automobile has provided us with prosperity which has allowed us to lengthen our lifespans, and therefore, save many more lives than what they have taken. (0347-7 [Morrow, Jon Paul])

Comment: The same is true of nuclear energy. While there is no doubt that the nuclear industry and the NRC has had its share of problems, the problems are fewer and becoming more and more insignificant everyday. (0347-8 [Morrow, Jon Paul])

Comment: Claims have been made that Germany has it right by eliminating Nuclear yet, this has caused increases in the burning of coal, more nuclear material (which is found in coal) is entering the atmosphere more than ever in Germany (and many purported environmentalist are happy about this....and using the very same logic presented by anti-nuclear activist...that would mean many more deaths than all the nuclear catastrophes combined will happen because of Germany's anti nuclear policy. At least Nuclear power plants contain the nuclear waste rather than letting it be spread into the atmosphere for all to breathe! (0347-9 [Morrow, Jon Paul])

Comment: Every year thousands of people die prematurely as a result of burning coal to provide our required electrical power. In the entire history of nuclear power in the USA no member of the public has ever been physically harmed by this energy source. Consider the saving of life and accrued medical costs if only nuclear power plants had been built over the past several decades. A more comprehensive review of the energy situation is provide at: www.energyfactoepriim.blogspot.com (0360-1 [Fray, Joseph])

Comment: Our atomic energy plant has an excellent record and is essential to the central coast power supply--Unless you can assure us that those hapless wind-mills can keep our homes lited and warm, please keep Diablo working--If you want to cool the run off water- that would be OK- (0374-2 [Landers, Don])

Comment: There is of course a lot of noise from those that oppose but most do not live here nor do they see a requirement for businesses and residences to have the power necessary to exist. I for one would hate to see any change, shut down or brown out coming from Diablo. (0382-2 [Tognazzini, Randall])

Comment: Nuclear power is a vital part of the energy sources society needs to maintain civilization. Without enough energy people could not produce, process, and transport enough food to keep most of the people on earth alive today. Starvation is not pleasant. (0390-1 [Kirkland, Gary L.])

Comment: Both Congressional actions described above occurred because of the fear of nuclear power. Cowards make decisions based on fear, an emotion. Our forefathers founded this country based on reason after defeating the most powerful military on earth. We must be brave. (0390-4 [Kirkland, Gary L.])

Comment: I urge you *not close the Diablo Nuclear Power Plant!* The power plant's energy is essential to a large population in California. It is a clean and efficient form of electrical power. (0408-4 [Watson, Jeannette])

Comment: I am quite sick of the anti-nuke, tin-foil hat club interfering with policy, frightening the public in their disinformation campaigns, and providing no rational alternative to the decisions made by the industry nor the NRC. They worked to prevent Yucca Mt. from opening and now at SONGs, these air heads are demanding we get rid of the SNF ASAP. The fools don't seem to recognize any inconsistency in these activities. I do hope the NRC will pay them the attention their ideas merit, i.e., none, and round file any correspondence from these knuckleheads. (0418-3 [Davison, David])

Comment: Nuclear power continues to be important in New England, because the alternative for baseload power is mostly coal. Several coal power stations are now scheduled for closure in Mass., so the continued operation of New England power stations is even more important than a few years ago. (0448-2 [Moncy, Charles])

Comment: Nuclear energy is a clear necessity as we move forward in developing a green world. The transition away from our dirty power, like coal and oil, cannot be as sudden as the flip of a switch and nuclear energy is key in this gradual transition. It is safe, for each facility takes great care to maintain a top safety protocol, and the clean nature of the power provides an excellent means to reduce the world's carbon footprint. In summary, nuclear power is essential for our world's future. (0449-1 [Zimmern, Matt])

Comment: I believe nuclear energy plays a vital role in meeting our nation's electricity needs. One hundred nuclear power plants generate nearly 20 percent of our electricity and in seven states; nuclear plants generate more electricity than any other source. The Energy Department projects that U.S. electricity demands will rise 28 percent by 2040, even with very modest economic growth. That means, the United States will need hundreds of new power plants of all types to meet increased demand and replace older facilities that are retired. I strongly believe some of these new power plants will have to be nuclear like the five reactors under construction in Georgia, South Carolina and Tennessee. Nuclear energy is the only emission-free source of electricity that can be widely expanded. The President has set ambitious goals for reducing carbon dioxide emissions, and the United States simply cannot get there without nuclear energy. In addition to generating clean-air electricity, nuclear plants strengthen state and local economies through jobs, taxes, and direct and \$35 million in total labor income secondary spending. A typical nuclear plant generates \$470 million a year in economic output, including more than These figures include both direct output and secondary effects. The direct output reflects the plant's annual electricity sales--approximately \$453 million. The secondary effects at the local level include subsequent spending attributable to the presence of the plant and its employees as plant expenditures filter through the local economy. That spending amounts to

approximately \$17 million a year. Analysis shows that every dollar spent by the average nuclear plant results in the creation of \$1.04 in the local community, \$1.18 in the state economy and \$1.87 in the U.S. economy. The average nuclear plant pays about \$16 million in state and local taxes annually. These tax dollars benefit schools, roads and other state and local infrastructure. A September 18 story in The Boston Globe highlighted the economic impact of a nuclear plant from the standpoint of a community whose plant closed. The article states, and I quote: "In the 17 years since Maine Yankee began dismantling its reactors and shedding its 600 workers, the town of Wiscasset have experienced drastic changes: property taxes have spiked by more than 10 times the number living in poverty has more than doubled and town services and jobs have been cut." The article quotes the town manager, Laurie Smith: "All these years later," she said, "we're still feeling the loss of jobs, the economic downturn and the huge tax increases." (0456-2 [Hoisington, Paula])

Comment: I am in total agreement that nuclear will power the future. Its' the only way to reduce dumping CO2 in the atmosphere. (0489-1 [Padden, Jim])

Comment: NAYGN strongly believes that nuclear energy is an integral part of a national energy plan and must continue to generate an essential share of the nation's clean, non-emitting, zero-carbon baseload electricity. Nuclear energy plays a vital role in meeting our nation's electricity needs, protecting the environment, and preserving the fuel and technology diversity that is the U.S. electricity supply system's strength. In addition to generating clean-air electricity, nuclear plants strengthen state and local economies through jobs, taxes, and spending. As a member of the River Bend NAYGN chapter, I know first hand the impact nuclear power has in the state of Louisiana. The two nuclear reactors in Louisiana provide approximately 15.8% of the state's electricity, provide more than 1,350 high paying jobs and contribute \$470 million to the local economy. (0535-1 [Damratoski, Katie] [Thornton, Adam])

Comment: I, and many others I know, would support construction of new nuclear power plants here in California, especially reactors that do not generate waste in their fuel cycle. I do hope that the opposition and political climate regarding the issue of waste storage and the use of nuclear power plants will subside in time, especially with future implementation of newer, cleaner reactors. (0538-3 [Kaul, Michelle])

Comment: I don't believe that renewable energy alone would be sufficient to address the US and World's energy needs and consider that Nuclear Energy has to be an integral part of the electricity generation options. (0568-2 [Michael, Edward])

Comment: I strongly believe that nuclear energy is an integral part of a national energy plan and must continue to generate an essential share of the nation's clean, non-emitting, zero-carbon baseload electricity. Nuclear energy generates 26.5% of the carbon-free electricity produced in our state, according to the Energy Information Administration and nearly 20% of our nation's electricity output. (0598-2 [Wicks, Tonja])

Comment: [T]he one conclusion I have come to is that our country, our state, and our cities need a diverse portfolio of energy resources to meet our current and future energy needs. It's imperative that we do not repeat the past and move to an over-reliance on any single generation source, which could lead to potential reliability issues and extreme price volatility. As a result, nuclear energy must remain a vital part of that diverse energy resource mix. I believe we need to continue to find ways to utilize these resources to meet our energy needs and also keep our local and state economies viable and our residents employed. (0598-3 [Wicks, Tonja])

Comment: Our nuclear energy facilities provide substantial economic benefits to the state and local community, including high-paying jobs and tax revenue that helps keep town services funded and property taxes much lower than they otherwise would be. On average, a nuclear energy facility generates nearly \$500 million in annual economic output, including more than \$35 million in labor income. Each year, it pays about \$67 million in federal taxes and nearly \$16 million in state and local taxes alone. (0598-4 [Wicks, Tonja])

Comment: Thank you for the opportunity to express my support for nuclear power. (0642-6 [Picking, Brian])

Comment: As someone who is concerned about the environment, I am a strong supporter of nuclear energy. In fact, it is the reason I became a nuclear engineer. Nuclear energy is safe, reliable, and does not emit greenhouse gases during operation. Why is it safe? Nuclear power has the lowest number of deaths per kilowatt hour when compared to fossil fuels, biofuel, rooftop solar, and wind power. [James Conca, "How Deadly Is Your Kilowatt?" Forbes, June 10, 2012] Why is it reliable? The United States nuclear fleet has a capacity factor of 90%. Finally, nuclear power does not emit carbon dioxide, methane, or nitrous oxide during operation. An advantage of nuclear energy, over other sources of electricity generation, is the concentrated manner of the waste. (0674-1 [Lang, Amanda])

Comment: Nuclear waste is a solid, and very compact, unlike gases, ash, particulate matter, toxic chemicals from solar panel production, etc. from other types of electricity generation. This waste, or "used fuel," accumulated over 50 years of nuclear operation in the US, can fit in the area of one football field filled to a height of about 20 feet. [Max Carbon, "Nuclear Power: Villain or Victim?"] I feel much more confident handling this waste, than I would other types of waste. In addition to being compact, another advantage of nuclear waste is the fact that it's not really waste. (0674-2 [Lang, Amanda])

Comment: Actually, nuclear waste from a fission reactor has been stored on earth for approximately 2 billion years without any storage casks. The Oklo reactors are natural reactors active approximately 2 billion years ago [Alex P. Meshik, The Workings of an Ancient Nuclear Reactor, Scientific American, January 26, 2009]. The "waste" from these reactors was never contained by human actions and yet it remained stable for billions of years within the geological formation where it formed. (0674-6 [Lang, Amanda])

Comment: Many of the environmental concerns the public has with nuclear waste storage stem from a fear of radiation. I would like to address the perception of radiation that exists with the public. Radiation is "mysterious" (really, it's just quantum mechanics!) and some people think it is scary because you can't see it/touch it/smell it and you don't know when you are being irradiated. In fact, you are being irradiated all the time. Radiation is naturally occurring and it's found all around us! Life would not be possible without radiation. (0674-7 [Lang, Amanda])

Comment: In the nuclear industry, safety and health of the public and environment are first and foremost in the minds of employees (like myself). (0674-9 [Lang, Amanda])

Comment: As you know, nuclear energy provides safe, clean, economical and reliable electricity--approximately 20 percent of the Nation's needs. In addition to the vital importance of the existing U.S. nuclear energy fleet and the jobs, competitiveness and clean energy they provide, additional reactors are currently under construction and more will be needed to meet growing demand. (0685-1 [Davis, Ed])

Comment: I urge the Commission to not be swayed by activists who cannot or will not do the math to see that nuclear power is by far the least carbon-generating power source available to humans on the scale necessary to mitigate global warming. The Commission's foresight in this matter should prevail. (0802-2 [Moore, Richard])

Comment: On average, a nuclear energy facility can generate nearly \$500 million in annual economic output, including more than \$35 million in labor income. Each year, it pays about \$67 million in federal taxes and nearly \$16 million in state and local taxes. In addition, one nuclear energy facility creates 1,400 to 1,800 high-paying jobs during construction, with peak employment estimated as high as 3,500 jobs during that period, yielding 400 to 700 jobs during the operation of the facility. These are jobs that cannot be shipped overseas. (0825-2 [Palomarez, Javier])

Comment: The United States was the first country to develop commercial nuclear power plants, and we now have the largest nuclear program in the world with 100 reactors. But we are at risk of losing our competitive edge. Of all energy sources, nuclear energy is the most eco-efficient of all, as it produces the most electricity in relation to its minimal environmental impact. Nuclear power plants produce no controlled air pollutants or greenhouse gases and produces nearly two-thirds of all carbon-free electricity in the U.S. We urge the Nuclear Regulatory Commission to continue its thoughtful and robust oversight of commercial nuclear energy facilities - the operation of existing plants, licensing new reactors, renewing the operating licenses of existing reactors, and the management, transportation and disposal of used nuclear fuel. (0825-6 [Palomarez, Javier])

Comment: My quest is scientific in nature, but it seems that NRC is being treated as a pawn. Nuclear energy in my opinion is the ultimate green energy and recycling model. Our past leaders discovered a new power and without haste exploited the power. (0881-2 [Szymanowski, Jennifer])

Comment: [Will Congress please give the NRC some teeth and make law to] 3) sell the American public on nuclear energy as effectively as private interest groups have defiled it. (0881-7 [Szymanowski, Jennifer])

Comment: I appreciate the fear invoked by mechanisms we don't understand but that fear will not make problems disappear. Education not public service announcements is the most effective way to dismiss these fears. Education is the most effective way to allow our generation to be great. (0881-8 [Szymanowski, Jennifer])

Comment: NAYGN strongly believes that nuclear energy is an integral part of a national energy plan and must continue to generate an essential share of the nation's clean, non-emitting, zero-carbon baseload electricity. Nuclear energy plays a vital role in meeting our nation's electricity needs, protecting the environment, and preserving the fuel and technology diversity that is the U.S. electricity supply system's strength. In addition to generating clean-air electricity, nuclear plants strengthen state and local economies through jobs, taxes, and spending. As a member of the River Bend NAYGN chapter, I know first hand the impact nuclear power has in the state of Louisiana. The two nuclear reactors in Louisiana provide approximately 15.8% of the state's electricity, provide more than 1,350 high paying jobs and contribute \$470 million to the local economy. (0948-1 [Commenters, Multiple])

Comment: Until renewables are fully developed, we may need to keep nuclear as an option, particularly when compared with coal and oil, but so long as we are going to use it, we need to make every effort to preserve the safety of people and the environment. (0971-2 [Schneider, Linda])

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Abbott, Dana		ML13329A684	257
Abbott, Sandra		ML14027A588	947
Abdro, Ann		ML14001A016	752
Abendano, Juan		ML13323B474	250-41
Adam, Peter	Santa Barbara County, California	ML13360A113	682
Adams, Grace		ML13275A664	13
Adams, Grace		ML13303B533	97
Adams, Grace		ML13351A305	439
Affonso, Jane		ML13329B078	271
Agnew, David		ML13320A012	419
Agnew, David	Cape Downwinders	ML13339A173	348
Agnew, David	Cape Downwinders	ML13310B069	112-11
AGreen Road Project,		ML13353A025	498
Anonymous			
Aguilar, Margaret		ML13330C033	245-45
Allen, Judy		ML13318A129	163-24
Allen, Rick	United Association of Plumbers and Pipefitters	ML13282A605	45-13
Allerton, George		ML13365A338	726
Amos, T.J.		ML13323B474	250-52
Amram, David		ML13308C106	117
Amram, David		ML13350A648	476
Amram, David		ML13318A129	163-26
Amthony, Elizabeth		ML14001A067	794
Anderson, Cody		ML14009A004	885
Anderson, Janet M.		ML14014A078	901
Andrews, Richard		ML13360A317	447
Andrews, Richard		ML13294A563	59
Andrews, Richard		ML13282A605	45-6
Anonymous		ML13275A663	7
Anonymous		ML13280A840	47
Anonymous		ML13320A015	200
Anonymous		ML13320A026	210
Anonymous		ML13336A379	281
Anonymous		ML13351A008	412
Anonymous		ML13351A018	425
Anonymous		ML13353A622	518
Anonymous		ML13353A640	524
Anonymous		ML13353A731	533
Anonymous		ML13355A014	594
Anonymous		ML13358A140	623
Anonymous		ML13358A154	626
Anonymous		ML13358A167	629
Anonymous		ML13358A428	661
Anonymous		ML13359A013	676
Anonymous		ML13359A014	677
Anonymous		ML13365A340	728
Anonymous		ML14001A020	754
Anonymous		ML14001A046	777
Anonymous		ML14007A005	844
Anonymous		ML14007A036	857
Anonymous		ML14008A349	870

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Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Anonymous		ML14008A431	874
Anonymous		ML14008A433	876
Anonymous		ML14008A434	877
Anonymous		ML14008A437	880
Anonymous		ML14008A429	896
Anonymous		ML14027A588	947
Anonymous, Brian		ML13359A007	670
Anonymous, Debra		ML14006A372	829
Anonymous, Janet		ML13361A014	933
Anonymous, JEC		ML13353A621	517
Anonymous, Jeff		ML13358A169	630
Anonymous, Jill		ML14027A588	947
Anonymous, Scott		ML13355A009	590
Apted, Michael		ML13282A605	45-7
Arauz, Jorge		ML13309A886	143
Archie, Jeff	South Carolina Electric & Gas	ML13323B474	250-3
Armer, Sunny	Raging Grannies WOWW	ML13318A129	163-25
Armerding, Christopher		ML13304C023	105
Arnason, Deb		ML13268A101	18
Arnason, Deb		ML13319B249	175
Arnason, Deb		ML14008A365	890
Arnason, Deb		ML13323B474	250-42
Arnold, James		ML13352A519	480
Arnott, Melissa		ML13353A643	526
Arrabaca, Andrew		ML13350A652	396
Ashe, Kenneth		ML13323B474	250-23
Atlee, Susan		ML13346A226	389
August, Bernard	Committee Against Plutonium Economics	ML14001A014	750
Avilla, Karen	City of Carson, California	ML13329A678	253
Azulay, Jessica	Alliance for a Green Economy	ML13318A129	163-34
Baade, Joanne	City of San Clemente, California	ML13357A318	605
Babski, Mark		ML13355A003	584
Bagwell, Charles		ML13336B471	321
Bailey, Savannah	CASEnergy Coalition	ML13308C179	122
Bailey, Savannah	CASEnergy Coalition	ML13318A129	163-29
Bailey, Savannah	CASEnergy Coalition	ML13339A942	325-16
Bailey, Savannah	CASEnergy Coalition	ML13339A946	326-25
Baker, Anna		ML13345A077	371
Baker, Anna		ML13310B069	112-9
Baker, Crystal	North American Indigenous Peoples Caucus	ML13339A946	326-45
Baker, Hannelore		ML13336B479	322
Baker, Helen		ML13351A307	441
Baker, Sheila		ML13329A675	251
Baker, Tammera	Palo Verde Nuclear Generating Station	ML13282A605	45-9
Balgemann, Dennis		ML13298A769	81
Balke, Karl		ML13338A732	333
Bandfield, Gary		ML14027A588	947

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
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Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Barczak, Sara	Southern Alliance for Clean Energy	ML13345B014	329-27
Barczak, Sara	Southern Alliance for Clean Energy	ML13345B014	329-5
Barilla, Frank		ML13323B474	250-37
Barker, Laurenn		ML13365A337	725
Barnes, Kathryn		ML13351A139	416
Barnes, Kathryn		ML13340A572	327-8
Bartlett, Bill	Green Party	ML13282A605	45-8
Barton, Jim		ML13319A919	167
Bast, Nancy		ML13351A484	450
Batobato, Alicia		ML13353A009	496
Bauer, Scott	STARS	ML13359A012	675
Bay, Miki		ML14007A028	850
Bean, Judith		ML13339A946	326-11
Beane, Gary		ML13354C106	577
Beccia, John		ML13338A729	330
Becker, Joanna		ML13360A309	696
Becker, Rochelle		ML13339A942	325-3
Behling, Steve		ML13304C034	100
Behling, Steve		ML13351A472	100
Bennett, Mary		ML14027A588	947
Bennett, Nathan		ML13330B840	246-10
Bergier, Kim		ML13357A307	597
Bergier, Kim		ML13357A312	599
Berlincourt, Kerry		ML13340A572	327-40
Bernhoft, Eric		ML13358A378	635
Bernstein, Patricia		ML13353A625	519
Bessette, Paul	Counsel for Entergy Nuclear Operations, Inc	ML13360A316	697
Betancourt, Nelson		ML13330B643	244-10
Bethlenfalvay, Marina		ML14014A096	907
Bettega, Gayle		ML14006A440	835
Bevill, Bernard	Arkansas Department of Health	ML14015A083	913
Bibb, William		ML13353A457	512
Biddle, Lynn		ML13269A407	21
Biersdorf, John		ML13344B149	328-10
Bilenko, Stephanie		ML13330C033	245-37
Bird, Melissa		ML13323C013	216
Bird, Melissa		ML13345A070	367
Black, Ryan		ML13298A209	72
Blackburn, Lee		ML13354A000	576
Blackburn, Lee		ML13354C107	578
Blacker, Paul		ML14008A152	343
Blake, Elisabeth		ML13357A818	613
Blankenmyer, Eric		ML13350A671	400
Blee, David	U.S. Nuclear Infrastructure Council	ML13277A455	30-23
Blevins, Eric		ML13323B474	250-50
Bluestein, Bonnie		ML13358A379	636
Bluestein, Bonnie		ML13330C033	245-51
Bogdan, Andrew		ML14001A040	772
Bogen, Doug	Seacoast Anti-Pollution League	ML13360A105	680

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(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Bogen, Doug	Seacoast Anti-Pollution League	ML13310B069	112-5
BojeLebs, Nannette		ML13359A001	664
Bolognini, Franceseca		ML13268A331	14
Bonanno, Jerry	Nuclear Energy Institute	ML13277A455	30-16
Bonanno, Jerry	Nuclear Energy Institute	ML13318A129	163-38
Bonney, Mary		ML13358A423	656
Bonniwell, Colleen		ML14008A184	744
Bonniwell, Colleen		ML13344B149	328-16
Boosinger, Marilyn		ML13354B896	570
Borchmann, Patricia		ML13323C022	218
Borchmann, Patricia		ML13336A546	284
Borchmann, Patricia		ML13339A942	325-11
Borchmann, Patricia		ML14006A362	866
Border, Gary		ML13340A572	327-16
Borie, Edith		ML13298A199	71
Bosold, Patrick		ML14002A008	803
Boudart, Jan		ML13330C033	245-21
Boudart, Jan		ML14007A009	861
Bourgeois, Paula		ML13352A525	486
Boyd, David	Nuclear Waste Strategy Coalition	ML13360A277	689
Boyd, Jonathan		ML13339A171	346
Boyes, Pam		ML13310B069	112-35
Brack, H.G.		ML13354A019	554
Brancato, Deborah	Riverkeeper	ML13361A004	710
Branigan, Mary Beth	Ecological Options Network	ML13339A942	325-28
Brave, Jacqueline		ML13308C983	980
Brechin, Vernon		ML13357A807	610
Brefeld, James		ML14001A027	760
Bridgeman, Janis		ML13361A007	932
Bridges, Martha		ML13269A409	23
Brinton, Samuel		ML13310B069	112-26
Brinton, Samuel		ML14006A444	863
Britz, Joan		ML13358A412	645
Bromm, Susan E.	U.S. Environmental Protection Agency	ML14016A089	915
Brookhart, Ryan		ML13323B474	250-14
Broska, Robert		ML13355A008	589
Brotine, Howard		ML13365A343	731
Brousse, Elizabeth		ML13339A946	326-5
Brown, Deborah		ML13350A675	403
Brown, Jeffrey		ML13318A129	163-36
Brown, Jerry	World Business Academy	ML13353A029	501
Brown, Jerry	World Business Academy	ML13339A946	326-4
Brown, Marti		ML13339A946	326-14
Brown, Marty		ML13336A567	290
Brown, Steve		ML13351A311	444
Brown, Susan		ML13353A725	528
Brown, Tim	City of San Clemente, California	ML14029A015	315
Brunelli, Crystal		ML13302C613	972
Buchanan, Tom		ML13311A777	146

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Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Buckingham, Jeffrey		ML13346A202	385
Bucklin, Christine		ML13352A488	474
Burchfield Rhodes, Valerie		ML14001A005	742
Burkhead, Elizabeth		ML13351A500	457
Butler, Dee		ML13351A308	442
Butler, Ruth		ML13352A521	482
Byrne, Genevieve	Project for Energy Accountability and the Concerned Neighbors of Pilgrim	ML13310B069	112-13
Byrne, Peter		ML13339A946	326-46
Byrne, Timothy	United Association Plumbers and Pipefitters Local 51	ML13303B532	96
Cagnetta, Matt		ML13323B474	250-58
Caldicott, Helen	Physicians for Social Responsibility	ML13308C062	113
Callahan, Mike	Decommissioning Plant Coalition	ML13330B840	246-4
Callen, Ronald C.	Public Law Resource Center PLLC	ML13360A363	704
Calnan, Christopher		ML14001A021	755
Campbell, Bruce		ML14007A116	937
Campbell, Bruce		ML13339A946	326-63
Campbell, Mary		ML13269A413	26
Cannon, Tom	Arizona Public Service	ML13282A605	45-5
Capozzelli, J.		ML13304A019	91
Capurso, Thomas	I.B.E.W. Local Union #3	ML13312A356	153
Carberry, Mike	Sierra Club Nuclear-Free Campaign	ML13277A455	30-21
Carberry, Mike	Sierra Club Nuclear-Free Campaign	ML13345B014	329-18
Carberry, Mike	Sierra Club Nuclear-Free Campaign	ML13345B014	329-31
Carey, Corinne		ML14014A110	910
Carey, Corinne		ML13340A572	327-33
Carey, Kevin		ML14002A000	795
Carlton, Paul		ML14001A039	771
Carrigan, Milton		ML13339A946	326-19
Carter, Pat		ML13269A406	20
Cartmell, Cathy		ML13347A291	1003
Case, Ed		ML13339A165	340
Casebier, William		ML13358A135	621
Cash, Joy		ML13358A421	654
Casteleiro, Darcy		ML13318A129	163-13
Casten, Liane		ML13330C033	245-36
Cato, Michael		ML13358A364	634
Caulfield, Lee		ML13303B525	95
Caulfield, Lee		ML13339A946	326-20
Causey, Lee		ML13323B474	250-43
Cavlan, Michael		ML13344B149	328-17
Cella, Dr. Francine		ML13330C033	245-41
Cerrito, Robert		ML13323C212	198
Chamberlain, Lora		ML13330C033	245-7
Chambers, Fred		ML13339A942	325-10
Chappellet, Carissa		ML14008A356	887
Chavez, Tim		ML13340A572	327-44
Chen, S.Y.		ML13330C033	245-5
Chichester, Ben		ML13310B069	112-34

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Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Chin, Rebecca	Duxbury Nuclear Advisory Committee	ML13353A003	490
Chrisler, Gary		ML13298A192	68
Christie, Andrew	Santa Lucia Sierra Club	ML13357A820	614
Chunglo, Steve		ML13358A411	644
Church of New York, The Riverside		ML14017A121	918
Ciferri, Flavio		ML13355A006	587
Clark, Brita Larsen	PSR	ML14008A367	891
Clark, Terrence	Physicians for Social Responsibility	ML13351A141	417
Clark, Terrence	Physicians for Social Responsibility	ML13354A015	417
Clark, Terry	Physicians for Social Responsibility	ML13323B474	250-31
Claybourne, Ana		ML13353A726	529
Clemons, Victoria		ML13340A572	327-20
Clemons, Victoria		ML13351A014	421
Clendening, Tommie		ML13294A569	62
Clermont, Elaine		ML14006A443	838
Cleveland, Charles		ML13339A942	325-30
Clig, George		ML14027A588	947
Coalition, Clean and Safe Energy	Clean and Safe Energy Coalition	ML13323C007	213
Cobb, Sandra		ML13280A096	33
Cohen, Sam	Santa Ynes Band of Chumash Indians	ML13353A028	500
Cohn, Jeremy	Mitsubishi Nuclear Energy Systems	ML13277A455	30-19
Colfi, Alessandra		ML14002A009	804
Collier, Grant		ML13336A723	295
Collins, Fred	Northern Chumash Tribal Council	ML13339A946	326-2
Collins, Jessie	Alliance to Halt Fermi 3	ML14014A092	904
Collins, Jessie Pauline		ML13339A174	349
Collins, Jessie Pauline		ML13340A572	327-5
Collins, Yoko		ML14006A378	831
Comer, Gail		ML13336A570	292
Commenters, Multiple		ML13269A282	2
Commenters, Multiple		ML13269A279	3
Commenters, Multiple		ML13326B058	465
Commenters, Multiple		ML13330A726	491
Commenters, Multiple		ML14055A035	537
Commenters, Multiple		ML13354C040	555
Commenters, Multiple		ML14027A510	946
Commenters, Multiple		ML14027A588	947
Commenters, Multiple		ML14027A612	948
Commenters, Multiple		ML14027A632	949
Commenters, Multiple		ML14043A331	950
Commenters, Multiple		ML14027A648	951
Conley, Pam		ML13359A008	671
Conley, Patrick		ML13304C148	974
Conn, Corey		ML13330C033	245-24
Conn, Diane		ML13339A946	326-21
Connor, Vicki		ML13339A946	326-49
Connoy, Gina		ML13355A002	583
Conrad, Chad		ML13355A011	592

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Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Cook, Andrew		ML13323B474	250-35
Cook, Dr. Andrew G.		ML13308D096	138
Cooper, Elaine	South Carolina Sierra Club	ML13323B474	250-20
Cooper, Mark		ML14030A152	900
Coor, Kristen		ML13351A142	435
Corbett, Susan		ML13323B474	250-7
Cordes, Reo		ML13339A946	326-59
Corrino, G		ML14006A448	841
Costanza, Frank		ML13330C033	245-50
Cox, Bruce		ML13308C638	130
Cox, David		ML13346A218	388
Craig, Anne		ML13270A457	28
Craig, Anne		ML13319B252	177
Craig, Evan		ML13330C033	245-46
Craig, Tom		ML13273A496	29
Crimmel, Steve		ML13339A946	326-54
Crocker, George	North American Water Office	ML13357A804	608
Crocker, George	North American Water Office	ML13344B149	328-7
Crow, Valerie		ML13340A572	327-25
Crowley, Lawrence		ML13358A417	650
Cullen, Noreen		ML13325A001	237
Cummings, Kristopher		ML13344B149	328-8
Cunningham, William and Barbara		ML13308C635	129
Curran, Diane	Harmon, Curran Spielberg & Eisenberg, LLP; For the Office of	ML14030A152	897
Curran, Diane	Harmon, Curran Spielberg & Eisenberg, LLP; For the Office of	ML14030A152	898
Curran, Diane	Harmon, Curran Spielberg & Eisenberg, LLP; For the Office of	ML14030A152	952
Curran, Diane	Harmon, Curran Spielberg & Eisenberg, LLP; For the Office of	ML14030A152	953
Curran, Diane	Harmon, Curran Spielberg & Eisenberg, LLP; For the Office of	ML14030A152	954
Curran, Diane	Harmon, Curran, Spielberg & Eisenberg, LLP	ML14030A152	899
Curran, Diane	Harmon, Curran, Spielberg & Eisenberg, LLP	ML14030A152	900
Curran, Diane	Harmon, Curran, Spielberg & Eisenberg, LLP	ML14030A152	916
Curren, Elizabeth		ML13336A565	289
Curtin, Kenneth	Clean and Safe Energy Coalition	ML13277A455	30-18
Curtis, Daniel		ML13310B069	112-27
Curtis, Daniel		ML14006A444	863
Cuthbert, Donna	The Alliance for a Clean Environment	ML13345B014	329-26
Cuthbert, Lewis	The Alliance for a Clean Environment	ML13345B278	377
Cuthbert, Lewis	The Alliance for a Clean Environment	ML13345B014	329-3
Cypser, Betty		ML13308D082	135
Cypser, Betty		ML13308D087	137
Cypser, Betty	Raging Grannies	ML13318A129	163-28

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Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
D'Arrigo, Diane	Nuclear Information Resource Service	ML13277A455	30-8
D'Arrigo, Diane	Nuclear Information Resource Service	ML13330B840	246-2
Dailey, Arthur		ML13320A014	199
Daily, G. Allen		ML13339A916	357
Dalton, Andrew		ML13318A129	163-43
Daly, John		ML13268A330	8
Damratoski, Katie	North American Young Generation in Nuclear	ML13353A736	535
Daniels, John		ML13319B254	178
Darling, Ann	Safe and Green Campaign	ML13310B069	112-24
Davidson, Judith		ML13280A845	48
Davies, Phyllis		ML13339A946	326-22
Davis, Adrienne		ML13339A946	326-58
Davis, Anonymous		ML14006A441	836
Davis, Cherie		ML14007A004	843
Davis, Ed	Nuclear Infrastructure Council	ML13360A116	685
Davis, Leslie	Earth Protector Environmental Group	ML13344B149	328-15
Davis, Patti		ML13339A942	325-27
Davis, Shelle		ML13298B092	83
Davis, Suzanne		ML13353A006	493
Davis, Tom		ML13353A006	493
Davison, David		ML13351A011	418
Davison, Heidi		ML13298B225	85
de Graaf, Brandon		ML13330C033	245-12
De Lacey, Carol		ML14001A052	780
Dean, Janice	New York State Attorney General's Environmental Protection Bureau	ML13365A345	473
deBruler, Gregory		ML14002A003	798
DeCrescenzo, Jackie		ML13318A129	163-50
DeCrescenzo, Jocelyn		ML13350A651	395
DeCrescenzo, Jocelyn		ML13318A129	163-51
Degher, Darius		ML13324B143	220
DeLano, Harry		ML14001A012	748
DeMare, Joseph		ML13340A572	327-29
Dengler, Allegra	Sierra Club	ML13318A129	163-40
Denneen, Bill		ML13329A680	254
Denneen, Bill		ML13345A063	365
Denneen, Bill		ML14008A351	871
Dennis, Harold E.B.		ML13302C184	93
Denton, Jill		ML13320A022	207
Deshotels, Bob		ML13323C009	214
Deshotels, Bob		ML13324B619	231
Deshotels, Bob		ML13339A942	325-6
Devitt, Andrea		ML14001A019	753
Devitt, Andrea		ML13339A946	326-27
DeVoe, Joe		ML13323B474	250-67
Dew, Jane		ML14001A058	786
Diaconeasa, Mihai		ML13310B069	112-28
Diamond, Jim		ML13351A200	1007
Diem, Larkin		ML13319B260	184

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Diem, Larkin		ML13323B474	250-47
Dimondstein, Carla		ML13351A185	1004
Doctor, Appalled		ML13324B148	223
Dolegowski, John		ML13358A351	632
Dolph, Ivar		ML13281A074	49
Dolph, Phyllis		ML13281A074	49
Donaldson, John		ML13323A701	996
Donnelly, Dennis		ML13336B459	316
Dorans, Rob	Affiliated Construction Trades Foundation of Ohio	ML13340A572	327-31
Dorsey, Chris		ML13345B014	329-1
Doyle, Rosemary		ML13320A007	193
Doyle, Rosemary		ML14008A159	940
Drey, Kay		ML13361A012	715
Drotar, Laura		ML13319A938	172
Dubois, Gwen L	Chesapeake Physicians for Social Responsibility; Crabshell Alliance	ML13330B840	246-11
Dubois, Gwen L	Chesapeake Physicians for Social Responsibility; Crabshell Alliance	ML13324B621	233
Dudley, Chris		ML13351A015	422
Dugan, Pat		ML13350A678	405
Dugdale, Jane		ML13329A674	249
Dugdale, Jane		ML13330B840	246-17
Duke, George		ML13353A633	575
Duke, Paul	PSEG Nuclear LLC	ML13358A414	647
Duke, Paul	PSEG Nuclear LLC	ML14001A007	647
Dunlap, Jeff	Exelon	ML13330C033	245-20
Dupiche, Sharon		ML13304C031	99
Dupont, Alice		ML14001A041	773
Earl, David		ML14001A056	784
Eckert, Rose		ML13324B617	229
Eder, Harvey	Public Solar Power Coalition	ML14001A010	746
Edwards, Gordon	Canadian Coalition for Nuclear Responsibility	ML13361A010	714
Edwards, Greg		ML13302C185	94
Ehrle, Lynn Howard	International Science Oversight Board	ML13308C062	113
Ehrlich, Jeremy		ML13338A734	335
Eide-Tollefson, Kristen		ML13344B149	328-12
Eide-Tollefson, Kristen	PINGP Study Group	ML14002A040	820
Ein, Mark		ML14007A030	852
Einhorn, Jeremy		ML13320A006	192
Eisman, Val		ML13360A279	690
Elie, Marilyn		ML13318A129	163-21
Ellison, David		ML14008A435	878
Ellison, David		ML13340A572	327-14
Embrey, Monica		ML13323B474	250-28
Emerson, Willis		ML13298A768	80
Emmons, Roger		ML13346A214	387
Endo, Yuki		ML13308C071	114
Endo, Yuki		ML13318A129	163-27

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
English, Becky	Sierra Club, Rocky Mtn. Chapter	ML13282A605	45-1
Enriquez, Elizabeth	Nye County, Nevada	ML13354A007	544
Epple, Melissa		ML13322B769	995
Evans, Laurie	Westchester Safe	ML13318A129	163-49
Evans, Michael W.		ML14027A588	947
Evans, Pete		ML13339A946	326-50
Evjion, Virginia		ML13316C349	159
Fabihn, Dagmar	Crabshell Alliance of Greater Baltimore, Maryland	ML13330B840	246-30
Fahey, John		ML13353A476	514
Falis, Edward		ML13301B123	969
Fallon, Gloria		ML13311A781	147
Farbish, Peter		ML13355A015	595
Faris, Kelly		ML13340A572	327-42
Fast, Wendy		ML13296A228	55
Fast, Wendy		ML13302A854	88
Fast, Wendy		ML13360A298	695
Fasten, Susan		ML13345B284	381
Fasten, Susan		ML13351A312	445
Fasten, Susan		ML13358A388	641
Fasten, Susan		ML14014A087	902
Fasten, Susan		ML14014A089	903
Faunce, Stephanie		ML14027A588	947
Feathers, Jösan		ML13351A494	453
Feathers, Jösan		ML13339A942	325-29
Felder, H.M.		ML13308C640	131
Feldman, Jane	Sierra Club (Toiyabe Chapter)	ML13345B014	329-33
Ferguson, Tom		ML13324B144	221
Ferreira, Raul		ML14027A588	947
Fettus, Geoffrey	Natural Resources Defense Council, Inc.	ML13360A365	706
Fettus, Geoffrey	Natural Resources Defense Council, Inc.	ML14030A152	954
Fisher, Allison		ML14014A312	912
Fisher, Allison	Public Citizen's Energy Program	ML13330B840	246-22
Fisher, Peter		ML13354B902	572
Fishman, Zelma		ML13336A726	297
Fitch-Johnson, Janet		ML13353A031	503
Fleischer, Robert		ML13310B069	112-32
Fleming, Scott		ML13336A373	278
Fleming, Scott	Will County Center for Economic Development	ML13330C033	245-4
Foley, Nancy		ML14002A021	814
Follett, Carol		ML13268A325	11
Ford, Jay		ML13324B623	235
Fosmo, Vaugh		ML13339A946	326-52
Foster, Ruth	New Jersey Department of Environmental Protection	ML14015A566	920
Foster, William		ML14027A588	947
Foushee, Lea		ML13344B149	328-6

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Fox, Patsy		ML13304C030	111
Fox, Rick	Global Warming Solutions Group of Central Illinois	ML13330C033	245-8
Fox, Tracy		ML13330C033	245-31
Fradella, Richard		ML13352A478	471
Frances, Esther		ML13351A490	452
Frank, Fred		ML13329A682	255
Frank, Fred		ML13339A946	326-28
Frankland, Chris	ConverDyn	ML13282A605	45-14
Frantz, Charles		ML13280A756	961
Fray, Joseph		ML13340A436	360
Freeman, S. David	Consultant	ML13308C062	113
Freeman, Susan		ML14001A030	763
Fregonese, Vic		ML13323B474	250-62
Fregonese, Vic	AREVA	ML13320A016	201
French, Walter	Plumbers, Pipe and Refrigeration Fitters Local Union No. 403	ML13346A189	574
Freund, Tim		ML13280A444	51
Frey, Paul		ML13345A069	366
Friedman, Avram	Canary Coalition	ML13320A001	187
Friedman, Avram	Canary Coalition	ML13323B474	250-33
Fritz, John		ML14007A035	856
Fry, Mark		ML13318A129	163-42
Fuentes, Julio	Florida State Hispanic Chamber of Commerce	ML13336B028	307
Fullerton, Dan		ML13318A129	163-23
Fulton, Doris		ML13280A098	35
G, Ambriel		ML13304C026	108
G., Brittany		ML13319A942	173
Gale, Maradel		ML13329A948	269
Gale, Robert and Beverly		ML13311A789	151
Gall, Gary		ML13329A942	265
Gallagher, Dr. Terry		ML13330C033	245-44
Gamble, Dan	INviro Design and Consulting, LLC	ML13365A334	724
Gantt, Carol		ML13323B474	250-49
Garb, James		ML13324B618	230
Garcia, Diego		ML13310B069	112-12
Garcia, Diego		ML13330B840	246-21
Garden, Claire		ML13324B152	226
Garner-Ritter, Maureen		ML13318A129	163-15
Garvey, Lydia		ML13352A522	483
Garza, John	SCE&G – V.C. Summer Nuclear Station	ML13357A319	606
Geary, B.		ML13358A387	640
Geesman, John	Alliance for Nuclear Responsibility	ML13339A946	326-7
Geist, Sheila		ML13350A650	476
Geist, Sheila	Shut Down Indian Point Now	ML13318A129	163-33
Gellert, Sally Jane		ML13318A129	163-20
Gellert, Sally Jane		ML14006A386	864
Georgi, Carol	California Central Coast Marine	ML13360A102	678

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Georgi, David	Sanctuary Alliance	ML13345A073	369
Gerard, Daniele	Three Parks Independent Democrats	ML13318A129	163-9
Gerhart, Dan		ML13354B906	573
Gerleman, Doug		ML13330B840	246-27
Gerleman, Douglas		ML13350A679	406
Gerstein, Bill		ML13320A008	194
Gibson, Bruce	San Luis Obispo County California	ML13354A013	548
Gibson, Julie		ML14007A008	845
Giese, Mark M.		ML13353A439	507
Giese, Mark M.		ML13353A000	487
Giese, Mark M.		ML14001A004	741
Gill, Susan		ML13352A470	468
Gilmore, Donna		ML13339A942	325-2
Gilmore, Donna		ML14001A022	756
Gilmore, Donna		ML14001A031	764
Ginsberg, Ellen	Nuclear Energy Institute	ML13277A455	30-3
Ginsberg, Ellen	Nuclear Energy Institute	ML13310B069	112-19
Ginsberg, Ellen	Nuclear Energy Institute	ML13318A129	163-30
Ginsberg, Ellen	Nuclear Energy Institute	ML13330B840	246-14
Ginsberg, Ellen	Nuclear Energy Institute	ML14001A002	827
Giunta, Tony	City of Franklin, NH	ML13310B069	112-1
Glass, Peter	Xcel Energy	ML13358A385	638
Glime, Janice		ML13298B503	964
Gloege, William		ML13339A946	326-24
Golden, Leon		ML13329A676	252
Goldin, Martha		ML13329A676	252
Goldstein, Mindy	Turner Environmental Law Clinic	ML14030A152	897
Goldstein, Mindy	Turner Environmental Law Clinic	ML14030A152	952
Goley, Timothy		ML13336A722	294
Good, Joyce		ML13330C033	245-38
Goodwin, Liberty		ML13331C303	997
Gordon, Mark		ML13359A005	668
Gordon, Michelle		ML13359A005	668
Gordon, Michelle		ML14001A003	740
Goudeau, Terry		ML13344A757	1001
Grace, Karli		ML13330C033	245-47
Graham, Candace		ML13352A490	475
Graham, Susan		ML13319B255	179
Grannies, Raging		ML14037A420	959
Graves, Caryn		ML13351A016	423
Gray, Erica		ML13277A455	30-15
Gray, Erica		ML13330B840	246-3
Gray, Erica		ML13345B014	329-17
Gray, Erica		ML13345B014	329-35
Gray, Erica		ML14006A385	865
Gray, Susan	Maryland Department of Natural Resources	ML13345B014	329-35
Green, Carlyn		ML13319B259	183

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Green, Jeane		ML13365A344	732
Green, Jeanne		ML13336B032	309
Green, Michael	Arizona Public Service Company	ML13282A605	45-2
Greene, David		ML13325A003	238
Greene, Linda		ML13275A665	31
Greenfield, Jan		ML13340A437	361
Greenwood, John		ML13340A572	327-28
Greisch, Edward		ML13268A332	16
Greisch, Edward		ML13269A415	17
Griffin, William	Office of the Attorney General, State of Vermont	ML13365A345	473
Griffin, William	Office of the Attorney General, State of Vermont	ML13149A446	1
Griffin, William	Office of the Attorney General, State of Vermont	ML14006A368	867
Grigg, Richard		ML13353A008	495
Grodzinsky, D.M.	Presidium of the National Academy of Science of Ukraine	ML13308C062	113
Groff, Inga		ML13280A452	41
Groff, Joe		ML13280A452	41
Groot, Henriette		ML13339A946	326-29
Gross, Cheryl		ML13350A674	402
Guido, Jeffry	Maryland State Pipe Trades Association	ML13277A455	30-9
Guindon, Ernest		ML13340A572	327-45
Gunderson, Arnie	Fairewinds	ML13308C062	113
Gunn, George	Vogtle Units 1 and 2	ML13323B474	250-21
Gunter, Keith	Alliance to Halt Fermi 3	ML14002A022	815
Gunter, Keith	Alliance to Halt Fermi 3	ML13340A572	327-7
Gunter, Paul	Beyond Nuclear	ML13360A282	691
Gupton, William		ML13323B474	250-64
Gutherman, Brian		ML13318A129	163-11
Gutierrez, Ruth		ML13329A941	264
Gutierrez, Ingrid		ML13339A946	326-51
Haber, Jim		ML13336A381	282
Hafemeister, David		ML13339A946	326-30
Hafer, Sarah		ML14027A588	947
Haggerty, Bernard		ML13296A084	955
Haggerty, Bernard		ML13282A605	45-3
Hall, Caroline		ML13324B620	232
Hall, Christoper		ML13298B564	965
Hamilton, Richard		ML13353A639	523
Hancock, Mandy		ML13330B643	244-3
Hancock, Mandy	Southern Alliance for Clean Energy	ML13330B643	244-3
Handelsman, Robert		ML13268A102	19
Hands, Tara		ML13323B474	250-22
Hanna, Helen		ML14002A001	796
Hannaman, Bill		ML13336A551	286
Hannaman, Bill		ML13339A942	325-26
Hanrahan, Carol		ML13323B474	250-48

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Hanson, Courtney	Alliance for Nuclear Accountability	ML13358A413	646
Hanson, Courtney	Georgia Women's Action for New Directions	ML13323B474	250-66
Hanson, Lauren		ML13351A005	409
Harkins, Lynne		ML13329A683	256
Harlan, Thomas	City of Red Wing, Minnesota	ML14001A055	783
Harris, Kate		ML14001A034	767
Hatfield, Barry		ML13280A095	32
Haughney, Charles		ML14007A038	859
Hayati, Sally		ML13336A730	301
Headington, Maureen		ML13365A332	722
Headington, Maureen		ML13330C033	245-6
Headington, Maureen	Stand Up/Save Lives Campaign	ML13277A455	30-22
Headington, Vince		ML13365A331	721
Headington, Vince		ML13330C033	245-22
Headrick, Gary		ML13358A427	660
Headrick, Gary	San Clemente Green	ML13353A091	957
Headrick, Gary	San Clemente Green	ML13339A942	325-1
Headrick, Gary	San Clemente Green	ML14007A014	860
Heald, Deborah		ML13339A169	344
Hedlund, Robert L.	Massachusetts Senate	ML14015A365	943
Heinle, Helen		ML13316C332	156
Helker, David P.	Exelon Generation Company, LLC	ML14008A173	942
Hellwig, Louis		ML13280A453	42
Helsel, Adam		ML13350A655	398
Hennen, Jimmy	North American Young Generation in Nuclear	ML13323B474	250-54
Hennessey, Diane		ML14002A002	797
Hennig, Anna Christina		ML13298B624	84
Henning, Marcia		ML13320A416	993
Henry, Anita		ML13339A946	326-61
Herwig, Bill	V.C. Summer Nuclear Station	ML13323B474	250-13
Hibbard, Angela		ML13350A677	719
Higgins, Kevin		ML13352A517	478
Highfill, Debbie		ML13339A946	326-31
Hill, Adam	San Luis Obispo County Board of Supervisors	ML13339A946	326-1
Hill, Barbara		ML13298A762	75
Hill, Jack		ML13320A017	202
Hiller, Stephanie		ML13351A022	429
Hinch, Richard		ML13301A866	87
Hirsch, Daniel	Physicians for Social Responsibility- LA, Southern CA Fed. of Scientists; Committee to Bridge the Gap	ML13365A335	738
Hirsch, Daniel	Physicians for Social Responsibility- LA, Southern CA Fed. of Scientists; Committee to Bridge the Gap	ML14006A382	738
Hisasue, Carole		ML13365A347	734
Hisasue, Carole		ML13365A348	734
Hoch, Susan		ML13324B615	243

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
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Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Hodik, Barbara J.		ML13308D098	139
Hoffman, Ace		ML13268A430	561
Hoffman, Ace		ML13354B054	562
Hoffman, Ace		ML13357A822	616
Hoffman, Ace		ML13277A455	30-4
Hoffman, Ace		ML13330B840	246-29
Hoffman, Ace		ML13339A942	325-7
Hoffman, Ace		ML13345B014	329-16
Hoffman, David		ML13350A672	401
Hoisington, Paula		ML13351A499	456
Hollingsworth, Timothy		ML13339A946	326-42
Holloway, Patricia		ML14007A033	855
Holmes, Helen		ML13353A449	510
Holt, Cathy		ML13296A257	66
Holt, Joan		ML13345B283	380
Homick, Nick		ML14008A189	869
Homick, Nick		ML13339A946	326-56
Horne, Shari		ML14001A013	749
Houston, Ann E.		ML13308C612	126
Howard, Claude		ML13323B474	250-38
Howard, Gordon		ML13353A032	504
Howarth, Robert		ML13320A002	188
Howarth, Robert		ML13323B474	250-12
Howell, Adam		ML13323B474	250-19
Hughes, Kevin		ML13320A025	209
Hulstrunk, Matt		ML13354B893	569
Hunt, Le		ML13301A125	966
Husch, Ben	National Conference of State Legislators	ML13330B840	246-1
Hynes, H Patricia		ML13352A468	467
Imhoof, Christina		ML13358A416	649
Ingram, Gwen		ML14002A051	824
Iwane, Cathy		ML13339A942	325-21
Iwashita, Thomas		ML14001A059	787
Izant, Carol	Alliance to Halt Fermi 3	ML14002A022	815
Izant, Carol	Alliance to Halt Fermi 3	ML13340A572	327-39
Jackson, Bruce		ML13298A760	73
Jackson, Carol		ML13353A735	536
Jacobs, Kamri		ML13319A922	168
Jacobson, Janet		ML13353A642	525
Jacopetti, Anna		ML13298A391	963
Jaffee, Ellen	97th Assembly District	ML13318A129	163-13
James, Andrew		ML13323B474	250-70
Jamil, Dhiaa	Duke Energy	ML13359A009	672
Jennings, Stephanie		ML13358A425	658
Jensen, Phyllis		ML13298A763	76
Johanson, Birgit		ML13310B069	112-31
Johnson, Abigail	Eureka County, Nevada	ML13351A528	459
Johnson, Amber		ML14014A108	909
Johnson, Arlene		ML13338A737	338

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
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Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Johnson, Bobie		ML13304B963	973
Johnson, Joe		ML13355A007	588
Johnson, Madeleine		ML13336B048	311
Johnson, Ray		ML13354A022	557
Johnson, Reed		ML13338A736	337
Johnson, Reed		ML14001A053	781
Johnson, Roger		ML13357A832	618
Johnson, Roger		ML14001A033	618
Johnson, Roger		ML13339A942	325-31
Johnson, Ron	Prairie Island Indian Community	ML13344B149	328-1
Johnson, Troy		ML14006A365	828
Johnston, Christined		ML13365A350	736
Johnston, Gretel	BEST/MATRR	ML13345B014	329-13
Johnston, Josiah		ML13308C646	134
Jones, Angela		ML14002A012	806
Jones, Lauren	North American Young Generation in Nuclear	ML13323B474	250-57
Jones, Mary		ML13351A005	409
Joslyn, Celia		ML13352A472	469
Jouet, Lisa		ML13329A949	270
Jouet, Tim		ML13329A949	270
Judson, Tim	Nuclear Information and Resource Service	ML13277A455	30-17
Justesen, Evelyn		ML13354A004	541
Kalama, Laura		ML14027A588	947
Kalas, Mike		ML13330C033	245-52
Kamps, Kevin		ML13277A455	30-2
Kamps, Kevin		ML13330B840	246-32
Kamps, Kevin		ML13330C033	245-13
Kamps, Kevin		ML13340A572	327-10
Kamps, Kevin		ML13345B014	329-11
Kamps, Kevin		ML13345B014	329-20
Kamps, Kevin	Beyond Nuclear	ML13360A356	698
Kamps, Kevin	Beyond Nuclear	ML14017A423	919
Kamps, Kevin	Beyond Nuclear	ML14021A053	921
Kamps, Kevin	Beyond Nuclear	ML14021A054	922
Kamps, Kevin	Beyond Nuclear	ML14021A056	923
Kamps, Kevin	Beyond Nuclear	ML14021A060	924
Kamps, Kevin	Beyond Nuclear	ML14021A065	925
Kamps, Kevin	Beyond Nuclear	ML14021A068	926
Kamps, Kevin	Beyond Nuclear	ML14021A071	927
Kamps, Kevin	Beyond Nuclear	ML14021A074	928
Kamps, Kevin	Beyond Nuclear	ML14021A075	929
Kane, Lynne		ML13301A327	967
Kansas, Sharon		ML13317A192	987
Karas, Catherine		ML13352A524	485
Karbowsky, Brad	United Association of Plumbers, Steamfitters, and Sprinklerfitters	ML13330B840	246-18
Karson, Ann		ML13308C642	132
Kasher, Brian		ML13323B474	250-63

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
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Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Kates, Daisy		ML13276A768	960
Katz, Shari		ML13329A687	259
Kaul, Michelle		ML13354A001	538
Keegan, Michael		ML13340A572	327-2
Keegan, Michael J.	Coalition for a Nuclear Free Great Lakes	ML13361A009	713
Keegan, Michael J.	Coalition for a Nuclear Free Great Lakes	ML14022A282	945
Kelley, Devin	AREVA Inc.	ML14001A009	745
Kelley, Don		ML13280A830	46
Kelly, Dan		ML13268A321	4
Kemp, James		ML13276A237	15
Kemp, Karla		ML14006A446	839
Kennedy, David		ML13336B467	320
Kernahan, Gary		ML13339A942	325-24
Kernahan, Mel		ML13336A548	285
Kernahan, Mel		ML13339A942	325-23
Kerr, Beverly		ML13323B474	250-40
Kerr, Julius		ML13323B474	250-11
Kerr, Mary Ellen		ML13351A003	407
Keskey, Donald L.	Public Law Resource Center PLLC	ML13360A363	704
Kessler, John	Electric Power Research Institute	ML13345B282	379
Kidney, Barbara A.		ML13308C609	125
Kidney, Barbara A.		ML13318A129	163-41
Killpack, Gary		ML13351A192	1006
Kimmich, Erl	Three Parks Independent Democrats	ML13318A129	163-10
Kinnaird, Eleanor		ML13351A303	437
Kinnicle, Kat		ML13319A933	171
Kinsella, William		ML13360A115	684
Kinsey, Bob		ML13282A605	45-12
Kinzinger, Adam	16th District of Illinois	ML13336A364	273
Kirkland, Gary L.		ML13346A233	390
Kirsch, Steve	OneID	ML13336B021	306
Kirschbaum, Saran		ML13339B033	999
Kirton, Kenneth	CASEnergy Coalition	ML13294A568	61
Kirton, Stratton	CASEnergy Coalition	ML13310B069	112-4
Kirton, Stratton	CASEnergy Coalition	ML13339A942	325-5
Kirton, Stratton	CASEnergy Coalition	ML13339A946	326-16
Klein, George	Sierra Club Lower Hudson Group	ML13318A129	163-45
Klepner, Lou		ML13339A913	356
Kline, Connie		ML14001A017	819
Kline, Connie		ML14001A018	819
Kline, Connie		ML13340A572	327-11
Klutho, Mark		ML13330B643	244-5
Kneidel, Ken		ML13323B474	250-17
Kneidel, Sally		ML13319B261	185
Kneidel, Sally		ML13323B474	250-16
Knisley, Mike	Ohio State Donating Construction Trades Council	ML13340A572	327-12
Knowles, Berdell	Florida Chapter of the American	ML13330B643	244-2

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Koehl, Dennis L.	Association of Blacks in Energy	ML14015A079	914
Koehnlein, Wolfgang	STP Nuclear Operating Company	ML13308C062	113
Koerblein, Alfred		ML13308C062	113
Korn, Susan		ML13330C033	245-23
Korsen, Alan		ML14001A057	785
Korsen, G		ML14006A442	837
Kotra, Janet		ML13277A455	30-1
Kotra, Janet		ML13353A729	532
Kovacs, Ashley		ML13330C033	245-26
Kraft, Dave	NEIS	ML13361A013	716
Kraft, David	NEIS	ML13336A366	274
Kraft, David	NEIS	ML13330C033	245-3
Kraskian, Jessica		ML13358A420	653
Krause, Laurel		ML13351A313	446
Kremer, Jerry	New York Affordable Reliable Electricity Alliance	ML13318A129	163-19
Krimsky, Pam		ML14002A013	807
Krist, Mark		ML13339A946	326-55
Krotz, Susan		ML13323B474	250-59
Krumm, Paul		ML13351A007	411
Kuchnia, Margaret		ML14001A025	758
Kuntawala, Jitesh		ML13330B643	244-7
Kurland, Miriam		ML13296A217	54
Kurz, Carol		ML13336A370	276
Kurz, Carol		ML13330C033	245-14
Kurz, Carol		ML13358A353	633
Kushigian, Elizabeth		ML13340A434	359
Kutcher, Celia		ML13329A943	266
Kuttler, Eugeni		ML14001A045	776
Kuyler, Raphael	Counsel for Entergy Nuclear Operatinos, Inc	ML13360A316	697
Kysor, Jillian	Blue Ridge Environmental Defense League	ML13354A016	551
Kysor, Jillian	Blue Ridge Environmental Defense League	ML14030A152	897
Labiosa, Eleanor		ML13324B614	242
LaForge, John		ML13344B149	328-9
Laing, Josephine		ML13351A137	415
Lamb, Charles		ML13351A304	438
Lamberger, Paul		ML13340A572	327-36
Lamberts, Frances		ML13336A738	303
Lamberts, Frances		ML14008A373	892
Lamont, Dana		ML13294A037	57
Lampert, Jim		ML13310B069	112-2
Lampert, Mary	Pilgrim Watch	ML13354A021	556
Lampert, Mary	Pilgrim Watch	ML14001A038	556
Lampert, Mary	Pilgrim Watch	ML13310B069	112-3
Landers, Don		ML13345B259	374
Landgren, Nancy		ML14008A149	342

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Landreth, Will		ML13339A946	326-32
Laney, Nan S.		ML14002A014	936
Lang, Amanda		ML13323B474	250-18
Lang, Amanda		ML13359A011	674
Lange, Howard		ML13355A010	591
Lapiska, Evan	Clean and Safe Energy Coalition	ML13294A564	60
Lapiska, Evan	Clean and Safe Energy Coalition	ML13323C000	212
Lapiska, Evan	Clean and Safe Energy Coalition	ML13277A455	30-20
Lapiska, Evan	Clean and Safe Energy Coalition	ML13318A129	163-18
Lapiska, Evan	Clean and Safe Energy Coalition	ML13330B840	246-20
Large, Gerry		ML13358A143	624
Larsen Clark, Brita		ML13323B474	250-53
Larson, Jean		ML13323B474	250-44
Laverty, Michael		ML13320A235	991
Lawhorn, Larry		ML13365A342	730
LeCour, Melinda		ML13298A764	77
Lee, Catherine		ML13308C622	127
Lee, Denise		ML13323B474	250-60
Lee, Michel		ML13360A357	699
Lee, Michelle		ML13318A129	163-12
Lehman, Dale		ML13330C033	245-25
Leichtling, Don		ML13323B992	211
Leichtling, Don		ML13330B840	246-5
Leighton, Taigen		ML13329B080	272
Leiter, Susan	Sierra Club; Stoney Point 55	ML13318A129	163-46
Lemmon, Tom		ML13339A942	325-18
Leon, Vicki		ML13357A806	609
Leonardi, Michael		ML13340A572	327-6
Leontis, Neocles		ML13340A572	327-37
Levine, Jeff		ML13308D270	981
Levine, JR		ML13338A513	1009
Lewis, Carol		ML13301A857	86
Lewis, Dave		ML13280A454	43
Lewis, Marvin		ML13345B267	376
Lewis, Marvin		ML13345B280	378
Lewis, Marvin		ML13351A020	427
Lewis, Marvin		ML13351A023	430
Lewis, Marvin		ML13351A498	455
Lewis, Marvin		ML13353A030	502
Lewis, Marvin		ML13353A104	958
Lewis, Marvin		ML13357A821	615
Lewis, Marvin		ML14015A084	906
Lewis, Marvin		ML13277A455	30-14
Lewis, Marvin		ML13330B840	246-6
Lewis, Marvin		ML14001A048	818
Lewis, Sherry	Mothers for Peace	ML13336A571	293
Lewis, Sherry	Mothers for Peace	ML13339A946	326-44
Lewison, Linda	Sierra Club Nuclear Free Campaign	ML13361A002	708
Lewison, Linda	Sierra Club Nuclear Free Campaign	ML13361A015	717
Lewison, Linda	Sierra Club Nuclear Free Campaign	ML13361A016	934

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Lewison, Linda	Sierra Club Nuclear Free Campaign	ML13330B840	246-9
Lewison, Linda	Sierra Club Nuclear Free Campaign	ML13330C033	245-10
Lewison, Linda	Sierra Club Nuclear Free Campaign	ML13345B014	329-23
Leyse, Mark		ML13330B840	246-28
Leyse, Mark	Atomic Safety Organization	ML13351A310	463
Lieberman, Bruce		ML14006A438	833
Light, Lillian	Environmental Priorities Network	ML13336A732	302
Lind, Jeff	S. Lombardi and Associates	ML14009A005	886
Lish, Christopher		ML13338A735	336
Little, Jim	Carolinas Nuclear Cluster	ML13323B474	250-61
Littlejohn, Nick		ML13280A449	39
Livingston, Rosanne		ML13339A946	326-57
Lochbaum, David		ML14030A152	899
Lodge, Terry		ML13340A572	327-13
London, Rick		ML13339A946	326-33
Long, Marcie		ML13298A770	82
Longyear, John		ML13353A446	509
Lord, Stephen		ML13339A942	325-32
Louise, Tiffany		ML13320A018	203
Ludwig, Andy		ML13324B151	225
Luttinger, Lionel		ML13354A002	539
Lutz, Ray		ML13339A942	325-19
Lutz, Ray	Citizens Oversight	ML13360A358	930
Lynch, Laura		ML14001A024	757
Lyons, Laura		ML13320A020	205
MacKenzie, Therese		ML13316C334	157
Macks, Vic		ML13354A017	552
Macks, Vic		ML13340A572	327-27
Madden, Donna		ML14001A028	761
Magda, Marni		ML13294A573	63
Magda, Marni		ML13336A377	280
Magda, Marni		ML13339A942	325-12
Magda, Marni		ML13352A520	481
Maghakian, Carol		ML13353A005	492
Maguire, Cynthia		ML13308C570	977
Magyar, Michael		ML14002A006	801
Maher, Ed		ML14001A037	770
Mahowald, Philip	Prairie Island Indian Community	ML13344B149	328-3
Mahowald, Philip R.	Praire Island Indian Community	ML13365A345	473
Mahowald, Philip R.	Praire Island Indian Community	ML14014A319	619
Maier, Marie		ML13280A443	36
Makhijani, Arjun		ML14030A152	898
Makhijani, Arjun		ML14030A152	953
Malboeuf, Simone		ML13360A121	686
Malboeuf, Simone		ML13339A946	326-23
Mallon, James	PSEG Power, LLC	ML14002A017	810
Malone, Patricia		ML13351A135	434
Mandrell, Rebecca		ML13358A147	625
Manfredi, Timonthy		ML13357A314	601
Maphet, Sheila		ML13323B474	250-26

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
March, Leslie		ML13277A455	30-12
March, Leslie		ML13282A605	45-11
Marcley-Hayes, Janet		ML13318A129	163-44
Marida, Patricia		ML13340A572	327-4
Marks, Lisa		ML13355A004	585
Marschak, Cheryl		ML14008A148	939
Marsh, Kathryn		ML13353A444	508
Martin, David		ML13308C812	978
Martin, David		ML13345B014	329-9
Martini, Shawn	Consumer Energy Alliance	ML13282A605	45-4
Martz, Robert		ML13339A175	350
Marzullo, Dominic	Utility Works Union of America Local 1-2	ML13308C187	123
Marzullo, Dominic	Utility Works Union of America Local 1-2	ML13318A129	163-6
Massey, Jennifer		ML13359A010	673
Masullo, Ginny		ML13361A005	931
Matsuda, Thomas		ML13323C011	215
Matthews, Tim	Morgan, Lewis & Bockius	ML13277A455	30-7
Mattox, Judy		ML13345A072	368
Maurer, Bill		ML13310B069	112-23
Maurer, William		ML13358A419	652
Mauter, Nancy		ML13336A569	291
Mazzocco, Kevin		ML14001A035	768
McArdle, Ed	Michigan Sierra Club	ML14009A001	883
McArdle, Ed	Michigan Sierra Club	ML13340A572	327-9
McClintock, Francene		ML13358A429	662
McClintock, Francene		ML13358A424	657
McClintock, Francene		ML13358A430	663
McComb, Sandy		ML13330C033	245-15
McCoy, Dave		ML13354A975	559
McCraney, Richard		ML14008A436	879
McCraney, Richard		ML13340A572	327-34
McCullum, Rod		ML13277A455	30-6
McCullum, Rod	Nuclear Energy Institute	ML13310B069	112-25
McCullum, Rod	Nuclear Energy Institute	ML13323B474	250-36
McCullum, Rod	Nuclear Energy Institute	ML13330B643	244-11
McCullum, Rod	Nuclear Energy Institute	ML13330B840	246-19
McCullum, Rod	Nuclear Energy Institute	ML13330C033	245-34
McCullum, Rod	Nuclear Energy Institute	ML13345B014	329-10
McCune, Chuck		ML13330B840	246-24
McGibney, Patrick		ML13339A946	326-53
McMillian, C.C.		ML13329B043	1008
McMurrian, Katrina	Nuclear Waste Strategy Coalition	ML13330B840	246-12
McNair, Robert		ML13346A329	1002
McNeil, Dorothy F.		ML13324B622	234
Meinke, Doro		ML13354B880	564
Mellow, Marion		ML13339A946	326-62
Mermelstein, Richard	Leadership Council of the Indian Point Safe Energy Coalition	ML13360A355	341

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Merrifield, Jeffrey		ML13319B256	180
Merrifield, Jeffrey		ML13323B474	250-4
Messer, Diane		ML13345B014	329-29
Messer, Diane		ML13345B014	329-4
Messinger, Michael		ML13357A321	607
Metcalf, Michael		ML14001A006	743
Metcalf-Kemp, Joni		ML13276A237	15
Meyer, Alfred C.	Friends of Chernobyl Centers U.S.	ML13308C062	113
Meyer, Bill		ML13318A129	163-48
Meyer, Charles		ML13336B056	312
Meyer, Frederick		ML14001A000	737
Michael, Edward		ML13354B889	568
Michaud, Debra		ML13330C033	245-43
Michetti, Susan		ML14002A045	823
Michetti, Susan		ML13330B840	246-16
Mierzwicki, Tony		ML14001A064	791
Mikkelsen, Sara		ML14014A102	908
Milcarek, Thomas		ML14007A031	853
Miller, Daniel		ML14007A011	847
Miller, Kirk		ML13338A730	331
Miller, Susan		ML13340A572	327-15
Milone, Deb	Hudson Valley Gateway Chamber of Commerce	ML13318A129	163-8
Minniss, Regina	Crabshell Alliance	ML13330B840	246-15
Minno, Maria		ML13296A215	53
Minster, Bernard		ML13336B461	317
Mironova, Dr. Natalia	Movement for Nuclear Safety	ML13308C062	113
Mirsky, Steven		ML13345B014	329-2
Miskena, Jessice		ML13340A572	327-21
Mitchell, Steve		ML13359A004	667
Mock, Neal		ML13298A765	78
Moffroid, Jenn		ML13358A422	655
Moncy, Charles		ML13351A480	448
Monge, Roberto		ML13339A946	326-47
Mooney, William	Westchester County Association	ML13308C141	119
Moore, Richard		ML14002A007	802
Moran, Aliese		ML13352A473	470
Mordaunt, Brandon		ML13346A197	383
Mordaunt, Laura		ML13346A197	383
Mordaunt, Philip		ML13346A197	383
Morgal, Richard		ML13336A375	279
Morgal, Richard		ML13339A942	325-22
Morgal, Rick		ML14002A036	826
Morgan, Leona		ML13319A931	170
Morgan, Sally	Clean Water for North Carolina	ML13353A728	531
Morris, Beverly		ML13301A564	968
Morris, Kelsi	CASEnergy Coalition	ML13310B069	112-21
Morris, Wendy		ML13351A019	426
Morrow, Jon		ML13340A572	327-43
Morrow, Jon Paul		ML13339A172	347

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Mull, Steven		ML13345A061	363
Mullens, Mark		ML13350A645	394
Muller, Alan		ML13344B149	328-11
Munson, Marcia		ML14002A031	817
Murdock, J.		ML13336B481	323
Murphy, William		ML13323B474	250-56
Musegaas, Philip	RiverKeeper	ML13361A004	710
Musegaas, Philip	RiverKeeper	ML13318A129	163-2
Muser, Mary Jo		ML13340A572	327-22
Myers, Dan		ML13340A572	327-26
Myers, Susan		ML13345B014	329-34
Navrkal, Alisa		ML13282A605	45-10
Nelson, Bob	Santa Barbara County	ML13360A114	683
Nelson, David		ML13339A946	326-64
Nelson, Dennis		ML13351A006	410
Nelson, Dennis	Support and Education for Radiation Victims	ML13277A455	30-24
Nelson, Dennis R		ML13320A010	196
Nelson, Pam	Sierra Club	ML13351A527	464
Nesbit, Steve	Duke Energy	ML13323B474	250-6
Nestel, Hattie		ML13310B069	112-22
Nester, Dennis F.		ML13353A011	497
Nichols, John		ML13336B465	319
Nichols, Susan		ML14007A013	849
Nickerson, Samantha		ML13309A846	140
Nixon, Kerry		ML13324B613	241
Norman, M. Jean		ML13336B019	305
Norton, Wayne	Decommissioning Plant Coalition	ML13358A384	637
Nuccio, Theresa		ML13338A733	334
O'Brien, Doug	Illinois Clean Energy Coalition	ML13330C033	245-16
O'Brien, Patricia		ML13353A454	511
O'Leary, David	Maryland Sierra Club	ML13330B840	246-13
O'Mahony, Emily		ML13336A572	324
O'Malley, Brian		ML13345A267	373
O'Nan, Margaret S.		ML13309A885	144
Ober, Jack		ML13319A929	169
Oeser, Robert		ML13339A693	354
Olmstead, Stan		ML13324B142	219
Olsen, Steven		ML13352A523	484
Olson, K.		ML14001A011	747
Olson, Mary		ML13323B474	250-2
Olson, Mary	Nuclear Information and Resource Service	ML13361A006	711
Orlinski, Patricia		ML13353A007	494
Osta, Hanna		ML13319A914	165
Oster, Phyllis		ML13336B041	310
Overland, Carol		ML14009A003	884
Overland, Carol		ML13344B149	328-14
Owen, Linde		ML13339A946	326-35
Ower, Douglas		ML13330C033	245-27

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Owl, Griffin		ML13350A642	392
Pace, Greg	Radioactive Waste Alert	ML13340A572	327-32
Pace, Gregory	Radioactive Waste Alert	ML13354A009	546
Padden, Jim		ML13353A002	489
Paddock, Brian		ML14002A042	821
Paddock, Brian		ML13345B014	329-12
Paddock, Brian		ML13345B014	329-25
Padot, Paul		ML13340A572	327-17
Palaia, Joyce		ML13351A009	413
Paleias, Lewis		ML13354A005	542
Paleias, Linda		ML13354A005	542
Palomarez, Javier	United States Hispanic Chamber of Commerce	ML14002A211	825
Pan, Arthur		ML13350A670	461
Parker, Bob		ML13340A572	327-30
Parks, Eric		ML13338A731	332
Parks, Sheila		ML13357A315	602
Parks, Sheila		ML13310B069	112-30
Parrish, Dave		ML13294A572	67
Pascall, Glenn		ML13351A131	431
Pascall, Glenn		ML13336A383	283
Pascall, Glenn		ML14017A116	944
Patrick, Kay		ML13351A143	436
Patrie, Lewis	Western North Carolina Physicians for Social Responsibility	ML14008A385	894
Patrie, Lewis E.	Western North Carolina Physicians for Social Responsibility	ML13323B474	250-30
Patrie, MD, MPH, Lewis E.	Western North Carolina Physicians for Social Responsibility	ML13354A008	545
Patrie, MD, MPH, Lewis E.	Western North Carolina Physicians for Social Responsibility	ML13320A003	189
Patterson, Jeffrey J.	Physicians for Social Responsibility	ML13308C062	113
Patterson, Karen	SC Governors Nuclear Advisory Council	ML13329A938	262
Paul, Jerry		ML13330B643	244-9
Paul, Stephen		ML13308C826	979
Paulsen, Carol		ML14002A018	811
Paulus, Jill		ML13330C033	245-49
Pavlik, Rayena		ML13329A940	263
Payne, Gail		ML13296A255	65
Payne, Joanne		ML13316C347	158
Pearson, Jeremy		ML13339A942	325-17
Peck, Jerry	Illinois Manufacturers Association	ML13330C033	245-9
Peck, Joe		ML13318A129	163-3
Peinado, Susan		ML13365A339	727
Pelletier, David A.	United Association Local Union 131	ML13312A354	152
Pennington, Charlie	NAC International	ML13323B474	250-27
Perez, Robert		ML13353A630	520
Perkins, V.E.		ML13358A160	628
Peters, Mark		ML13298A197	70

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
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Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Peterson, Alyse	New York State Energy Research and Development Authority	ML13365A336	681
Petro, James	NextEra	ML14002A015	808
Pflugbeil, Sebastian	German Society for Radiation Protection	ML13308C062	113
Phelan, Steven		ML13320A004	190
Phelan, Walter		ML13320A004	190
Phillips, Mark		ML13339A946	326-34
Pickens, Terry	Xcel Energy	ML13344B149	328-5
Picking, Brian		ML13358A409	642
Pieart, Richard		ML13351A306	440
Pierman, Bette	Michigan Safe Energy Future	ML13336A371	277
Pierman, Bette	Michigan Safe Energy Future	ML13330C033	245-11
Pipes, Betty		ML13304C024	106
Pisha, Gayla		ML13357A317	604
Pittillo, Dan		ML13298A766	79
Pluta, Tim		ML13303B537	98
Poole, Jesse		ML13339A922	766
Popa, Jeni		ML13304C025	107
Poprafsky, Nancy		ML13340A572	327-35
Poulson, Judi		ML13296A238	56
Poulson, Judi		ML13268A322	5
Powell, Michael		ML13317A120	149
Powers, Jim		ML14002A004	799
Pratt, Curtis		ML14027A588	947
Preobrazhenskaya, Natalia	The Save Children of Ukraine from Chernobyl Catastrophe Charitable Fund	ML13308C062	113
Preschle, Gus		ML13316C330	155
Prescott, Lisa Marie		ML13330B643	244-14
Priano, Guy		ML14021A042	917
Priano, Guy		ML14021A047	917
Price, Scott	Alliance for Progressive Values	ML13358A415	648
Price, Scott	Alliance for Progressive Values	ML13345B014	329-30
Proeller, John		ML13353A727	530
Prosser, Audrey		ML14007A032	854
Qian, Dorothy		ML13350A646	460
Quarterman, John S.		ML14001A001	739
Quinn, Ted		ML13339A942	325-4
Racano, Joey	Nukes Templar	ML13339A946	326-12
Raimondi, Frank		ML13355A012	593
Ramsay, Rebecca		ML13353A027	499
Ramsey, Betty		ML13320A394	162
Rasmussen, Kenneth		ML13325A004	239
Ratchford, James	CASEnergy	ML13330B643	244-12
Rauterkus, Ralph	Red Wing City Council	ML13344B149	328-2
Raynier, Kathleen		ML13280A451	40
Reichardt, Dorothy		ML13336A729	300
Reimer, Matt		ML13358A349	631
Reinheimer, Alice		ML13325A000	236

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
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Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Remein, Warren		ML13324B155	240
Renzoni, Dante		ML14002A005	800
Resnyanky, Dmitry		ML14001A026	759
Reson, Myla		ML13339A942	325-9
Rethmeier, Blain		ML13339A946	326-37
Revilla, Oscar		ML14001A042	774
Richards, Kitty Katherine		ML13323B474	250-39
Richardson, Carlos		ML14001A062	790
Richardson, Don		ML13316C328	154
Richardson, Don		ML14001A051	779
Riddle, William		ML13357A313	600
Rielly, Thomas P.	Vista 360	ML13304C013	956
Rielly, Thomas P.	Vista 360	ML14002A016	809
Riesterer, Zita-Ann		ML13353A461	513
Rippner, Sharon		ML13351A489	451
Rippner, Sharon		ML13339A946	326-43
Rippner, Thomas		ML13351A489	451
Rivard, Betsey	Georgia WAND; Women's Action for New Directions; Nuclear Watch South	ML13323B474	250-29
Rivera, Evelyn		ML13358A134	620
Rivera, Wendy	MultiCultural Education Alliance	ML13311A788	150
Rivers, Alicia		ML13340A572	327-24
Robinson, David		ML13320A000	186
Robinson, David		ML13323B474	250-68
Robinson, Eric		ML13339A942	325-15
Robinson, Herb		ML13310B069	112-20
Robinson, Herb		ML13320A024	208
Rochte, Tim		ML13339A170	345
Rodack, Tom		ML13323B474	250-15
Rodarte, Ron		ML14030A541	267
Rogers, Tim		ML13323B474	250-24
Rogers, William		ML13353A637	522
Rogina, Raymond	City of St. Charles, Illinois	ML13316C344	247
Rohl, T.		ML13354C110	581
Roman, Margo		ML13310B069	112-29
Rorem, Bridget		ML13330C033	245-42
Rosanelli, Donald		ML13338A876	998
Roscoe, Lee	Cape Downwinders	ML13339A173	348
Roscoe, Lee	Cape Downwinders	ML13339A298	352
Rose, Melene		ML13316C354	161
Rosenstein, Carl		ML13329A946	268
Rosin, Lawrence		ML13316C352	160
Rosin, Lawrence		ML13329A686	258
Rossin, A. David		ML13320A005	191
Rossin, A. David		ML14008A362	889
Rossin, A. David		ML13330B643	244-4
Rossin, Linda		ML13311C320	984
Rosso, Chris		ML13330C033	245-28
Rousseau, Barbara		ML13304C022	104
Rowlett, Kimberly		ML13298A761	74

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
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Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Rude, Kathleen		ML13330C033	245-32
Rudolph, Shannon		ML13268A445	420
Rundle, Steve		ML13323B474	250-69
Ruppe, Lorraine		ML13330B840	246-23
Ryan, Kate		ML13319A916	166
Ryan, Paul		ML13311A782	148
Sabo, Betty		ML13351A309	443
Sachs, Gary		ML13310B069	112-1
Sachs, Gary		ML13310B069	112-8
Sachs, Leslie Sullivan	Safe and Green Campaign	ML13310B069	112-7
Sack, Emily		ML13318A129	163-39
Safer, Don		ML13277A455	30-5
Safer, Don	Tennessee Environmental Council	ML13323B474	250-5
Sahagian-Allsopp, Ed		ML13352A518	479
Salas, Peggy		ML13345A080	372
Salgaller, Stephen		ML13351A010	414
Salley, Lawrence	African American Men of Westchester	ML13308C083	115
Sallis, Gary	United Association of Plumbers and Pipefitters	ML13339A942	325-14
Salto, Don		ML14001A061	789
Saltzman, Dale		ML13336B463	318
Sams, David		ML13359A003	666
Sanders, John		ML14006A374	830
Sandos, Theann	ConverDyn	ML13282A605	45-15
Sass, Jim	Ottawa County	ML13340A572	327-1
Sattler, Alfred		ML14001A060	788
Sauerheber, Richard		ML14001A066	793
Saxon, Craig		ML13354B881	565
Scarff, Steve		ML13360A361	702
Scharin, Lisa		ML13301A855	92
Scheller, April		ML13280A447	38
Schepart, Margot		ML13318A129	163-14
Schepperly, David	North American Young Generation in Nuclear	ML13318A129	163-17
Scherbak, Yuri	World Academy of Art and Science	ML13308C062	113
Schietinger, Helen		ML13345A060	362
Schilling, Francis		ML13320A234	990
Schimmelpfennig, Pamela Y.		ML13361A008	712
Schimmelpfennig, Pamela Y.		ML14007A034	712
Schlegel, Ed		ML14001A054	782
Schmidt, Otto		ML14014A093	905
Schmidt, Peg		ML13350A644	393
Schmitz, Diane		ML13269A411	25
Schneider, Howard		ML13296A358	962
Schneider, Linda		ML13302C533	971
Schneiderman, Eric		ML13318A129	163-1
Schonberger, David		ML13357A316	603
Schonberger, David		ML13340A572	327-17

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Schonberger, David		ML13340A572	327-18
Schonberger, David		ML13345B014	329-36
Schonberger, David		ML13345B014	329-7
Schrader, Ken		ML13339A946	326-18
Schulte, Karen		ML13358A410	643
Schumann, Klaus		ML13339A919	358
Schumann, Klaus		ML13339A946	326-15
Schussele, Samantha		ML13330C033	245-33
Schwartz, Robert		ML13330C033	245-40
Schwartzberg, Lora		ML13280A848	9
Scott, Emily Elizabeth		ML13350A643	460
Scott, Sabra		ML14008A166	941
Sears, Peggy		ML13304C651	976
Seastrom, Tina	Nuclear Energy Information Service	ML13330C033	245-35
See, Daniel		ML13339A946	326-17
Seeley, Linda	San Luis Obispo Mothers for Peace	ML13339A946	326-9
Seeley, Linda	San Luis Obispo Mothers for Peace	ML13345B014	329-32
Seeman, Laurie		ML13308C151	120
Seeman, Laurie		ML13318A129	163-45
Segal, Elizabeth		ML13318A129	163-47
Seitz, Tim		ML13351A021	428
Selesky, Laura		ML14007A037	858
Senkiw, Sheryl		ML13354A006	543
Severance, Beth		ML13321A545	994
Severance, Bruce		ML13339A946	326-26
Shadis, Raymond	New England Coalition And Friends of the Coast	ML13365A333	723
Shapiro, Susan		ML13357A816	611
Shapiro, Susan	Radiation Public Health Project	ML13318A129	163-7
Shaw, Gary		ML13308D085	136
Shaw, Gary		ML13318A129	163-22
Shaw, Jeanne		ML13318A129	163-35
Shaw, Sally		ML13302C183	89
Shaw, Sally		ML13310B069	112-18
Shea, Joseph	TVA	ML13360A297	694
Shelton, Matt		ML13353A485	516
Sheridan, Paul		ML13352A480	472
Shima, Tetsuo		ML13355A016	596
Shineflug, Marilyn		ML13330C033	245-29
Shinker, Carol		ML13354C109	580
Sieling, Jerry and Jean		ML13311B278	982
Silberstein, Mary		ML13336A724	296
Silver, Daniel		ML13324B153	227
Simon, Daniel		ML13324B150	224
Sipos, John	Assistant Attorney General, State of New York	ML13361A000	718
Sipos, John	Assistant Attorney General, State of New York	ML13149A446	1
Skopic, Catherine		ML13308C163	121
Skopic, Catherine		ML13318A129	163-32

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Skopic, Catherine		ML14001A029	762
Skov, Jeff		ML13339A911	355
Skov, Jeff		ML13360A288	692
Skud, Bruce	No More Fukushimas	ML13294A575	64
Skud, Bruce	No More Fukushimas	ML13310B069	112-10
Smith, Adam		ML14006A388	832
Smith, Amanda	Utah Department of Environmental Quality	ML13354C108	579
Smith, Diane		ML13269A408	22
Smith, Diane		ML13336A728	299
Smith, Ed	Missouri Coalition for the Environment	ML13330C033	245-19
Smith, Roger		ML13350A676	404
Snook, Robert	Assistant Attorney General, State of Connecticut	ML13365A345	473
Snook, Robert	Assistant Attorney General, State of Connecticut	ML13149A446	1
Snyder, Gail		ML13277A455	30-10
Snyder, Gail		ML13330B840	246-25
Snyder, Gail		ML13330C033	245-30
Snyder, Mark		ML13324B154	248
Soldier, Wolf		ML14002A043	822
Solinsky, Joseph		ML13351A526	458
Solomon, Laurie		ML13309A880	142
Sondheim, Steven		ML14007A120	938
Sondheim, Steven		ML13277A455	30-13
Sondheim, Steven		ML13330B840	246-26
Sondheim, Steven		ML13345B014	329-14
Sondheim, Steven		ML13345B014	329-22
Songchild, Stephanie		ML13354B877	563
Sorensen, Laura		ML13311A775	145
Sorensen, Ole		ML13336B071	314
Sorenson, Laura	SAFE Carolinas	ML13323B474	250-45
Sorenson, Ole		ML13323B474	250-34
Sorgen, Phoebe		ML13360A103	679
Sorgen, Phoebe		ML14001A050	778
Soto, Carol		ML14001A065	792
Souza, Celine		ML14002A019	812
Sovacool, Benjamin K.	Vermont Law School	ML13308C062	113
Sovereign, David		ML13304C027	109
Spangenberg, Samuel		ML13298A195	69
Spooner, Rena		ML13339A946	326-60
Spring, Janet		ML13360A364	705
Springer, Darren	Vermont Department of Public Service	ML13365A345	473
Springer, Darren	Vermont Department of Public Service	ML13149A446	1
Stadnik, George		ML13350A653	397
Stamm, Steve		ML13310B069	112-17
Stanick, Kim		ML13358A426	659
Stansberry, Mark		ML14002A029	816

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Stansberry, Mark		ML13340A572	327-38
Star, Priscilla	Coalition Against Nukes	ML13345B014	329-15
Star, Priscilla	Coalition Against Nukes	ML13345B014	329-21
Starr, Steven	University of Missouri	ML13308C062	113
Steidler, Paul	New York Affordable Reliable Electricity Alliance	ML13318A129	163-19
Stein, Ed		ML14008A428	895
Stein, Ed		ML13323B474	250-46
Stein, Robert		ML13339A297	351
Stein, Tami		ML13320A019	204
Stennes, Nancy		ML13353A480	515
Stenson, Amanda		ML13330C033	245-18
Steorts, Tim		ML13330B643	244-6
Stewart, Jim		ML13351A017	424
Stone, Gene	Residents Organized for a Safe Environment	ML13351A133	433
Stonecipher, Carolyn		ML13303C070	90
Stork, Gilbert	Cuesta College	ML14014A311	911
Streeter, Richard		ML13304C376	101
Strell, Ethan	Columbia Center for Climate Change Law	ML13354A023	558
Strickland, Gerald	Diablo Canyon	ML13339A946	326-3
Stringfellow, Paris		ML13319B250	176
Sugas, Zick		ML13354C111	582
Sullivan, Cornelia		ML13310B069	112-33
Sullivan, Martha	Coalition to Decommission San Onofre	ML13339A942	325-20
Sunderland, Mary Brooke		ML13330B840	246-31
Sunflower, Susan		ML13308C644	133
Swanson, Jane	San Luis Obispo Mothers for Peace	ML13336A552	287
Swanson, Jane	San Luis Obispo Mothers for Peace	ML13339A946	326-8
Swanson, Mark		ML13268A329	12
Sweeney, Jay	Green Party of Pennsylvania	ML13329A935	261
Sylvester, Richard		ML13350A669	399
Szabo, Lou		ML14008A432	875
Szabo, Lou		ML13340A572	327-19
Szymanowski, Jennifer		ML14008A438	881
Tache, Jan		ML13352A516	477
Takarabe, Tamae		ML13357A817	612
Talbot, J		ML13280A822	44
Tampas, Courtney	V.C. Summer Nuclear Station	ML13323B474	250-10
Tanner, John		ML13352A459	466
Tannler, Sandra		ML13346A199	384
Tapp, Yvette		ML13353A034	506
Taylor, David		ML13355A005	586
Taylor, Jeff		ML13354B886	567
Taylor, Tom		ML14006A447	840
Taylor, Wallace	Sierra Club Nuclear Free Campaign	ML13360A270	688
Taylor, Wallace	Sierra Club Nuclear Free Campaign	ML13344B149	328-4
Temlock, Ayumi		ML14001A015	751

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Temple, Scott		ML13353A632	521
Terra, Ben		ML13336A727	298
Thabit, Nick		ML14006A439	834
Thatcher, Tami		ML14007A029	851
Thaw, Karen		ML13320A271	992
Thesling, William	The Energy From Thorium Foundation	ML13340A572	327-41
Thomas, Bill		ML13269A410	24
Thomas, Ellen		ML13323B474	250-51
Thomas, Ellen	Women's International League for Peace and Freedom, Western Carolina Branch, and Proposition One Cam	ML13319A947	174
Thomas, Richard	Affordable Reliable Electricity Alliance	ML13318A129	163-4
Thomas, Ruth	Environmentalists, Inc.	ML14002A020	813
Thomas, Ruth	Environmentalists, Inc.	ML13319A947	174
Thome, William L.		ML14008A430	873
Thompson, Gordon R.	Institute for Resource and Security Studies	ML14030A152	916
Thompson, Lydia		ML13346A208	386
Thompson, Tammy		ML13330C033	245-17
Thompson, Tammy		ML14006A445	862
Thornlow, Ann		ML13304C021	103
Thornton, Adam	North American Young Generation in Nuclear	ML13353A734	535
Thunder, Warren Storm		ML14007A003	842
Tietjen, Jamie		ML13296A226	52
Tilbury, Don		ML14008A188	868
Tilbury, Don		ML13310B069	112-14
Titus, Mary		ML13353A724	527
Tobin, Clare		ML13330C033	245-39
Tocornal, John		ML13354B885	566
Todd, Doug		ML13340A572	327-3
Tognazzini, Randall		ML13346A186	382
Tognini, Dana		ML13358A158	627
Tolls, Leatrice		ML13340A572	327-23
Tomlin, Willie		ML13323B474	250-9
Tompkins, Robert		ML13320A009	195
Tompkins, Robert		ML13320A021	206
Tonohira, Yuko		ML13318A129	163-31
Tonohira, Yuko		ML13309A862	141
Totoiu, Jason	Everglades Law Center	ML13330B643	244-8
Trahey, Linda		ML13346A236	391
Tucker, Alison		ML14001A032	765
Tulenko, James	University of Florida	ML13330B643	244-1
Turnbow, Lisa M.		ML13294A038	58
Turner, D		ML14027A588	947
Uhls, Agnes		ML14001A044	935
Utley, Charles	Blue Ridge Environmental Defense League	ML13323B474	250-8

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Vale, Karen	Cape Cod Bay Watch	ML13358A137	622
Vale, Karen	Cape Cod Bay Watch	ML13310B069	112-16
Van Leekwijck, Natalie		ML14027A588	947
van Thillo, Grace		ML13359A002	665
Van Wicklen, Betty J.		ML13268A324	6
Vandel, Niki		ML13277A455	30-11
Vandel, Niki		ML13345B014	329-19
Vandel, Niki		ML13345B014	329-6
Vandel, Nikohl		ML13358A386	639
Vandel, Nikohl		ML13360A362	703
Vandel, Nikohl		ML13339A946	326-36
Vandenberg Clermont, Elaine		ML13360A362	703
Vandenbosch, Robert		ML13269A414	27
Vanderlan, Kelly		ML13365A346	733
Vanderwoerd, Jennifer		ML13323C015	217
VanWicklen, Betty J.		ML13340A515	1000
Vejdani, Vivianne	SC Department of Natural Resources	ML13354A978	560
Velazquez, Lisette		ML13365A349	735
Vesperman, Gary		ML13329A807	550
Vetter, Richard	Health Physics Society	ML13353A732	534
Vilen, Sydney		ML13351A187	1005
Vince, Jenny	Clean and Safe Energy Coalition	ML13330B840	246-8
Von Duvillard, Serge		ML13311C450	985
Von Thillo, Grace		ML13339A942	325-8
Vytlacil, Gordon	Generation mPower	ML13319B258	182
Vytlacil, Gordon	Generation mPower	ML13323B474	250-65
Waage, Edward		ML13336B063	313
Waddell, Duane		ML13339A946	326-38
Wagner, Deborah		ML13318A489	988
Wagner, Jim and Virginia		ML13280A097	34
Wagner, Sam		ML13344B149	328-13
Waldstein, Joe		ML13351A496	454
Walking Turtle, Willow		ML13339A946	326-6
Waller, Viviane		ML13339A942	325-34
Walter, Beverly		ML13330C033	245-48
Walter, Joan	California Energy Commission	ML13359A006	669
Warren, Barbara	Citizens Environmental Coalition	ML13360A292	693
Waterman, Charles		ML13281A076	50
Waters, Christine		ML13319B257	181
Watkins, Conor		ML13353A001	488
Watkins, Karen		ML13304C570	975
Watland, George		ML13351A131	431
Watland, George		ML13354A003	540
Watland, George		ML13336A383	283
Watland, George		ML14017A116	944
Watson, Jeannette		ML14008A170	408
Wayland, Gregory		ML13312A106	986
Webb, David		ML13320A013	197
Webb, Hubert		ML13311C141	983

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Weinberg, Luz	City of Aventura, Florida	ML13336B030	308
Weisman, David	Alliance for Nuclear Responsibility	ML13354A010	547
Weisman, David	Alliance for Nuclear Responsibility	ML13339A946	326-13
Weissglass, Theresa		ML13339A946	326-39
Wells, Gerald		ML14007A010	846
Wells, Harmony		ML13318A771	989
Wells, Jim		ML13358A418	651
Wellwood, Jay		ML13323B474	250-25
Welty, Delores		ML13339A942	325-25
Werner, Shahla M.	Sierra Club- John Muir Chapter	ML13361A001	707
Wesley, Ashleigh	Southern Nuclear	ML13323B474	250-32
Westchester, Business Council of		ML13308C119	118
Whiting-Broeder, Pamela		ML14007A012	848
Wickham, Wendelyn		ML13336A562	288
Wicks, Tonja	TLW Legal and Government Support Services	ML13357A310	598
Wicks, Tonja	TLW Legal and Government Support Services	ML13339A942	325-13
Wieder, Dr. Robin		ML13308C599	124
Wigglesworth, Marilyn		ML14027A588	947
Wilansky, Laura		ML13360A122	687
Wilansky, Laura		ML13345B014	329-28
Wilde, Paul		ML13302A491	970
Williams, Chris	Citizen's Awareness Network	ML13310B069	112-15
Williams, David		ML13329A934	260
Williams, Jim	Western Interstate Energy Board	ML13353A033	505
Williams, Robert		ML13354A014	549
Wilmott, Emily		ML13338A739	339
Wilshire, Howard		ML13354A018	553
Wilshire, Howard		ML14002A010	805
Wilson, Annie	New York Environmental Law and Justice Project	ML13318A129	163-5
Wilson, Greg		ML13360A360	701
Wilson, Greg		ML13345B014	329-8
Wilson, Greg	Coalition Against Nukes	ML13345B014	329-24
Wilson, Greg	Windjammer Energy Incorporated	ML13330B643	244-13
Wilson, Lavern		ML13324B616	228
Wilson, Reed	The Office of Congressman Adam Kinzinger	ML13330C033	245-1
Wilver, Calvin		ML13345B263	375
Wilver, Calvin		ML14008A353	872
Wilver, Rosemary		ML14008A359	888
Wilver, Rosemary		ML13339A946	326-40
Windsong, Debra		ML13350A673	462
Wing, Steve	University of North Carolina	ML13308C062	113
Wolf, Ann		ML13304C028	110
Wolf, Peter		ML13318A129	163-16
Wolf, Robert S.		ML13345A075	370
Wolf, Tom		ML13336A367	275

Table 2. Individuals Providing Unique Comments on the Draft GEIS and Proposed Rule
(continued)

Commenter	Affiliation (if stated)	ADAMS Accession #	Correspondence ID
Wolf, Tom		ML13330C033	245-2
Wolpoff, Deborah		ML13365A341	729
Women's Action for New Direction, Georgia		ML13360A359	700
Wood, Keely		ML13308C633	128
Wood, Nick		ML13323B474	250-55
Woodward, Julie		ML13305A112	102
Woodward, Julie		ML13318A129	163-37
Wopat, Jeen		ML13351A132	432
Worthington, Juniel		ML14001A036	769
Wrenn, Nancy		ML13308C096	116
Wrenn, Nancy		ML13310B069	112-6
Wright, Margaret Z.		ML14009A000	882
Wylie, Robert	Duke Energy	ML14008A383	893
Wythe Elnagar, Romi		ML13361A003	709
Yablokov, Alexey	International Socio-Ecology Union	ML13308C062	113
Yarrobino, Erin		ML14027A588	947
Yelda, Peter		ML13345A062	364
Young, Jane		ML13354B899	571
Young, Roberta		ML13336A743	304
Yusuf, Hassan		ML13339A691	353
Zaitz, Kristin		ML13339A946	326-41
Zaklan, Jill		ML13319A912	164
ZamEk, Jill	San Luis Obispo Mothers for Peace	ML13339A946	326-10
Zawalick, Steven		ML13339A946	326-48
Zeller, Lou	Blue Ridge Environmental Defense League	ML13324B147	222
Zeller, Lou	Blue Ridge Environmental Defense League	ML13323B474	250-1
Zeller, Lou	Blue Ridge Environmental Defense League	ML13330B840	246-7
Zeller, Louis	Blue Ridge Environmental Defense League	ML13365A330	720
Zidbeck, George		ML13280A445	37
Zigler, Randy		ML13339A942	325-33
Zimmern, Matt		ML13351A481	449
Zuccarini, Ana		ML13330B643	244-15
Zuckerman, Naomi		ML13268A327	10
Zure, Lisa		ML13357A823	617
Zure, Lisa		ML14001A043	775

Table 3. Individuals Submitting the Form E-mail Sponsored by Beyond Nuclear with Correspondence ID 2 and Representative ADAMS Accession No. ML13269A282

Commenter	ADAMS Accession #
Armistead, Susan	ML13298A709
Bartholomew, Alice	ML13270A283
Bartholomew, Alice	ML13352A482
Bernstein, Laura	ML13276A830
Brown, Deb	ML13298A700
Burton, Vic	ML13280A856
Clausen, Ted	ML13298A711
Dixon, Vernon and Mary Joyce	ML13290A621
Egan, John	ML13298A717
Field, Robert	ML13270A392
Goldman, Steven	ML13274A403
Henry, Mallika	ML13298A710
Hilfer, Susanna	ML13290A629
Hoffman, Elisabeth	ML13290A616
Jeffrey, Monroe Edwin	ML13290A626
Jessler, Darynne	ML13290A623
Jessler, Darynne	ML133521491
Kirk, John	ML13298A701
Knipp, Donna	ML13280A852
Knipp, Donna	ML13298A698
Koepp, Steve and Betsy	ML13298A729
Lambert, Gwen	ML13274A405
Larsen, Eric	ML13290A618
Lebowitz, Ellen	ML13290A622
McFarland, Theresa	ML13298A728
Ostoich, Julie	ML13280A850
Putnam, Carol	ML13269A282
Regan, David	ML13290A619
Roland, J.	ML13290A627
Schrier, Barb	ML13336A501
Schwartzberg, Lora	ML13280A848
Sheridan, Paul	ML13280A859
Shevis, Aron	ML13274A659
Shevis, Aron	ML13280A847
Shevis, Aron	ML13298A721
Shuput, Stephen	ML13280A864
Sims, Millicent	ML13280A851
Small, Sally	ML13274A404
Spilsbury, Delaine	ML13290A617
Tache, Jan	ML13298A703
Williams, Taffy	ML13290A615
Zucker, Lee	ML13336A498

Table 4. Individuals Submitting the Form E-Mail Sponsored by the Sierra Club with Correspondence ID 3 and Representative ADAMS Accession No. ML13269A279

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Acker, Robert	ML13313A131	Bill, Eileen	ML13318A527
Adler, Ellen	ML13303B712	Black, Joan	ML13323C170
Aegerter, Bob	ML13274A377	Blair, Judith	ML13317A565
Ahn, Hye Mi	ML13314A300	Bloom, Nicolas	ML13323C012
Alahan, Vinaya	ML13301B118	Bly, David	ML13324B539
Albanese, A.	ML13320A426	Boelsche, Joyce	ML13321A241
Alexander, Susan	ML13313A199	Bollin, Joseph	ML13314A460
Amann, William	ML13317C211	Bolognini, Francesca	ML13309B745
Ames-Curtis, Juli	ML13298A488	Bonner, Hazel	ML13316A710
Amos, Barbara	ML13298A691	Booth, Elizabeth	ML13281A106
Anderson, Marjory	ML13311C354	Booth, Richard	ML13319A613
Anderson, Robin	ML13308D071	Borchers, Margie	ML13309B677
Archer, Tracey	ML13302C492	Borst, Laura	ML13273A677
Armao, Terri	ML13304B999	Borstelmann, John	ML13310C522
Armstrong, Mary	ML13315A027	Bosold, Patrick	ML13280A729
Armstrong, Sara	ML13324B320	Botsford, Tonya	ML13324B471
Arneson, Carla	ML13301A335	Boucher, J.	ML13309B955
Arvola, Andarin	ML13310A158	Bourgeois, Paula	ML13317A115
Ascher, Miriam	ML13309C158	Branson, Mary	ML13302C722
Aurigemma, Kaye	ML13294A243	Brave, Jacqueline	ML13308C983
Auris, Jean	ML13273A645	Bresnahan, Rosalind	ML13322B709
Avogardo, Thomas	ML13323A707	Brewster, Terry	ML13298A484
Bailey, Ross	ML13323A714	Brewster, Thomas	ML13309C091
Bailey, Stephen	ML13314A224	Cannon, B.	ML13298B139
Baker, Paul	ML13299A015	Cano, Martha	ML13314A566
Baker, R.	ML13321A519	Capozzelli, J.	ML13308D067
Bankston, Kathryn	ML13317C190	Carnevale, Selva	ML13316C742
Bannerman, Patricia	ML13311C484	Carr, Hope	ML13304C038
Bannister, Susan	ML13322B346	Carrubba, Sandra	ML13322B422
Barnett, Vaughn	ML13298A575	Carter, Pamela	ML13282A287
Baroni, Cherie	ML13311B319	Cascio, Lynn	ML13280A691
Bartczak, Andi Weiss	ML13311A004	Casey, Claire	ML13310B870
Barthel, Carolyn	ML13304A087	Catherine, John	ML13311C420
Batey, Sandra	ML13318B612	Cerrito, Robert	ML13323C212
Batt, Davonna	ML13323C058	Chachula, Julian	ML13310C418
Bauer, Sanda	ML13311C827	Chafe, Jennifer	ML13309B959
Baumgartner, Paul	ML13323B856	Chan, Sonja	ML13315A597
Bayouth, Michael	ML13302C522	Chase, Jayne	ML13318A553
Beattie, Jane	ML13301A898	Chasse, Joe	ML13301B318
Beattie, Walter	ML13322B908	Chastain, Peggy	ML13323A837
Beck, Nicole	ML13303C481	Chasteen, Jessica	ML13324B231
Beer, Joan	ML13321A585	Chatelain, Abigail	ML13318A855
Beitzel, Margaret	ML13311B186	Chavarria, Gus	ML13308D090
Benham, Mary	ML13311C823	Childress, Cerena	ML13308D081
Berg, Richard	ML13316C815	Christensen, Gary	ML13275A521
Bergen, Jeanne	ML13298A826	Christenson, Mary	ML13313A398
Berkowitz, Henry	ML13317A572	Church, Jane	ML13315A356
Bernard, William	ML13316B591	Cirami, Barbara	ML13321A394
Best, Margaret O'Hara	ML13317C047	Cladianos, John	ML13321A361
Best, Randy	ML13320A687	Clancy, Justine	ML13302C464
Bigari, Randy	ML13303C165	Cleary, Micaela	ML13311C911

Table 4. Individuals Submitting the Form E-Mail Sponsored by the Sierra Club with Correspondence ID 3 and Representative ADAMS Accession No. ML13269A279 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Clemson, G. Scott	ML13319A591	Dickman, Steve	ML13311C683
Cliffe, Karen	ML13319A734	Dieterle, Eric	ML13309A452
Cline, Thaddeus	ML13305A647	Diggs, Linelle	ML13316C596
Coates, Arthur	ML13276A651	DiNardo, Judith	ML13314A394
Cochran, Joyce	ML13304A080	Dipaola, Marisa	ML13324B210
Colburn, Matt	ML13313A618	Dixon, Vernon & Mary Joyce	ML13318B228
Coleman, Ian	ML13295A126	Doepp, John	ML13308D018
Coleman, Josh	ML13281A100	Doland, Todd	ML13311C276
Comella, John	ML13275A488	Donaldson, John	ML13323A701
Commons, T. Mark	ML13317C096	Donohue, Bonnie Ann Peate	ML13308C094
Cone, Jane	ML13323A691	Doodigian, Tari	ML13322A872
Conley, Patrick	ML13304C148	Doukas, Andrea	ML13311C143
Conley, Patrick Clay	ML13321A502	Dowell, Jean	ML13323C326
Connour, Connie	ML13310C096	Drew, William	ML13273A756
Conrad, Daniel	ML13324B262	Du Faur, Brenda	ML13310C369
Copeland, Maurice	ML13324B658	duBois, Pine	ML13308D093
Cort, John	ML13309C151	Duffy, Deidre	ML13310C432
Costello, Joseph	ML13322B965	Dunlap, Paige	ML13318B683
Cotrell, Shelley	ML13323C084	Durbin, P.J.	ML13317B724
Cruz, Evelyn	ML13310C382	Durnell, Tim	ML13309A480
Curry, Denise	ML13317B800	Dyer, William	ML13294A189
Dale, Barbara and Jim	ML13298B057	Dzindzeleta, Mercedes	ML13311C852
Daniels, Betsy	ML13303C067	Eckman-Onyskow, Beverly	ML13316C314
Danjin, Jane	ML13318B302	Ehrhardt, Carole	ML13276A612
Darst, Dolores	ML13318B378	Eilenberg, Alisa	ML13298B325
Davidson, David	ML13316D001	Ellis, Heidi	ML13321A243
Davies, Cynthia	ML13298A849	Ellis, Tammy	ML13322B414
Davis, A.J.	ML13322C127	Ellison, Kay	ML13305A065
Davis, Barbara	ML13310A186	Elman, Barbara	ML13298A926
Davis, Carla	ML13298A416	Elton, Wallace	ML13310C462
Davis, Donna	ML13319A150	Embree, PhD, M.P.H., S.	ML13310A588
Davis, William	ML13323A696	Emerson, Jan	ML13309C080
Davison, Heidi	ML13298B225	Emrick, Roy	ML13290A484
De Cicco, Richard	ML13314A030	Eppele, Melissa	ML13322B769
Dean, Nancy	ML13301A605	Erb, Jay	ML13315A575
Deboni, Thomas	ML13276A732	Erickson, Steve	ML13298B315
Decianni, William	ML13305A339	Ernst, Harold	ML13301B275
Degannes, Karen	ML13323B900	Ettinger, Sonia	ML13315A170
Degrande, Barbara	ML13321A180	Evert, Kathy	ML13302B395
Delsasso, Janis	ML13316C573	Ewen, Kerry	ML13321A562
Denny, Rachael	ML13318A397	Falis, Edward	ML13301B123
Dereix, John	ML13276A663	Fandel, Rosemary	ML13316C608
Derieg, G.W.	ML13309A063	Fary, Jim	ML13311B255
Derose, Nicolet	ML13282A261	Fasnacht, Sharon	ML13317C082
Devine, Barbara	ML13323A694	Fegley, Julie	ML13313A605
deVitalis, Arthur	ML13304A141	Feldman, Jane	ML13314A523
Dezendorf, Andrea	ML13323A713	Feldman, Mark	ML13310C158
		Feldman, Mark	ML13321A593

Table 4. Individuals Submitting the Form E-Mail Sponsored by the Sierra Club with Correspondence ID 3 and Representative ADAMS Accession No. ML13269A279 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Feldman, Mark	ML13324B417	Grzeskowiak, Richard	ML13319A205
Ferguson, Ruth	ML13276A655	Guthrie, David	ML13304A163
Fiorillo, Cristina	ML13308B165	Hadcroft, James K.	ML13311B302
Fisher, MD, H. Kenneth	ML13308D086	Hall, Christopher	ML13298B564
Flaherty, Ned	ML13320A095	Hall, Don	ML13304C164
Floyd, Mary	ML13301A498	Hammarstrom, Bryn	ML13302A065
Fogg, Margaret	ML13324B240	Hanbury, Sherry	ML13290A590
Forray, Brett	ML13323B951	Harnisch, Susan	ML13298B569
Foster, Will	ML13305A320	Harrah, Jovita	ML13298A827
Fox, Nannette	ML13316B653	Harrington, Joyce	ML13298B311
Fox, Sheila	ML13308A912	Harris, April	ML13316C403
Francis, Toni	ML13301B036	Hathaway, Arthur	ML13322A671
Frantz, Charles	ML13280A756	Heard, Marcia	ML13317B677
Freewoman, Faith	ML13316B512	Heath, Linda	ML13318B686
French, Sarah	ML13314A524	Helmer-Sindemark, Freyja	ML13320A460
Fritch, Jackie (Marion J.)	ML13315A384	Henderson, PhD, Donald W.	ML13316C525
Gaisu, Kathy	ML13298B069	Hennig, Anna Christina	ML13298B624
Galbreath, Jerry	ML13309B720	Henning, Marcia	ML13320A416
Gall, Thenice	ML13310C179	Henry, George	ML13320A632
Gardam, Marybeth	ML13276A681	Herbert, Wendy	ML13323C185
Gardner, Bruce	ML13304C122	Herdan, Deborah	ML13290A393
Gardner, Gerald	ML13323B970	Hernandez, Maria Celia	ML13302C338
Gartner, Daniel	ML13324B542	Herrgesell, Ron	ML13323B978
Gehlert, Edgar	ML13323B539	Hill, Rebecca	ML13290A568
Germain, Mary	ML13276A587	Hinze, Dennis	ML13295A263
Giacomozzi, Christine	ML13318B071	Hirsch, Arlene Gloria	ML13316C876
Giesy, Theo	ML13312A303	Hirsch, Robert	ML13321A578
Givens I, Terrance Alexander	ML13309B728	Hirschhorn, Janet	ML13301A106
Glaserng, Michael	ML13303C381	Hitchcock, Tui	ML13322C083
Glime, Janice	ML13298B503	Hoagland, Christina	ML13314A497
Godwin, Larry	ML13310C392	Hoch, S.	ML13322A831
Gohl, Joy	ML13302C568	Hoekstra, Robert	ML13313A221
Gold, David and Judy	ML13318A656	Hogan, Kathleen	ML13315A209
Gonzalez, Eusebio	ML13310B900	Holmes, Lorna	ML13310C218
Gonzalez, Nando	ML13298A582	Holtzberg, Diana	ML13305A772
Goodman, Diana	ML13314A250	Hoover, Paul	ML13309C188
Goodwin, Thomas	ML13318B602	Hoppenbrouwers, Elke	ML13304C468
Gouge, Deborah	ML13316D075	Hopson, Maury	ML13308C605
Grace, Kathryn	ML13311C788	Horning, Judson	ML13321A370
Graf, Charles & Mary	ML13313A582	Houlihan, Rita	ML13298B345
Gravander, Geri	ML13321A463	Hsu, Jennifer	ML13303C396
Gray, Erica	ML13302B033	Hunt, Le	ML13301A125
Greco, Rosemarie	ML13311C840	Huntington, Elizabeth	ML13301B091
Greenman, David	ML13302A071	Hurley, Mary	ML13308B048
Greenstreet, Carol	ML13323C068	Hutchison, Regina	ML13309B717
Gregg, Virginia	ML13317B963	Hyman, Ruth	ML13319A201
Gregory, Gregory B.	ML13298B603	Irwin, Hannah	ML13311C252
Griffin, Eileen	ML13324B610	Jackson, Anne	ML13313A311
Grill, Brock	ML13320A188	Jackson, Carol	ML13313A590

Table 4. Individuals Submitting the Form E-Mail Sponsored by the Sierra Club with Correspondence ID 3 and Representative ADAMS Accession No. ML13269A279 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Jackson, Carolyn	ML13323A693	Kopp, Roland	ML13308B042
Jackson, Karen	ML13315A112	Kramer, Audrey	ML13311B151
Jackson, Kristina	ML13317B598	Kraut, Rochelle	ML13321A012
Jacobs, John	ML13276A696	Kresser, Jeanne	ML13317A167
Jacobs, John	ML13316C384	Kreuttnr, Phyllis	ML13302A794
Jacobs, John	ML13319A177	Kronenberg, Esther	ML13310C803
Jacopetti, Anna	ML13298A391	Kwartler, Sheila	ML13309C218
Jacques, Susan	ML13320A276	LaBelle, Barbara	ML13305A060
Janquart, Laurence	ML13302A063	Lackey, Mercedes	ML13304B611
Jennings, Scott	ML13311C755	Lambeth, Larry	ML13308B043
Jezierski, E.	ML13290A381	Landes, Joan	ML13294A297
Jobe, Laura	ML13316C276	Landes, Robert	ML13301A926
Johnson, Bobie	ML13304B963	Landis, Beth	ML13298B362
Johnson, Lee	ML13321A206	Lands, Lark	ML13304B895
Johnson, Leslie	ML13298B221	Lane, Christopher	ML13302C480
Johnson, Richard	ML13318B104	Langmuir, Jonathan	ML13321A260
Jones, Gary	ML13322A773	Lappas, Theodore	ML13298A866
Jones, Jane	ML13316C671	Larason, Christofer	ML13310C709
Jones, Rodney & Terri	ML13316C654	Laverne, David	ML13316C530
Jones, Virginia	ML13317B538	Laverty, Michael	ML13320A235
Joppich, Grace	ML13298B210	Lawrence, George	ML13316D033
Joshi, Madhup	ML13323C298	Lawson, Lynda	ML13310C728
Juracich, Maureen	ML13313A339	Lazell, James	ML13308C707
Jurczewski, Carol	ML13317B791	leBourgeois, Myrthe	ML13296A200
Juszkiewicz, Barbara	ML13322B410	Lee, Jay	ML13310C636
Kachold, Patricia	ML13295A087	Lehman, Cynthia	ML13304C683
Kaffer, Kathryn	ML13322C050	Leider, Charles	ML13298B615
Kane, Lynne	ML13301A327	Leite, Adam	ML13319A576
Kanfer, Sheldon	ML13308C675	Lerman, Steven	ML13304C566
Kansas, Sharon	ML13317A192	Letendre, Michael	ML13308C985
Kates, Daisy	ML13276A768	Levine, Jeff	ML13308D270
Kay, Colin	ML13309C099	Lewis, Dennis	ML13298A987
Keane, Marie	ML13308C831	Lewis, Dorothy	ML13313A350
Keeland, Bob	ML13311C201	Lindeman, Thomas And Joan	ML13318B685
Kegeles, Gloria	ML13301A045	Lindsey, Judi	ML13323C173
Keith, JL	ML13318B581	Lindsey, Linda	ML13298B518
Kelleher, Agnes	ML13310C208	Litwak, Taina	ML13301A945
Keller, JoAnn	ML13317B973	Litzsinger, Raymond	ML13301A026
Kelley, Francis	ML13311C896	Lobdell, James	ML13302C328
Kenny, Constance	ML13308C686	Lograsso, Karen	ML13304B915
Kidd, Meg	ML13311C885	Lonchar, Susan	ML13318A790
Kiernan, John	ML13321A546	Lopez, Gilberto	ML13305A735
Kimball, Larry	ML13317C219	Lotus, Trisha	ML13308D142
Klepper, Bruce	ML13318A982	Love, Vera	ML13317A113
Kleppin, Julia	ML13316B513	Lukas, James	ML13323A937
Kloos, Robert and Jean	ML13311C254	Lumpkin, Kirk	ML13303B706
Knieriem, Jane	ML13308C579	Lyle, Peggy	ML13318B130
Knudson, Claudia	ML13304C362	Lynch, Laura	ML13296A405
Kopp, Roland	ML13305A036	Macraith, Bonnie	ML13295A111

Table 4. Individuals Submitting the Form E-Mail Sponsored by the Sierra Club with Correspondence ID 3 and Representative ADAMS Accession No. ML13269A279 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Maguire, Cynthia	ML13308C570	Monaghan, Nancy	ML13316C565
Maisel, Jane	ML13318B607	Monroe, Michael	ML13301A136
Malarney, Holly	ML13321A456	Montgomery, Betty	ML13316D029
Mann, Dennis	ML13316B625	Mook, Terry Crowhawk	ML13318B124
Manning, Gerald L.	ML13322B795	Moore, Donna	ML13295A058
Marie, Krystalya	ML13298B037	Moore, Ken	ML13313A048
Marion, Don and Helene	ML13317C049	Moore, Linda	ML13316A750
Markesteyn, Marie	ML13315A044	Moradian, Ann	ML13324B211
Marks, Luan	ML13281A120	Moran, Sharon	ML13299A035
Marriott, Clayton	ML13298A319	Morelli, Wendy Lee	ML13301B291
Marsh, George	ML13318A454	Morey, Clarence	ML13304B594
Martin, David	ML13308C812	Morin, Darlene	ML13309B740
Marvin, Heather	ML13302C318	Morphopoulos, Hercules	ML13301B104
Marye-Baker, Taylor	ML13317C015	Morris, Beverly	ML13301A564
Mason, Marty	ML13317B789	Morris, Linda and Joel	ML13321A516
Masters, Mary	ML13313A447	Mountain, Wendy	ML13311C069
Mastro, Cynthia	ML13317A231	Mucci, Joseph	ML13273A762
Matlack, PhD, Louis	ML13316C908	Muchui, Mary	ML13302A611
Mcarthur, Steven	ML13314A120	Muller, August	ML13302C586
Mccabe, Cynthia	ML13302A966	Mullett, Michael A.	ML13310C360
Mccombs, Annie	ML13323C063	Nagler, Catherine	ML13314A244
Mccombs, Robert	ML13295A065	Nakamura, Cecilia	ML13290A472
Mccue, David	ML13296A350	Naples, Jean	ML13321A557
Mcdonald, Laura	ML13304A144	Narveson, D.	ML13315A380
Mcdonald, Phyllis	ML13311C216	Nau, Dean	ML13304B914
Mckee, Sarah	ML13313A144	Neace, M. B.	ML13298A301
McKeehan, Susan	ML13320A358	Necker, Barbara	ML13304B853
Mclean, Mary	ML13322C067	Neuhauser, Robert	ML13303B683
McMeniman, Marjorie	ML13312A336	Newman, Kent	ML13318B376
Mcneilly, Diane	ML13301B135	Niedworok, Claudio	ML13304A078
Mcnicholas, David	ML13303A010	Nolastname, Freedom	ML13298B487
McNutt, Karen	ML13303C370	Noonan, Donna	ML13323B630
Mcrae, Erin	ML13318B337	Norkus, Edward	ML13316C826
Meacham, Thomas	ML13318A710	Norton, Susan	ML13315A229
Meissner-Jackson, Margit	ML13317B527	Novick, Joan	ML13310C778
Mellors, Colleen	ML13308C695	O'Connor, Mary	ML13323B681
Mendelsohn, Alex	ML13280A574	Oehlerich, Mary	ML13309C011
Messer, Pat	ML13318A585	Olsen, Corey E.	ML13310A117
Meyer, Mildred	ML13311C679	Orlandoni, Marilyn	ML13320A242
Meyer, Pamela	ML13319A689	Ostebee, Kristin	ML13318A421
Michel, Sister Anne	ML13311B291	Palmgren, Charlie	ML13313A176
Millbrooke, Anne	ML13316B494	Palola, Darlene	ML13310C107
Miller, John	ML13315A375	Pankoe, Walter	ML13322B591
Miller, Lisa	ML13311A006	Panzer, Bob	ML13301B079
Miller, Sue	ML13303C580	Pappas, Nicholas	ML13304C576
Milley, Cynthia	ML13323B631	Pappas, Nicholas	ML13312A139
Milne, Lorree	ML13322B443	Paris, Rodrigo	ML13310C819
Milstead, James	ML13275A528	Parks, Jeffrey	ML13310A017
Mitchell, Cheryl	ML13320A207	Patrick, Cynthia	ML13317A533

Table 4. Individuals Submitting the Form E-Mail Sponsored by the Sierra Club with Correspondence ID 3 and Representative ADAMS Accession No. ML13269A279 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Paul, Stephen	ML13308C826	Riggiola, Lisa	ML13323A712
Pearson, Melissa	ML13321A020	Riley, Jennifer	ML13317C034
Pendle, Carolyn	ML13308D075	Rittenhouse, Carol Ann	ML13309B779
Pennoyer, Ruth	ML13321A102	Roberts, Muriel	ML13304A173
Penzenstadler, Joan	ML13298A918	Robinson, Jane	ML13282A184
Perez, Albert	ML13304C543	Robison, Brian	ML13324B335
Pesce, Lee	ML13323B560	Robison, Dawn	ML13316C801
Petering, Louise	ML13322B872	Rocco, Y.	ML13310C686
Peters, Sarah	ML13318B002	Rodemann, Tim	ML13318B414
Petty, Judith	ML13316C331	Rolle, Kurt	ML13319A555
Pfeifer, Ivan	ML13308C991	Rollo, Pat	ML13323A884
Phillips, Thomas	ML13322B514	Roon, Bradley	ML13303C507
Phillipson, Anthony	ML13308C209	Rosart, Sheila	ML13309B780
Philp, Freewil	ML13314A642	Rosenblum, Bruce	ML13322B705
Phipps, Jim	ML13311C001	Ross, Errole	ML13301A470
Piatt, Dean	ML13323A047	Ross, Errole	ML13304C246
Pickard, Barbara G.	ML13308B129	Ross, Molly	ML13323C163
Pierce, Kathleen	ML13323A690	Rossin, Linda	ML13311C320
Piernot, Carol M. and Craig A.	ML13323A727	Rubenstein, Myrna	ML13308B185
Ploeger, Glenda	ML13318B269	Rudner-Muench, Ruth	ML13280A731
Polley, Barbara	ML13303C267	Ruggiero, Linda	ML13317C160
Pomeroy, Susan	ML13319A751	Rumke, Lali	ML13310A073
Pope, Elsie	ML13311C759	Rummerfield, Michael	ML13298B541
Porter, Amanda	ML13295A233	Russell-Shalev, Loreнна	ML13301B320
Potok, Adena	ML13276A617	Ryan, Claudia	ML13311C326
Powell, Michael	ML13317A120	Ryan, Jean	ML13304C253
Prael, Tressa	ML13303C248	Sabo, Betty	ML13318B413
Precourt, Bernice	ML13304A097	Sadergaski, Bev	ML13310C288
Pretlow, Theresa	ML13281A260	Sage, Florence	ML13321A278
Pretorius, Christel	ML13317A172	Sala, Robert	ML13302C409
Price, Kenneth	ML13280A826	Sanchez, Marybeth	ML13301B108
Pringle, Shirley	ML13304B930	Sandel, Morris	ML13301A973
Pritikin, Joshua	ML13304C117	Sauer, Ronald	ML13308C111
Quinn, George	ML13316C565	Scheer, David	ML13276A616
Rahbari, Carol	ML13273A747	Scherer, Michelle	ML13315A519
Ramsay, Maxine	ML13314A675	Schexnayder, Patrice	ML13282A130
Ramsey, Betty	ML13320A394	Schilling, Francis	ML13320A234
Randall, MaryRose	ML13294A077	Schlamme, Rhoda	ML13323A684
Raven, Robert	ML13301A991	Schlemel, Pierre	ML13298B007
Raymond, Helen	ML13322C081	Schmidt, Jan	ML13311B984
Reeves, Kay	ML13318B445	Schmidt, John	ML13303C356
Refes, Necia	ML13313A598	Schmidt, Karla	ML13305A274
Reif, Frederick	ML13298A373	Schmitz, Erik	ML13301A091
Reisenweber, Doretta	ML13298B450	Schneider, Howard	ML13296A358
Reithel, Barb	ML13316C567	Schneider, Linda	ML13302C533
Ricci, Jean	ML13298A549	Schreck, Dianne	ML13298B652
Rice, Robert	ML13317B872	Schwartz, Eric	ML13310C773
Ricketts, Carolyn	ML13322B680	Schwarz, Don	ML13320A451
Rigby, Cheryl	ML13304A098	Scott, Cecil	ML13308D204

Table 4. Individuals Submitting the Form E-Mail Sponsored by the Sierra Club with Correspondence ID 3 and Representative ADAMS Accession No. ML13269A279 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Scott, Gudrun	ML13301B005	Steuber, Sari	ML13280A752
Scott, Martha	ML13321A061	Stirling, Lauren	ML13304C144
Scott, Theresa	ML13316D080	Stocker, Nancy and Robert	ML13298B613
Sears, Jeanne	ML13322B846	Stone, Jeffrey	ML13308C314
Sears, Peggy	ML13304C651	Stonecipher, Carolyn	ML13303C070
Sembrowich, Nita	ML13314A582	Stookey, Jeff	ML13323B706
Senft, Hannah	ML13309C096	Stracchino, Keith	ML13314A649
Serna, Joyce	ML13318B676	Strait, Cindy	ML13310C553
Severance, Beth	ML13321A545	Streck, Diane	ML13311C415
Seymour, Phil	ML13301A919	Summey, Matt	ML13298B138
Shaffer, Alma	ML13302A014	Sundburg, Suzanne	ML13298B254
Sheffield, Carol	ML13310C791	Sutkowski, John	ML13318B550
Shekeloff, Katherine	ML13310C285	Sutta, Janet	ML13294A143
Sheppard, John	ML13309C244	Swanson, Lauren	ML13302A739
Shimada-Brand, T. Alex	ML13311C016	Swartz, Patti	ML13324B655
Shimizu, Michele	ML13317B748	Sweeney, Lisette	ML13301A120
Shirey, Elizabeth	ML13313A655	Swiatek, Robert	ML13322B758
Shook, Emma	ML13322A910	Szabo, Liz	ML13276A644
Shore, Laura	ML13318A295	Taiani, Nancy	ML13316C594
Shorin, Robert	ML13316B455	Taslit, Marc	ML13303C558
Sieling, Jerry and Jean	ML13311B278	Tawnamaia, Leslie	ML13322C060
Simmons, Carole	ML13316C893	Taylor, Jim	ML13318B158
Simmons, Stephen	ML13318B341	Taylor, John	ML13310C777
Sims, Layne	ML13309C194	Teresi, Fran	ML13323B788
Skog, Judy	ML13322C084	Thaw, Karen	ML13320A271
Sleeper, Stephen	ML13310C187	Thode, Anne	ML13313A563
Slinker, Barbara	ML13275A460	Thomas, Trudi	ML13303C111
Slovak, Bobby	ML13317C210	Thompson, Kenneth	ML13308D302
Smith, Deborah	ML13308C385	Thompson-Nelson, Carol	ML13295A070
Smith, Iris	ML13316B023	Tkacz, Sharon	ML13318A386
Smith, Mary Lou	ML13308B041	Todd, Donna	ML13310C127
Smoyer, Cynthia	ML13301A047	Toth, Jane	ML13302C515
Smyke, Peter	ML13318B255	Trischka, Aurora	ML13308D026
Snider, Larry	ML13311C283	Troil, Linda	ML13308C931
Solomon, Philippa	ML13320A481	Troise, Ann	ML13320A395
Sommer, Jean	ML13317B821	Trypaluk, Barbara	ML13317B738
Songwinds, Jean	ML13308B194	Turner, Kelly	ML13323B866
Soule, Peter	ML13322B663	Tursi, Patricia	ML13317C065
Southey, Lynn	ML13320A465	Tyler, Marshall	ML13308B094
Sowder, Barbara	ML13309A228	Udson, Edson	ML13282A099
Spangler, John	ML13304C473	Unger, Art	ML13308C239
Spencer, Adelaide	ML13313A061	Urkowitz, Prof. Steven	ML13303C164
St. Clair, Laura	ML13315A434	Vacin, Ruth	ML13317B968
Stamm, Patricia	ML13305A596	Valpreda, David	ML13308C703
Stanich, June	ML13319A019	Van Koolbergen, James	ML13322B396
Steakley, Marjorie	ML13304C380	Varecha, Debbie	ML13298A660
Steere, Charity	ML13323A839	Vedder-Shults, Nancy	ML13321A553
Steffen, Paul	ML13317A112	Ventre, John	ML13313A627
Stengl, Keith	ML13301A343	Vertigan, Vanessa	ML13308C617

Table 4. Individuals Submitting the Form E-Mail Sponsored by the Sierra Club with Correspondence ID 3 and Representative ADAMS Accession No. ML13269A279 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Victour, Patricia	ML13318B306	Weaver, Kathleen	ML13308D055
Viel, Juli	ML13311C277	Webb, Hubert	ML13311C141
Villa, Joan	ML13302C577	Wells, Harmony	ML13318A771
Villon, Jania	ML13323A711	West, Norman	ML13303C477
Von Duvillard, Dr. Serge	ML13311C450	White, Roberta	ML13313A056
von Walthausen, Rolf	ML13321A276	Wiest, Cheryl	ML13322A824
Waggoner, Gene and Sharon	ML13301A048	Wilde, Paul	ML13302A491
Wagner, Deborah	ML13318A489	Wilkerson, Colleen	ML13308D277
Wagoner, Jacqueline	ML13313A500	Willet, Zoe	ML13309B917
Walker, Donald	ML13309C047	Williams, Chuck	ML13318B239
Walker, Jenny	ML13303C451	Williams, George M.	ML13311C387
Walker, Nan	ML13318B277	Williams, James	ML13308C851
Walker, Steven	ML13316B572	Williams, Lloyd	ML13323A704
Walker, Willie	ML13318A814	Wilson, Mary Lee	ML13308C733
Walker, Willie	ML13323B991	Wilson, Tiffany	ML13302B278
Wallace, Emily	ML13280A694	Winkle, Anne	ML13310C672
Ward, Charlotte	ML13316C964	Winkler, Shelley	ML13321A139
Ward, Henry	ML13318B523	Woelper, Gordon	ML13302C549
Warren, Roxanne	ML13318B162	Wood, Rachel	ML13311B232
Wasielewski, Alison	ML13320A224	Worley, David	ML13323B578
Wasson, Helen	ML13317C195	Wormley, Peter	ML13311C677
Waters, Greg	ML13318B620	Wyatt, Carol	ML13321A217
Watkins, Karen	ML13304C570	Wylie, Mary and Doug	ML13318A623
Watkins, Sharon	ML13294A241	Zachmann, John	ML13321A443
Watson, Eileen	ML13298B203	Zitzwitz, Helmut	ML13295A256
Watson, Natalie	ML13316C706	Zizzo, James	ML13303B685
Wayland, Gregory	ML13312A106		

Table 5. Individuals Submitting the Form E-Mail Sponsored by Riverkeeper with Correspondence ID 465 and Representative ADAMS Accession No. ML13326B058

ADAMS		ADAMS	
Commenter	Accession #	Commenter	Accession #
Ahronheim, Mr. Albert	ML13338A479	Bernard, Dr. Janice	ML13330B951
Aigner, Andreas	ML13329B081	Bianco, Ms. Diletta	ML13336A453
Alden, Diane	ML13329B225	Bien, Ms. Annie	ML13330B734
Alfano, Joseph	ML13329B222	Biesanz, Karen	ML13329B046
Alman, John	ML13329B258	Binder, Mr. Gene	ML13330B803
Almonrode, Pat	ML13329B208	Binetsky, Ms. Lois	ML13330B818
Amoroso, Miss Isabella	ML13330B938	Birnbaum, Beth	ML13329B127
Amsel, Martin	ML13329B040	Birnbaum, Ms. Jacqueline	ML13338A461
Anderson, Diana	ML13329B206	Bishop, Mr. Damon	ML13330B856
Andrus, Mrs. Melanie	ML13330B756	Bishop, Ms. Melissa	ML13330B942
Angel, Ms. Beth	ML13330B963	Blaire, Jan	ML13329B132
Anne-Lise, Coste	ML13329B171	Blanco, Yadira	ML13329B068
Annetts, Mrs. Chloe	ML13330B922	Blechar, Mrs. Heidi	ML13338A717
Applebaum, Daniel	ML13329B256	Bleckinger, Dana	ML13329B278
Arkema, Mr. Carroll	ML13330B842	Bleifeld, Mr. Neil	ML13330B821
Arnone, Mr. K.	ML13330B876	Blyth, Mr. Christopher	ML13339A388
Aronowitz, Mrs. Barbara	ML13330B987	Bober, Mrs. Loretta	ML13338A471
Asheber, Onaje	ML13329B215	Bodane, Richard	ML13329B155
Asteinza, Ms. Maria	ML13330B882	Bonavita, Dr. Francesco	ML13339A379
Athans, Mr. Richard	ML13330B894	Boomhower, Deborah	ML13329B107
Aures, Bonita	ML13329A820	Borget, Ms. Suzanne	ML13330B920
Auyang, Ms. Czerny	ML13338A708	Bosnos, Ms. Lorna	ML13330B890
Avallone, Dan	ML13329A793	Bradbeer, Ms. Wilma	ML13330B807
Avellino, Barbara Tuller	ML13330B927	Bragg, Mrs. Emma	ML13330B839
Axelrod, Mr. Andrew	ML13329B335	Brandt, Ms. VL	ML13330A320
Babiak, Ms. Katherine	ML13330A242	Braverman, Sidney	ML13329B279
Bader, Jessica	ML13329B023	Brennan, Mr. Patrick	ML13330C003
Badia, Nelly Baldan	ML13329B053	Brennan, Ms. Denise	ML13338A495
Bagatta, Ms. Joanna	ML13330B967	Breyman, Dr. Steve	ML13338A469
Bainer, Ms. Katherine	ML13330B975	Brizzi, Paul	ML13329B110
Bains, Jeffrey	ML13329B245	Brocius, Pam	ML13329B181
Barbier, Mr. Alan	ML13330C008	Broekman, Dr. Marinus	ML13339A932
Barclay, Daniel	ML13329B190	Brooking, Lillian	ML13329B303
Barone, Mr. Harry	ML13330B809	Brown, Mr. Robert	ML13330B954
Barouh, David	ML13329A999	Brown, Ms. Tracy	ML13330A176
Bartholomew, Alice	ML13329A828	Brunton, James	ML13329B203
Bartholomew, Catherine	ML13329B253	Bucher, Ms. Anne Marie	ML13330C000
Bassett, Ms. Elizabeth	ML13330A194	Bullard, David H.	ML13329B183
Batterman, Alan	ML13329A837	Burch, MaryAnn	ML13329A797
Baxter, Susan	ML13329B164	Burke, Mr. Bill	ML13329B329
Bay, Mrs. Rosemary	ML13330B911	Burzinski, MD, Kathryn E.	ML13330B983
Beck, Ms. Deborah	ML13336A439	Busani, Elena	ML13329B285
Beels, Mrs. Margaret	ML13338A543	Buschi, Serena	ML13329A997
BeGell, Mrs. Alisha	ML13338A530	Busse, Ms. Judith	ML13330B997
Belachew, Daniel	ML13329B234	Butler, Dr. Edward	ML13330B815
Bellone, Mr. Dennis	ML13330B916	Butterfield, Doris	ML13329B015
Bennett, Michael V. L.	ML13329B199	Byrnes, Cecelia	ML13329B058
Benvenuto, Amanda	ML13329B216	C, Mrs. A	ML13330B912
Berg, David	ML13329B292	Caldas, Miss Alejandra	ML13330A246
Bergenthal, Ms. Vivian	ML13338A706	Camerman, Ms. Virginia	ML13339A920
Bergman, Ms. Carol	ML13330B914	Camorati, Nancy	ML13329B039

Table 5. Individuals Submitting the Form E-Mail Sponsored by Riverkeeper with Correspondence ID 465 and Representative ADAMS Accession No. ML13326B058 (continued)

ADAMS		ADAMS	
Commenter	Accession #	Commenter	Accession #
Capotorto, Jeanette	ML13329A845	Cruz, Mr. Juan	ML13339A367
Capra, Miss Michele	ML13330C010	Cu, Ms. Helen	ML13330B923
Carey, Mr. Edward	ML13330B878	Currie, Dr. Cathie	ML13338A709
Carey, Mrs. Doris	ML13338A486	Cutul, Mr. Peter	ML13330B755
Carleton, Cathy	ML13329B099	D'Addamio, Mr. Fabio	ML13330B866
Carosella, Christy	ML13329B254	D'Agostino, David	ML13329B178
Cassidy, Ms. Leslie	ML13330A222	Dal Cais, Mrs. Sandra	ML13330B899
Casstevens, Ms. Rebecca	ML13330A183	Dangol, Krishna	ML13329B221
Catherine, Mr. John	ML13330B897	Dannett, Ms. Wendy	ML13346A953
Chamberlin, Dorothy and Richard	ML13329B041	Darata, Vincent	ML13329A991
Chambers, Gwendolyn	ML13326B058	D'Arcangelo, Mr. Richard	ML13330A179
Chapman, Mr. Alexander	ML13336A430	Darco, Lawrence	ML13329B152
Chapman, Ms. Barbara E.	ML13330B980	Davenport, Ms. Stirling	ML13338A518
Chavez, Franklin	ML13329B165	Davies, Dr. Aleta	ML13330A427
Chazin, Mr. Al	ML13336A455	Davis, Lisa	ML13329B044
Chemick, Ms. Allison	ML13330A265	Davis, Ms. Susan	ML13329B316
Cherwink, Mr. Rob	ML13330B891	Dawson-Rhodes, Mrs. Juanita	ML13330B932
Chianis, Mrs. Antonia & Andrew	ML13330B752	De Jasu, Mr. Barry	ML13330B935
Chitwood, Ms. Melissa	ML13329B327	DeAngelo, Ms. Carol	ML13338A567
Cho, Mr. Dean	ML13330B934	DeGraw, Ms. Catherine	ML13330B992
Cho, Ms. T	ML13329B337	Delachartre, Ms. Eve	ML13330B974
Choi, Kelly	ML13329B027	Delachartre, Ms. Eve	ML13340A749
Christensen, Mr. Ronald	ML13338A481	DeLagostti, Sarah	ML13329A811
Ciambrone, Jennifer	ML13329B224	DeLorenzo, Pete	ML13329A849
Cicero, Brigitte	ML13329B094	DeMark, Ms. Christi	ML13330C009
Clark, Amy	ML13329B102	Dempsey, Michael	ML13329B296
Clark, Marilyn	ML13329B025	Derrington, Ms. Erin	ML13336A446
Clark, Ms. Bobbie	ML13330B950	Desai, Ms. Angel	ML13330A292
Clark-McKittrick, Ms. Blythe	ML13330B936	DeSimone, Ms. Deborah	ML13330B869
Cohen, Dr. Daniel	ML13340A751	Didrichsen, Ms. Susan	ML13330C028
Cohen, Mr. Peter	ML13338A505	Diederichs, Dr. Barbara	ML13339A354
Cohen, Mrs. Holly	ML13330B896	Diefenbach, Ms. Karen	ML13330B749
Cohen, Mrs. Naomi	ML13330B939	Dietrich, Mr. Robert	ML13330B808
Cohen, Ms. Samantha	ML13338A542	Dillon, Ed	ML13329B272
Coleman, Ms. Judy	ML13336A427	Dinhofer, Jacalyn	ML13329A843
Coleman, Richard	ML13329B011	Dlugosz, Mrs. Janice	ML13339A359
Coles, Mr. Herbert	ML13330A441	Dobkin, Alix	ML13329B267
Colon, Ms. Norma	ML13338A554	Dobosz, David	ML13329B170
Colton, Sara	ML13329B298	Dobson, Ms. Carol	ML13330A481
Conca, Mrs. Joan	ML13339A387	Dobson, Ms. Carol	ML13338A555
Congdon, Ms. Dolores	ML13330A324	Doherty, James	ML13329B066
Cook, Anita	ML13329B202	Dolan, Deborah	ML13329B145
Cooley, Timothy	ML13329B232	Donch, Ms. Mary	ML13330B858
Cooper, Mr. James	ML13330A477	Donch, Ms. Mary	ML13330B865
Cornelia, Mr. Jared	ML13330A249	Dow, Ms. Sally	ML13338A464
Correia, Ms. M. Cecilia	ML13330A475	Drucker, Barbara	ML13329B065
Cossa, Fletcher	ML13329B235	Drumright, Chris	ML13329B074
Cozza, Ms. Laurie	ML13330B792	Duchon, Ms. Laura	ML13330B823
Crawford, Mr. Timothy	ML13339A364	Duran, Ms. Janet	ML13330C023
Crouse, Dr. Gerrit	ML13330A254	Dwyer, Joan Adelson	ML13329B223
Crowell, Ms. Saundra	ML13330B847	Eddie, Choral	ML13329B249

Table 5. Individuals Submitting the Form E-Mail Sponsored by Riverkeeper with Correspondence ID 465 and Representative ADAMS Accession No. ML13326B058 (continued)

ADAMS		ADAMS	
Commenter	Accession #	Commenter	Accession #
Edelman, Ellen	ML13329B163	Flanagan, Ms. Lynn	ML13330B970
Egan, Dr. Margaret	ML13339A392	Fleischman, Mr. Glenn	ML13330B957
Eilenberg, Mrs. Alisa	ML13329B308	Flowers, Bobbie Dee	ML13329B154
Einerson, Esmee	ML13329B271	Foley, Mrs. Anne	ML13330B736
Eisen, Josh	ML13329B159	Foley, Ms. Erin	ML13336A425
Eisen, Mr. Josh	ML13338A564	Foley, Ms. Valerie	ML13330C032
Eisenstark, Sarita	ML13329B212	Forbes, Janet Brandariz	ML13329B029
Ellick, Mrs. Kathi	ML13339A350	Forward, Mrs. Arlene	ML13330B928
Elovic, Ms. Barbara	ML13329B339	Fox, Ms. Eleanor	ML13330B913
Embler, Kyle	ML13329B141	Fox, Ms. Vicki	ML13330C005
Emerson, Jan	ML13329B268	Frater, Ms. Lara	ML13336A434
Erickson, Ms. Kimberly	ML13329B306	Frisbie, Mrs. Nancy	ML13330B880
Eriksson, Dr. Peter	ML13330B904	Frome, Mr. Dan	ML13338A473
Ertz, Ms. Nancy	ML13330B961	Fromer, Ms. Suzie	ML13336A437
Esteve, Gregory	ML13329B120	Frosch, Suzanna	ML13329B054
Etherton, Ms. S.	ML13330A419	Fuchs, Sister Lorelei	ML13329B055
Evans, Mr. Michael W.	ML13330B906	Furgatch, Lisa	ML13329B103
Evans, Mrs. Patricia	ML13330A206	Furlong, Ms. Mary	ML13330A237
Evans, Ms. Bronwen	ML13329B345	Fursich, Mr. Rob	ML13329B320
Everette, Walker	ML13329B077	Gabin, Jane S.	ML13329B138
Evett, Ms. Elisa	ML13338A514	Gaines, Ms. Nora	ML13330A465
Eyster, Mr. Bruce	ML13339A360	Galiley, Mr. Bernard	ML13330A306
fall, Mr. Fred	ML13329B352	Galli, Mrs. Barbara	ML13338A551
Faller, Dr. Russell	ML13330B966	Garbarini, Suzanne	ML13329B086
Falzone, Mr. Dominick	ML13330A457	Garcia, Mr. Armando A.	ML13338A559
Farbstein, Neil	ML13329B240	Gardner, Cari and Donald	ML13329B250
Farhi, Ms. Serena	ML13338A532	Garton, Ms. Katie	ML13339A363
Farrington, Mr. Raymond	ML13330B965	Garvett, Ms. Esther	ML13330B871
Fasano, Mr. Jeff	ML13329B342	Gendreau, Julia	ML13329B050
Fassman, Dennis	ML13329B251	Gendvil, Mr. Derek	ML13330B843
Fast, Ms. Wendy	ML13330B848	Genin, Merideth	ML13329B294
Faulhaber, Ms. Linda	ML13330B852	George, Ms. Patricia	ML13339A928
Feinberg, Ms. Emily	ML13329B317	Gerhardt, Mrs. Franziska	ML13330B994
Feinstein, Jerome	ML13329B115	Ghenoiu, Mr. Paul	ML13330B800
Feinstein, Veronica	ML13329B293	Gibbons, Ms. Patty	ML13330C018
Feltch, Mr. Nicholas	ML13330A400	Giblin, Thomas	ML13329A801
Fenderson, Mr. Wardel	ML13330B817	Gibson, Ms. Alison	ML13330B960
Fernandez, Antonio	ML13329B073	Gilardi, Mr. Gary	ML13330A365
Ferrand, Mrs. Irene	ML13340A752	Gilbert, David	ML13329B140
Ferrari, Mr. Glenn	ML13330B791	Gilbert, Valerie	ML13329B124
Feuerman, Mrs. Arlene	ML13330B830	Giles, Sally	ML13329B198
Fierle, Ms. Mimi	ML13330B925	Gillespie, Sharon	ML13329B193
Filipowski, Mr. Martin	ML13338A538	Gilmour, Mr. Ken	ML13330A186
Fink, Ms. Lyn	ML13338A550	Girardin, Josephine	ML13329B241
Finn, Mr. Dennis	ML13330A230	Glasse, Mrs. Bernadette	ML13330B993
Fisher, Linda	ML13329B042	Gluck, Mrs. Aileen	ML13330B883
Fitzgerald, Ms. Barb	ML13330B846	Godici, Katherine	ML13329B092
Fitzgerald, Ms. Barb	ML13339A369	Goldman, Susan and Richard	ML13329B133
Fitzsimmons, Ms. Marie	ML13330B738	Goldmark, Ms. Lela	ML13338A500
Flanagan, Mr. Owen	ML13338A492	Goldsmith, Ms. Patricia	ML13330A482

Table 5. Individuals Submitting the Form E-Mail Sponsored by Riverkeeper with Correspondence ID 465 and Representative ADAMS Accession No. ML13326B058 (continued)

ADAMS		ADAMS	
Commenter	Accession #	Commenter	Accession #
Goldstein, Mr. Arthur	ML13338A526	Havan, Artineh	ML13329B026
Goldstein, Sharon	ML13329B095	Haverkamp, Kathy	ML13329B131
Gonzalez, Mr. William G.	ML13330A471	Hayes, Mr. Tim	ML13329B332
Goodman, Ms. Debbie	ML13330B893	Hayes, Ms. Maureen	ML13338A512
Gordon, Mr. Jon	ML13339A381	Hazelton, Ms. Judith	ML13329B309
Gordon, Myra	ML13329B070	Hazynski, Mr. Chris	ML13330B879
Gore, Mr. Arnold	ML13330A463	Heaning, Richard and Eileen	ML13329A848
Gorman, Ms. Deborah	ML13330A433	Hebron, Mary	ML13340A748
Gould-Donath, Ms. Reisa	ML13330B836	Heffron, Mr. Joshua	ML13330A461
Grace, Mr. Harry	ML13338A560	Hegarty, Elizabeth	ML13329B265
Grace, Phoenix	ML13329B179	Hegeman, Dr. E.	ML13338A525
Grasch, Lauren	ML13329B076	Hegeman, E	ML13329B122
Greeman, Mrs. Julie	ML13330A486	Heller, Mr. Dennis	ML13329B346
Green, D	ML13329B139	Henes, Donna	ML13329B276
Greenbaum, Lynda	ML13329B231	Henry, Devin	ML13329B117
Greenfield, Lenore	ML13329B281	Henry, Mallika	ML13329A815
Greenspan, Karen	ML13329B149	Henry, Mallika	ML13329B001
Greenwell, Donna	ML13329A994	Herlihy, Mr. Tom	ML13338A711
Greer, Ms. Carol	ML13329B314	Herrington, Mr. Randy	ML13339A357
Gregg, Ms. Daria	ML13330B822	Hetzner, Thea	ML13329B021
Greinke, Pamylle	ML13329B290	Higashi, Ms. Rico	ML13330B898
Grifalconi, Ms. Ann	ML13336A428	Hildreth, Stephanie	ML13329A796
Grillot, Mrs. Charlotte	ML13330B933	Himpel, Mr. Kurt J.	ML13330B814
Grimm, Mr. Carl	ML13336A436	Hirsh, Mr. Seth	ML13330A395
Grishman, Joan	ML13329B246	Hoch, Nancy	ML13329B126
Griswold, Mr. Tracy	ML13338A511	Holshouser, William	ML13329B137
Guida, Ms. Georgia	ML13329B330	Holtzman, Dorothy	ML13329B071
Guidarelli, Mrs. Alicia	ML13330B802	Hommel, Ms. Teresa	ML13336A429
Gunther, Mr. Ken	ML13330A478	Howard, Claire	ML13329B012
Gustafson, Mr. Marcy	ML13330A464	Howard, Lynn	ML13329B270
Guthrie, Elizabeth	ML13329B005	Hubert, Larry	ML13329B008
H., Ms. B.	ML13330B910	Hughes, Mr. Kevin	ML13330B835
Haas, Ms. Margaret	ML13338A726	Hungerford, Ms. Rhonda	ML13330B908
Hagerman, Ms. Kathryn D.	ML13338A509	Hunter, Miss Virginia	ML13338A546
Half, Monika	ML13329B228	Hurst, Mr. Randolph	ML13329B331
Hamlin, Ms. Leslie	ML13330A467	Hurst, Ms. June	ML13338A494
Hamlin, Ms. Lucile	ML13338A490	Idesawa, Naoko	ML13329B158
Hammermeister, Ms. Lisa	ML13330A414	J, Miss Renee	ML13330C014
Handford, Jeffrey	ML13329B004	Jackman, George	ML13329B047
Hanford, Mr. Thomas	ML13330A212	Jackson, Ms. Carol	ML13330B739
Harada, Dr. Mark	ML13338A523	Jackson-Miller, Ms. Marie-Louise	ML13330B955
Harrison, Jan	ML13329B067	Jacob, Mr. Guy	ML13330B851
Harrison, Paige	ML13329B104	Jacobsen, Karen	ML13329B037
Hart, Mr. Dennis	ML13338A562	Jacobson, Robert	ML13329B184
Hart, Ms. Margaret	ML13330A408	Jagiello, Carol	ML13329B175
Hartel, Ms. Elaine	ML13338A502	Jasper, Mr. Alan	ML13330B868
Hartten, Erik	ML13329B201	Jensen, Ms. Cheriell	ML13338A724
Harvey, Ms. Christine	ML13330B826	Johnson, David	ML13329B105
Hassett, Mr. Gerald	ML13338A472	Johnson, Michele	ML13329A789
Hausner, Marise	ML13329B034	Johnson, Mrs. Ann	ML13330B991

Table 5. Individuals Submitting the Form E-Mail Sponsored by Riverkeeper with Correspondence ID 465 and Representative ADAMS Accession No. ML13326B058 (continued)

ADAMS		ADAMS	
Commenter	Accession #	Commenter	Accession #
Johnson, Paul	ML13329B060	Kyriacou, Miss Sophie	ML13330B901
Johnson, Sarah	ML13329B129	La, Ms. Anh N.	ML13338A574
Jones, Robert	ML13329B182	Landau, Mr. Doug	ML13330B805
Juliano, Alyssa	ML13329B134	Lan-Eddy, Ms. Joyce	ML13340A750
Jurczewski, Mrs. Carol	ML13330A483	Lang, Jonathan	ML13329B180
Just, Leslie	ML13329B049	Langer, Norbert	ML13329A839
Kaggen, Ms. Marilyn	ML13330B881	Lapetino, Ms. Carol	ML13330B885
Kalan, Ms. Susan	ML13339A393	Lapite, Mr. Arthur	ML13339A383
Kantrowitz, Ms. Edith	ML13338A474	Larkin, Mr. Peter	ML13329B307
Karpel, Dr. Ruth	ML13330A311	Lathrop, Mr. Donald	ML13329B319
Katen, Ms. Lora	ML13339A378	Laughlin, Ms. Virginia	ML13330B985
Katsanis-Semel, Goldalee	ML13329B079	Launois, Chris Pan	ML13329B237
Kaup, Corey	ML13329B176	Laverdiere, Mr. Marc	ML13330B944
Kazolias, Alethea	ML13329B151	Lawford, Mrs. Laura	ML13330A340
Keen, Rebecca	ML13329B063	Lawrence, Dr. Glen	ML13339A362
Keiser, Mr. John	ML13330A460	Lawson, Joseph	ML13329B062
Kennedy, Ms. Betsy	ML13329B312	Leary, Doreen	ML13329A822
Kentner, Ms. Jane	ML13330C012	Lee, Mr. Brendan	ML13330B872
Kern, Mr. David	ML13330A472	Lee, Mr. Irving	ML13330B743
Khadafi, Bayhaqi	ML13329B045	Leeb, Mr. Kurt	ML13330A469
King, Mr. Ben	ML13329B340	Leighty, Ms. Jill	ML13330A369
Kinney, Honora	ML13329A821	Leonard, Lois	ML13329B064
Kirch, Eve	ML13329B247	Lesko, Mr. Robert	ML13338A462
Kirsch, Keith	ML13329B108	Lesser, Dr. Gerson	ML13339A358
Kleiber, Jessica	ML13329B010	Lesser, Lauren	ML13329B219
Klint, Rolfe	ML13329B277	Lesser, Victoria	ML13329B016
Klippel, Nina	ML13329B207	Levey, Laura	ML13329B274
knauber, Terri	ML13329B014	Levine, Mr. JR	ML13338A513
Koblinsky, Mr. John	ML13329B350	Levine, Ms. Rhoda	ML13329B322
Koch, Ms. Joann	ML13330B795	Levy, Mrs. Claudia	ML13330B844
Kohls, Dr. Carl	ML13330B953	Lewis, Erma	ML13329B088
Komisar, Ms. Sher	ML13330B999	Li, Ms. Wendy	ML13346A947
Komisar, Ms. Sher	ML13330C029	Li, Wendy	ML13329A810
Kooney, Rodney	ML13329B291	Lieberman, Ms. Elizabeth	ML13329B343
Kormendi, George	ML13329B031	Liebowitz, Priscilla	ML13329B118
Korn, Ms. Patricia	ML13338A718	Likes, Mr. Philip	ML13330B892
Koster, Mr. Fred	ML13330B829	Liona, Mr. Edward	ML13330A351
Kostis, Mr. Steven	ML13338A488	Lipson, Howard	ML13329B275
Kostis, Steven	ML13329B262	Lipten, Ms. Danette	ML13330B793
Koteen, Lucy	ML13329B284	Lipton-Neill, Ms. Amy	ML13338A483
Kourie, Kathleen	ML13329B109	Littlefield, West Coast Director,	ML13329B313
Kourie, Mrs. Kathleen	ML13339A924	S.E.A., Mr. Jim	
Kraft, Ms. Diane	ML13330B855	Litwak, Mrs. Mona	ML13338A723
Kreiner, Mr. Dennis	ML13346A955	Locks, Renee	ML13329B304
Kreuscher, Irene	ML13329A995	Loftus, Mrs. Mairin	ML13338A719
Kribs, Ms. Jane	ML13330B849	Lombardozzi, Mrs. Vivian	ML13330B827
Kuczenska, Ewa	ML13329A786	Long, Mrs. Nina	ML13339A933
Kunzler, Philip	ML13329A846	Long, Nina	ML13329B024
Kupniewska, Jolanta	ML13329B106	Longyear, Sharon	ML13329A800
Kyriacou, Anastasia	ML13329B089	Lopez-Ortiz, Miss Nina	ML13330B813

Table 5. Individuals Submitting the Form E-Mail Sponsored by Riverkeeper with Correspondence ID 465 and Representative ADAMS Accession No. ML13326B058 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Louis, Miss Hilarie	ML13330B753	Mintz, Barbara	ML13329B230
Love, Ms. Katie	ML13330C030	Mitchell, Ms. Grace	ML13338A501
Lozano, Mr. Nelson	ML13338A545	Mitchell, Ms. T	ML13338A563
Ludwig, Eric	ML13329B189	Mitchell, Patrick J.	ML13329B195
Lynch, Ms. Maureen	ML13330B874	Mizhir, Ms. Tina	ML13330B862
Lyon, Ms. Sally	ML13330C024	Moderacki, Ms. Deidre	ML13330B754
Lyons, Mike	ML13329B248	Modjeski, Dr. Jan	ML13329B321
Lyttle, Ms. Nancy	ML13330A389	Modra, Debora	ML13329B295
M, Mrs. G.	ML13330A462	Moeller, Mr. Robert	ML13330B889
Macek, Ms. Barbara	ML13330A282	Mohabir, Ms. Sonia	ML13340A747
Mackenzie, Kendra	ML13329A993	Mohapatra, Tamanna	ML13329B075
MacLean, John	ML13329B150	Mohr, Mr. Bruce	ML13330B748
Madnick, Mr. Neal	ML13329B324	Mon, Mr. John	ML13330B873
Magnavita, Tony	ML13329B236	Montagna, Mrs. Doris	ML13339A365
Maher, Kathleen	ML13329B301	Montaine, Ms. Dorthea	ML13330C007
Maldonado, Mr. Richard	ML13338A540	Montapert, Mr. Anthony	ML13330B757
Malina, Matthew	ML13329A818	Moretti, Mrs. Barbara	ML13330A270
Mangini, Richard	ML13329B209	Morgan, Mrs. Nancy	ML13338A468
Manley, Mr. George	ML13330B919	Morotti, Ms. Gloria	ML13338A715
Mantas, Esq., Nick	ML13329B112	Morris-Karl, Ms. Kathy	ML13330B986
Manzi, ToniMarie	ML13329B173	Mosa, Deborah	ML13329B264
Marcley, Richard	ML13329A842	Moses, Mr. Steve	ML13330C002
Marcus, Christina	ML13329B130	Moyer, Mr. Ken	ML13330B902
Marshall, Mrs. Carlotta	ML13330A345	Mueller, Mr. Todd	ML13330A332
Martinez, Ms. Sylvia	ML13330A423	Mulder, Mr. James	ML13338A553
Martorano, Joan	ML13329B096	Mullany, Ms. Maryanne	ML13330B820
Mastri, Mr. Francis	ML13330B884	Muller, Elisabeth	ML13329B101
Materson, Melanie	ML13329A841	Muller, K. Paul	ML13329B113
Matlak, Stephen	ML13329B059	Mumford, Andrew	ML13329B146
Maya, Janet	ML13329B218	Munger, Richard	ML13329A836
Mayer, Mr. George Louis	ML13330B819	Murakami, Ms. Maki	ML13330B735
McCoy, Mr. Michael	ML13330A452	Murphy, Mr. Michael	ML13330A431
McDermott, Mr. James	ML13336A433	Murphy, Ms. Theresa	ML13330B962
McEntee, Mr. Robert	ML13339A391	Murray, Mr. Brian	ML13330C031
McGregor-Mento, Emma	ML13329B002	Murtha, Mr. William	ML13330B762
McKeon, Mr. James	ML13330A301	Myers, Mrs. Carol	ML13330B845
McLaughlin, Mr. Brian	ML13330A470	Naples, Dr. Jean	ML13330B888
McMillian, C.C.	ML13329B043	Napoli, Robert	ML13329B242
McNamara, Ms. Eileen	ML13330B810	Nascimben, Mr. Maurizio	ML13330B930
McNerney, Jerome	ML13329B260	Nathan, Ms. Geraldine	ML13338A712
McNulty, Ms. Claudia	ML13330A380	Neiman, Laura	ML13329B187
Medina, Liza	ML13329B091	Neumann, Mrs. Nancy	ML13330C021
Meeker, Mr. Wesley	ML13330A297	Neumeister, John	ML13329A814
Memmert, Mr. Jonathan	ML13330B811	Newhart, Ms. Kim	ML13330B952
Middlebrooks, Mr. Ethan	ML13339A923	Newhouse, Mr. Richard	ML13330C025
Milano, Ms. Barbara	ML13329B315	Nichols, Mr. Robert	ML13330A468
Miller, Miss Janet	ML13339A389	Nicolau, Anthony	ML13329B121
Miller, Mr. Mitchell	ML13338A572	Niederhofer, Ms. Laura	ML13330A227
Miller, Ms. Rebecca	ML13338A466	Nielsen, Louise	ML13329A990
Miller, Russell	ML13329B119	Nielsen, Ms. Antonella	ML13330B751

Table 5. Individuals Submitting the Form E-Mail Sponsored by Riverkeeper with Correspondence ID 465 and Representative ADAMS Accession No. ML13326B058 (continued)

ADAMS		ADAMS	
Commenter	Accession #	Commenter	Accession #
Noll, Mary	ML13329B017	Quintana, Mr. Dacio	ML13346A952
Nolting, Ms. Sharon	ML13330B867	Rabois, Ira	ML13329B261
Nord, Dr. Jill	ML13330C006	Racks, Ms. Stefanie	ML13330C026
Nordheimer, Mary Ann	ML13329B097	Ragone, Ms. Eileen	ML13339A371
Norton-Hunt, Ms. Zandra	ML13346A954	Ralph, Karin	ML13329B177
Ober, Mr. Stuart	ML13338A498	Ramos, Ms. Joann	ML13330B789
O'Brien, Mr. Michael	ML13329B348	Rand, Abby	ML13329B259
Obrig, Mrs. Jill	ML13330B946	Randall, David	ML13329B238
Olejak, Joseph	ML13329B169	Rappe, Mr. Leonard	ML13330B915
O'Rourke, Mr. Kevin	ML13330B816	Raup-Kounovsky, Ms. Pamela	ML13330B945
Orum, Ms. Shyama	ML13330B948	Ravnitzky, Gerald	ML13329B257
Ozols, Ed	ML13329B111	Redington, Caroline	ML13329B052
Packer, Ms. Patti	ML13330B854	Reens, Mrs. Linda	ML13339A366
Padilla, Melania	ML13329B255	Reeves, Ms. Lenore	ML13330B870
Pakaln, Ms. Laura	ML13330B907	Reichert, Mrs. Sabine	ML13330B917
Palacky, Tami	ML13329B100	Reilly, Loretta	ML13329B082
Palecek, Mrs. Bridget	ML13339A921	Reilly, Ms. Kathleen	ML13338A552
Palitti, Nicole	ML13329B156	Rein, Mr. Barry	ML13330A385
Pandori, David	ML13329A834	Renaud, Ms. Michele	ML13330B740
Panko, Mr. Drew	ML13330A487	Rengers, Mr. Edward	ML13330B850
Pantazis, Ms. Laura	ML13338A565	Renk, Edeltraut	ML13329B009
Papandrea, John	ML13329B038	Renz, Sandye	ML13329A794
Parvin, Lisa	ML13329B166	Revis, Ms. Cathy	ML13346A948
Pascual, Ricardo	ML13329B186	Rial, Maria	ML13329B197
Patterson, Martina	ML13329B033	Rice, Ms. Beverly	ML13330B864
Paula, Ms. Clair	ML13330B968	Rich, Mr. J.	ML13330C027
Pawlick, Ms. Patricia	ML13330B981	Richkus, Mr. John	ML13330B900
Payne, Ms. Gail	ML13338A533	Riddick, Sandra	ML13329B048
Peake, Beverly	ML13329B084	Rinear, Paul	ML13329B161
Pearson, Mrs. Donna	ML13330B929	Rissenberg, Dr. Marian	ML13330A403
Pedicini, Mrs. Melanie	ML13330A315	Rivera, Mr. Javier	ML13330B857
Pelakh, Ms. Susan	ML13339A355	Rivola, Mr. Alessio	ML13329B349
Perez, Mr. Luiz	ML13329B336	Roberta, Ms. Forest	ML13330B943
Perlmutter, Mrs. Martha	ML13330B863	Roberts, Anne	ML13329A803
Perry, Betty	ML13329B243	Robey, Mr. Michael	ML13338A549
Persad, Mr. Ryan	ML13329B326	Robinson, Marcia	ML13329B302
Peters, Ms. Amy	ML13329B347	Robinson, Mr. Daniel and Joy	ML13338A707
Piel, Mrs. Madelaine	ML13330B924	Rocha, Nidia	ML13329B266
Pintagro, Mr. Thomas	ML13330A484	Rodriguez, Sylvia	ML13329B022
Pizzo, Sherrie	ML13329B288	Rohde, Mrs. Mary	ML13339A918
Plumeri, April	ML13329B087	Rojeski, Mary	ML13329A996
Pogue, Robert	ML13329B229	Ronell, Dr. Avital	ML13339A375
Polgar, Mr. Richie	ML13330C019	Roos, Ms. Ann	ML13339A368
Poole, Mr. Jesse	ML13339A922	Rosario, Heriberto	ML13329B227
Procida, Richard	ML13329B019	Rosen, Mr. Jay	ML13329B338
Prychodko, Mr. Nicholas	ML13330A201	Rosenblum, Herbert and Sandra	ML13329B057
Puca, Dr. Robert	ML13330B956	Ross, Ms. Alice	ML13338A710
Puca, Ms. Laurie	ML13330A256	Ross, Ms. Suzie	ML13339A927
Puca, Robert	ML13329B282	Rothstein, Roslyn	ML13329B153
Pyun, Mrs. Lydia	ML13330B921	Royce, Carol	ML13329B273

Table 5. Individuals Submitting the Form E-Mail Sponsored by Riverkeeper with Correspondence ID 465 and Representative ADAMS Accession No. ML13326B058 (continued)

ADAMS		ADAMS	
Commenter	Accession #	Commenter	Accession #
Ruas, Dr. Charles	ML13338A534	Shaver, Mrs. Vera	ML13330B990
Rubino, Ms. Karen	ML13330C016	Shaw, Ms. Sally	ML13339A373
Rubinsky, Mr. Jake	ML13338A524	Sherber, Michael	ML13329B083
Rusch, Mr. Vincent	ML13330A404	Sheridan, Mr. Ian	ML13338A531
Russell, Dr. Paul	ML13330B964	Sherwood, Kate	ML13329B167
Ryan, Ms. Megan	ML13330C004	Shimkin, Michael	ML13329B252
Saderman, Lydia	ML13329B239	Showers, Mr. Sterling	ML13338A522
Saia, Mr. Chris	ML13338A482	Shrader, Mr. Gary	ML13346A949
Sailors, Emma Lou	ML13329B297	Siegel, Johanna	ML13329B213
Sak, Myrna	ML13329B174	Silano, Mrs. Alice	ML13330A328
Salomon, Ms. Mary	ML13330B905	Silman, Dr. Jeffrey	ML13339A390
San Marco, Mrs. Lesley	ML13330B744	Silverman, Dara	ML13329B287
Sanchez, Mr. Noah-D.M.	ML13330A274	Silverman, Mrs. Laura	ML13330B834
Sanchez, Ms. Heidi	ML13330B982	Silverstein, Sasha	ML13329B020
Sandoval, Mr. Gustavo	ML13330B853	Simon, Mr. Samuel	ML13338A487
Santana, David	ML13329B028	Simone, Ms. Beverly	ML13330B790
Santana, Mr. Danni	ML13336A441	Sims, Millicent	ML13329B090
Santiago, Ana	ML13329B123	Sissman, Dr. Norman	ML13330B958
Santonas, Ms. Gina	ML13330B841	Skaret, Mr. Mark	ML13330B887
Sartoris, Ms. Elaine and John	ML13330B988	Skotnes, Darren	ML13329B142
Savage, Mr. Matthew	ML13330B877	Sky, Ms. Alison	ML13330A279
Scaife, Ms. Emily	ML13330C020	Slonaker, Mrs. Lynn	ML13338A722
Scallon, Kenneth	ML13329B116	Smith, Ms. Sally	ML13330B909
Scanlon, Ms. Kelley	ML13330B832	Smith, Robert and Mary Lou	ML13329B283
Scheer, Mr. August	ML13330B824	Smock, Amanda	ML13329B217
Scheinfeld, Jodi	ML13329B204	Smyla, Mrs. Laurie	ML13339A376
Schintone, Mr. Karl	ML13330A450	Sobanski, Ms. Sandy	ML13330A421
Schlamm, Rhode	ML13329B191	Soffler, Mrs. Judy W.	ML13330B875
Schlanger, Ms. Anne	ML13330C015	Solovyev, Vitaliy	ML13329B098
Schleiter, Ms. Gail	ML13330B926	Sorensen, Mr. David	ML13339A934
Schmidt, Mr. Gene	ML13330A445	Sorensen, Mr. Robert	ML13330C017
Schneebeli, Chris	ML13329B006	Soroka, Cynthia	ML13329B061
Schoonover, Brandon	ML13329B051	Spencer, Mr. Jonathan	ML13330B971
Schulof, Mr. Robert	ML13330B895	Sperbeck, Miss Elaine	ML13330B747
Schulz, Ms. Gretchen	ML13329B325	Spiegelman, Mr. Joel	ML13329B351
Schuman, Mr. Paul Frederic	ML13330B838	Spiegelman, Mrs. Robin	ML13330C001
Scoville, P.	ML13329B072	Spiess, Ms. Anne-Katrin	ML13330B976
Seaver, Ms. Linda	ML13330B861	Sprayregen, Ms. Ann	ML13338A520
Seddon, Ms. K	ML13330B977	Starke, Ms. Alexis	ML13330B761
Seely, Ms. Margaret	ML13340A745	Stavis, Mr. Alex	ML13339A385
Segal, Ms. Elizabeth	ML13338A480	Stearney, Ms. Fern	ML13330A261
Seligman, Ms. Tchira	ML13330B833	Steele, Ms. Joanne	ML13330B804
Serota, Lane	ML13329B035	Stein, Mr. Herbert	ML13338A721
Serxner, Mr. Eric	ML13339A352	Stein, Renee	ML13329B013
Seymour, Mrs. Stephanie	ML13338A504	Steinberg, Dr. Theodore	ML13330B837
Shamah, Mr. Isaac	ML13330A234	Steinbock, Mr. Reguel	ML13330B750
Shanker, Mr. Adrian	ML13330B989	Steininger, Mr. Lorenz	ML13329B344
Shapiro, Ms. Laura	ML13339A931	Stepkin, Frederick	ML13329B135
Shapley, Dan	ML13329A817	Sterback, Ms. Carolyn	ML13338A720
Sharfman, William	ML13329B200	Stern, Mr. Linda	ML13338A557

Table 5. Individuals Submitting the Form E-Mail Sponsored by Riverkeeper with Correspondence ID 465 and Representative ADAMS Accession No. ML13326B058 (continued)

ADAMS		ADAMS	
Commenter	Accession #	Commenter	Accession #
Stern, Mr. Richard	ML13330B996	Tyler, Francine	ML13329A992
Sternfeld, Ms. Hagit	ML13330B794	Ulrich, Mr. Albert	ML13338A521
Stevens, Mr. Dennis	ML13330B825	Ungar, Elizabeth	ML13329B210
Stevenson, Noreen	ML13329A787	Ury, Dr. Gregg	ML13329B333
Stigdon, Ms. Kate	ML13338A537	Vaccaro, Ms. Terry	ML13330B918
Stillson, Robert	ML13329B160	Vairo, Mr. Pat	ML13330B801
Stock, Ms. Rhonda	ML13339A370	Valdemi, Ms. Maria	ML13329B341
Stocker, Michael	ML13329B220	Valdez, Wendy	ML13329A806
Stone, Ms. Lorraine	ML13336A435	Valente, Rosalie	ML13329B003
Stowe, Ms. Sondra	ML13330B947	Valentine, Mrs. Jennifer	ML13330A334
Straus, David	ML13340A746	Van Riper, Mr. Michael	ML13329B323
Strecker, Ms. Lynda	ML13330A217	Van Wicklen, Ms. Betty J.	ML13330B972
Sucklal, Miss Sirina	ML13329B328	Velez, Mr. Francisco	ML13330B758
Sullivan, Gail	ML13329B269	Veraldi, Ms. Anne	ML13330B828
Sullivan, Mrs. Terry	ML13330B903	Vesperman, Gary	ML13329A807
Summers, Ms. Carolyn	ML13330B859	Violi, Ann	ML13329B136
Sunshine, Jane	ML13329B030	Vivian, Mr. Nick	ML13330B959
Sweeny, Peter	ML13329B114	von Rohr, Heather	ML13329B205
Swenson, Eloise	ML13329B244	Vultaggio, Mr. Richard	ML13346A951
Tabin, Mr. Sandy	ML13339A377	Wallace, Mr. Martin	ML13330B940
Talbot, Ms. Kathleen	ML13339A930	Wallberg, Ms. Risa	ML13330B973
Talip, Miss Rashna	ML13330B937	Walling, Mr. Alexander	ML13338A541
Temple, Edward	ML13329B263	Walsh, Ms. Kristin	ML13338A496
Temple, Michele	ML13329B300	Ward, Mr. Lewis	ML13338A470
Teplin, Ms. Lynne	ML13329B310	Ward, Ms. Joan	ML13338A493
Tepper, Mr. William	ML13330A190	Ward, Ms. Sheila	ML13329B318
Terwilliger, Susan	ML13329B188	Warren, Roxanne	ML13329B162
Tesar, William	ML13329B056	Wassell, Ms. Liz	ML13329B305
Tevis, Ms. Eleanora	ML13330A198	Weaver, Esther	ML13329B194
Thames, Susan	ML13329B185	Webb, Mr. T.Ed.	ML13330B737
Thomas, Ms. Barbara	ML13338A536	Wei, Ms. Kimi	ML13330A435
Thompson, Anita	ML13329B000	Weisburd, Ms. Stana	ML13330B998
Tick, Mr. Paul	ML13330B831	Weisfeld, Marsha	ML13329B018
Tieger, Ms. Rachel	ML13330C013	Weissberg, Eric	ML13329B168
Tignanelli, Ms. Doreen	ML13338A476	Welchman, Miss Jessica	ML13330A480
Titus, Ms. Susan	ML13330C022	Wellens, Evan	ML13329B280
Toan, Meryl	ML13329B085	Welton, John	ML13329A998
Todras, John	ML13329B069	Wesley, F. Robert	ML13329B226
Tompkins, Mr. Robert	ML13330A357	West, Andre	ML13329B007
Torres, Mr. Eric	ML13330B741	Westergaard, Ms. Barbara	ML13330A287
Torres, Susan	ML13329B148	Westmoreland, Dr. Henry	ML13330B995
Trani, Patricia	ML13329B172	White, Lois	ML13329B196
Trengove, Mr. Thomas	ML13329B334	White, Ms. E.	ML13338A713
Tritmemel, Ms. Lisa	ML13336A440	White, Penny	ML13329B032
Trotter, Mr. John	ML13339A353	Whitman, Aimee	ML13329B233
Tsalikis, George	ML13329B192	Whitten, Mr. Christopher	ML13330B742
Tulve, Mr. Nicholas	ML13338A556	Widercrantz, Jon	ML13329B211
Tulve, Mr. Nicholas	ML13338A561	Wilder, Dwain	ML13329B289
Turowski, Ms. Anamyn	ML13338A528	Wildman, Ms. Teena	ML13339A384
Turpin, Jenny	ML13329B147	Wiley, Dr. Kimberly	ML13336A432

Table 5. Individuals Submitting the Form E-Mail Sponsored by Riverkeeper with Correspondence ID 465 and Representative ADAMS Accession No. ML13326B058 (continued)

ADAMS		ADAMS	
Commenter	Accession #	Commenter	Accession #
Williams, Ms. Mary	ML13338A716	Yacht, Janet	ML13329B157
Wilson, Ernest	ML13329B036	Yanoff, Mr. Neal	ML13330B969
Windberg, Thomas	ML13329A785	Young, Jane	ML13329B286
Winn, Ms. Laraine	ML13330B978	Young, Jeffery	ML13329B143
Winner, Angelika	ML13329B093	Zablow, Mr. Leonard and Mrs. Ellen	ML13338A506
Winner, Sylvia	ML13329B144	Zelcer, Mr. Brook	ML13338A516
Wish, Dr. Ron	ML13330B812	Zielinski, Ms. Rita	ML13329B311
Wittenborn, Mr. Andrew & Kathleen	ML13330A473	Zimmerman, Janet	ML13329B128
Wolf, Mr. Alexander	ML13330B984	Zinn, Andrea	ML13329B299
Wolfe, Mrs. Ellen	ML13339A926	Zoubeck, Ms. Suzanne J.	ML13339A351
Wood, Miss Megan	ML13330A474	Zuckerman, Mrs. Sandra	ML13339A380
Wurtz, William	ML13329B125	Zure, Lisa	ML13329B214
Wyer, Ms. D	ML13338A489		

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
A, A,	ML13344A886	Ague, Kate,	ML13343B081
Abare, Jeff,	ML13347A222	Aguilar, Lisa	ML13347A096
Abate, Gabriel,	ML13346A702	Ahlbach, Justin	ML13347A019
Abbot, Marrisha,	ML13339A292	Ahn, Karen	ML13343A894
Abbott, Dana,	ML13331B914	Ahring, Tracey	ML13347A709
Abbott, Lawrence,	ML13336B305	Aiken, Edwin	ML13337B561
Abdel-Gawad, Aliaa,	ML13340A421	Ajamian, Michele	ML13347A211
Abel, Jerian,	ML13346B318	Ajemian, Peter	ML13344A117
Abel, Judith,	ML13336A916	Alabaster, Eric	ML13344A024
Abel, Judith,	ML13339B556	Alagammai, Andrea	ML13347A829
Abella, Olga,	ML13331B847	Al-Aqeel, Tamadhur	ML13337A750
Aber, Thomas,	ML13331C035	Albani, Rik	ML13337B370
Abernathy, Shannon,	ML13346B280	Albano, Louis G.	ML13331C302
Ables, Ray,	ML13331A578	Albar, Mike	ML13347A158
Abrams, Michael,	ML13346A799	Albert, Anthony	ML13336A974
Abruzzo, Joan,	ML13339A004	Albert, Anthony	ML13339A234
Ackerman, Barb,	ML13337B217	Albert, Gwendolyn	ML13346A666
Acs, Deborah,	ML13336B607	Albert, Harrison B.	ML13346B405
Acuña, Carlos,	ML13340A599	Albrecht, Tom	ML13331A575
Adair, Sandra,	ML13337A806	Alcalde, Evelyn	ML13339B569
Adams, A.,	ML13343A753	Alderette, Gary	ML13343A558
Adams, Ariel,	ML13346A853	Alderman, Mick	ML13347A042
Adams, Cynthia,	ML13347A811	Aleniak, Agatha	ML13347A246
Adams, Helene,	ML13344A564	Alenik, Arthur	ML13339A097
Adams, Jean,	ML13338B405	Alet, Frances	ML13339B541
Adams, Leslie,	ML13346B567	Alex, Sheela	ML13339B733
Adams, Linda,	ML13343A956	Alexander, Charles	ML13344A203
Adams, Lisa,	ML13347A583	Alexander, Eugene	ML13337B280
Adams, Shana,	ML13344A119	Alexander, Jenifer	ML13344A818
Adams, Virgil,	ML13339A002	Alexander, Maitland	ML13331B999
Adams, Wayne,	ML13344A093	Alexander, Maitland	ML13337A812
Adams-Cogan, Nancy,	ML13347A290	Alexander, Melody	ML13339B675
Adamson, Dr. William R.,	ML13331C253	Alexander, Melvin	ML13340A294
Adare, Darley,	ML13339B509	Alexander, Rhetta	ML13346A674
Adebanjo, Doris,	ML13339B578	Alexander, V.	ML13331B606
Adel, Nina,	ML13337B310	Alexander, V.	ML13338B238
Adelman, Barry Eshkol,	ML13338A041	Alexander II, Charles K	ML13347A729
Adelson, Julie,	ML13338B461	Alexandre, Charlotte	ML13331C001
Ader-Steinhauser, Shay,	ML13346B192	Alexandre, Charlotte	ML13339B392
Adler, Ellen,	ML13331C208	Alfano, Joseph	ML13338B428
Adler, Ellen,	ML13337A888	Alfano, Leah	ML13343A456
Adler, June,	ML13336B059	Alford, Gail	ML13347A654
Adler, Pat,	ML13331B970	Allara, Ann Marie	ML13339B053
Adler, Robert,	ML13346A862	Allee, Pennellope	ML13347A313
Adrian, Marian,	ML13336B670	Allen, Benjamin	ML13347A140
Aere, Honora-Bright,	ML13338B213	Allen, Dennis	ML13338B135
Aeschliman, Alan,	ML13338A817	Allen, Donna	ML13346A764
Agigian, Amy,	ML13337A124	Allen, Frances	ML13344B055
Agius, Madeline,	ML13346B079	Allen, Georgia	ML13346A989
Agonito, Rosemary,	ML13338A898	Allen, Heidi	ML13344A794
Agren, Elizabeth,	ML13339B498	Allen-Nykaza, Chad Thomas	ML13347A445

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Alley, Julie	ML13346A814	Anderson, David	ML13331B679
Alleyne-Chin, Donna	ML13346A400	Anderson, David	ML13344A142
Allgood, Courtney	ML13343A872	Anderson, David	ML13344A737
Alliance, Crabshell	ML13331B954	Anderson, Diana	ML13339B491
Allison, Kelly	ML13338B194	Anderson, Don	ML13344A102
Allman, Esther	ML13336B289	Anderson, Dorothy	ML13346A442
Allmaras, Paula	ML13337A025	Anderson, Dorothy	ML13347A317
Almaguer, Michael	ML13346B484	Anderson, Erica	ML13346B173
Almon, Michael	ML13346A393	Anderson, Glen	ML13347A443
Alon, Jan-Paul	ML13344A061	Anderson, Isabel	ML13344A401
Alper, Gregory	ML13338A080	Anderson, Jeffry	ML13331C141
Alstrum, Timothy	ML13336B083	Anderson, Joseph	ML13346B412
Alstrum, Timothy	ML13339A058	Anderson, Karen	ML13337A022
Altamirano, Andrew	ML13347A617	Anderson, Karin	ML13338B038
Alter, Judy	ML13336B477	Anderson, Larry	ML13346A826
Alter, Judy	ML13343B199	Anderson, Larry	ML13347A618
Altman, Peter	ML13346B110	Anderson, Lowell	ML13337B362
Al-Tukhaim, Mary Jo	ML13336B120	Anderson, Lynnette	ML13346A760
Alva, Susanjane	ML13331C081	Anderson, Marc	ML13339B031
Alva, Susanjane	ML13331C082	Anderson, Marcia	ML13347A027
Alvarez, Analise	ML13338A884	Anderson, Maurica	ML13343B131
Alvarez, Choky	ML13343A808	Anderson, Michelle	ML13346B248
Alvarez, Choky	ML13346B158	Anderson, Patricia	ML13337B082
Alvarez, Oscar	ML13344A933	Anderson, Roger	ML13344A884
Amalfitano, Gloriamarie	ML13338A090	Anderson, Sandra	ML13339B146
Ambrose, Darryn	ML13344A795	Anderson, Stephen	ML13344A010
Ambrose, Melissa	ML13338B192	Anderson, Steven	ML13343A915
Amelang, Loren	ML13336B236	Anderson, Susan	ML13343A890
Ames, Nancy	ML13338B188	Anderson, William	ML13346A290
Ammirati, Gary	ML13347A544	Anderssen, Saliane	ML13331C114
Amonette, Alexandra	ML13336B123	Andrade, Sherri	ML13343B135
Amory, James	ML13336B599	Andrasik, Alexander	ML13346A380
Amory, James	ML13344A273	Andre, Mary	ML13337B232
Amos, Jerry	ML13339B712	Andreacchio, Tonya	ML13336B597
Amos, Naomi	ML13339A284	Andree, Charles	ML13337A788
Amour, Greg	ML13344A165	Andrews, Carolyn	ML13344B003
Amsden, Liz	ML13347A298	Andrews, Geneva	ML13338B306
Amundson, Beret	ML13331B702	Andrews, Ilse	ML13338B074
Anaya, Andrea	ML13338B379	Andrews, M	ML13343A852
Anbinder, Helen	ML13338B104	Andronaco, Gregory	ML13331A649
Anderholm, Jon	ML13331A710	Andrus, M	ML13344B091
Anderholm, Jon	ML13346B320	Angel, Beth	ML13336B484
Andersen, Eric	ML13338B175	Angel, Beth	ML13337B546
Andersen, Evette	ML13344A732	Angel, Laura	ML13338A052
Andersen, Mary	ML13337B105	Angell, J.	ML13331B764
Andersen, Rene	ML13344A174	Angell, J.	ML13337B562
Anderson, Amy	ML13336B254	Angelone, Jennifer	ML13339B109
Anderson, Amy	ML13344A959	Angelus, Joshua	ML13339B072
Anderson, Beverly J.	ML13337B487	Angus, Billy	ML13339B565
Anderson, Charles	ML13339B093	Angus, Robert	ML13347A673

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Anipen, Louis	ML13338B053	Arnold, J.	ML13338A959
Anomen, Sir	ML13339B722	Arnold, Julie	ML13339B759
Anorve, Raul	ML13347A177	Arnold, Maris	ML13343A935
Ansarifar, Vafa	ML13338A984	Arnold, Ricky	ML13339B085
Ansbro, Rose	ML13337B401	Arnold, Thomas	ML13346B203
Ansell, Martin	ML13346B080	Arntson, David	ML13346B523
Antal, Marie C.	ML13344A706	Aroner, Ai	ML13347A331
Antczak, Elisse	ML13337B392	Aronoff, Nina	ML13337B018
Antelo, Juan	ML13343A552	Arons, Ellie	ML13343A984
Anthony, Erica	ML13347A007	Aronson, Dr. Neil and Evelyn	ML13336A881
Anthony, Hal	ML13346B263	Aronson, Robert	ML13337B366
Antuna-Melendez, Armando	ML13338A918	Arosarena, Oneida	ML13346B492
Apfel, Sarah	ML13337B287	Arribas, Raul	ML13347A151
Apfelberg, Elizabeth	ML13337A699	Arthur, Aleta	ML13337B124
Appell, Stephen	ML13346B560	Arumugham, Vinu	ML13343A268
Applebaum, Doris	ML13343A958	Arwood, John	ML13347A250
Appledorf, Bill	ML13339A096	Asada, Akira	ML13338B144
Appleton, Stephanie	ML13331B588	Asbury, Craig Lee	ML13344A023
Appleton, Thomas	ML13347A592	Asbury, Luke	ML13343B009
Aquino, D.	ML13346A488	Ash, Rose	ML13337A905
Arace, Marylucia	ML13337B339	Ashcraft, Jesse	ML13344A399
Arago, Marybeth	ML13346B410	Asher, Lucy	ML13343A389
Arago, Marybeth	ML13346B454	Ashley, Eric	ML13337B253
Araiza, Jeanette	ML13346B395	Ashley, John	ML13347A955
Aram, Susaan	ML13336B170	Ashton, Elyse	ML13337B249
Arango, Robert	ML13338B117	Askins, Andrew	ML13339B283
Arapoudis, Sandra	ML13336B445	Aslam, Nayeem	ML13339A028
Arapoudis, Sandra	ML13346B219	Asnes, Ann	ML13331B625
Araujo, Isabel	ML13337B430	Aspin, Karen	ML13344A798
Arceo, Aimee	ML13336B735	Aspiras, Armando	ML13339A263
Arcila, Natalia	ML13338B143	Aszman, Jan	ML13343A762
Arconti, Ken	ML13338A859	Atencio, Patricia	ML13346B215
Arcure, Anthony	ML13339A021	Aterianus, Pierre	ML13347A129
Argo, Allison	ML13337B182	Atherton-Dat, Lynne	ML13339B394
Arist, Phyllis	ML13347A594	Athey, Bruce	ML13343A455
Arizona, Liz	ML13343A276	Atkins, Ed	ML13338B183
Arizona, Liz	ML13343A278	Atkins, Ilene	ML13346A519
Arkema, Carroll	ML13337A686	Atkins, Kathryn	ML13336B074
Arkema, Carroll	ML13347A305	Atkinson, Ellen	ML13336B493
Armand, Shirley	ML13347A016	Atkinson, Kim	ML13331B843
Armand, Shirley	ML13347A621	Attneave, Dorothy	ML13347A338
Armin, Andrea	ML13336B025	Atwood, Bob	ML13337B334
Armitage, Chris	ML13346A454	Atwood, David	ML13331B727
Armm, Edward	ML13340A379	Audette, David	ML13337A755
Armstrong, John	ML13339B127	Auer, Marilyn	ML13346B553
Armstrong, Stephan	ML13339B349	Auerbach, Irene	ML13337A921
Armstrong, Stephen	ML13365A120	August, Leila	ML13337B426
Arneson, Peter	ML13331C011	Augustine, Ellen	ML13331C126
Arneson, Peter	ML13339B236	Augusto, Keith	ML13336B185
Arnold, Charles	ML13343A874	Austin, Christine	ML13340A217

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Austin, Gregory	ML13344A574	Bailey, Michael	ML13344A161
Austin, Lynda	ML13344A672	Bailey, Michael	ML13346B431
austin, marilyn	ML13346A703	Bailey, Norene	ML13347A860
Auyang, Czerny	ML13339A280	Bailly, Barbara	ML13338B312
Averett, A.J.	ML13337B097	Bails, Kirk	ML13344A126
Avery, Sara	ML13338A055	Bails, Kirk	ML13347A681
Avila, Elizabeth	ML13346A419	Bain, Don	ML13331B523
Avila, Ron	ML13331B677	Bainbridge, Colleen	ML13343A250
Avila, Ron	ML13339B693	Bains, Jeffrey	ML13339A124
Avrami, Louis	ML13339B597	Bair, Barbara	ML13343B104
Axelrod, Andrew	ML13337B293	Baise, Taber	ML13346A669
Axelrod, Evelyne	ML13343A975	Bajwa, Raghbir	ML13340A328
Axt, Benjamin	ML13347A750	Baker, Charles	ML13338A109
Aydelott, Ruth	ML13343A991	Baker, Chris	ML13344A689
Ayers, Randall	ML13336B333	Baker, Deborah	ML13339A017
Aylward, David	ML13343A407	Baker, Diana L.	ML13337B077
Ayral, Odile	ML13337A146	Baker, Ilse	ML13344A396
Azar, Daniel	ML13344A131	Baker, Keith	ML13344A500
B, Jess	ML13347A788	Baker, Kelsey	ML13337B215
B, Jessica	ML13347A360	Baker, Lani	ML13343A763
B, Shary	ML13346B460	Baker, Leda	ML13336B691
B, V.	ML13346B132	Baker, Lee	ML13344A487
B., Sharon	ML13340A553	Baker, Linda	ML13343B016
Baab, Yvonne	ML13337B036	Baker, M.	ML13336A828
Baab, Yvonne	ML13337B037	Baker, Sheila	ML13337A849
Babbitt, Susan	ML13336B491	Baker, Victoria	ML13346B220
Babie, Rita	ML13347A487	Baker, Virginia	ML13340A499
Babson, Leslie	ML13346A389	Baker, William	ML13339A244
Babst, Christina	ML13339B433	Baker, William	ML13344A276
Bachand, Richard	ML13338B184	Baker-Smith, Gerritt and Elizabet	ML13336B090
Bachmann II, Daniel	ML13346A566	Baker-Smith, Gerritt and Elizabet	ML13337A809
Backos, Anthony	ML13339B536	Bakos, Larry	ML13337B411
Bacon, Drury	ML13331A624	Baksa, Revs. Adrienne and	
Bacon, Verna	ML13344A719	Richard	ML13337B434
Bader, William	ML13338B424	Balanda, Brenda	ML13340A314
Badger, Terry	ML13331B796	Balding, Mary	ML13346B240
Badger, Terry	ML13337A838	Baldwin, Natylie	ML13331B818
Badran, C.	ML13331C315	Baldwin, Natylie	ML13337B285
Baechle, Mary	ML13344A918	Balfour, Joan	ML13331C312
Baer, Ken	ML13331B795	Balgemann, Elaine	ML13339B437
Baggs, Bo	ML13344A518	Balian, Marsha	ML13338B097
Bagley, Rosette	ML13347A022	Ball, Jerome	ML13344A833
Baglini, Sidne	ML13338A950	Ball, William	ML13337B559
Bahti, Z.	ML13339A208	Balla, Nick	ML13338B416
Baier, Dawn	ML13346A613	Ballen, Lee	ML13344A090
Baier, Mary Ann	ML13338A793	Balles, Katherin	ML13343A464
Baier, Mary Ann	ML13347A565	Ballinger, Brandon	ML13344B023
Baier, Mary nn	ML13347A822	Balmes, Kenneth	ML13346B321
Bailey, Deborah	ML13338A979	Baloyra, Enrique	ML13337B055
Bailey, Lee	ML13336B203	Balsai, Michael	ML13344A407

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Balthasar, Susan	ML13336B337	Barr, Roger	ML13346B348
Balzer, Trent	ML13344A865	Barrand, Sheila	ML13343B140
Bamford, Robert	ML13338B393	Barre, Mandy	ML13346A309
Banbury, Scott	ML13331C278	Barrett, Brad	ML13338B423
Bander, Felicia	ML13346B473	Barrett, Mary	ML13338B137
Banerdt, Brendan	ML13344A127	Barrett, Mary Ann	ML13343A777
Banever, Robert	ML13336B194	Barrett, Phil	ML13339B720
Banks, Jerry	ML13343A423	Barrington, Tim	ML13331C019
Banks, Rita	ML13339B046	Barrington, Tim	ML13338B114
Banks, Wesley	ML13346B433	Barron, Anna Rita	ML13343A598
Banner, Robert	ML13346B548	Barron, Tiobe	ML13346A626
Bannister, Bert	ML13344A579	Barros-Ruof, Paul	ML13344A213
Bannon, Russ	ML13337A965	Barry, Steven	ML13336A883
Banta, Margaret G.	ML13346B120	Barrymore, Joan	ML13339A215
Baptist, MD, PhD, Jeremy	ML13336B422	Barsamian, Paula	ML13339B702
Barajas, Graciela	ML13346A833	Barshiis, Jan	ML13347A362
Baraouch, Roslyn	ML13346A830	Barshlomo, Nehemiah	ML13346B489
Barbeau, Clayton	ML13337B538	Bartelme, Ricardo	ML13339B336
Barber, Frances	ML13343A896	Bartels, John R.	ML13343A711
Barbezat, Mary	ML13338A967	Bartholomew, Steve	ML13343A222
Barbieri, Kristine	ML13346A986	Bartkowicz, Richard	ML13343A801
Barbieri, Lynn	ML13343A710	Bartleman, Mark	ML13339A067
Barcellona, Nancy	ML13346B020	Bartol, Nick	ML13336B718
Barcott, Nick	ML13344A939	Bartolomeo, Kahleen	ML13340A506
Bardo, Ellen	ML13339B511	Barton, Cathy	ML13339B101
Barger, Rosemary	ML13337A982	Barton, Jane	ML13331B620
Barham, John	ML13344A896	Barton, Karen	ML13331B762
Barker, Mary	ML13336B678	Barton, Karen	ML13343A694
Barker, Mary	ML13339B666	Barton-king, Sarah	ML13339B009
Barker, Monique	ML13343A623	Barve, Purnima	ML13337A972
Barker, Rebecca	ML13347A422	Basaj, Barbara	ML13331B930
Barlow, Joel	ML13347A976	Basaj, Barbara	ML13339B051
Barlow, Joel	ML13353A190	Bashen, Melinda	ML13331B542
Barlow, Paul	ML13337B247	Basin, Ben	ML13346B147
Barlow, Paul	ML13339B352	Basnar, Lee	ML13339B218
Barlow, Robert	ML13331C111	Bason, George	ML13346B364
Barnard, Alex	ML13337B108	Bass, Ana	ML13337A789
Barnard, Alex	ML13347A013	Bass, Lisa	ML13336B574
Barnard, Jeff	ML13337B416	Bassett, Susan	ML13338A111
Barnard, Sylvia	ML13337A080	Bassingthwaite, Anne Woodworth	ML13336B693
Barnes, Adam	ML13347A198	Bast, Nancy	ML13337A839
Barnes, Alex	ML13346A323	Bastian, Anne	ML13331B777
Barnes, Kathryn	ML13347A150	Bastian, Mark	ML13347A742
Barnes, Linda	ML13343A622	Batchelder, Roger	ML13351A167
Barnett, David	ML13338A857	Bateman, Guy	ML13337B446
Barnett, Renee	ML13343A228	Bateman, Joseph	ML13346B543
Barnett, Scott	ML13337B144	bateni, joanne	ML13346B441
Barnwell, Daniel	ML13347A375	Bates, Brooke	ML13338B403
Barolsky, Deborah	ML13339B744	Bates, Donna	ML13338A026
Barr, Clifford	ML13339B305	Bates, Sally	ML13343A953

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Bates, Thomas	ML13347A078	Beckman, Mary	ML13343B148
Batsios, Athena	ML13343A788	Beckwith, Jenelle	ML13338A008
Batsis, Katherine	ML13336B092	Bedard, Karen	ML13336B221
Batson, Jon	ML13338B363	Bedard, Peter	ML13340A507
Batt, Alicia	ML13337A145	Bedaw, Christopher	ML13336B527
Batt, David	ML13338B139	Bee, Claire	ML13336B524
Batty, David	ML13347A186	Beebe, Adam	ML13347A263
Baud, Annick	ML13344A214	Beebe, Carolyn	ML13346A844
BaUernschmidt, Lauren	ML13340A495	Beebe, Russ	ML13338A828
Baum, Miriam	ML13346B370	Beegle, Katherine	ML13336A866
Baum, Phil	ML13336B208	Beeman, Dorothy	ML13347A171
Bauman, James	ML13331C216	Beeman, Howard	ML13336B690
Bauman, Joan-Marie	ML13347A983	Beeman, Howard	ML13344A604
Bauman, Mariah	ML13344A821	Beer, Julie	ML13347A834
Bauman, Marian	ML13338A953	Begalske, Leigh	ML13339A268
Bauman, Sarah	ML13339A176	Behl, Daniel	ML13336A857
Baures, Timothy	ML13339B628	Behm, Dustin	ML13337B403
Bausch, Robert	ML13339B114	Behr, Alec	ML13347A120
Bautista, Mary	ML13339B205	Behrendt, Tom	ML13347A498
Baxter, Bea	ML13340A268	Behrns, Mary Alyce	ML13336B320
Bayer, John	ML13346B207	Behroozi, Anne	ML13331B647
Bayley, Daniel	ML13337B281	Bein, Ann	ML13346A364
Bayley, Daniel	ML13337A938	Bek, Mark	ML13346A408
Bayon, Eric	ML13346B208	Bel, Phoebe	ML13340A474
Bazar, Julia	ML13340A608	Belachew, Daniel	ML13331B875
Beach, Craig	ML13347A389	Belachew, Daniel	ML13347A176
Beach, Linda	ML13347A601	Belcastro, Frank	ML13336B336
Beam, Gabriel	ML13331B613	Belcastro, Frank	ML13343A565
Beamer, John	ML13343A556	Belch, John	ML13339B607
Bean, Courtney	ML13337A853	Belcher, Dixie	ML13331B619
Bear, Steve	ML13336B198	Belford, Nancy	ML13346B255
Beard, Valerie	ML13339A151	Bell, Denise	ML13344A942
Beardsley, William	ML13344A805	Bell, Jim	ML13336B098
Bearer, Andrew	ML13351A170	Bellacosa, Angela	ML13347A431
Beato-Lanz, Maria Cristina	ML13337B113	Bellem, Sarah	ML13339A068
Beattie, Evan	ML13339B611	Bellemare, Patrick	ML13336B641
Beattie, Evan	ML13346B435	Bellers, Nancy	ML13338B020
Beatty, Lorne	ML13336B151	Bello, D.	ML13344A793
Beatty, Lorne	ML13344A326	Benavides, David	ML13339A156
Beaulieu, Richard	ML13344A380	Benavides, David	ML13339A157
Beavers, Nancy	ML13344A375	Bender, Matt	ML13343B188
Bechtel, Albert	ML13336B182	Benedict, Douglas	ML13344A049
Bechtel, Paul	ML13339A999	Benezra-Herwitt, Robin	ML13346A345
Beck, Daniel	ML13347A437	Benford, Al	ML13340A182
Beck, Jean	ML13344A341	Bengivenga, Loretta	ML13347A035
Beck, Lorraine	ML13339A205	Bengtson, Nancy	ML13331C048
Becker, Anna	ML13346B458	Benjamin, Corey	ML13343A593
Becker, Carol	ML13343A381	Benjamin, Elaine	ML13337B029
Becker, Peter	ML13337B187	Benjamin, Glen	ML13336B370
Becker, Stanley	ML13343A799	Benjamin, Glen	ML13343A715

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Benjamin, Sue	ML13337A147	Bergman, Werner	ML13339B568
Benmoschi, Shoshannah	ML13343B073	Bergman, William	ML13339B665
Benneian, Jonathan	ML13344A107	Bergquist, Kathy	ML13331B763
Benneian, Travis	ML13346B564	Bergs, M.	ML13339B775
Benner, Ed	ML13344A134	Berkenpas, John	ML13343A421
Bennett, Brad	ML13338A762	Berkheimer, James	ML13343A792
Bennett, Carol	ML13339B688	Berkowitz, Henry	ML13331C084
Bennett, Matthew	ML13336B438	Berkowitz, Henry	ML13344A392
Bennett, Richard	ML13347A139	Berkshire, David	ML13337B291
Bennett, Virginia H.	ML13336B494	Berlet, Chris	ML13343B039
Benoit, Marguerite	ML13336B027	Berlin, Sharon	ML13339B687
Benoit, Marguerite	ML13343A490	Berliner, Diane	ML13336B316
Bensetler, Shirley	ML13343A279	Berling, Lyn	ML13337A019
Benson, Janet	ML13338A046	Berling, Lyn	ML13347A558
Benson, Richard	ML13346A774	Berman, John	ML13347A842
Benson, Stephanie	ML13339B512	Bernaert, Ruthie	ML13337B165
Benson, Susan	ML13339B082	Bernard, Janice	ML13339B030
Benson-Bodkin, Amalia	ML13339A207	Bernard, John	ML13338B278
Bensussen, Abot	ML13338A905	Bernard, Mark	ML13344A286
Bent, George	ML13339B627	Bernat, Ric	ML13338A038
Bentley, Beverly	ML13337B033	Berndt, Ann	ML13339B088
Bentley, Kathleen	ML13337A898	Bernet, Maurita	ML13339A111
Bentley, Richard and Sudjai	ML13339B029	Bernier, Elizabeth	ML13331C213
Benton, Michael	ML13338B147	Bernieri, Lou	ML13343A537
Benveniste, Heide	ML13338A912	Bernieri, Lou	ML13343A538
Benyam, Finhas	ML13347A794	Bernstein, Arielle	ML13347A406
Benz, Danielle	ML13343A869	Bernstein, Laura	ML13337A877
Berditshevsky, Michelle	ML13331C096	Bernstein, Marcia	ML13343A494
Berditshevsky, Michelle	ML13331C133	Bernstein, Marcia	ML13346A304
Beresford, Margaret	ML13338B459	Berntson, LynMarie	ML13337A014
Berezansky, Nick	ML13338A854	Berrian, Denise	ML13340A347
Berg, Patricia	ML13353A200	Berry, Janet	ML13344A388
Berg, Samuel	ML13337B120	Berry, Midi	ML13331B548
Bergen, David	ML13337B238	Berry, Nicholas	ML13344A164
Bergen, Joanne	ML13346A796	Berry, Robert	ML13336B224
Berger, Dian	ML13331B739	Berry, Robert	ML13339B769
Berger, Dian	ML13336B456	Bertram, Harrison P.	ML13344A220
Berger, Dian	ML13347A070	Bertsch, Dar	ML13347A634
Berger, Dian	ML13347A071	Beschler, Ellen	ML13343A521
Berger, Dian	ML13347A106	Beschler, Marc	ML13331C274
Berger, Pat	ML13337B420	Bescript, Ruth	ML13331C219
Berger, Russ	ML13331B769	Bescript, Ruth	ML13336B587
Berger, Russ	ML13336B458	Best, Lourdes	ML13343B084
Berger, Russ	ML13347A069	Best, Paul	ML13336B631
Berger, Russ	ML13347A107	Bethlenfalvay, Marina	ML13347A203
Bergeron, Jeanene	ML13337B319	Betit, Chris	ML13344A940
Bergeron, Terry	ML13343A626	Bettenhausen, Elizabeth	ML13337A805
Bergh, Darcy	ML13336B353	Bettenhausen, Elizabeth	ML13343A656
Bergh, Darcy	ML13346A670	Bettin, Herbert	ML13338B091
Bergin, Grace	ML13346B378	Bettis, Annetta	ML13347A131

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Bettwy, Erica	ML13346B356	black, marilyn	ML13347A525
Betz, Ann	ML13343A526	Black, Michael	ML13344A799
Beverly, J.	ML13340A509	Black, Monica Latka	ML13331B881
Beverly, J.	ML13336A859	Black, Monica Latka	ML13344A669
Bezecny, Rory	ML13339A236	Black, Nikoe	ML13346B449
Bianco, Peter	ML13343A396	Black, Vicki	ML13339A277
Bibb, William	ML13331B561	Blackburn, Judith	ML13340A663
Bibeau, Kathy	ML13343A754	Blackham, Uphoria	ML13347A775
Bibel, Barbara	ML13337B192	Blackman III, William	ML13344A542
Bible, Lee	ML13331B584	Blackmon, M.	ML13346A863
Bible, Lee	ML13339B402	Blackwell, Albert	ML13336B187
Bichan, Molly	ML13347A745	Blackwell, Joseph	ML13346A660
Biel, Mary Hartl	ML13344A507	Blackwell, Pat	ML13336B257
Biernat, Heather	ML13346B520	Blackwell, Robert	ML13336B255
Biers, Reva	ML13338B441	Blackwood, Jean	ML13331B903
Biery, Sherri	ML13338B344	Blaedel, Robert	ML13331C051
Bigelow, A.	ML13343A784	Blain, Susan	ML13346A673
Bigler, Roy	ML13343A487	Blair, William	ML13331C207
Bigwood, David	ML13344A590	Blaisdell, Charles	ML13343B032
Bikoff, Louise	ML13339B679	Blaisdell, Jill	ML13343A555
Bilenko, Stephanie	ML13339B656	Blake, Pam	ML13338A062
Bill, Eileen	ML13343A986	Blake, Sean	ML13338B126
Billings, Leslie	ML13343A734	Blanchard, Gary	ML13339A212
Billingsley, Greg	ML13338A973	Blanchard3, John	ML13338A904
Billiris, Georgii	ML13343B079	Blanck, Eugene	ML13336A827
Billmeier, Jr., MD, Gerard J.	ML13336A833	Bland, Emilia	ML13346A500
Bilsky, Cathy	ML13337A749	Blaney, Carol	ML13337B193
Binder, Caroline	ML13344A817	Blanks, Diana	ML13346A513
Bingham, Donald J.	ML13331A716	Blanton, Jonathan	ML13346A994
Bingo, Vicki	ML13338B086	Blanton, Thomas	ML13344B078
Bini, Katherine	ML13340A711	Blasche, Karen	ML13339B292
Birckhead, Peter	ML13337B004	Blatt, Miriam	ML13338B149
Bird, Mike	ML13331B531	Blau, Louis	ML13339B593
Birdsey, Natasha	ML13347A054	Blauwet, Lori	ML13337B535
Biren, Paula	ML13338B067	Bleckinger, Dana	ML13340A276
Birmingham, Maggie	ML13337A966	Bleifeld, Neil	ML13336B216
Bishop, Cori	ML13331C038	Bleifeld, Neil	ML13338B055
Bishop, Cori	ML13344A540	Blevins, Katherine	ML13340A286
Bishop, Melissa	ML13343A258	Bline, Valerie	ML13347A453
Biss, Jeffery	ML13338A975	Bline, Valerie	ML13347A456
Bissex, Glenda	ML13337A765	Bliss, Jenifer	ML13344A042
Bixenstine, Anita	ML13346A671	Bloch, Alice	ML13339B169
Bjorkman, Inge	ML13347A500	Bloch, Maureen	ML13344A228
Black, Caren	ML13337A008	Blochowiak, Patricia	ML13344A221
Black, Carol	ML13331B931	Block, Cynthia	ML13344A767
Black, Dana	ML13331C145	Block, Tye	ML13343A787
Black, Denise	ML13344A036	Bloom, Andrea	ML13337B350
Black, Janet	ML13331B978	Bloom, Carla	ML13347A327
Black, Janet	ML13337B268	Bloom, Jennie	ML13339A090
Black, Marilyn	ML13339A098	Bloom, Marilela	ML13337A090

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Bloom, Sara	ML13343A311	Booton, Marilyn	ML13336B196
Bloom, Steve	ML13340A668	Booyjzsen, Allan	ML13331C004
Bloomberg-Rissman, John	ML13331B538	Booz, Martha	ML13336B152
Bloomgarden, Robin	ML13346B025	Bora, A.Y.	ML13337B373
Blundell, Dion	ML13338B341	Borcherding, Paul	ML13337A963
Bly, David	ML13340A446	Bordbar, Robert	ML13344A522
Boatman, Larry	ML13347A863	Bordegaray, Dana	ML13339A054
Bobb, Kathleen	ML13346A923	Borie, Edith	ML13344A306
Bobb, Mary	ML13343A821	Borreggine, Anne	ML13338A799
Bobo, Truett	ML13339B306	Borrelli, Silvana	ML13346B268
Bochenek, James	ML13336B507	Borri, Patricia	ML13347A414
Bodden, Joseph	ML13347A303	Borst, Laura	ML13336B312
Boddicker, Ron	ML13340A550	Borst, Laura	ML13346B148
Bodine, Ann	ML13338B351	Borst, Tom	ML13347A262
Bodlaender, CA	ML13344A136	Bortz, Stephen	ML13337B448
Boeheim, Frank	ML13337B213	Bosold, Patrick	ML13331C072
Boehnert, Caryl	ML13338B150	Bossong, Ken	ML13336B624
Boesl, Fred	ML13344A122	Bostock, Vic	ML13344A382
Bogart, Jeanine	ML13346B204	Bosworth, Carol	ML13339B732
Bogartz, Phyllis	ML13338A955	Bottomly, Eric	ML13338B251
Bogdan, Emma	ML13347A439	Botwinick, Joan	ML13338B198
Bogdan, Radu	ML13337B179	Botz, Liza	ML13346A335
Bogie, Arthur	ML13336B138	Boucher, Anna	ML13331B874
Bogoff, Stephen	ML13339B446	Boucher, Victoria	ML13346B314
Bohac, Stephen	ML13338B220	Boudart, Jan	ML13351A197
Bohmhauer, Maria	ML13353A189	Bourgeois, Eric	ML13336B283
Boisvert, Larwence	ML13344A434	Bourgeois, Paula	ML13331C232
Bolen, D.K.	ML13331C064	Bourgeois, Paula	ML13338A120
Bolen, D.K.	ML13344A057	Bourgin, Richard	ML13338B222
Boliver, Emily	ML13338B297	Bourlotos, George	ML13338A915
Bolognini, Francesca	ML13337A835	Bouscaren, Charles	ML13338B072
Bonatti, Karen	ML13337B135	Bousquet, Bob	ML13331B967
Bonazzi, Robert	ML13336B110	Boutell, Margaret	ML13347A804
Bonchi, Susan	ML13343A472	Bouyea, Lauren	ML13343B055
Bondurant, Barbara	ML13331B601	Bowden, Rich	ML13338B014
Bondurant, Barbara	ML13346B565	Bowen, Mary	ML13347A520
Bonelli, Ricco	ML13339A243	Bower, Virginia	ML13336B547
Bonetti, Donna	ML13336B205	Bowerman, Eileen	ML13339B415
Bonilla, Michael	ML13347B034	Bowes, Joe	ML13337B450
Bonvouloir, A.	ML13331A635	Bowling, John	ML13339A203
Bonney, Patty	ML13338B409	Bowman, Candy	ML13336B548
Bonnheim, Joanna	ML13343A617	Bowman, James	ML13331B719
Bonnier, Mary	ML13346A496	Bowman, Jason	ML13336B178
Bonsignore, Antoinette	ML13339A135	Bowman, Kenneth	ML13331B736
Bonvouloir, A.	ML13338B226	Box, Bruce	ML13331B656
Books, Steve	ML13336B139	Box, Bruce	ML13338B178
Boone, Rita	ML13346A473	Boyce, Nancy	ML13331B816
Booth, Jacalyn	ML13340A321	Boyden, Jon	ML13343A665
Booth, Richard	ML13347A008	Boyer, David	ML13337B236
Booth, Sara	ML13338B173	Boyer, Kathleen	ML13346A758

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

ADAMS		ADAMS	
Commenter	Accession #	Commenter	Accession #
Boykin, D.J.	ML13343A313	Bremmer, Suzanne	ML13346A898
Boykin, Jr., R.T.	ML13343A315	Bremner, Steve	ML13344B113
Brac, Raquel	ML13346A918	Brennan, A.	ML13339A211
Bracken, Fay	ML13347A101	Brennan, Denise	ML13331C054
Bradbury, Joan	ML13338B202	Brennan, Jamie Lee	ML13346B550
Bradfield, John	ML13344A146	Brennan, Sean	ML13339A204
Bradford, Leslie	ML13339B594	Brennecke, Paula	ML13331C138
Bradford, Susan	ML13337B190	Brennecke, Paula	ML13344A566
Bradley, Amanda	ML13347A213	Brenneis, Aida	ML13344A832
Bradley, Kathy	ML13338B249	Brenner, Michelle	ML13331B899
Bradley, Priscilla	ML13347A862	Brenner, Noah and Natasha	ML13346A529
Bradley, Ryan	ML13346B402	Brenner, Royce	ML13331C003
Bradley, Sabine	ML13340A305	Brenner, Thomas	ML13337B565
Bradshaw, Seren	ML13338A856	Brenner-Ward, Isis	ML13343A803
Brady, Anke	ML13339B099	Brenza, Tina	ML13346B117
Brady, Ann K.	ML13347A057	Bresnahan, Rosalind	ML13339B213
Brady, Sandra	ML13347A004	Bresnan, L.	ML13331B888
Braffman-Miller, Judith	ML13339B330	Brewer, Dave	ML13336B051
Brainerd, Tim	ML13331C049	Brewer, John	ML13331B988
Braithwaite, Georgia	ML13338B116	Brewste, Thomas	ML13337B462
Braithwaite, Roxanne	ML13343A596	Brexel, Sr., Charles	ML13331A680
Bramlage, Laurie	ML13338B450	Brey, Mary	ML13347A735
Bramlette, Jenny	ML13344A079	Breznai, Ann	ML13339B056
Branch, Steve	ML13346B323	Briggs, Frank	ML13338B442
Brand, Jackson	ML13347A651	Briggs, Jr., William C.	ML13344A642
Brandariz, Anita	ML13347A465	Briggs-Carrington, Maure	ML13339A003
Brandler, Barbara	ML13340A453	Brigham, Sara	ML13337B505
Brandon, Lee	ML13346B295	Brightheart, Sue	ML13346B309
Brandon, Sara	ML13337B061	Brill, Rob	ML13338A958
Brandt, Chris	ML13344A659	Bringman, Jennifer	ML13346A374
Brandt, Vicky	ML13338A079	Brinker, Mary Jo	ML13346A859
Brashears, Armida	ML13331B599	Brister, Bob	ML13347A776
Bratcher, Deborah	ML13347A830	Britcher, Joyce	ML13347A451
Braun, Jim	ML13339B235	Brittle, Stephen	ML13337B119
Bray, Brent	ML13343B056	Britton, Joanne	ML13338B396
Brayton, Shana Schwartzberg	ML13336B676	Broad, PhD, Yolanda Stern	ML13331B987
Brazy, Deena	ML13336B186	Broadstock, Harold	ML13344A317
Brazy, Deena	ML13343A612	Broadwater, David	ML13336B137
Brazy, Robert	ML13337A980	Broadwater, David	ML13340A683
Breakey, Gail	ML13336B383	Brock, Frieda	ML13343A934
Breakstone, Enid	ML13339A145	Brockman, Alex	ML13337A975
Brebner, Linda	ML13337A786	Brockton, Dallas	ML13331C287
Breed, Davi	ML13337A953	Brodersen, Nancy	ML13338B316
Breed, Davi	ML13337B080	Broderson, Peter	ML13336B533
Breeden, Paul	ML13338A811	Brodie, Paul	ML13337B189
Breen, Madeleine	ML13339A554	Brodnax, David	ML13346A403
Breiding, Joan	ML13346A749	Brody, Debbi	ML13337B452
Breit, Allan	ML13344A510	Brody, Neil	ML13344A578
Breitenbach, Teri	ML13331B946	Broecker, Burkhard	ML13346A593
Brekhus, Rachel	ML13336B640	Broecker, Ingrid	ML13346A538

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Broll, Carol	ML13336B043	Browning, Cassandra	ML13339A076
Bromberg, Michael	ML13339B142	Browning, Craig	ML13339B318
Bromer, John	ML13331C006	Browning, Joyce H.	ML13331B846
Brook, Dan	ML13339B458	Brownlee, Cathy	ML13331B784
Brooker, Gary	ML13337B068	Brownlee, Cathy	ML13337A846
Brooking, Elizabeth	ML13338B354	Brownlee, Cathy	ML13337B471
Brooks, Betty	ML13346A308	Broz, Barbara	ML13336B211
Brooks, Dorothy Lynn	ML13339B713	Bruce, Jean	ML13337A793
Brooks, Jillian	ML13337B096	Bruce, Linda	ML13339B683
Brooks, Roger	ML13344A570	Bruce, William	ML13338A094
Brophy, Bernadette	ML13337A103	Bruehl, Dirk	ML13338A865
Brophy, John	ML13344A868	Brugh, Mercedes	ML13336B706
Broselofsky, Karyn	ML13346B239	Brumbaugh, Catherine	ML13347A322
Bross, C.T.	ML13339A566	Brun, Marianne	ML13340A585
Brotherton, Kate	ML13339B065	Brundage, Donald	ML13338B253
Brotman, Chuck	ML13339B035	Brunelle, Roberta	ML13347A948
Brouillet, Ellen	ML13344A239	Brunette, Mary	ML13336A953
Brown, Bill	ML13331B809	Brunner, Ada	ML13337A096
Brown, Craig	ML13336B526	Brunner, Bryan	ML13331C282
Brown, Dace	ML13344A149	Brunner, Linda	ML13343A260
Brown, Dorothy	ML13347A345	Brunner, Philip	ML13346B108
Brown, Doug	ML13337A748	Bruns, Carol	ML13344A499
Brown, Duncan	ML13339B718	Brunt, Terry	ML13337A862
Brown, Elaine	ML13336B499	Brunton, James	ML13339A059
Brown, Francine	ML13343A742	Brushaber, Marcie	ML13340A588
Brown, Jeff	ML13336B682	Brusnwig-Bosso, Diana	ML13339B635
Brown, Jeffrey	ML13331B812	Bruss, Deborah	ML13336A868
Brown, John	ML13347A144	Bruton, Babette	ML13346B495
Brown, Kathleen	ML13336B172	Bryan, Lori	ML13340A203
Brown, Kathleen	ML13344A005	Bryan, Timothy	ML13340A196
Brown, Kathleen	ML13344A308	Bryant, Cade	ML13340A458
Brown, Kathleen	ML13344A309	Bryant, Elizabeth	ML13339A009
Brown, Jr., Lawrence R.	ML13339B220	Bryant, Emily	ML13339B410
Brown, Myrna	ML13343A912	Bryer, Gladys	ML13337A745
Brown, Nathanael	ML13346B244	Bubb, Ken and Donna	ML13344A741
Brown, Renate	ML13331B983	Bubenick, Jack	ML13346B494
Brown, Rod	ML13337A134	Buchan, Martha	ML13344A539
Brown, Shelley	ML13343A316	Buchanan, Barbara	ML13344B049
Brown, Susan	ML13339B158	Buchanan, Betty	ML13340A459
Brown, Susan	ML13353A199	Buchanan, Thomas	ML13331B849
Brown, Taylor	ML13347A508	Bucherre, Veronique	ML13339A148
Brown, Thomas	ML13346A418	Buck, Margaret	ML13343A575
Brown, Thomas	ML13346B128	Buckardt, Russell	ML13346A348
Brown, Tom	ML13337B051	Buckler, Daniel	ML13337B164
Brown, Virjeana	ML13346B317	Buckley, Betty	ML13339B421
Brown, Walter	ML13337A936	Buckley, Laurie	ML13344A908
Brown, William	ML13344A403	Buckley, Maura	ML13344B012
Browne, Donna	ML13347A056	Buckner, M.	ML13343A376
Brownell, Deirdre	ML13337B569	Budd, Steven	ML13346B266
Brownfield, Harry and Kathy	ML13346B291	Buerger, Michelle	ML13347A501

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Buffington, Drew	ML13337A091	Burns, Susan	ML13343A885
Buffum, Frank	ML13343B025	Burns, Terry	ML13346B242
Buhowsky, Joe	ML13336B466	Burpo, Leslie	ML13331B663
Buhowsky, Joe	ML13337A869	Burpo, Leslie	ML13344A878
Buhowsky, Joe	ML13339A260	Burr, Elizabeth	ML13343A251
Buhtz, Barton	ML13339A245	Burrell, Pamela	ML13344A726
Bulling, Larry	ML13331B838	Burrill, Rebecca	ML13338A774
Bullock, Elizabeth	ML13338A882	Burt, John	ML13337B536
Bullock, Sharon	ML13347A848	Burton, Nancy	ML13331B940
Bunce, Peter	ML13339B083	Burton, Vic	ML13336B650
Bungarz, Kathleen	ML13339B515	Burton, Vic	ML13343A400
Bunson, Ryan	ML13339B125	Busch, Dorothy	ML13331C092
Bupp, Sherry	ML13346A744	Bush, Ronald	ML13331B676
Burdick, Amanda	ML13337B409	Bushnell, Martha W.D.	ML13336B348
Burger, Carl	ML13338B357	Buskirk, Danny	ML13339B735
Burger, Carl	ML13338B358	Bustos, Ray	ML13337B008
Burger, Carl	ML13339A042	Butcher, Joan	ML13347A210
Burgess, Amy	ML13331C174	Butler, David	ML13337B369
Burgess, Amy	ML13346A326	Butler, Diane	ML13336B716
Burgess, Barbara	ML13339B610	Butler, Edward	ML13331B862
Burgess, Vivian Valtri	ML13337A045	Butler, Edward	ML13344A652
Burgess, Wendy	ML13338B044	Butler, Edward	ML13347A308
Burgin, Holly	ML13338B181	Butler, Elizabeth	ML13344A965
Burk, Robert	ML13339B396	Butler, Pat	ML13344A585
Burkard, Peter	ML13347A598	Butler, Rita	ML13343B134
Burkart, Bonnie	ML13343A782	Butler, Ruth	ML13336B105
Burke, Bonnie Margay	ML13340A355	Butler, Ruth	ML13343A717
Burke, John	ML13336B181	Butterfield, Lisa	ML13331A581
Burke, Kathleen	ML13339B487	Butts, Judith	ML13338B235
Burke, Kathleen	ML13339B551	Buxton, Raquel	ML13346B265
Burkhardt, Kerry	ML13343A216	Bx, Kx	ML13344A747
Burkhart, Alice	ML13343A529	Byars, Joanne	ML13346B440
Burkhart, David	ML13331C154	Byers, Byron	ML13336A847
Burkhart, David	ML13344A882	Byers, Joe	ML13344A278
Burkholder, Wes	ML13347A098	Byers, Nancy	ML13347A245
Burks, Paul	ML13340A545	Byers, Shirley Drake	ML13340A330
Burleson, Annie	ML13346B129	Byrd, Craig	ML13346A574
burley, Maureen	ML13344A800	Byrd, Darlenr	ML13340A311
Burnett, Gerald	ML13338A945	Byrne, Charles	ML13339B441
Burney, Keith	ML13344A453	Byrnes, Leslie	ML13346A733
Burnham, Bob E.	ML13338B230	C, A.	ML13347A217
Burnley, Mary	ML13339A546	C, A.	ML13347A986
Burns, Bruce	ML13337A094	C, Amanda	ML13338B186
Burns, Bruce	ML13339B480	C, E.	ML13343A696
Burns, Bruce	ML13346B195	C, E.	ML13346B297
Burns, Carole	ML13344A268	C, Greg	ML13344A292
Burns, Jim	ML13339B261	C, Joe	ML13347A436
Burns, Kathryn	ML13344A013	C, Michael	ML13344A304
Burns, Mary	ML13344A810	C, Nicole	ML13347A805
Burns, Matthew	ML13340A193	C, S.	ML13337B049

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
C., T.	ML13343A828	Cantalupo, Nancy	ML13343A547
Cabot, Victor	ML13347A110	Canter, Linda	ML13337A992
Cacciatore, Edith	ML13346B508	Canti, Roel	ML13344A325
Cachopo, Patricia	ML13339B401	Capasso, Bill	ML13339B583
Cadman, Coral	ML13344B116	Capeless, Michael	ML13344A664
Cady, Scott	ML13347A924	Capobianco, Anthony	ML13331B974
Cage, Buddy	ML13337B140	Cappa, Karen	ML13346A575
Cahill, Pat	ML13347A326	Cappetta, Mark	ML13338B391
Cain, Larry	ML13343A375	Capps, Paul	ML13343A780
Caldarella, Kathryn	ML13340A661	Capron, Barbara	ML13336A848
Caldwell, Jesse	ML13337B103	Capron, Barbara	ML13344A601
Caldwell-Clark, Toni	ML13337B091	Caps, Phillip	ML13338B366
Calendine, Georgeann	ML13347A085	Capstick, Hilary	ML13337B516
Calhoun, Jerry	ML13331C280	Capuano, Joseph	ML13347A230
Calhoun, Jerry	ML13338B224	Capurro, Lyn	ML13347A638
Callahan, DrRev	ML13340A309	Carbia, Vanessa	ML13343A970
Callahan, Pamela Vouros	ML13336A864	Carbonell, T.	ML13338B165
Callahan, Sharon	ML13343A886	Card, J.	ML13346B238
Callard, Diane	ML13343A336	Card-Derr, Geraldine	ML13346B350
Callaway, Jane	ML13344A002	Cardella, Richard	ML13346B469
Callaway, Lauren	ML13340A408	Cardella, Sylvia	ML13346B470
Callaway, Michael	ML13338A787	Cardiello, Timothy	ML13331C061
Callow, Tracy	ML13339B386	Cardiff, Lynn	ML13331C079
Calvillo, Lucy	ML13336B241	Cardone, Bethany	ML13343A673
Cam, Bill	ML13336B699	Cardoso, Flavio	ML13343A879
Camera, Christopher	ML13336B175	Carey, Edward	ML13331B851
Camerman, Virginia	ML13346A421	Carey, Edward	ML13339A240
Cameron, Paul	ML13344A115	Carey, Gerard	ML13331C143
Camhi, Gail	ML13336B299	Carey, Patricia	ML13336B643
Camorati, Nancy	ML13344A368	Cargman, Jered	ML13338A015
Camp, Michael	ML13339B335	Carl, Stephen	ML13344A330
Campbell, Allan	ML13347A075	Carlin, Rita	ML13344A074
Campbell, Constance	ML13337B256	Carlin, Star	ML13337A689
Campbell, Donna	ML13338B187	Carlisle, Julie	ML13346B063
Campbell, Dudley and Candace	ML13337B548	Carlson, Cheri	ML13347A835
Campbell, Ethan	ML13337B288	Carlstone, Darry	ML13344A335
Campbell, Grant	ML13343B183	Carlton, Keith	ML13337B454
Campbell, Karen	ML13331C127	Carlton-McQueen, Patricia	ML13347A061
Campbell, Liz	ML13340A454	Carman, Margaret	ML13343A904
Campbell, Max	ML13338B401	Carmichael, Janet	ML13347A416
Campbell, Richard	ML13344B108	Carnahan, Cheryl	ML13344A730
Campbell-Carney, Cindy	ML13344B006	Carnahan, Florence	ML13339B745
Campbell-Fox, Kye	ML13344A400	Carner, A.	ML13336A965
Camus, Judy	ML13338A826	Carney, Larry	ML13337B356
Canada II, Riley	ML13344A469	Carney, Larry	ML13347A536
Canaparo, Donald	ML13339B748	Carney, Larry	ML13347A546
Cancel, Diana	ML13347A048	Carns, Ronald	ML13347A675
Canning, Thomas M.	ML13346A437	Carodiskey-Wiebe, Jenna	ML13339A586
Cannon, Dale	ML13343B127	Carpenter, L.	ML13331B842
Cannon, Marcia	ML13339B650	Carper, Robert	ML13339B098

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Carr, Barbara	ML13347A228	C'de Baca, Phil	ML13339A286
Carr, Chris	ML13331B608	Cecere, Jerry	ML13331B593
Carr, MD, Donna	ML13331A629	Cech, Lubosh	ML13338B171
Carr, Gerald and Kathleen	ML13336B129	Cecil, Jan	ML13339B652
Carr, Jay	ML13343A462	Celebre, Alice	ML13336B395
Carr, Peter	ML13339B176	Cellier, Alfred	ML13346A704
Carr, Seth	ML13337B202	Cenci, Carol	ML13339A562
Carranza, Ann	ML13338B142	Certo, Salle	ML13337B475
Carrigan, Milton	ML13337A743	Cerutti, Vince	ML13344A883
Carroll, Diane	ML13344A045	Cespedes, Melinda	ML13339B739
Carroll, Diane	ML13344A048	Cevasco, John	ML13336B126
Carroll, Glenn	ML13336B687	Chadwell, Maribeth	ML13339A579
Carroll, Judy	ML13346A771	Chafer, Clive	ML13344A225
Carroll, Katy	ML13343A843	Chalot, Andrew	ML13343A559
Carr, Chris	ML13347A691	Chamberlin, Dorothy and Richard	ML13337A101
Carruthers, Martha	ML13331C320	Chamberlin, John	ML13343A662
Carson, Mark	ML13347A850	Chambers, Claire	ML13343B132
Carson, Tamar	ML13337B239	Chambers, Martha	ML13338B345
carstarphen, kristin	ML13347A127	Champion, Margaret	ML13347A028
Carstensen, Teresa	ML13344A312	Champney, Elizabeth	ML13336B571
Carter, Bill	ML13336B287	Chan, B.	ML13340A513
Carter, John	ML13339B017	Chan, Chung-Wei	ML13343B089
Carter, Marian	ML13344B105	Chan, Wallace and Sonja	ML13338B127
Carter, Michael	ML13336B109	Chandler, Colleen	ML13344A858
Carter, Patricia	ML13336A983	Chandler, David B.	ML13339B572
Cartmell, Cathy	ML13347A291	Chandler, Susan	ML13338B196
Case, Elizabeth	ML13331B724	Changus, Carol	ML13344A177
Caspary, Rachel	ML13347A664	Chapman, Alexander	ML13347A837
Casper, Charles	ML13344A201	Chapman, Hellene	ML13336B435
Casper, Chris	ML13331B837	Chapman, Margaret	ML13346B155
Casper, Chris	ML13339B613	Chapman, Mark	ML13331C321
Cassar, Kristine	ML13347A692	Chaput, Rachel	ML13337A796
Cassidy, Leslie	ML13331A639	Charest, Karry	ML13337B494
Cassidy, Leslie	ML13339B741	Charlebois, Stacie	ML13343A651
Cassidy, T.	ML13336B313	Charlson, Jerry	ML13338A064
Cassinelli, Robert	ML13339B271	Charnofsky, Norene	ML13331A647
Casstevens, Rebecca	ML13331C249	Charrier, J.L.	ML13336A869
Casten, Liane	ML13339B659	Chase, Daniel E.	ML13344A319
Castillo, Anthony	ML13343A993	Chase, Kate	ML13339A230
Casto, Toni	ML13339B560	Chase, Kathy	ML13331B921
Castro, Elizabeth	ML13347A124	Chase, Kathy	ML13337B327
Castro, Patricia L. & Peter S.	ML13346A896	Chatfield, Betty	ML13339A187
Castro-Orozco, Juliette	ML13336B439	Chatterjee, Samir	ML13347A306
Cate, Deborah	ML13338B257	Chavez, Leslie	ML13336B167
Cathcart, Melissa	ML13343A329	Chavez, Phyllis	ML13344A512
Cattell, June	ML13346A526	Chazin, Julian	ML13346B466
Caulfield, Lee	ML13337A867	Cheatham, Angela	ML13347A153
Cavaliere, John	ML13338B264	Check, Pamela	ML13340A561
Cavanaugh, Michael	ML13337A756	Cheli, Meg	ML13343A360
Cave, Sallie	ML13337B308	Chelmecki, Patricia	ML13331C018

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Chelsea-Seifert, Dave	ML13344A110	Clark, Jean	ML13339B774
Chemai, Beverly	ML13347A241	Clark, Jean and Donald	ML13337A889
Chen, Lee	ML13340A526	Clark, Jeff	ML13347B010
Chenault, Tom	ML13344A444	Clark, Joe	ML13336B278
Chenkin, Cari	ML13338B029	Clark, Kerry Ellen	ML13347A021
Cherier, Elanor	ML13338B068	Clark, Malcolm	ML13339B604
Cherry, Carla	ML13343A367	Clark, Morgan	ML13336B280
Cherwink, Rob	ML13339B577	Clark, Pamela	ML13346B222
Chiappari, Chris	ML13339A072	Clark, Pamela	ML13346B347
Chiappone, Marianne	ML13338B064	Clark, Robert	ML13331B802
Chidester, Kyle	ML13331C317	Clark, Susan	ML13346B227
Chilcote, Marilyn	ML13344B110	Clark, Todd	ML13343A248
Childers, Deborah	ML13339B104	Clark, Valerie	ML13338A756
Childs, Peter	ML13336A887	Clarke, Chuck	ML13344A233
Chill, Deborah Lee	ML13346B298	Clarke, Judy	ML13344A426
Chirpin, Robert	ML13331B788	Clarke, Rita	ML13347A882
Chischilly, Jane	ML13336B610	Clark-McKitrick, Blythe	ML13343A816
Chischilly, Jane	ML13338B283	Casemann, Joel	ML13346B383
Cho, T.	ML13331C288	Claus, Carol	ML13331C013
Chodron, Thubten	ML13337B504	Claus, Carol	ML13344A263
Chollet, Michele	ML13347A314	Clausen, Sven	ML13337B255
Chou, Ruthan	ML13337B010	Clay, Metric	ML13336B427
Chouinard, Fletcher	ML13344A855	Clayton, Ronald	ML13346B293
Chrislip, Frederic	ML13344A272	Cleary, Katherine and William	ML13347A065
Chrisos, Nick	ML13343A632	Cleesattel, Deana	ML13346A405
Christa, Reyes	ML13331B697	Clemens, Beatrice	ML13337A011
Christa, Reyes	ML13343A450	Clemens, Beatrice	ML13344A321
Christensen, Doree	ML13331B845	Clement, James	ML13336A896
Christensen, Joan	ML13343A302	Clements, Gloria	ML13339B049
Christensen, Joan	ML13347A540	Clements, Matt	ML13347A409
Christian, Frank	ML13338B052	Clepper, Lindsey	ML13344A948
Christison, Yvonne	ML13337A049	Cleveland, George	ML13346B481
Christner, Darl	ML13343B139	Cleveland, Matthew	ML13331C098
Christopher, Angela	ML13339B476	Cleveland, Matthew	ML13340A168
Chung, Gay	ML13346B022	Clifford, Ruth	ML13331A638
Cicchi, Carla	ML13338B301	Clifford, Ruth	ML13337A902
Cielukowski, John	ML13346B461	Clig, George	ML13347A333
Cignoli, Karen	ML13344A563	Cline, Cliff	ML13344A072
Citrin, Victor	ML13338B371	Clipka, Mike	ML13336B084
Citron, Alan	ML13339B419	Cloud, Michael	ML13339B027
Civitelli, Susan	ML13344A550	Cloud, Thomas	ML13346B271
Clague, Joan	ML13338B362	Clough, Cyndi	ML13338A914
Claiborn, William	ML13338A084	Clough, Heather	ML13344B026
Claman, Elizabeth	ML13338B268	Clouser, Marcia	ML13346A293
Clare, Anne	ML13344A283	Cloutier, Roger	ML13339A568
Clark, Brooks	ML13344A297	Cobb, Robert	ML13346A641
Clark, David	ML13336B096	Cobb, Sandra	ML13337A143
Clark, Donna	ML13347A800	Cobb, Sandra	ML13346A302
Clark, Edie	ML13337A737	Cobbum, Garry	ML13347A381
Clark, Elizabeth	ML13344A646	Cocco, Brian	ML13337B125

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Cocco, Brian	ML13346B189	Collins, Lauren	ML13338B239
Cochran, Joyce	ML13343A583	Collins, Lyle	ML13346B181
Cochrane, John	ML13337B115	Collins, Peggy S.	ML13331B871
Cody, Mary	ML13338A095	Collins, Peggy S.	ML13344A323
Cody, Mary	ML13338A096	Collins, Rita	ML13340A622
Coelho, Ryan	ML13337B274	Collins, Steven	ML13347A566
Coffey, Richard	ML13347A342	Collins MD CM, David	ML13340A419
Cogswell, Jack	ML13338A951	Colombo, Jean	ML13338B275
Cohen, A.	ML13340A615	Colotti, Deborah	ML13347A549
Cohen, Beth	ML13343A871	Colton, Steve	ML13347A382
Cohen, Beverly	ML13344A746	Colucci, Juanita	ML13344A900
Cohen, Dan	ML13343A345	Colucci, Sue	ML13365A135
Cohen, Louisa	ML13365A134	Colvert, Lara	ML13337B337
Cohen, Mark	ML13331B556	Colvin, Kathleen	ML13344A748
Cohen, Marvin	ML13339B006	Colwell, Elizabeth	ML13344A519
Cohn, Jonathan	ML13337A991	Combes, Steven	ML13338A881
Coker, Courtney	ML13344A580	Combs, Jan	ML13343A592
Colabella, Charles	ML13343A814	Combs, Janice	ML13343A770
Colangelo, Annapoorne	ML13336B698	Combs, William	ML13338B170
Colangelo, Annapoorne	ML13339B625	Comella, John	ML13337B277
Colangelo, Mark	ML13344A390	Comer, Virginia	ML13343B101
Cole, B.	ML13339B730	Comfort, David	ML13337B497
Cole, Courtney	ML13346A475	Cominos, Joan	ML13344A015
Cole, Dori	ML13331C164	Commons, Sandy	ML13347A111
Cole, Pat	ML13347A869	Conklin, Jan	ML13339A217
Cole, Russell	ML13331B717	Conklin, LuMarion	ML13336B026
Cole, Sandra	ML13346B525	Conlan, Mike	ML13337B156
Coleman, Claire	ML13338B008	Conley, Jan	ML13346B368
Coleman, Edith	ML13339A084	Conley, Jan	ML13347A347
Coleman, Judy	ML13347A865	Conlon, Jane	ML13344A155
Coleman, Kelly	ML13344B088	Connell, David	ML13339B570
Coleman, Ricky	ML13344A684	Conner, Rebecca	ML13344A955
Coles, Herbert	ML13339B250	Connett, Ellen	ML13336B561
Collecchia, Geri	ML13331A653	Connick, Cherie	ML13339B048
Collecchia, Geri	ML13339A274	Connolly, Dennis	ML13347A767
Collier, Cathie	ML13338B313	Connolly, J. Patricia	ML13337B021
Collier, Fran	ML13344A602	Connolly, Sheila	ML13347A163
Collier, Robert	ML13347A194	Connor, Arthur	ML13344A997
Collingwood, Tim	ML13338A790	Connor, Bill	ML13347A323
Collins, Carol	ML13331B617	Connor, Thomas V.	ML13331A596
Collins, Carol	ML13336A861	Connor, Thomas V.	ML13344B119
Collins, Carol	ML13337A895	Connors, Clare	ML13336B565
Collins, Carol L	ML13347A919	Conrad, Jack	ML13337A951
Collins, David	ML13336B247	Conrad, Norm	ML13347A348
Collins, Gerald	ML13338A772	Conrad, William	ML13331C094
Collins, Gerry	ML13336A997	Conroy, Thomas	ML13344A644
Collins, Gerry	ML13339A202	Console, Robert	ML13338A883
Collins, Gerry	ML13344A740	Constantino, Patricia	ML13331B648
Collins, Kristi	ML13336B646	Constantino, Patricia	ML13344A632
Collins, Kristi	ML13344A329	Constantino, Patricia	ML13344A634

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Consul, Don	ML13337A111	Cornette, Cheryl	ML13336A919
Consul, Don	ML13340A529	Cornette, J. Simon	ML13347A506
Contessa, Nidhi	ML13336B189	Cornish, Christopher	ML13344A054
Contival, Delbert	ML13338A078	Corr, Carey	ML13337A903
Contos, John	ML13339B347	Correll, Quentin	ML13331B611
Converse, Martin	ML13343A963	Corrigan, Anne	ML13343B150
Conviser, Richard	ML13337A856	Corry, Ronit	ML13337A747
Conway, Machiko	ML13338B130	Corry, Ronit	ML13338A978
Conyers, Laurinda	ML13347B005	Corsover, Harry	ML13336B415
Coogan, Julie	ML13347A376	Cort, John	ML13343B105
Coogler, Thelma	ML13346A664	Cortes, Colin	ML13346B135
Cook, Charles	ML13331B803	Corwin, Valarie	ML13337B357
Cook, Chris	ML13331B748	Cosby, David	ML13337B282
Cook, Craig	ML13346B087	Coscione, Nancy	ML13331B959
Cook, David	ML13336A855	Cosgriff, Mark	ML13346B056
Cook, Gary	ML13338B025	Cosgrove, Rachel	ML13343A919
Cook, Geoffrey	ML13336A950	Cossa, Fletcher	ML13336B644
Cook, Roberta	ML13346A643	Cossa, Fletcher	ML13344A690
Cook, Sean	ML13339B651	Costa, Demelza	ML13340A678
Cooke, Don	ML13347A764	Costa, Demelza	ML13340A680
Cooley, Marian	ML13336B119	Costa, Lynn	ML13338A752
Cooley, Marian	ML13344A781	Costanzo, Grace	ML13337A768
Cooley, Marian	ML13347A600	Costas, Deborah	ML13346B562
Cooley, Trisha	ML13344A796	Costello, Michael	ML13331B715
Coombes, Jack	ML13339B182	Costion, Jo	ML13344A397
Cooney, Don	ML13331B873	Cote, Theresa	ML13339B374
Cooney, Don	ML13338B415	Cotner, Robert	ML13338B026
cooney, margaret	ML13346A563	Cotty, Marion	ML13331B544
Coontz, Sharron	ML13331A707	Cotugno, Caroline	ML13343A342
Cooper, Betty	ML13344A296	Couch, Sandra	ML13336B044
Cooper, Cara	ML13331B827	Couch, Sandra	ML13340A633
Cooper, Charlene	ML13344A827	Countee, Charles	ML13338B311
Cooper, Kevin	ML13338A028	Cousiins, Vera	ML13336B161
Cooper, Pat	ML13344A108	Cousino, Joyce	ML13339B143
Cooper, Polly	ML13337A742	Cousins, Vera	ML13340A734
Cooper, Trina	ML13336B231	Cousins, Vera	ML13343A854
Cooper, Veronica	ML13340A593	Covell, Sandi	ML13338A974
Cope, Peggy	ML13336A867	Covey, Alan	ML13347A997
Cope, Peggy	ML13336B108	Covington, Cathy A.	ML13347B032
Cope, Peggy	ML13344A709	Covington, Linda	ML13347A121
Cope, William	ML13346B068	Cowan, Bruce	ML13339A144
Copeland, Emily	ML13347A557	Cowan, Diana	ML13347A572
Coppotelli, Heide	ML13340A665	Cowgill, Carla	ML13336B660
Coray, Phil	ML13336B166	Cowin, Caryn	ML13331B681
Corbett, Kathleen	ML13331B960	Cowin, Caryn	ML13337B278
Corbett, Tina	ML13340A344	Cowin, Caryn	ML13338B075
Cordella, Anna	ML13337B025	Cox, Chadwick	ML13344A532
Corio, Joe	ML13340A609	Cox, Donald	ML13331C147
Cornelia, Jared	ML13346B514	Cox, Gary	ML13339B258
Cornette, Cheryl	ML13331C270	Cox, Karen	ML13338A900

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Cox, Lanie	ML13343A681	Crow, Barbara S.	ML13331C059
Cox, Louis	ML13337A713	Crow, Benita	ML13347A268
Cozad, Leslie	ML13343A509	Crowder, Rebecca	ML13343B114
Crabill, Phillip J.	ML13331A645	Crowder, Robert	ML13340A705
Craig, Anne	ML13336B665	Crowe, Eileen	ML13340A274
Craig, Tom	ML13336B272	Crowell, John	ML13339A126
Cramer, Rebecca	ML13331B854	Crowell, Sandra	ML13336A880
Cramer, Seth	ML13344A147	Crowley, Brooke	ML13337B188
Crameri, Scott	ML13336B684	Crowley, Lawrence	ML13331C037
Cranach, Jaclyn	ML13331B701	Crowley, Lawrence	ML13338A751
Crandall, Curtis	ML13331C144	Crown, Alvin	ML13337B477
Crandell, Steven	ML13331B604	Crown, Deborah	ML13336B050
Crane, Donna	ML13347A918	Cruger, Kurt	ML13343B076
Crane, Jeff	ML13340A660	Crum, Jennifer	ML13339B605
Crane, William	ML13347A196	Crumble, Leuise	ML13331B833
Cratty, Bruce	ML13344A460	Crumble, Leuise	ML13339B327
Craver, Shea	ML13347A377	Crump, Ruth	ML13336A863
Crawford, George	ML13331B638	Cruz, John	ML13340A424
Crawford, Heather	ML13339B012	Cruz, Marian	ML13339A117
crawford, mariebessie	ML13346A731	Csedo, Jackie	ML13347A580
Crawford, Nancy	ML13331C231	Cuadra, Jennifer	ML13340A462
Crawford, Richard	ML13337A709	Cuce, Stephen	ML13344A299
Credille, Ellen	ML13337A753	Cudnohufsky, Walter and Susan	ML13331A598
Creighton, Mark	ML13331C214	Cuevas, Eleanor	ML13344A972
Creighton, Mark	ML13344A419	Cuff, Kermit	ML13336B375
Cresic, Kimberly	ML13347A226	Cullen, Frank	ML13339A177
Crespi, Sam	ML13346A341	Culley, Marci	ML13347A515
Cresseveur, Jessica	ML13338A919	Culloty, John	ML13343A731
Crew, Julie	ML13337B385	Culp, Philip	ML13339A032
Crews, Harriet	ML13343A685	Culver, Jake	ML13346B354
Crickard's, Kim	ML13339B478	Cummings, Brian	ML13331B779
Crimmins, Patricia	ML13331C261	Cummings, Frank	ML13331B933
Cripps, Phillip	ML13339A079	Cummings, Johanna	ML13337A057
Crites, Marla	ML13339A152	Cummings, Johanna	ML13337A915
Crittenden, Kathleen	ML13336B294	Cummings, Kathy	ML13336B407
Crocker, David	ML13337B028	Cummings, Timothy	ML13338B413
Crockett, Marjorie	ML13331A614	Cuneo, Sherrell	ML13343A439
Crockett, Marjorie	ML13344B037	Cunningham, Eithne	ML13331C022
Crockett, Scott	ML13336B399	Cunningham, Gerry	ML13337A062
Crockett, Tobey	ML13337A842	Cunningham, James	ML13343A247
Crofts, Betsy	ML13343A430	Cunningham, Jennifer	ML13346B475
Crompton, Nancy	ML13331B703	Cunningham, Sharon	ML13344A378
Cronin, Donald	ML13346B315	Cupani, Shirley	ML13346A444
Cronin, Gary	ML13344A495	Cupani, Shirley	ML13346A532
Cross, Elizabeth	ML13339B736	Cupito, Caia	ML13331A715
Cross, Gregory	ML13339B758	Cuppoletti, William	ML13339A182
Crossland, Terry	ML13347A676	Curia, Peter	ML13338A925
Crotty, John	ML13331A637	Curran, Anne	ML13331C166
Crouch, Dorothy	ML13339B174	Curran, Cindy	ML13339B462
Crouse, Gerrit	ML13339B734	Currie, Christopher	ML13344A389

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

ADAMS		ADAMS	
Commenter	Accession #	Commenter	Accession #
Currier, Vaughn	ML13338B395	Daniels, Marta	ML13331C044
Curry, Richard	ML13343A359	Daniels, Michael	ML13331C305
Curtice, Sean	ML13343A864	Danjin, Jane Auringer	ML13336B238
Curtin, John	ML13343A582	Dannecker, Erin	ML13344A474
Curtis, Colleen	ML13344A071	Dansberry, Elizabeth	ML13346B009
Curtis, Connie	ML13331B517	Dantonio, Kathy	ML13337A089
Curtis, Frank	ML13346B104	Danzinger, Ryan	ML13346B483
Curtis, John	ML13343A516	DaPolito, Judith	ML13337B157
Curtis, Marie	ML13337A098	Darbro, Michelle	ML13346B551
Cusick, Amy	ML13331C053	Darcy, Frances	ML13347A363
Cusick, William	ML13346A907	Dardarian, Denise	ML13347A504
Cusumano, Richard	ML13336B274	Darden, Elizabeth	ML13346B258
Cuthbert, Dr. Lewis	ML13336B492	Dare, Cheryl	ML13338A783
Cuthbert, Dr. Lewis	ML13346B225	Darensbourg, Cary	ML13347A491
Cutler, Kim	ML13344A256	Darling, Chris	ML13336B681
Cutting-Brady, Joanna	ML13340A188	Darling, Cindi	ML13331B741
Cyriac, Cigy	ML13343B128	Darovic, Elizabeth	ML13343A998
Czajkowski, C.	ML13331B782	Darpinian, Lynn	ML13338A901
Czajkowski, C.F.	ML13338A837	Dashe, Julia	ML13344A754
Dace, Letitia	ML13336B556	Daskal, Sharon	ML13343A267
Dadah, Shawn	ML13344A814	Dastrup, Melinda	ML13336B688
Dagher, Carrie	ML13338B447	Daub, Mary	ML13337B141
Dagher, Cathleen	ML13346B502	Davenport, Susan	ML13331C097
Dahl, Pamela	ML13343A943	David, Amin	ML13337B492
Dahlgren, Deborah	ML13346B106	David, Esther	ML13339A228
Dahlgren, PhD, Shelley	ML13346A377	David, Norman	ML13343A836
Dahlquist, Abby	ML13344A284	Davidson, Joel	ML13338A849
Dailey, Eileen	ML13344A649	Davidson, Lisa	ML13344A762
Dailey, Jim	ML13338A997	Davidson, Maggie	ML13347A556
Dailey, Susan	ML13339B554	Davidson, Michael	ML13344A189
Dalcais, Sandy	ML13343A562	Davies, Ronnye	ML13346A404
Dale, Byron	ML13344A909	Davies, Ronnye	ML13347A256
D'Alessandro, Jenette	ML13339A193	Davies, Sue	ML13337B558
D'Alessandro, Keith	ML13347A916	Davine, Jill	ML13331A703
Daley, Rev.	ML13339A186	Davis, Ann Marie	ML13340A488
Dalition, Mitch	ML13337B254	Davis, Ashlee	ML13346A642
Dallin, Eric	ML13347A674	Davis, Carla	ML13346A708
Dalton, Sandra	ML13344A428	Davis, Chandler	ML13336B653
Dalwin, Ken	ML13338B419	Davis, Cynthia	ML13331B646
Daly, John	ML13336B531	Davis, Hillary	ML13337A979
Daly, Lisa	ML13338B261	Davis, J.	ML13336B595
D'Ambrosio, Nancy	ML13344A173	Davis, James	ML13339A261
Dame, Laura	ML13344A921	Davis, Jeremiah	ML13336B334
Damian, Paul	ML13337A790	Davis, Jim	ML13331C073
Damron, Patricia	ML13337B502	Davis, Jim	ML13338B315
D'Angelo, Janis	ML13346B073	Davis, Jo	ML13346B137
Daniel, Donna	ML13347A216	Davis, Karen	ML13347A433
Daniel, Marinell	ML13344B102	Davis, Kat	ML13346A696
Daniel, Roger	ML13338B255	Davis, Liz	ML13338B434
Daniels, Geneva	ML13344A364	Davis, Mary	ML13347A391

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Davis, Patti	ML13331C192	Decker, Eric	ML13337B084
Davis, Ryan	ML13337B421	Decker, Eric	ML13337B355
Davis, S	ML13346B538	Decker, M.	ML13343A760
Davis, Shellee	ML13331C304	DeCristo, Jeramy	ML13343A209
Davis, Shirley and Ronald	ML13336B576	Deem, J.	ML13343A392
Davis, Shirley and Ronald	ML13344A421	Dees, Roberta	ML13340A271
Davis, Vicki	ML13343A283	Deferrante, Robert	ML13337B178
Davis, Virginia	ML13336B201	deGero, Beverly	ML13338B378
Davis, Virginia	ML13346B034	Dehn, Megan	ML13343A687
Davis, Wendy	ML13336B248	DeKeyrel, Dallas	ML13338A800
Davis, William	ML13344A429	del Rosario, Theresa	ML13346B041
Davis, William	ML13347A785	Del Zoppo, Maria	ML13346A693
Davis III, Frank	ML13339B243	Delaney, Dan	ML13340A341
Dawson, James R.	ML13331B580	Delaney, Priscilla	ML13344A504
Dawson, James R.	ML13346B396	Delarosa, Irina	ML13337A125
Dawson-Rhodes, Juanita	ML13343A779	DeLeone, Barb	ML13338B308
Day, C.	ML13343A294	Delevoryas, Prof. John	ML13339A062
Day, Jonathan	ML13343B068	Delgado, Jr., Victor	ML13346B005
Day, Wayne	ML13343A947	Delibos, John	ML13344A035
Dayspring, Margaret	ML13346B496	DellaLoggia, Denis	ML13336B648
Dazey, Kendal	ML13340A729	Dellavecchia, Mark Alan	ML13344A065
De Baca, Sylvia	ML13346B004	Dell'Italia, Patrick	ML13346B476
de Blas, Celia	ML13346A997	DeLorenzo, Pete	ML13336B470
De Boer, Melanie	ML13347A165	DeLorenzo, Pete	ML13338A018
De Goff, Victoria and family	ML13337B131	Delson, Dave	ML13346A877
De Goff, Victoria and family	ML13347A257	DeMarco, Ellen	ML13340A627
De Hart, Jane	ML13339B020	DeMark, Christi	ML13344A954
de Haven, Sarah	ML13337B245	DeMarsh, Julianne	ML13336B606
de Javelina, Olivia	ML13347A713	Dembos, Walter	ML13347A184
de Javelina, Olivia	ML13347A714	Dembaska, Anna	ML13343A666
De La Garza Und Senkel, Patrick	ML13338B347	Demers, Edward	ML13337B128
De La Rosa, Ken	ML13338A878	Demers, Edward	ML13340A580
de Mott, Margaret	ML13343A591	Dempsey, Mark	ML13337B566
De Nicola, Franco	ML13337B039	Dempsey, Sheila	ML13340A342
De Smedt, Jeanne	ML13331A574	Denenberg, Harold	ML13343A387
De Stefano, Vincent	ML13337B521	Denham, Jessica	ML13347A341
de Vet, Therese	ML13343A961	DeNicola, JoEllen	ML13343A393
Dean, Abigail	ML13338B155	Denison, Marcia	ML13346B003
Dean, June	ML13347A849	Denison, Mr. & Mrs. James	ML13346A342
Dean, Mary	ML13346A825	Denman, Alexandra	ML13339A287
Dean, Norma	ML13339B776	Dennany, Philip	ML13331B696
Dean, Sue	ML13347A374	Dennany, Philip	ML13337B436
Dean, Sue E.	ML13331B865	Denneen, Bill	ML13337A695
Dearing, Deb	ML13344A750	Denney, Joel	ML13338B333
Dearmas, Franshisca	ML13346A658	Dennis, Lori	ML13339B544
Dearstyne, William	ML13344A931	Dennison, Brett	ML13343B196
DeBoer, Elisa	ML13344A616	Dennison, Genevieve	ML13337A916
DeCarlo, Erika	ML13347A286	Dennison, Victoria	ML13339A989
Decker, Dorothy	ML13339B162	Denny, Bruce	ML13338A921
Decker, Elaine	ML13343A312	Denton, David	ML13343B155

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Denton, Jill	ML13337A714	Diener, B. Thomas	ML13336B520
Depinto, Frank	ML13337A092	Diener, B. Thomas	ML13344A113
Derbigny, Rodney	ML13337B498	Dietrich, Chris Omeara	ML13351A188
Dereszynski, Kim	ML13344A034	Dietrick, Jan	ML13336A987
Derleth, Penny	ML13339B552	Dietzel, Colleen	ML13337A079
Dervin, John	ML13339A137	Digiovanni, Susan Johnson	ML13331C047
DeSantis, Amy	ML13346B281	DiGiovanni, Jr., Robert B.	ML13343B137
Descamps, Karen	ML13339B631	Dillard, Gavin	ML13343B041
Deshayes, Thierry	ML13336B517	Dilley, Berry	ML13337B107
Deshotels, James	ML13338B240	Dilley, Mark	ML13337B465
Desmond, Alyson	ML14015A240	Dilling, Brock	ML13338B425
Desmond, Sheila	ML13340A287	Dillon, Kay	ML13346B187
DeSourdis, Bertha	ML13346B505	Dillon, Sheila	ML13340A397
Desrosiers, Martha	ML13347A040	Dillon III, M.S.	ML13337A829
Detrick, Mary	ML13339A116	DiMarco, Corrine	ML13338B304
Deutschlander, Bill	ML13344A785	Dimitri, Katherine	ML13347A457
Dever-Reynolds, Penny	ML13331B658	Dimondstein, Carla	ML13351A185
Devers, Thomas and Suzanne	ML13344A210	Dimorest, Carolyn	ML13338B093
Deveze, Luis	ML13343A957	DiNardo, Judith	ML13338A897
Devine, Lauren	ML13339B417	Dineen, Charles	ML13331B993
Devona, Donald	ML13347A650	Dineen, Charles	ML13339B361
DeWald, Lloyd	ML13343A966	Dinescu, Carmen	ML13347A309
Deweese, Carol	ML13344A336	Dinitz, Richard	ML13347A260
Dewell, Dorothy	ML13347A330	Dinwiddie, Erin	ML13346B361
DeWitt, AE	ML13343A629	D'Inzillo, Nancy	ML13347A989
Dewitt, Ethlynn	ML13336A841	Dirr, Jeanie	ML13337B000
Di Benedetto, Rainbow	ML13337B152	DiSanto, Cynthia	ML13339B726
Di Russo, Donald	ML13337B472	Distasi, Mia	ML13339B561
Di Stefano, Carl	ML13331C063	Distefano, Michael	ML13336B645
Di Vittorio, Diane	ML13344A788	DiTizio, Vincent	ML13336B545
Diamond, J.	ML13338A858	Dittmer, Grant	ML13338A936
Diamond, Jim	ML13351A200	Dix, Deborah	ML13331B892
Diamond, Mitchell	ML13338A110	Dixon, Charles	ML13331B708
Diamond, Rosalind	ML13346A646	Dixon, Joanne	ML13331B770
Diamond, Rosalind	ML13346A651	Dixon, Joanne	ML13337B445
Diamond, Susan	ML13344A191	Dixon, S.M.	ML13340A219
Diaz, Antonieta	ML13339A070	Dixon, Sarah	ML13338A965
Diaz, Francisco	ML13339A008	Dixon, Vernon and Mary Joyce	ML13339B698
Diaz, Tony	ML13344A968	Dlugosz, Janice	ML13336B237
Dibbern, Carol	ML13331B823	Doak, Hartson	ML13347A994
DiBenedetto, Margaret	ML13339A118	Dobkin, Alix	ML13338A830
DiCarlo, Cindy	ML13347A762	Dobles, Michael	ML13339B077
Dickason, Daniel	ML13338B325	Dobson, Carol	ML13336B708
Dickason, Tina	ML13337A852	Dockendorff, Merle	ML13346B437
Dickemann, Jeffrey	ML13337A013	Dockendorff, Merle	ML13347A695
Dickens, Aaron	ML13343A286	Dodd, Elizabeth	ML13331C182
Dickey, Helen	ML13338A076	Dodge, Fred	ML13336B449
Dickey, Laura	ML13336B226	Dodge, Laura	ML13339B537
Dickman, Steve	ML13343A927	Doenmez, Sarah	ML13336B140
DiDonato, Toni	ML13339B591	Doepker, Dan	ML13336B629

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Doeppers, James	ML13336B275	Dosier, Herschel	ML13343A900
Doesserich, Diane	ML13347A410	Doskow, Minna	ML13340A215
Doherty, Beth	ML13343A982	Dostalek, Frank	ML13339A276
Doherty, Donna	ML13344A016	Douda, Paul	ML13347A474
Dolbear, Robin	ML13338A994	Dougherty, Bill	ML13343B054
Dolezal, Wayne	ML13339B638	Dougherty, Sallie and Jim	ML13347A789
Doll, Carl	ML13331A678	Douglas, Carolyn	ML13339B474
Doll, Garry M.	ML13339B351	Douglas, John	ML13347A793
Doll, Joan	ML13331B707	Douglas, Pam	ML13343A867
Dollat, Alina	ML13336B635	Douglas, Robert	ML13337B483
Dollat, Alina	ML13337A857	Dowdle, Daniel	ML13339A104
Dollins, Randall	ML13339B011	Dowe, Chuck	ML13343A827
Dolly, William	ML13344A671	Dowling, Gary	ML13347A091
Domb, Doreen	ML13343B109	Dowling, Holly	ML13346A474
Domenici, Marir	ML13331B896	Downing, Gregory	ML13340A348
Domenico, Jim	ML13338B092	Downing, Jacquelyn	ML13338B380
Dominguez, Laura	ML13339B500	Downing, John	ML13338A814
Donahue, Brad	ML13338A868	Downing, John	ML13346B421
Donaldson, John R.	ML13343A743	Doyle, Jeff	ML13336B197
Donaldson, Marcy	ML13339B069	Doyle, Meg	ML13344A315
Donaldson, Mark	ML13343A616	Doyle, P.K.	ML13347A472
Donaldson, Patrick	ML13337B520	drabic, AniMaeChi	ML13346A602
Donch, Mary	ML13343A960	Dragon, Chris	ML13338B322
Donegan, Chuck	ML13337A137	Dragon, Judy	ML13336B440
Donehoo, Douglas	ML13343A606	Dragon, Judy	ML13343A403
Donnelly, Bill and Tesse	ML13344A863	Drake, EdM, Marian	ML13339B038
Donnelly, Debbie	ML13346A659	Drake, Priscilla	ML13344A251
Donnelly, Patricia	ML13344A229	Drake, Tracy	ML13338A108
Donofrio, Tristan	ML13340A450	Dralla, G.	ML13344B008
Donohew, Kenyon	ML13338B402	Drapeir, Rich	ML13337B298
Donohew, Kenyon	ML13338B412	Draper, Glen	ML13331C184
Donohue, Bonnie Ann Peate	ML13336B243	Draper, Janet	ML13336B107
Donohue, Bonnie Ann Peate	ML13336B244	Draper, Lynne	ML13347A463
Donoso, Steve	ML13343A380	Draves, Peter	ML13347A727
Donovan, Brian	ML13331C031	Dreier, Tamara	ML13339B711
Donovan, Charlotte	ML13343A702	Drelios, George	ML13344A159
Donovan, Elaine	ML13331B612	Drummond, Marie	ML13343A940
Donovan, Elaine	ML13344A195	Druwing, Bob	ML13338A759
Doolittle, Christine	ML13338B102	Duarte, Philip	ML13336B329
Dopp, Marischka	ML13347A668	Dubetz, Paulette	ML13337A023
Dorame, Barbara	ML13347A235	Dubin-Vaughn, Sarah	ML13336A991
D'Orazio, Barry	ML13337B543	DuBois, John	ML13339B002
D'Orazio, Barry	ML13337B563	Dubovick, Carol	ML13339B436
Dorer, Jeffery	ML13337A845	Duda, Tim	ML13331B555
Dorf, Barbara	ML13346A445	Dudan, Claire	ML13343A379
Dorner, Andrea	ML13347A164	Duddy, Eve	ML13338B373
Dorr, Laurel	ML13344A493	Dudek, Jan	ML13344A288
Dorr, Mark	ML13343A654	Dudzinski, Steve	ML13343B141
Dorsey, Jeanette	ML13343A684	Duenas, Deborah	ML13344A784
Dorsey, Thomas	ML13339B772	Duerksen, Mary	ML13331C289

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Dufel, Laura	ML13338B258	Easley, Joan	ML13346A383
Duffy, Connor	ML13347A795	Eastabrooks, Ann	ML13339A221
Dugan, Pat	ML13337A029	Easterling, Nancy	ML13338B451
Dugar, Alice	ML13344A591	Eastman, Linda	ML13344A479
Dugaw, Anne	ML13331A630	Eastman, Sylvia	ML13337A871
Dugaw, Anne	ML13338A801	Easton, Rick	ML13339B428
Dugdale, Jane	ML13337A071	Eaton, James	ML13343A825
Duke, Carol	ML13331C224	Eaton, Kandace	ML13343A724
Dukler, David	ML13338B085	Eaton, Mimi	ML13344A217
Dulik, John	ML13346A434	Eberg, Nancy	ML13347A175
Dumont, Lynette	ML13331B745	Eberle, Martha	ML13347A579
Dumont, Lynette	ML13331B752	Echevarria, Carlos	ML13344A192
Dunbar, Andrew	ML13344A346	Eckhardt, Gerhard	ML13344A118
Duncan, Arnold	ML13338B368	Ecklund, Suzanne	ML13339B021
Dunham, Elizabeth	ML13337A130	Eckstein, Curtis	ML13331A618
Dunham, Frances	ML13347A781	Edelman, William	ML13346A672
Dunham, Jack	ML13344A353	Eden, Carolyn	ML13347A368
Dunham, Suzanne	ML13331C069	Eden, Jonathan	ML13346A436
Dunivant, Terre	ML13337A738	Edesteom, Steve	ML13340A737
Dunkak, Dave	ML13339B546	Edinberg, Phyllis	ML13336A917
Dunn, Elmo	ML13338B356	Edman, John	ML13338B390
Dunn, Joel	ML13336B537	Edmonds, PhD, Sarah	ML13337A881
Dunn, John	ML13331C298	Edmonds-Rodgers, Joann	ML13343A634
Dunn, Rusty	ML13346A779	Edmonston, Pandora	ML13331C076
Dunn, Sherry	ML13344A770	Edney, Cynthia	ML13338B002
Dunne, Mary	ML13336A969	Edsall, Jane	ML13344A919
Dupre, Melanie	ML13339B092	Edson, Dan	ML13331B789
Durante, Anthony	ML13339B503	Edwards, Bruce	ML13344A582
Durnell, Tim	ML13343A807	Edwards, Charlotte	ML13346B153
Durrenberg, M.	ML13331A622	Edwards, Constance	ML13343A824
DuSold, William	ML13331A606	Edwards, Eric	ML13339A270
Dwight, Annie	ML13346A892	Edwards, Jane	ML13339A071
Dwyer, Anne	ML13346B133	Edwards, Judi	ML13331B953
Dyakon, Douglas	ML13337B081	Edwards, Michael	ML13337B449
Dyche, Danny	ML13337A696	Edwards, Nancy	ML13337A095
Dye, Joyce	ML13331C172	Edwards, Robert	ML13337B568
Dyer, Jym	ML13331B890	Edwards, Robert	ML13340A480
Dyksman, Leo	ML13331C046	Egan, John	ML13344A462
Dymzarov, Stuart	ML13337B126	Eggers, Arthur	ML13339B389
Dyrdahl, Kari	ML13339A061	Eggers, Kimmel	ML13340A620
Dyson, James	ML13331B889	Eggum, Bruce	ML13331C068
dzirson, Karin	ML13346A398	Eggum, Bruce	ML13338B050
Eager, Matthew	ML13336B642	Ego, Les	ML13331B915
Eagle, Zak	ML13346A834	Ehlen, Charlie	ML13337A040
Eakin, Tracey	ML13337B020	Ehlen, Martin	ML13336A985
Eanes, Scott	ML13343A908	Ehmann, Anne	ML13339B653
Earl, John	ML13339B196	Eichelberger, Donj	ML13347A148
Earle, Mike	ML13336B585	Eichenholtz, Michael	ML13339B514
Earle, Susan	ML13344A876	Eielson, Olivia	ML13347A100
Eash, David	ML13343A939	Eiger, Leonard	ML13347A014

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Eisentrager, Evan	ML13346B050	Enos, Jr., Wayne	ML13340A324
Eisman, Gregg	ML13346B122	Enright, Dorothy	ML13338A789
Eisman-Goldstein, Roberta	ML13344A546	Enright, Elizabeth	ML13331C242
Eister-Hargrave, Leah	ML13343A503	Enright, Elizabeth	ML13339A239
Eitelman, Andrea	ML13347A914	Enriquez, Frances	ML13346B392
Ekland, Annelise	ML13337B442	Enriquez, Irene	ML13344A055
Eklund, Steve	ML13331A613	Eppelsheimer, Sr., David	ML13337A977
El, Mira	ML13337A048	Eppstein, Nicole	ML13347A464
Elbrecht, Melissa	ML13346B427	Epstein, Ellen	ML13336B188
Elchesen, Carla	ML13347A964	Epstein, Ellen	ML13347A113
Elchesen, Carla	ML13347A988	Epstein, Kelly	ML13337B333
Elder, Angela	ML13346B472	Erb, Cheryl	ML13347A524
Elder, Rebecca	ML13331B841	Erb, Virginia	ML13346A813
Elder, Robert	ML13331B792	Erickson, Christy	ML13346B333
Elfenbein, Fred	ML13336B394	Erickson, Ingrid	ML13336B292
Elia, Rob	ML13343A445	Ernst, Catie	ML13339B622
Eliggi, Raymond	ML13339A154	Ernst, Monty	ML13339B075
Elijah, Ananda	ML13338B266	Erpelding-Garratt, Elizabeth	ML13331C245
Elkins, Elizabeth	ML13338B309	Erpelding-Garratt, Elizabeth	ML13347A623
Elkins, Karen	ML13339B189	Erwin, Phyllis	ML13336A853
Elliott, Adriane	ML13347A138	Escajeda, Mark	ML13346A330
Ellis, Cathy	ML13347A237	Eschen, John	ML13337B044
Ellis, Marie	ML13346B251	Eschenfelder, Jame	ML13338B061
Ellis, Mavonna	ML13338A838	Esperas, Randall	ML13339A010
Ellis, Robert	ML13347A953	Espinosa, Gale	ML13346B274
Ellison, Janet	ML13338B445	Espinoza, Bernadette	ML13347A516
Ellyn, Maura	ML13340A524	Espinoza, Michael	ML13344A247
Elovic, Barbara	ML13331A602	Esson, Genevieve	ML13344A804
Elsdon, Jane	ML13347A049	Esstman, Barbara	ML13337B258
Elwell, Herbert	ML13347A300	Estes, Donna	ML13343A902
Elzinga, Clayton	ML13337B163	Estes, Douglas	ML13340A223
Emarita, Betty	ML13344B059	Estes, John	ML13347A269
Embers, Pat	ML13339A030	Estes, Julia	ML13347A271
Embry, Irucka	ML13344A612	Esteve, Gregory	ML13336B297
Emery, Edie	ML13347A470	Estrin, Michael	ML13346B493
Emmons, Beverly	ML13338A024	Euchler, Irene	ML13344B035
Emmons, Norman	ML13344A348	Eustace, Warren	ML13339B397
Emrich, Dee	ML13339A123	Evan, V.	ML13340A534
Enerson, Hal	ML13338B375	Evan, V.	ML13339A088
Enfield, Jackie	ML13331B878	Evans, Barbara	ML13331C241
Eng, Richard	ML13338B157	Evans, Bill	ML13337A732
Engardio, Judy	ML13346A920	Evans, Bronwen	ML13331B582
Engineer, Fali	ML13339B586	Evans, Bronwen	ML13338B035
Engle, Constance	ML13340A307	Evans, Christopher	ML13347A705
Engle, Harry	ML13336B546	Evans, Colleen	ML13337B510
Englert, Mike	ML13339B746	Evans, David	ML13344A655
English, Denie	ML13340A457	Evans, Diane	ML13339A162
English, Dixie	ML13347A398	Evans, Dinda	ML13347A968
English, Victoria	ML13339B346	Evans, Dinda	ML13347A969
Ennor, Kenneth	ML13339B678	Evans, Jason	ML13337A986

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Evans, Keisha	ML13340A491	Farnum, Lorna	ML13337B360
Evans, Michael W.	ML13344A198	Faro, Gina	ML13343A819
Evans, Mr.	ML13339B469	Farrar, Alonna	ML13346A791
Evans, Robert	ML13343B020	Farrell, Richard	ML13340A652
Everard, Rowan	ML13336B655	Farrell, Sita	ML14176A710
Everett, Greg	ML13338A782	Fasano, Jean	ML13338A021
Everett, Jack	ML13347A679	Fassler, Cary	ML13339B086
Evitt, Kinney	ML13344A029	Fast, Wendy	ML13336B067
Evjion, Virginia	ML13339B707	Fasten, Susan	ML13337A142
Evoniuk, Nancie	ML13347A280	Fasten, Susan	ML13347A328
Ewing, Suzanne	ML13331B830	Fatemi, Al	ML13331B785
Eye, Bob	ML13331B574	Fatouros, Naomi	ML13347A523
Ezust, Paul	ML13343A554	Faulkner, Don and Mary	ML13338B338
F., Lisa	ML13339B007	Fausnacht, Craig	ML13340A195
F., Wendy	ML13339A237	Favello, David	ML13338B062
Faas, Gary Owen	ML13339B649	Favre, Thierry	ML13336B376
Faas, Ronald C.	ML13336B069	Fazzari, Angela	ML13347A814
Faber, Fanshen	ML13331C236	Federico, Kellie	ML13337B342
Fabian, Dagmar	ML13337A050	Feeley, Marie	ML13347A178
Fabian, Dagmar	ML13346B559	Feeley, Susan	ML13331C238
Fabing, Keith	ML13346A336	Feichtinger, Dennis	ML13344A183
Facer, Roxanne	ML13339B661	Feinberg, Cynthia	ML13339B148
Factor, Anna	ML13340A171	Feinerman, Lynn	ML13346B425
Fadden, Heather	ML13337A082	Feingold, Emily	ML13346B078
Fahey, Dennis	ML13347A973	Feiring, Stephanie	ML13344A967
Fairchild, Karl	ML13339A295	Feissel, John	ML13347A548
Fairchild, Stephanie	ML13336B033	Feissel, Sharon	ML13344A012
Faith-Smith, Bonnie	ML13336B460	Feiste, Edie	ML13346A885
Falcon, Dave	ML13336B723	Feld, Ellin	ML13336B717
Falcon, Ruth	ML13346B033	Feldman, M	ML13346A414
Fales, Evan	ML13346B290	Feldman, Mark	ML13344A902
Falk, Jennifer	ML13344A257	Felix, Lindy	ML13331C268
Faller, Helen	ML13343A225	Felizola, James	ML13344A415
Fallon, Kathie	ML13344A222	Fellner, David	ML13338A048
Fallow, Dave	ML13338A887	Fenwick, Steven	ML13339B144
Falzone, Dominick	ML13346A869	Ferguson, Cheryl	ML13347A711
Famette, Audrey	ML13343A208	Ferguson, James	ML13344A520
Famularo, Rlph	ML13347A741	Ferguson, Linda	ML13340A380
Fannin, Valerie	ML13344A727	Ferguson, Linda Jones	ML13337A102
Fanning, Don	ML13346B186	Ferguson, Vicki	ML13346B070
Farago, Katherine	ML13343A287	Fering, James	ML13331B916
Farber, Alice	ML13336B685	Ferkingstad, Don	ML13343A618
Farber, Joan	ML13343A518	Fernandez, Della	ML13346B021
Farber, Joyce R.	ML13343A243	Fernandez, T.	ML13347A208
Fard, Hamid	ML13343A830	Fernandez, T.	ML13347A772
Fargotstein, Fred	ML13336A936	Ferrara, Loraine	ML13344B050
Faris, James	ML13331C128	Ferrari, Allison	ML13339B119
Farnsworth, Christina	ML13338B319	Ferraro, Mary	ML13343A533
Farnsworth, Ron	ML13331B800	Ferri, Ralph	ML13346A747
Farnum, Lorna	ML13336B516	Ferris, Neal	ML13346A836

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Ferrucci, Al	ML13346A394	Fischella, Bob	ML13331C151
Ferry, William	ML13338A966	Fischer, Elaine	ML13346B193
Feryok, J. Allen	ML13336B132	Fischer, Lynn	ML13346B083
Festa, Angelo	ML13331C167	Fischer, Lynn	ML13347A141
Festa, Angelo	ML13338B302	Fischer, Quentin	ML13347A595
Fetter, Sharon	ML13346A680	Fischman, la	ML13344A575
Fetty, Karen	ML13337A084	Fischman, la	ML13344A665
Feuille, Leslie	ML13339B222	Fischman, la	ML13344A707
Feves, Angene	ML13347A599	Fischhoff, Robert	ML13337A941
Fialkoff, Gene	ML13331B781	Fisher, Audrey	ML13337A994
Fickert, Mark	ML13338A903	Fisher, Cheryl	ML13337B226
Fidler, Gabriel	ML13347A077	Fisher, Edward	ML13336B343
Fiedler, Brandan	ML13339A107	Fisher, Hal	ML13338A761
Fiedler, Ed	ML13336B579	Fisher, Kenneth	ML13339B451
Fiedler, Ed	ML13346A692	Fisher, Loretta	ML13347A701
Fiedler, Ed	ML13346A697	Fisher, Mark	ML13338B465
Fiedler, Ed	ML13347A192	Fisher, Mary Sue	ML13347A717
Fiedler, Patricia	ML13337B299	Fisher, Patrice	ML13339B482
Field, David	ML13340A378	Fisher, S.	ML13337A937
Field, Ellen	ML13338A880	Fishkin, Lana	ML13343A271
Field, Marilyn	ML13336B091	Fishman, Ted	ML13344B079
Field, Marilyn	ML13338B331	Fitch, Athena	ML13336A990
Field, Rebecca	ML13344A657	Fitch, James H	ML13347A923
Fielder, Aixa	ML13339B138	Fitch, James H.	ML13343A959
Fields, Kate	ML13344A056	Fitton, Norma	ML13340A186
Fiels, Craig	ML13331B525	Fitzgerald, Colleen	ML13339A081
Fighera, Linda	ML13339A031	Fitzpatrick, Patric	ML13338B369
Figtree, Craig	ML13344A568	Flaherty, Ned	ML13344A670
Filan, Sheila	ML13338B414	Flake-Bunz, Colette	ML13339B592
Filepp, Thomas	ML13337B201	Flamm, Maya	ML13344A853
Files, Heather	ML13331C310	Flanagan, Marianne	ML13343B017
Files, Heather	ML13338B108	Flanagan, Peter	ML13331C248
Filho, Clayton Cunha	ML13337B469	Flanagan-Allein, Richard and	
Filipelli, PhD, Deborah	ML13346A387	Susan	ML13344A560
Filler, Matthew	ML13347A816	Flanders, Lenore	ML13346B537
Findeis, Jeffrey	ML13344A645	Flanery, John	ML13331C095
Fineran, Mary	ML13344A966	Flannigan, Brian	ML13338A875
Fingerman, Robert	ML13343A933	Fleche, Anne	ML13347A195
Finke, David	ML13336A946	Fleischaker, Gail	ML13339B749
Finke, David	ML13343A883	Fleischer, Tim	ML13339B171
Finke, David	ML13343A884	Fleitman, Bernard	ML13346B439
Finkelstein, C. Robert	ML13346A385	Fleming, Cheri	ML13344A656
Finlayson, Erid	ML13337A797	Fleming, SF	ML13331C057
Finlayson, Erid	ML13346B045	Fleming, Sophie	ML13339B192
Finley, Joel	ML13339B685	Fletcher, Judith	ML13336A854
Finman, Sigmund	ML13337B507	Fletcher, Mark	ML13331A708
Fioramanti, Jeri	ML13331A692	Fletcher, Tanis	ML13340A363
Firestine, Richard	ML13339B490	Flick, Betsy	ML13347A234
Firestone, Klara	ML13347A478	Flock, Judy	ML13340A370
Firman, Lindsay	ML13347A393	Flom, Michele	ML13337A702

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Flood, Sally	ML13337B466	Fornia, Charles	ML13347A301
Flores, Brian	ML13343A427	Forsberg, Janice	ML13336B169
Flores, Frances	ML13337B398	Fortin, Kim	ML13331C101
Florian, Brian	ML13336B179	Fortner, John	ML13339A063
Florian, Brian	ML13347A103	Fortuny, Margaret	ML13344A673
Florsheim, Nancy	ML13331A619	Fosburgh, Eric	ML13347A708
Flottman, Wayne P.	ML13331B560	Foss, Jessine	ML13343A973
Flottman, Wayne P.	ML13346B394	Foster, Beverly	ML13340A257
Flowers, Michelle	ML13339B090	Foster, Colin	ML13343B113
Flowers, Parker	ML13343A249	Foster, Gregory	ML13340A604
Floyd, Jason	ML13344A524	Foster, Jane	ML13346A539
Floyd, Yvonne	ML13347A752	Foster, Lorraine	ML13347A359
Flynn, Charlotte	ML13344A558	Foster, Marlene	ML13346B246
Flynn, James	ML13344A234	Foster, R.P.	ML13346B124
Flynn, Kathleen	ML13339A043	Fotos, Janet	ML13344A862
Flynn, Patrick	ML13346B381	Foushee, Lea	ML13337A109
Fobes, Jeanne	ML13346B013	Fox, Carol	ML13338B105
Fodge, Doris	ML13344A867	Fox, Eleanor	ML13340A304
Fogarty, Dan	ML13343A823	Fox, Ellen	ML13347A009
Fogarty, Dan and Paula	ML13338B276	Fox, Gerald	ML13344B074
Fogel, Ken	ML13336B323	Fox, Louis	ML13338A843
Fogel, Ken	ML13340A361	Fox, Martin	ML13331B850
Fogel, Richard	ML13343A990	Fox, Vicki	ML13346A725
Fogle, David	ML13339B545	Foxall, Patricia	ML13346B062
Foley, Erin	ML13347A858	Foxhoven, Cathy	ML13343A868
Foley, Nancy	ML13347A818	Frachtman, Brianna	ML13344B095
Foley, Jr., Robert	ML13346A621	Frahm, Janene	ML13343A968
Foley, Timothy	ML13338B271	Frainaguirre, Frances	ML13331A712
Folkman, Jason	ML13347A220	Frame, Robert	ML13347B009
Follett, Carol	ML13337A123	Franchi, Irena	ML13337A876
Follette, Ann	ML13336B031	Francisco, Linda	ML13344A631
Folzer, Sandra	ML13346A429	Franck, Barbara	ML13346A530
Fondy, Jessica	ML13336B122	Franck, Matthew	ML13331B840
Fontaine, Anna Louise E.	ML13343B000	Franck, Matthew	ML13338A025
Fontana, Marie	ML13343A679	Francois-Pijuan, Corrine	ML13347A660
Fooladi, Siamak	ML13338B057	Frangakis, Nicholas	ML13331B825
Foot, Susie	ML13344A040	Frank, A.M.	ML13336B385
Foote, Sue	ML13338A879	Frank, Christine	ML13338B417
Forbes, Joel	ML13340A486	Frank, Joachim	ML13338A836
Ford, Barry	ML13331B720	Frank, Mitzi	ML13331C218
Ford, Betty	ML13344A457	Frank, Mitzi	ML13331C220
Ford, Julie	ML13336B103	Frank, Samantha	ML13347A221
Ford, Kara	ML13339B434	Frankel, Leroy	ML13344A729
Ford, Leslie	ML13347A319	Franklin, Doug	ML13344A705
Ford, IHM, Mary Ann	ML13338B277	Franklin, Ray	ML13346A416
Ford, Mr. Michael C.	ML13344A517	Frantin, Lillia	ML13347A232
Fordonski, Carol	ML13336B447	Frantz, Claudia	ML13336B136
Forest, Azima Lila	ML13339B239	Frantz, Glenn	ML13340A250
Forester, Christopher	ML13339A179	Franzen, Ellen	ML13343A775
Fork, Darin	ML13339A199	Franzmann, Paul	ML13343A394

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Frasieur, Forest	ML13344A167	Frost, Clarissa	ML13344A722
Frazier, Madelynn	ML13347A801	Frost, Martin	ML13337B231
Frazier, Shelley	ML13331B557	Frounfelter, Earl	ML13338A815
Frazier, Shelley	ML13351A171	Frumento, John	ML13339B403
Frcek, Robert	ML13344A067	Frumkin, Sherry	ML13344A589
Frech, Lisa Jo	ML13339B234	Fuchs, Hal	ML13347A551
Frederick, Lee	ML13331B659	Fuerte, Henry	ML13337B184
Fredericks, Jacqueline	ML13343B067	Fuertes, Daniel	ML13336B736
Free, Nancy	ML13339B680	Fues, Lisa	ML13339B084
Freeberg, James	ML13331B686	Fuess, Greg	ML13339B571
Freed, Dena	ML13337A935	Fuhrer, Gail	ML13336B608
Freedman, Lawrence	ML13331B834	Fuhs, Margaret	ML13346A440
Freedman, Michelle	ML13346B326	Fujii, Grant	ML13343A981
Freeman, Claudia	ML13343A240	Fujioka, Julia	ML13347A854
Freeman, Gary	ML13343A802	Fujita, Sandra	ML13340A229
Freeman, Gregory	ML13344A696	Fulk, Graham	ML13337A855
Freeman, J.	ML13347A097	Fuller, Aaron	ML13343A791
Freeman, Kyri	ML13347A240	Fuller, James	ML13337B155
Freeman, Linda	ML13343A954	Fuller, Richard	ML13340A479
Freeman, Myrna	ML13344A606	Fulps, David	ML13347A275
Freestone, Elijah	ML13337B205	Fulton, Doris	ML13336B420
Freestone, Mack	ML13338A963	Fulton, Robert	ML13331C323
Freewoman, Patricia	ML13343A668	Furlong, Patrick	ML13347A299
Freiberg, Patricia	ML13346A636	Furnish, Shearle	ML13347A771
Freibergs, Janet	ML13336B256	Fursich, Rob	ML13331B594
Freid, David	ML13337B009	Fursich, Rob	ML13347A294
Freidberg, Marianne	ML13337B408	Furst, Robert	ML13344A618
French, James	ML13344A066	Futrell, Sherrill	ML13347A467
Frenkel, Jessi	ML13340A706	Futrick, Wendy	ML13339B497
Freson, Neil	ML13339B277	Futterer, Rev. Joe	ML13343A950
Freudiger, Sabine	ML13347A066	G, Mariana	ML13344A038
Freund, Kate	ML13347A996	G., D.	ML13338B168
Frey, David	ML13331B668	G., Robert	ML13331B877
Frey, John	ML13336B214	G., S.M.	ML13343A718
Frey, John	ML13343A969	Gaab, Donna	ML13343A923
Frey, Nate	ML13343A397	Gaal, Tiffany	ML13344A109
Frey, Paul	ML13336A858	Gabriel, Candace	ML13343A332
Frey, Philip	ML13336B604	Gabriel, Robert	ML13336B230
Fried, Carmen	ML13337B495	Gabriele, Timothy	ML13344B022
Friederich, Catherine	ML13338A842	Gabrielsen, David	ML13340A428
Friedman, Clyde	ML13344A476	Gaeddert, David	ML13337A055
Friedman, Clyde	ML13346A577	Gaetano, Nick	ML13337B069
Friedman, Sarah	ML13344A011	Gaffney, Mal	ML13337B035
Friend, Deborah	ML13347A273	Gage, Frank	ML13336B374
Friessen, Michelle	ML13331B641	Gahce, Elena	ML13338A027
Friggetti, Paula	ML13347A841	Gaieck, William	ML13343A952
Fritch, Alyce	ML13337B030	Gailey, Susan	ML13340A464
Froehlich, William	ML13337B042	Gaines, Brenda	ML13344A185
Frohn, Joyce	ML13331B761	Galbavy, P	ML13336B217
Frohn, Joyce	ML13337B099	Galdo, Querido	ML13347A200

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Gale, Daryl	ML13347A763	Garfinkel, Mark	ML13339B766
Gale, Ken	ML13336B382	Garfinkel, Nina	ML13344A772
Gale, Ken	ML13343A460	Garg, Anu	ML13344A085
Gale, Michelle	ML13340A562	Garitty, Michael	ML13338A969
Galen, Ron	ML13346A556	Garmon, Jeff	ML13339B584
Gall, Gary	ML13337A864	Garner, Patrick	ML13331C223
Gallagher, George	ML13336B361	Garner-Jones, Gemini	ML13347A399
Gallagher, Sarah	ML13336B307	Garofalo, Christine	ML13343A361
Gallagher, Thomas	ML13338B031	Garrecht, Jamila	ML13340A719
Gallagher, Tim	ML13337B290	Garrett, Sheila	ML13336B577
Gallegos, Jeff	ML13344A647	Garriga, Jorge	ML13331B579
Gallicho, Monica M.	ML13339A267	Garrison, Donna	ML13339B752
Gallimore, Paul	ML13336B135	Garrison, Gail	ML13343A543
Gallipeau, Alex	ML13340A684	Garrison, Michael	ML13344A168
Gallo, Daniel	ML13347A543	Garson, J.	ML13343A334
Gallozzi, Flavio	ML13331B942	Gartsman, Herb	ML13337A840
Galo, Michelle	ML13346B566	Garvey, Lydia	ML13339B314
Galst, Liz	ML13331B695	Garwig, Liana	ML13338A039
Galst, Liz	ML13337B474	Gary, Michael	ML13344A916
Galvan, Roxanna	ML13339B295	Garza, Alvaro	ML13343A534
Gamble, Sara	ML13336B311	Garza, Ellen	ML13344A553
Gambol, Rhett	ML13337B227	Garza, Joseph	ML13339B132
Gamson, Mary	ML13344A467	Gasco, Christine	ML13339B285
Ganassi, Jill	ML13343A308	Gaskins, Danny	ML13347A386
Gandy, Nekita	ML13331B831	Gasper, Philip	ML13340A523
Gandy, Terri	ML13338A112	Gates, Nancy	ML13344A516
Gannett, M.	ML13344A355	Gattis, Doug	ML13346A322
Ganong, Sarah	ML13347A603	Gaudin, Gerard F.	ML13346A476
Gaona, Augustine	ML13338A016	Gauquier, Nancy	ML13338A764
Garber, Sandra	ML13337B432	Gay, Tammielyn	ML13340A721
Garbrick, Kathe	ML13337B166	Gaya, Alexander	ML13343B193
Garcia, Armando A.	ML13338B079	Gaylord, Steve	ML13336B365
Garcia, PhD-ABD, Ben F.	ML13343B069	Gaynor, Robert	ML13338B125
Garcia, Erin	ML13340A587	Gazzola, Linda	ML13337B424
Garcia, Linda	ML13336B722	Geary, Joan	ML13339B337
Garcia, Susan	ML13343A480	Gedutis, Wayne	ML13346A606
Garcia, Flora Pino	ML13336B528	Gee, Dee	ML13338B046
Garcia-Buñuel, Virginia	ML13336B354	Gee, Lisa	ML13347A645
Garden, Claire	ML13337B545	Gee, Paul	ML13339A278
Gardiner, P.C.	ML13337A763	Geeson, Linda	ML13339B708
Gardinerlauren, Lauren	ML13346B036	Gehman, Allan	ML13337B323
Gardner, Annah	ML13343A719	Geidel, Dr. Peter	ML13331B997
Gardner, Becca	ML13347A034	Geidel, Dr. Peter	ML13338B156
Gardner, David	ML13336B113	Geiger, Lori	ML13338A788
Gardner, Dr. A.	ML13343B075	Geiger, Richard	ML13337B114
Gardner, Mary	ML13337A729	Geiser, Becky	ML13337B143
Gardner, Nick	ML13338B326	Geist, Cathy	ML13338B463
Gardner, Susan	ML13346A615	Gelb, Sidney	ML13344B092
Garduno, Ellen	ML13331B687	Gelber, Noah	ML13347A421
Garfield, Dave	ML13344B077	Gelden, Ronald	ML13339B150

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

ADAMS		ADAMS	
Commenter	Accession #	Commenter	Accession #
Gelfand, Carol	ML13339A294	Gibson, Jim	ML13336A989
Gelineau, Michael	ML13344A215	Gibson, Jody	ML13336B046
Geller, Leslie	ML13346A628	Gibson, Jody	ML13338A922
Genasci, Jean	ML13344A998	Gibson, Sara	ML13343B198
Gendvil, Derek	ML13331B856	Gibson, Scott	ML13347A174
Gendvil, Derek	ML13346B127	Gicela, Raymond and Christine	ML13344A212
Gennarelli, Jesse	ML13339B598	Gierlach, Marian Baker	ML13343A847
Gentry, Greg	ML13336A838	Giese, Mark M	ML13347A620
Gentry, Greg	ML13339B270	Giesy, Theo	ML13344A098
Gentry, Rita	ML13347A995	Giffuni, Cathe	ML13336B603
Gentry, Rita	ML13351A180	Gigliotti, Robert E.	ML13338A957
George, Annie	ML13344A627	Gil, Karyn	ML13347A380
George, Catherine	ML13331C171	Gilardi, Gary	ML13331B581
George, Catherine	ML13343A486	Gilbert, Armida	ML13344B106
George, Diane	ML13344A459	Gilbert, Camille	ML13336B082
George, Meredith	ML13346A540	Gilbert, Camille	ML13337B307
Gerbitz, Gordon	ML13336B086	Gilbert, Camille	ML13338B252
Gerhardt, Allen	ML13339B420	Gilbert, David	ML13331C066
Gerhold, Kelly	ML13338A931	Gilbert, Judith	ML13339B152
Gerke, David	ML13331B634	Gilbert, Karen	ML13343B033
Gerke, David	ML13339B156	Gilbert, Sheldon	ML13337A053
Germanotta, Betsy	ML13337A955	Gilbert, Stephen	ML13337A711
Germino, Virginia	ML13331B895	Gilbert, Suzanne	ML13337B524
Gerrard, Ron	ML13343A447	Gilbert, Valerie	ML13331B901
Gerresheim, Patricia G.	ML13340A364	Gilbert, William	ML13337A688
Gersman, Steven	ML13339A160	Gilbert, William	ML13344A281
Gervais, Julie	ML13338A861	Gilbreath, Edythe	ML13336B263
Gervais, Julie	ML13343A610	Giles, Sally	ML13331C316
Gervase, Lucille	ML13331B712	Giles-Straight, Carol	ML13343A677
Getz, Jayce	ML13339B440	Gill, Ayesha	ML13340A447
Geurkink, Sue	ML13346B533	Gill, Glenn	ML13346A327
Gfroerer, Lee Anne	ML13336A901	Gill, Kathryn	ML13346A317
Gharazeddine, Laura	ML13346A819	Gill, Sharon	ML13343B012
Ghenoiu, Paul	ML13347A562	Gill, Susan	ML13337A758
Gherardi, Lisa	ML13331C185	Gill, Susan	ML13346A399
Gherardi, Lisa	ML13339A041	Gillen, Christine	ML13336B088
Gholson, Sheila	ML13331B955	Gillespie, Ellie	ML13343A936
Gholson, Sheila	ML13338A088	Gillespie, Sharon	ML13336B223
Gholson, Sheila	ML13338A976	Gillespie, Sharon	ML13339A000
Giamanco, Janet	ML13339B557	Gillespie, Thomas	ML13343A607
Gianantoni, Maryann	ML13346B398	Gillett, Julia Marie	ML13331C262
Gibb, Ken	ML13346A350	Gillham, Edgar	ML13338A977
Gibb, Robert	ML13339A052	Gillham, Edgar	ML13344A700
Gibb, Wayne	ML13331C225	Gilliam, James W.	ML13339B256
Gibb, Wayne	ML13339B596	Gillis, Nancy	ML13343A326
Gibberman, Pamela	ML13347A812	Gilman, Meg	ML13331A656
Giblin, Thomas	ML13339A078	Gilmore, Thomas	ML13336B249
Gibson, Alison	ML13337B387	Gilroy, Arthur	ML13331B829
Gibson, Bruce	ML13347A266	Gilroy, Arthur	ML13346B327
Gibson, Irene	ML13337A044	Gindele, Abigail	ML13344A466

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Giner, Germain	ML13338A029	Golata, Grace	ML13337A018
Gingrich, Nancy	ML13339B345	Gold, Carol	ML13343A698
Ginn, Dana	ML13337A113	Gold, Jeff	ML13343A242
Ginsburg, Stephen	ML13338B077	Gold, Leslie	ML13337B352
Gioia, Sarah	ML13347A492	Gold, Toni	ML13347A001
Gioseffi-Luttinger, Daniela & Lionel	ML13336B468	Goldberg, Hannelore	ML13343A994
Gioseffi-Luttinger, Daniela & Lionel	ML13337A879	Goldberg, Rich	ML13343B002
Gipple, Angela	ML13339A265	Goldin, Susan	ML13346A410
Gittelman, Patricia	ML13338B180	Golding, John	ML13346A358
Giugni, Natalina	ML13331B772	Goldmacher, Suzi	ML13331A689
Givers, David	ML13331C179	Goldman, Audrey	ML13347A253
Gladish, Christine	ML13337B316	Goldman, Daniel	ML13344A367
Gladish, R.	ML13346A840	Goldman, Jean	ML13339A279
Glanzman, Kiwibob	ML13331C077	Goldman, Steven	ML13343A599
Glanzman, Kiwibob	ML13346A571	goldman, Stuart	ML13346B165
Glaser, Helene	ML13347A018	Goldman-Hull, Sergi	ML13337B567
Glass, Richard	ML13339A125	Goldsmith, D.	ML13343A613
Glasser, Mark and Susan	ML13347A067	Goldsmith, Patricia	ML13337A100
Glasser, Mark and Susan	ML13347A068	Goldstein, Freya	ML13337B529
Glasser, Paul	ML13347A081	Goldstein, Leslie	ML13340A288
Glassman, Jean	ML13346B501	Goldstein-Dea, Pilar	ML13336B296
Glaston, Joe	ML13337B101	Golinveaux, Joseph	ML13339A001
Glavina, Vesna	ML13336A982	Gollobin-Basta, Ruth	ML13347A821
Glazar, MaryAnne	ML13338B383	Gomel, Michael	ML13337A890
Glenn, Teri	ML13336A922	Gomes, K.	ML13344A610
Glick, Art	ML13339A147	Gomez, Hannah	ML13344A913
Glick, Mike	ML13337A150	Gomez, Jorge I.	ML13339B095
Glick, Mike	ML13337A712	Gomolka, John	ML13343A505
Glidden, Jeff	ML13340A353	Gong, Sharon	ML13346A564
Gliem, Deke	ML13344A293	Gonigam, Phyllis	ML13338A004
Glier, Ingeborg	ML13337B354	Gonzales, George	ML13344A080
Gliva, Stephen	ML13331B905	Gonzales, J.L.	ML13347A352
Gliva, Stephen	ML13346A625	Gonzales Jr., Frank	ML13347A000
Glombiak, Joseph	ML13338B199	Gonzalez, Elisa	ML13337B425
Gloor, Prisca	ML13344A950	Gonzalez, Jorge	ML13338A829
Gloss, Glenda	ML13336B322	Gonzalez, Maria	ML13338B310
Glover, Julia	ML13343A853	Gonzalez, Yazmin	ML13339A006
Glover, Robert	ML13343A766	Good, Barbara	ML13344A349
Gluck, Erma	ML13331B787	Good, Caroline	ML13331B559
Goedhart, Hester	ML13331C161	Good, Joyce	ML13331B730
Goesten Kors, Tracy	ML13331B740	Goodale, Martha	ML13339A558
Goetting, Jeff	ML13346B355	Goode, Beth	ML13339B170
Goetz, Linda	ML13343B151	Goodin, Ben	ML13344A478
Goetzl, Randall	ML13339B227	Goodin, Dale	ML13347A576
Goff, Frances	ML13340A504	Goodman, Ellen	ML13336B079
Goff, Karyn	ML13339B147	Goodman, Margaret	ML13347A934
Goggins, Alan	ML13344A639	Goodman, Sidney	ML13346B283
Goin, Wayne	ML13339B331	Goodman, Willard and Joyce	ML13338B066
		Goodson, Sally	ML13337B168
		Goodstone, Sandra	ML13331C104

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Goodstone, Sandra	ML13339B725	Graham, Judith	ML13344A927
Goodwin, Elizabeth	ML13339B686	Graham, Justin	ML13346B310
Goodwin, Liberty	ML13331C303	Graham, Stephen	ML13337B410
Goodwin, Sheryl	ML13347A519	Graham, Vince	ML13346A792
Goodwin, Thomas	ML13344A088	Grajczyk, Joyce	ML13331C221
Goodwyn, Kahlil	ML13339B633	Graley, James	ML13339B005
Gordanier, Anna	ML13331B636	Granado, Andreina	ML13347A792
Gordon, Alexandra	ML13339B526	Grande, Paula	ML13347A712
Gordon, Bradley	ML13337A034	Grant, Keeley	ML13346B278
Gordon, Carol	ML13347A632	Grant, Troy	ML13331C176
Gordon, Christopher	ML13347A510	Grattino, Dawn	ML13340A640
Gordon, Joel	ML13331B530	Graubner, Gabriel	ML13343A477
Gordon, Joel	ML13331B532	Graver, Chuck	ML13339B400
Gordon, John	ML13344A926	Graves, Caryn	ML13331B618
Gordon, Judith	ML13338B191	Graves, Caryn	ML13337A844
Gordon, Julia	ML13339B334	Graves, Caryn	ML13339A258
Gordon, Laura	ML13346A652	Graves, Paul	ML13336B057
Gordon, Rick	ML13338A042	Graves, Ron	ML13336B024
Gordon, Scott	ML13337B085	Gray, Alison	ML13346A668
Gordon, Steven	ML13347A513	Gray, Brian	ML13347A080
Gore, Jean	ML13331B980	Gray, Charles	ML13338A059
Gorges, Robin	ML13339B001	Gray, Dennis	ML13339B388
Gorman, Bonnie	ML13340A494	Gray, H.	ML13347A777
Gormley, Vincent	ML13338A034	Gray, Jon	ML13343A951
Goslin, Diana	ML13344A358	Gray, Karen	ML13343A646
Gosnell, Lisa	ML13336B222	Gray, Sylvia	ML13343B049
Gosnell, Lisa	ML13343A497	Graziano, Laura	ML13346A851
Goss, Alice	ML13346B276	Graziosa, Anthony	ML13338A037
Gossard, Harvey	ML13338A054	Grearson, Arlynnne	ML13346B463
Gosselin, Paula	ML13343A353	Greaves, Denise	ML13336B513
Gosztonyi, Kevin J.	ML13344A588	Greaves, Lee Ann	ML13343A300
Gotjen, Deidre	ML13344A905	Grebanier, Marian	ML13336B417
Gottschalk, Eileen	ML13337A922	Greco, Elisa	ML13344A977
Gotvald, Mark	ML13331A600	Greeman, Julie	ML13337A028
Goudeau, Terry	ML13344A757	Green, Alice	ML13331C157
Gourley, Thomas	ML13337B112	Green, Alice	ML13339A291
Gover, Pat and Gary	ML13336B261	Green, Carl	ML13346A599
Gowens, Edward	ML13347A284	Green, Carol	ML13346A470
Goyetche, Paul	ML13339A210	Green, Daniel	ML13338B088
Grace, Joel	ML13339B595	Green, Donna	ML13336B680
Grace, Lise	ML13343A829	Green, Gale	ML13347B000
Grad, Ruby	ML13339A552	Green, Haley	ML13337B167
Graffagnino, Mary Ann and Frank	ML13344A946	Green, Jeane	ML13347A787
Graffell, Jess	ML13343A757	Green, Jeanne	ML13337A697
Graffin, Jeanne	ML13347A864	Green, Kristin	ML13338B124
Graham, Charlie	ML13337A945	Green, Rhonda	ML13340A584
Graham, Clayton	ML13347A099	Greenawalt, Lee	ML13336B525
Graham, Daniel	ML13339B452	Greenberg, Alfred and Esther	ML13336B424
Graham, Daniel	ML13347A840	Greenberg, Allen	ML13343A259
Graham, Jennifer	ML13343A476	Greenberg, Cory	ML13336B350

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Greenberg, Stephen	ML13336B193	Gritter-Dorr, Jacob	ML13346A498
Greenburg, Dan	ML13344B038	Groenendaal, Susanne	ML13339A283
Greenburg, Stuart	ML13340A333	Gromoll, Norda	ML13339A184
Greene, Amy	ML13344A535	Gromoll, Norda	ML13347A633
Greene, Becci	ML13331B623	Gronemeyer, Kim	ML13346B352
Greene, Becci	ML13338A767	Groob, Mike	ML13339B432
Greene, Edward	ML13339B691	Groot, Henriette	ML13337A766
Greene, Sid	ML13351A194	Groot, PhD, Henriette	ML13331C078
greenhut, Martin	ML13338B010	Grose, Harriet	ML13337B160
Greenland, Deborah	ML13331B614	Grosh, Barbara	ML13336B190
Greenough, Patricia	ML13339B485	Grosh, Barbara	ML13338A956
Greensfelder, Andy	ML13338B037	Grosh, William	ML13336B349
Greensfelder, Jean	ML13339A011	Groshardt, Joanne	ML13343B144
Greensfield, Zvika	ML13346B006	Grossi, Nancy	ML13344A062
Greenstein, Becca	ML13343A398	Grossi, Nancy	ML13344A063
Greenwald, Ken	ML13336B118	Grossman, Kathleen	ML13338B089
Greenwald, Ken	ML13344A184	Grote, William	ML13343A818
Greenwell, Lloyd	ML13347A744	Grotegut, Kate	ML13338A118
Greenwood, Ken	ML13340A406	Grubb, Angie	ML13346A507
Gregory, Michael	ML13338A060	GRubbs, Russ	ML13338A982
Gregory, Probyn	ML13336B146	Grubbs, Victoria	ML13347A104
Gregory, Probyn	ML13343A604	Grunwald, Vicki	ML13336A929
Gregory, Probyn	ML13343A764	Gryk, D.	ML13344A749
Greinke, Pamylle	ML13331B725	Guchi, Tanya	ML13339B700
Grenard, Mark Hayduke	ML13336B225	Guest, Kathy	ML13337A825
Grey, Sylvan	ML13346B226	Guh, H.	ML13337B065
Grey, Sylvan	ML13346B234	Guida, Patricia	ML13336B602
Greywolf, Lawrence	ML13346A516	Guillard, Lori	ML13340A611
Grib, Dawn	ML13339B353	Guillermo, Ma. Elena	ML13338B330
Gribble, C.	ML13347A082	Guinan, Valerie	ML13338B084
Grieco, Mercy	ML13338B377	Gulledge, Jon	ML13339B449
Griesedieck, Carroll	ML13347A838	Gulledge, Nadia	ML13336B011
Griffin, Arlene	ML13331A702	Gunther, Ken	ML13331C168
Griffin, Edith	ML13347A641	Gunther, Peter	ML13331B672
Griffin, Gregory	ML13340A715	Gunther, Peter	ML13337A816
Griffin, John	ML13339B289	Gunther, Peter	ML13337A894
Griffin, Robert	ML13343A932	Gunther, Peter	ML13347A541
Griffin, William	ML13346B450	Gunther, Robert	ML13346B369
Griffith, Jennifer	ML13336A851	Gupton, William	ML13344A383
Griffith, Matt	ML13347A214	Gurley, Marianne	ML13338B128
Griffith, Nancy R.	ML13344A820	Guskin, Amy	ML13346B371
Griffith, Phoebe	ML13338A794	Gussow, Joan	ML13346B322
Griffith, Yvone	ML13337B460	Gustafson, Gilda	ML13339B408
Griffith, Yvone	ML13337B482	Guth, Julie	ML13344A854
Grillo, John	ML13339B674	Guthrie, Cathy	ML13336A984
Grimes, Letitia	ML13344A874	Guthrie, Cathy	ML13340A248
Grindle, Russell	ML13343A948	Guthrie, Elizabeth	ML13331C140
Grinthal, Scott	ML13346B556	Guthrie, Elizabeth	ML13339B695
Griskaite, Vaiva	ML13337B297	Guthrie, Harvey H.	ML13346B040
Griswold, Tracy	ML13339B654	Guthrie, Iain M.	ML13338B436

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Gutierrez, Nancy	ML13339B151	Hall, Roger	ML13336B306
Gutierrez El, Cesar	ML13346A979	Hall, Zack	ML13339B324
Gutleber, Michael	ML13346B532	Hallal, Thomas	ML13339A128
guyette, michael	ML13346A740	Haller, Maggie	ML13344A081
Gwozdziwycz, Jeremiah	ML13340A255	Halligan, Marcia	ML13346B250
Gyatso, Lama-Jigme	ML13338A765	Hallman, Janice	ML13331B906
Gyncild, Brie	ML13344A891	Hallow, Leah	ML13339B130
h, Barbara	ML13347A012	Halperin, Hagit	ML13338B444
H, Michael	ML13346B261	Ham, B.	ML13343A985
H., S.	ML13339B765	Hamby, Joy	ML13331C191
H., T.	ML13337A985	Hamilton, Abby	ML13346B010
Haas, Erica	ML13346B445	Hamilton, Jeremy	ML13338A926
Haas, Evelyn	ML13331B882	Hamilton, Sarah	ML13336B004
Haas, Evelyn	ML13344A511	Hamlin, Jack	ML13344A600
Haase, Roger	ML13344A743	Hamlin, Lu	ML13346B451
Habas, Janet A.	ML13344A685	Hamlin, Randall	ML13339B338
Hackett, Ian	ML13344A135	Hammack, Penny	ML13338B323
Hackett, Lakshmi	ML13336B284	Hamme, Robyne	ML13346A292
Hackney, Stephen	ML13344A513	Hammel, John	ML13346B443
Hadaway, Peggy	ML13347B029	Hammer, Tatum	ML13339B325
Hade, Michaeline	ML13331B991	Hammond, David	ML13346B081
Hafer, Sarah	ML13337B224	Hammond, Marcella	ML13338B146
Hafner, Amanda	ML13339A048	Hammond, Ryan	ML13337B220
Hagele, Bob	ML13344A099	Hampton, Hazel	ML13346A755
Hagerty, M.C.	ML13339B467	Hampton, Hugh	ML13331B957
Haggard, Alan	ML13337B517	Hampton-Hunt, Laurel	ML13339A290
Haggard, Alan	ML13338B070	Hancock, Jonathan	ML13339A077
Hague, George	ML13340A601	Hancock, Roger	ML13338B176
Hahn, Gina	ML13339B370	Hand, David	ML13347A806
Hahn, John and Janice	ML13336B674	Hand, Susan	ML13338A850
Hahn, John and Janice	ML13344A427	Handelsman, Robert	ML13331B969
Haider, Paul	ML13347B011	Handford, Janet	ML13336B061
Haim, Carla	ML13331B965	Handler, Doug	ML13347A917
Haim, Mark	ML13336B381	Handwerker, Steven	ML13336B097
Haines, Roselene	ML13336A873	Hanks, Laura	ML13347A476
Haines, Shauna	ML13340A440	Hanmer, Jalna	ML13336B509
Halbedel, Tricia	ML13347A808	Hanna, Helen	ML13331C205
Halberg, Kathleen	ML13337B094	Hanna, Jeannette	ML13343A383
Halbert, Jen	ML13338B098	Hanna, Mary	ML13347A782
Halbig, James A.	ML13339A050	Hanneman, Paul	ML13346B066
Haley, Jim	ML13346B170	Hanrahan, Debby and John	ML13337B388
Haley, Nathan	ML13344A333	Hansen, Arthur	ML13365A130
Halgat, Billy	ML13343A645	Hansen, Gary	ML13331C189
Halinen, Jeremy	ML13346B218	Hansen, John	ML13339B381
Hall, Anthony	ML13346A281	Hansen, Marcus	ML13336B212
Hall, Carl	ML13347A768	Hansen, Michelle	ML13339B393
Hall, Linda	ML13338B078	Hansen, Mike	ML13346A727
Hall, Michael	ML13347A982	Hanson, Art	ML13336B500
Hall, Robert	ML13331C173	Hanson, Edward	ML13336B023
Hall, Robert	ML13343B064	Hanson, Edward	ML13339B533

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Hanson, Jody	ML13336B423	Harris, Zoe	ML13343A707
Hanson, Judy	ML13339B761	Harrison, Catherine	ML13346B390
Hanson, Mary	ML13337A127	Harrison, Guy	ML13344A764
Hanson, Natalie	ML13336B540	Harrison, Jeane	ML13337B142
Hanson, Phil	ML13336B268	Harrison, Lisa	ML13339B293
Hanus, Jeffry	ML13339B080	Harrison, Nathaniel	ML13344A758
Hanway, Katherine	ML13337B415	Harrison, William	ML13347A023
Hanzel, Milton	ML13337B148	Hart, Matthew	ML13339B204
Hara, TJ	ML13346A583	Hart, Pete	ML13346B340
Hardack, Richard	ML13338B177	Harting, Abha	ML13347A719
Harder, Gregory	ML13344A534	Hartle, Alison	ML13346A712
Harder, Kate	ML13337B526	Hartley, Rick	ML13346B521
Hardin, Ray	ML13347A807	Hartman, Kathy	ML13347A749
Hardwicl, Barbara	ML13336B478	Hartman, Megan	ML13339B582
Hardwicl, Barbara	ML13343A738	Hartman, Nancy	ML13344A018
Hardy, Linda	ML13331B684	Hartman, Randall	ML13347A956
Hargraves, Mark	ML13343A664	Hartmann, Lorraine	ML13336A832
Hargrove, David	ML13344A395	Hartnett, Erin	ML13344A594
Harkins, Joanne	ML13337A002	Hartray, Alexander	ML13346B085
Harlan, Miriam	ML13339A272	Harvey, Ian	ML13337B252
Harlan, Rick	ML13336B443	Harvey, Jef	ML13331B894
Harlan, Rick	ML13337A728	Harvey, Joyce	ML13347A563
Harland, Donald	ML13339A993	Harvey, Richard	ML13338B376
Harley, Betts	ML13338B073	Harvey, Sarah	ML13338B285
Harlow, Linda	ML13339B581	Harvey, Sarah	ML13338B287
Harmeyer, Brian	ML13338B115	Harvey, Sarah	ML13346B526
Harmon, Heidi	ML13337A116	Harvey, Travis	ML13343A373
Harmon, Heidi	ML13337B149	Harvey-Shea, Frankie	ML13340A322
Harney, James	ML13346B270	Harville, Av	ML13340A624
Harnisch, Susan	ML13336B143	Harwood, Katlin	ML13346A365
Harper, Barbara	ML13346A883	Hasemeier, Mary Jane	ML13337B321
Harper, Wende	ML13337A721	Hasenhuttl, Claudia	ML13337B083
Harper, Wende	ML13337B045	Hashman, Mark	ML13340A387
Harrell, Charles	ML13338B082	Haslag, Robert	ML13343A252
Harrell, Roger H.	ML13331B549	Hasselbrink, Robert	ML13336B549
Harrell, Roger H.	ML13344A342	Hasselbrink, Robert	ML13344A449
Harrell, Ron	ML13337B271	Hastings, Casey	ML13344A050
Harrell, William	ML13331B754	Hatfield, Barry	ML13336B251
Harriman, Frances	ML13344A379	Hatfield, Barry	ML13343A443
Harrington, Pamela	ML13346B241	Hatfield, Pamela	ML13343A348
Harris, Carolyn	ML13347A652	Hathaway, Susan	ML13337B431
Harris, David	ML13340A565	Hatmaker, Jayleen	ML13344A393
Harris, Jennifer	ML13347A630	Hatton, John	ML13337A896
Harris, John	ML13343A548	Hatton, Kathlen	ML13339B251
Harris, Norma	ML13337A998	Hauck, Barbara	ML13331B699
Harris, Peter	ML13343B186	Hauck, Kelsey	ML13343A597
Harris, Rosemary	ML13339A189	Hauck, Molly	ML13336B267
Harris, S	ML13344A385	Hauck, Molly	ML13340A227
Harris, Zoe	ML13336B430	Hauer, Martha	ML13343A726
Harris, Zoe	ML13343A706	Hauft, Claudia	ML13331B773

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Haugen, Lisa	ML13347A593	Hebert, Ryan	ML13347A688
Haupt, Carolyn	ML13337B557	Hebert, Ryan	ML13347A689
Havan, Artineh	ML13347A512	Heckendorn, Sherrie	ML13331B844
Havassy, Nancy	ML13344B014	Heckerroth, Stephen	ML13331B597
Havel, Timothy	ML13344A282	Hedberg, Eva	ML13344A721
Haverkamp, Patricia	ML13343A459	Hedgecock, James	ML13336B327
Hawk, Carolyn	ML13331C060	Hedrick, Suzanne	ML13336B234
Hawkins, Don	ML13339B004	Hedrick, Suzanne	ML13343A395
Hawkins, Paul	ML13339B257	Heenan, David	ML13338B437
Hawkins, Salome	ML13339B448	Heermans, James	ML13338B159
Hawks, Charles	ML13344B001	Heffernon, Susan	ML13339B549
Hawkshead, Jay	ML13347A170	Hegeman, D. Eli	ML13331A604
Hawley, Erica	ML13346B292	Hegner, John	ML13336B506
Hay, Alys	ML13337B145	Heide, Andra	ML13336B269
Hay, Carol	ML13344A361	Heideman, Judith	ML13337B384
Hay, Karen and Jeff	ML13338B095	Heilborn, Daniel	ML13344A603
Hay, Victoria	ML13336B406	heilman, sue	ML13347A770
Hay, Victoria	ML13347A658	Heimerman, Robin	ML13343B058
Hayakawa, Erica	ML13343A435	Hein, Mark	ML13336B472
Hayasaka, Kiyo	ML13337A827	Heinlein, Philip	ML13337A126
Hayden, Bruce	ML13337B428	Heinlein, Philip	ML13339B528
Hayden, Debbie	ML13337B406	Heinold, Christian	ML13331B626
Hayes, David	ML13339B489	Heinold, Christian	ML13339B464
Hayes, Jennifer	ML13337A741	Heinrich, Hans-Peter	ML13347A783
Hayes, Jennifer	ML13346B511	Heintz, Penny	ML13339B618
Hayes, Joseph	ML13346B479	Heist, Roberta	ML13337B040
Hayes, Ken	ML13338B426	Held, Carol	ML13338A075
Hayes, Sarah	ML13344A372	Helenchild, Liz	ML13336B485
Hayes, Tim	ML13339B350	Helenchild, Liz	ML13340A251
Hayes, Veronica	ML13351A181	Hellemn, Bruce	ML13339A023
Hayward, Mike	ML13337A887	Hellewell, Tacey	ML13337B153
Hazeltine, Prescott	ML13339B395	Helman, Elliot	ML13343B129
Hazelton, Judith	ML13337A010	Helmon, John	ML13331A655
Hazlett, Pat	ML13346B209	Helmore, Kristin	ML13339B286
Hazynski, Chris	ML13338B227	Hemmendinger, Ross	ML13343A887
Head, Ashley	ML13339A550	Hemmings, Daria	ML13346A817
Head, Jonnie	ML13336A839	Hemmingsen, Karin	ML13346B480
Head, Kris	ML13343B087	Hempel, Drew	ML13331C266
Head, Zona	ML13339A141	Henderson, Diana	ML13347A731
Heady, Paula	ML13344A811	Henderson, Doris	ML13337B266
Heald, Mark	ML13336B651	Henderson, J. Michael	ML13343A262
Heald, Mark	ML13337B284	Henderson, Julie	ML13346A872
Healey, Shannon	ML13336B367	Henderson, Lynn	ML13336B372
Heaning, Richard	ML13337B564	Henderson, Lynn	ML13347A358
Hearne, Ray	ML13337A086	Henderson, Martin	ML13338A928
Hearthstone, Bonnie	ML13346B168	Henderson, Nancy	ML13346B428
Heartson, Dorian	ML13331B545	Henderson, Robert	ML13347A720
Heath, Matthew	ML13346A895	Henderson, Steven	ML13346A370
Hebberger, Jo Anna	ML13346A316	Henderson, Tania	ML13346A991
Hebert, Ryan	ML13347A687	Hendricks, Diane	ML13338A753

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Hendricks, Phyllis	ML13344A552	Hicklin, Mary	ML13340A496
Hendricks, Richard	ML13347A295	Hicks, Christine	ML13340A192
Hendrickson, Nancy	ML13343A748	Hicks, Tom	ML13344B115
Henley, Charlene	ML13347A238	Hieber, Jr., L.D.	ML13337A973
Henline, Kathi	ML13339A049	Hiestand, Nancy	ML13337A070
Hennessy, Martha	ML13331B780	Higashi, Rico	ML13343A569
Hennings, Deirdre	ML13339B073	Higgins, Bob	ML13337B242
Henry, Anne	ML13339B248	Higgins, Dennis	ML13331B943
Henry, Carole	ML13340A426	Higgins, Michael	ML13344B071
Henry, Christopher	ML13346B420	Highfill, Debbie	ML13337A769
Henry, Devin	ML13331B553	Hildebrand, Ronald	ML13339B019
Henry, Devin	ML13337A893	Hildebrandt, Joel	ML13339B443
Henry, Lillian	ML13343A849	Hildebrandt, Todd	ML13339B383
Henry, Lyle	ML13343A290	Hildt, Barbara	ML13339B501
Henry, Mallika	ML13344A262	Hill, David	ML13336B049
Henry, Paul	ML13343A232	Hill, James	ML13343A385
Hensley, Gregory	ML13337B265	Hill, Janice	ML13347A146
Henson, Lana	ML13340A687	Hill, Kenneth	ML13347A248
Hepler, Juanita	ML13338B229	Hill, Michael and Barbara	ML13346B541
Herbener, Rachel	ML13336B331	Hill, Robert	ML13346A638
Herbers, Jill	ML13337B006	Hill, Wendolyn	ML13343A507
Herbert, Frank	ML13338A820	Hillard, Dale	ML13339B184
Herbert, Jan	ML13346B105	Hillen, Melissa	ML13353A194
Herbin, Richard	ML13331B640	Hillman, Holly	ML13340A403
Herke, PhD, William	ML13336B144	Hills, Arthur	ML13347A656
Herman, Bill	ML13338B454	Hills, Elizabeth	ML13337A988
Herman, Chris	ML13336B448	Hillson, Miriam	ML13343A595
Herman, Scott	ML13344A779	Himes-Powers, Susan	ML13340A657
Herman-Minsk, Hetty	ML13339B280	Hink, Lani	ML13347A631
Hermanns, David	ML13343A941	Hinkson, Jeremy	ML13339A253
Hermstad, Andre	ML13338B398	Hinshaw, Ann	ML13347A172
Hern, A.L.	ML13337B137	Hinson, Rodney	ML13338B400
Hernandez, Maria Elena	ML13343A891	Hinzpeter, Susan	ML13331C277
Hernandez, Steve	ML13347A678	Hipp, James	ML13343B021
Hernly, Barbara	ML13337B435	Hirashiki, Cora	ML13343B095
Herold, Ana	ML13337A997	Hirsch, Catherine	ML13336A842
Herr, Jo Ann	ML13338B133	Hirsch, Robin	ML13344A660
Herrington, Marna	ML13338A916	Hirshfield, Jeanne	ML13339B264
Hersch, Steve	ML13346A459	Hiseley, Michelle	ML13340A469
Hersh, Paul	ML13337B054	Hitchcock, Gary	ML13336B346
Herther, James	ML13346B482	Hite, George	ML13331C170
Herz, Randy	ML13346A663	Hittel, Kenneth	ML13337B336
Hess, Carla	ML13337A943	Hitz, Janet	ML13337B162
Hess, Ella	ML13344A536	Hladky, Adrian	ML13347A112
Hess, John	ML13337A987	Hlat, Mike	ML13347A219
Hesselinmk, Joanne	ML13337B522	Ho, Jennifer	ML13331B635
Hewes, William	ML13346B111	Ho, Jennifer	ML13347A073
Hewett, Heather	ML13344A910	Ho, Michael	ML13340A256
Heyneman, John	ML13343A416	Hoag, Lisa	ML13337A804
Hiatt, Joseph	ML13337A777	Hoagland, Dona	ML13337A027

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Hoar, Joseph	ML13337A785	Holland, Brett	ML13347A109
Hoar, Joseph	ML13347A715	Holland, John	ML13346B571
Hobbs, Carol	ML13346B126	Holland, Mara	ML13337B455
Hobbs, Steven	ML13336A876	Hollenbeck, Margaret	ML13336B273
Hobyan, Andreas	ML13337A051	Hollier, David	ML13339A024
Hochberg, Adrienne	ML13344A718	Hollinger, Patricia	ML13338B408
Hochberg, Charles	ML13340A701	Hollow, Anthony	ML13337B053
Hochberg, Charles	ML13343B028	Holmdahl, K.	ML13338A103
Hochberg, Charles	ML13343B044	Holmes, Andre	ML13347A361
Hochberg, Miriam	ML13347A010	Holmes, Andre	ML13347A518
Hochheiser, Harry	ML13336B128	Holmes, David	ML13338B279
Hochheiser, Harry	ML13340A237	Holmes, Howard H.	ML13339A223
Hochstetler, Jim	ML13343A465	Holsten, Donna	ML13340A583
Hockley, Glena	ML13346A921	Holt, Bill	ML13346A299
Hockley, Jessica	ML13343A330	Holt, Kendra	ML13343B197
Hodapp, Natalie	ML13336B309	Holt, Rhonda	ML13344A226
Hodapp, Natalie	ML13347A534	Holt, Roberta	ML13346A622
Hodapp, Natalie	ML13347A535	Holt, Sandra	ML13346B497
Hodes, Harold T.	ML13331B570	Holthaus, Tracy	ML13346B118
Hodges, Elizabeth	ML13344A598	Holtz, Sue	ML13339B062
Hoef-Bouchard, Fran	ML13344A264	Holtzman, Jed	ML13343A669
Hoefnagels, Julie	ML13336B630	holzberg, steve	ML13347A826
Hoehn, Jr., James	ML13338B164	Homan, Peter	ML13337B074
Hoemig, G. Thoma	ML13344A206	Homer, Deanna	ML13339A022
Hoening, Irwin	ML13337B347	Hondros, Maria	ML13331C100
Hoerner, Dennis	ML13336B351	Honsa, William	ML13343A355
Hoess, Joseph	ML13336B055	Hood, Joseph	ML13339B398
Hoess, Joseph	ML13343A648	Hood, Nick	ML13343A793
Hoex, Christine	ML13346B232	Hood, Shelby	ML13340A415
Hoff, Marilyn	ML13331C196	Hoodwin, Marcia	ML13336B673
Hoff, Marilyn	ML13347A511	Hoodwin, Marcia	ML13343A848
Hoffman, OFM, Fr. Jim	ML13337A136	Hook, Kristin	ML13365A123
Hoffman, Nancy	ML13343A317	Hoover, Michael	ML13339B063
Hoffman, Nancy	ML13365A129	Hope, Jane	ML13331B678
Hoffman, Sharon	ML13339B609	Hope, Jane	ML13338A855
Hoffman, Tuesday	ML13355A305	Hope, Katherine	ML13346A804
Hoffman, Virginia	ML13344A463	Hope, Laurie	ML13347A820
Hoffmann, Carl	ML13339B648	Hopkins, Alexandra	ML13346B098
Hoffmann, William	ML13346B434	Hopkins, Carol	ML13340A631
Hogan, Michael	ML13339B316	Hopkins, Jeff	ML13343A544
Hogarth, Mark	ML13343A451	Hopkins, Kirsten	ML13338A019
Hogg, Mary Frances	ML13343A860	Hopkins, Mary	ML13338B112
Hohn, Greg	ML13343B100	Hopkins, Miles	ML13337A752
Hohn, Thomas	ML13339A039	Hopkinson, Natasha	ML13339B339
Hokenson, Terry	ML13337A687	Hoppenbrouwers, Elke	ML13336B131
Holcomb, William, Margaret, and Scott	ML13331A660	Hormuth, Christine	ML13344A209
Holden, Sam	ML13347A790	Horn, Karen	ML13336A973
Holder, Elaine	ML13337A836	Horn, Roger	ML13344A303
Holford, Sharon	ML13337B418	Hornby, Mara	ML13343A339
		Horne, Shari	ML13340A535

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Horowitz, Terry	ML13346B540	Huelsberg, Carole	ML13343A644
Horowitz, Laura	ML13343A641	Huenefeld, Mary-Alyce and Carl	ML13338B245
Horsburgh, Suzanne	ML13339B155	Hufnagel, Glenn	ML13344A963
Horst, Amy	ML13337B095	Hughes, Bonita	ML13339B550
Horst-Kotter, William	ML13344A230	Hughes, John	ML13331C178
Horstmeier, Robb	ML13347A561	Huling, Phil	ML13340A718
Horwitz, Lillian	ML13339B200	Hull, Ace	ML13344A970
Horwitz, Lillian	ML13339B201	Hulse, Alvin	ML13344A628
Horwitz, Lucy	ML13338A805	Hulstrunk, Matthew	ML13337A005
Hosek, Ruth	ML13331B664	Hummasti, Arnie	ML13344A028
Hoskam, Susan	ML13337A021	Hummel, Erica	ML13346B486
Hosley, James	ML13338B464	Hung, Shiu	ML13331B738
Hoteling, Tracy	ML13338A748	Hung, Shiu	ML13337A880
Hougham, Tom	ML13336B614	Hungate, Nona	ML13346A780
Houghton, Natalie	ML13336B002	Hungerford, Rhonda	ML13337A120
Houghton, Sibby	ML13336A826	Hunt, Anita	ML13339B756
Houle, Melissa	ML13340A417	hunt, Barbara	ML13346B343
House, Michael	ML13343A432	Hunt, Catherine	ML13339B516
Houser, Susan	ML13346A595	Hunt, Dan	ML13343A438
Houston, Mandi	ML13347A447	Hunt, Myphon	ML13344A300
Howard, Bobbie	ML13339A209	Hunter, Dianne	ML13339A075
Howard, Carl	ML13337B244	Hunter, Elizabeth	ML13336A966
Howard, Celeste	ML13336B634	Hunter, Jacki	ML13347B008
Howard, Eileen	ML13331B808	Hunter, Shannon	ML13337A899
Howard, Jeanne	ML13339B657	Huntington, Stephanie	ML13339B247
Howard, Jessica	ML13346B474	Huntoon, Kristin	ML13346B568
Howard, John	ML13346B279	Huntsman, Carol	ML13340A431
Howard, Jonathan	ML13346A332	Hupperts, Connie	ML13343A561
Howard, Livya	ML13346B272	Hurley, Bethany	ML13347A871
Howard, Livya	ML13346B273	Hurley, Linda	ML13343A949
Howard, Lucy	ML13337A047	Hurley, Mark	ML13344A629
Howatt, Bill and Laurel	ML13346B094	Hurstun, Ronald	ML13336B233
Howe, Linda	ML13344A720	Hurwitz, Jeffrey	ML13343B194
Howse, Jo Ann	ML13331C222	Husby, Jason	ML13344A094
Hoyle, Lester and Judy	ML13339B018	Husk, Laurel	ML13339A262
Hoyt, Peter	ML13339B608	Husk, Laurel	ML13347A454
Hrynyszyn, Tatiana	ML13344A374	Huskisson, Irene	ML13331C113
Hubbard, Dan	ML13343A322	Husoe, Erik	ML13331A694
Hubbard, Joyce	ML13337B248	Hussey, Pamela	ML13346B334
Huber, Tara	ML13346A843	Hutchcroft, Dennett	ML13347A552
Hubert, Ron	ML13344A497	Hutchings, William	ML13331B985
Hudak, Lesley	ML13347A133	Hutchings, William	ML13331B986
Hudak, Sharon	ML13346B362	Hutchins, Jason	ML13331B554
Huddleston, Mary	ML13347A179	Hutchins, Jason	ML13337A908
Huddleston, Molly	ML13343B061	Hutchinson, Robert	ML13339B299
Hudson, Alan	ML13343A203	Hutchison, Dwight	ML13344A320
Hudson, Brandi	ML13344B052	Hutchison, Marlene	ML13331B855
Hudson, Brandi	ML13344B053	Hutchison, Marlene	ML13344A405
Hudson, Kay	ML13346B116	Hutchison, Sherry	ML13331C117
Hudson, Robin	ML13339A055	Hutzell, Jain	ML13347A657

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Hybil, Richard	ML13337A803	Jackson, Rena	ML13346B464
Hydar, John	ML13344B042	Jackson, Tom	ML13331B706
Hyde, Don	ML13347A287	Jackson-Miller, Marie-Louise	ML13339A127
Hynes, Nancy	ML13344A340	Jacob, April	ML13338B250
Iacovitti, Rose	ML13336B156	Jacobi, Donnasue	ML13344A956
Iannacome, Katia	ML13344A285	Jacobs, Dawie	ML13336B360
Iavarone, John	ML13337B283	Jacobsen, Inge	ML13340A649
Igla, John	ML13336B302	Jacobsen, Karen	ML13336B532
Ihrig, Glen	ML13339B399	Jacobsen, Kathleen	ML13340A354
Ilchuk, Emile G.	ML13340A502	Jacobsen, Michelle	ML13343B120
Illo, Dana	ML13336B035	Jacobson, Gail and Ralph	ML13337A115
Iluna, Mana	ML13336B058	Jacobson, Glenn	ML13343A563
Ince, Wilbur	ML13336B612	Jacobson, James	ML13337A770
Inere, Michelle	ML13339A570	Jacobson, Lisa	ML13346A333
Infantino, Chuck	ML13343A988	Jacobson, Lois	ML13337A065
Infantino, Chuck	ML13347A636	Jacobson, Robert	ML13331B616
Ingraham, Kevin	ML13343A817	Jacoby, Sharon	ML13337B138
Insurriaga, Aurora	ML13337A900	Jacques, Laus	ML13344A279
Intilli, Sharon	ML13337B397	Jacus, Anna	ML13346B159
Ippolito, Anthony	ML13346A728	Jaeckel, Jennifer	ML13337B556
Irving, Charles	ML13331C297	Jaeger, Beverly	ML13337B551
Irving, Jennifer	ML13331B992	Jaegers, Martha	ML13347A003
Irving, Sandy	ML13331C099	Jaffe, Burton	ML13346B360
Isler, David	ML13343B013	Jagerson, Sherry	ML13336B677
Israel, Miriam	ML13340A300	Jagiello, Carol	ML13336B259
Itzoe, Francis	ML13339B296	Jagiello, Carol	ML13339B369
Iverson, Steve	ML13347A957	Jahangeer, S.	ML13343B191
Ivey, Dana	ML13338A853	Jailer, Todd	ML13338B420
Iwankiw, Pilar	ML13336B632	Jain, Paula	ML13343A663
Iwen, Bryan	ML13344A613	Jakusz, Darlene	ML13331B685
Izant, Carol	ML13337A784	Jakusz, Darlene	ML13331B690
Izett, Mary	ML13336A992	Jakusz, Darlene	ML13344B018
Izzo, Martha	ML13331B639	Jakusz, Darlene	ML13347A528
Izzo, Martha	ML13344A242	Jalagam, Rama Rao	ML13336B386
Ja, Tia	ML13347A011	Jamal, Kate	ML13340A265
Jabbar, Leila	ML13337A106	James, Catherine	ML13344A158
Jachimiak, James	ML13339B343	James, Lorie	ML13344A936
Jack, Kookguma Scumhist	ML13339B332	James, Wendy	ML13347A354
Jacklin, Lynn	ML13337A007	Jamtaas, Philip	ML13344A831
Jackman, Jay	ML13338B167	jamvold, shunko	ML13337B222
Jackson, Alicia	ML13347A646	Janes, Judith	ML13346A460
Jackson, Anne	ML13339B602	Janicki, Ellaine Lurie	ML13331C058
Jackson, Carol	ML13331B692	Janowitz-Price, Beverly	ML13336B279
Jackson, Carol	ML13339B164	Janquart, Laurence	ML13331C156
Jackson, Carolyn D.	ML13346B196	Janusko, Robert	ML13336B652
Jackson, Jan	ML13346B088	Janusko, Robert	ML13339A100
Jackson, Karen	ML13339B753	Janzen, Gayle	ML13336B099
Jackson, Kathleen	ML13340A575	Janzen, Gayle	ML13337A918
Jackson, Lisa	ML13336B068	Jaramillo, Andres	ML13346B444
Jackson, Monica	ML13344A691	Jarboe, JoLynn	ML13339B471

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Jared, Stephen	ML13344A775	Johnson, Larry	ML13343A672
Jarvis, Scott	ML13343A318	Johnson, Logan	ML13340A632
Jayapandian, Magesh	ML13339A045	Johnson, Lorraine D.	ML13331B793
Jaye, Abigail	ML13338A816	Johnson, Lorraine D.	ML13339B287
Jeffery, Brian	ML13344B020	Johnson, Nancy	ML13347A202
Jeffrey, Mary Lue	ML13347A060	Johnson, Pat	ML13343A327
Jeffrey, Monroe	ML13331A669	Johnson, Paul L.	ML13336B366
Jeffries, Mark	ML13338A744	Johnson, Qayyum	ML13346B462
Jehn, Robert	ML13339B242	Johnson, R.	ML13336B413
jelinek, jennifer	ML13347A227	Johnson, Rachel	ML13337A117
Jenison, Robert	ML13331C252	Johnson, Randy	ML13339B553
Jenkins, Chris	ML13344A924	Johnson, Rheta	ML13331A583
Jenkins, Willard	ML13331B760	Johnson, Rheta	ML13344A663
Jensen, Brent	ML13339B534	Johnson, Robert	ML13337A976
Jensen, Donna	ML13337B210	Johnson, Robert	ML13344A144
Jerzgarzewski, Fran	ML13339B265	Johnson, Robert	ML13346B264
Jeschke, Herbert	ML13343A540	Johnson, Sharon	ML13336B431
Jessler, Darynne	ML13331C130	Johnson, Sharon	ML13337A913
Jessler, Darynne	ML13339B241	Johnson, Stuart	ML13347A488
Jessop, D.	ML13343A778	Johnson, Susan	ML13339B470
Jessop, Judith	ML13343B027	Johnson, Valerie and Eric	ML13344A475
Jetty, Charles	ML13344A674	Johnson, Vernon	ML13337A072
Jezierski, Elisabeth	ML13346B099	Johnson, Wendy	ML13344A711
Jimenez, Cynthia	ML13339B540	Johnsrud, Robert	ML13339B276
Jitcov, Cristina	ML13344A844	Johnston, Mary E.	ML13343A270
Jittipsopa-Zinner, John and AJ	ML13340A210	Johnston, Philip	ML13339B207
Jobe, Cindie	ML13343A454	Johnston, Susan	ML13337A682
Joern, Sara	ML13347A288	Johnston, Susan	ML13346B413
Johns, Lydia	ML13343B070	Johnston, Timothy	ML14015A233
Johnsen, Harold	ML13346B027	Johnston, Tori	ML13336B344
Johnson, Amber	ML13346A682	Johnston, Tori	ML13351A177
Johnson, Angeline	ML13337B537	Joiner, Dan	ML13337A964
Johnson, Ann	ML13344A450	Jokela, Mary	ML13347A265
Johnson, Bettemae	ML13338B210	Jolin, Leon	ML13337B441
Johnson, Christopher	ML13337B031	Jolles, Arnold	ML13339B742
Johnson, Dale F.	ML13346A391	Jones, Andrea	ML13343A997
Johnson, Delton	ML13344A058	Jones, Angela	ML13339A057
Johnson, Don	ML13343A349	Jones, Beth	ML13351A196
Johnson, Dwight	ML13338A892	Jones, Carol Lynn	ML13344A448
Johnson, Elaine Dorough	ML13338B293	Jones, Carole	ML13337A043
Johnson, Greg and Shara	ML13336B510	Jones, Clayton	ML13336B505
Johnson, Hal	ML13343A870	Jones, Dave	ML13351A193
Johnson, Jeanie	ML13336B661	Jones, Doyle	ML13331B975
Johnson, Jeanie	ML13347A559	Jones, Emmett	ML13344A031
Johnson, Joel	ML13347A304	Jones, Gary	ML13347A403
Johnson, Jolyn	ML13344A715	Jones, Ileana	ML13346B059
Johnson, Kathleen	ML13344A477	Jones, Judy	ML13346A401
Johnson, Katie	ML13343A877	Jones, Karen	ML13337B012
Johnson, Keith	ML13338B386	Jones, Kevin	ML13331B568
Johnson, Kimberly	ML13346A822	Jones, Linda	ML13331B716

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

ADAMS		ADAMS	
Commenter	Accession #	Commenter	Accession #
Jones, Rev. Allan B.	ML13339B424	Kaiser, Maxine	ML13331B735
Jones, Richard	ML13344A472	Kaiser, Robert	ML13343B086
Jones, Robert	ML13346B287	Kalik, Antal	ML13346B301
Jones, Rodney and Terri	ML13338B339	Kalisvaart, Carl	ML13331A685
Jones, Sam	ML13343A721	Kaller, Geraldine	ML13346A407
Jones, Sandra L.	ML13340A213	Kaller, J.	ML13343A572
Jones, Ted	ML13331C032	Kalnay, E.	ML13344A611
Jones, V and B	ML13337B552	Kaluza, N.	ML13337B540
Jones-Umberger, Stanley	ML13337B198	Kalwachia, Behroz	ML13346B372
Joos, Renee	ML13337A940	Kamath, Tara	ML13340A272
Joos, Sandra	ML13336B018	Kamlet, Chris	ML13346A356
Jordan, Dorothy	ML13346B259	Kamm, Barbara	ML13337B206
Jordan, Gil	ML13347A310	Kammerer, Lacey	ML13337B303
Jordan, Jessica	ML13343B060	Kampa, Jan	ML13336B636
Jordan, Laura	ML13339A020	Kampa, Jan	ML13344A280
Jordan, Laurence and David	ML13331B976	Kanak, Richard	ML13331B698
Jordan, Lois	ML13347A355	Kandeler, Mona	ML13344A825
Jordan, Patrick	ML13344A436	Kandell, Steve	ML13339B639
Jorgensen, Alena	ML13339B624	Kane, Caitilin	ML13343B097
Joseph, Shari	ML13338A750	Kane, Irene	ML13338A877
Joslin, Teresa	ML13344A505	Kane, Mike	ML13343B007
Josselyn, Susan	ML13346A572	Kaneko, Paul	ML13331B956
Joughin, Sally	ML13351A191	Kanemori, Ray and Charlotte	ML13343A813
Joy, Amber	ML13337A706	Kanner, Allen	ML13339B641
Joy, Sumitra	ML13336B486	Kansas, Sharon	ML13344A782
Joyce, Peter	ML13346A331	Kanter, David	ML13336B121
Joyner, Stephanie	ML13344A565	Kanthoul, Lee	ML13344A617
Jue, Michael	ML13344A253	Kantner, Donna	ML13343A614
Juelich, Robert	ML13346A685	Kantor, Sheryl	ML13336B177
Julian, Patrick	ML13337A952	Kapitan, Audrey	ML13343A446
Jumonville, John	ML13339B499	Kaplan, Adam	ML13347A218
Juskowich, Nancy	ML13339A225	Kaplan, Eliot	ML13337B228
Justin, Cristofer	ML13331A589	Kaplan, Joan	ML13346B231
K, C.	ML13343A492	Kaplan, Lisa	ML13336B464
K, Charlie	ML13344A391	Kaplan, Sheryl	ML13338A089
K, J.	ML13344A708	Kappes, Leslie	ML13337B367
K, Kristian	ML13346B325	Kappus, Mike	ML13331B768
K., Camille	ML13339B566	Kappus, Mike	ML13337B019
K., Julia	ML13338B236	Karasic, Dave	ML13331B705
K., Kristian	ML13338B090	Kardiak, Jennifer	ML13347A092
Kaback, Keith	ML13336B368	Karkheck, Johann	ML13338B161
Kadane, Edward	ML13337A904	Karp, Michael	ML13338B051
Kade, Linda	ML13338B455	Karpen, Leah	ML13337A700
Kaden, Hayden	ML13337A093	Karscch, Heike	ML13344A311
Kafka, Mo	ML13331B522	Kasbarian, A.	ML13346A874
Kafka, Mo	ML13337B346	Kasdorf, Katherine	ML13339B317
Kagel, Katharine	ML13336B117	Kaspar, Hank	ML13340A180
Kahn, Georgia	ML13339A587	Kaspark, Craig	ML13339A082
Kahn, Jennifer	ML13347A252	Kasregis, Earle	ML13339B010
Kahr, Helga	ML13339B363	Kassner, Kathryn	ML13343A800

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Kast, Michael	ML13343A683	Keller, Terri	ML13336B683
Kastl, Zoe	ML13337A132	Kellman, Steven G.	ML13339B510
Kastner, Margean	ML13343B098	Kells, Charlotte	ML13338A035
Katerinsky, Bess	ML13340A642	Kelly, Alice	ML13339B411
Katz, David	ML13343B099	Kelly, Brian	ML13344A097
Katz, Joanna	ML13339A560	Kelly, Brian	ML13347A276
Katz, Shari	ML13347A538	Kelly, Joanne	ML13331B771
Katz, Sondra	ML13337B560	Kelly, Joanne	ML13337B396
Katzman, Annie	ML13344A111	Kelly, JoAnne	ML13344A357
Kauffman, Dr. George B.	ML13340A527	Kelly, Kathy	ML13337B219
Kaufmann, Greg	ML13347A441	Kelly, Marie	ML13339B112
Kaufmann, Greg	ML13347A442	Kelly, Matt	ML13339B042
Kaufmann, Jeremy	ML13347A254	Kelly, Nancy	ML13343A977
Kavanaugh, Karla	ML13336B656	Kelly, Neil	ML13346B324
Kavruck, Deborah	ML13338A032	Kelly, Odette	ML13340A592
Kay, Joel	ML13336B206	Kelly, Velma	ML13346A684
Kay, Joel	ML13344A703	Kelsberg, Jane	ML13347A108
Kay, Virginia	ML13347A215	Kelting, Michael	ML13347A152
Kayan, Helmut	ML13343B167	Kemerer, Gail	ML13338A013
Kaymen, Louisa	ML13331B918	Kemerer, Gail	ML13338A014
Kaymen, Samuel	ML13336B600	Kemp, Johnie	ML13331B938
Kaymen, Scott	ML13346A930	Kemp, Johnie	ML13347A545
Kayser, Gabrielle	ML13331C014	Kemph, Elizabeth	ML13336B575
Kearns, Maggie	ML13336B733	Kendall, Dean	ML13336A942
Kearns, Meg	ML13347A920	Kendzierski, Alexandra	ML13337A105
Keast, Stephen	ML13336B617	Kennard, Clara	ML13344A873
Keating-Secular, Karen	ML13346B141	Kennedy, Arthur	ML13336B416
Kee, Robert	ML13346B478	Kennedy, David	ML13347A998
Keegan, Marie	ML13339A106	Kennedy, Joyce	ML13338A033
Keenan, Helen	ML13337B263	Kennedy, Katya	ML13346A993
Keenan, Kathy	ML13346B429	Kennedy, Steohen	ML13347A661
Keenan, Robert	ML13343B015	Kennedy, Terri	ML13331B963
Keene, Margaret	ML13346B082	Kennedy, William	ML13339B409
Keene, Patricia	ML13337B076	Kenney, Dave	ML13344A418
Keeton, Denise	ML13339A580	Kensler, Kim	ML13346B044
Kegler, Lori	ML13339B275	Kent, Ellen	ML13339B617
Kegler, Lori	ML13347A703	Kent, Martha	ML13347A870
Kehr, Katharine	ML13344A316	Kenton, Barbara	ML13343A347
Keightley, Leo	ML13336B728	Kenyon, Douglas	ML13338A102
Kein, Belinda	ML13343A621	Keough, M.	ML13331B821
Keir, Linda	ML13343A568	Kepley, Barbara	ML13331A718
Keiser, Cynthia	ML13365A133	Keppler, Dustin	ML13343A573
Keiser, John	ML13365A121	Keramaty, Valery	ML13347A090
Keiser, Peter J.	ML13343A893	Kerce, Tyler	ML13337A884
Keisker, Joe	ML13337B338	Kerkvliet, Brian	ML13331B979
Keistler, Susie	ML13339B298	Kern, Lindsay Hope	ML13336B010
Kelcey, Kathleen	ML13339B697	Kern, Vic	ML13340A308
Kelech, Susan	ML13344A406	Kernahan, Mel	ML13340A201
Keller, Jean	ML13343A413	Kerrigan, Warren	ML13343A227
Keller, Nina	ML13338A995	Kerry, Theodora	ML13331C263

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Kerschbaum, John	ML13339A178	Kinley, Alyssa	ML13343A761
Kershner, Harry	ML13336B729	Kinnaman, M.A.	ML13337B440
Kertis, Zeneta	ML13347A072	Kinnersly, Tal	ML13347B003
Kess, Rhonda	ML13337B326	Kinney, Liz	ML13346B570
Kessler, Carol	ML13340A483	Kipchak, Ismet	ML13337A990
Kestelyn, Kathleen	ML13331A577	Kipling, Caroline	ML13337B539
Kestler, Carol	ML13347A926	Kirby, Mary	ML13336B192
Kestler, Carol	ML13347A927	Kirby, Suzanne	ML13331C198
Kestler, Ronald	ML13331C169	Kirby, Suzanne	ML13336A980
Keswick, William	ML13346A319	Kirchner, John	ML13336B116
Ketels, Peter	ML13338B365	Kirk, Karen	ML13340A279
Ketels, Peter	ML13344A906	Kirk, Lorraine	ML13339B575
Keyes, Josh	ML13344B067	Kirkindall, Glenn	ML13344A141
Keys, Anne	ML13346A721	Kirkland, Steven	ML13337A798
Khalsa, Hari	ML13347A412	Kirkpatrick, PhD, Joanna	ML13331C056
Khalsa, Mha Atma S.	ML13331C103	Kirkpatrick, PhD, Joanna	ML13346B286
Khalsa, Nam Kaur	ML13337A954	Kirkpatrick, M	ML13347A046
Khalsa, Viriam	ML13346A585	Kirkpatrick, Peggie	ML13343B115
Khanlian, Richard	ML13331A615	Kirks, James	ML13346B517
Kieffer, Ramsay	ML13338A841	Kirsch, Marilyn	ML13338A981
Kiely, LaVive	ML13347A307	Kirschbaum, Saran	ML13339B033
Kienzle, Sandy	ML13339B527	Kirschling, James	ML13346A340
Kiley, Gabriel	ML13336B286	Kirschling, Karen	ML13331B565
Kiley, Joan	ML13338B022	Kirschling, Karen	ML13339A238
Kilgore, Catherine	ML13343A895	Kirshbaum, David	ML13336B475
Killeen, Agoya	ML13340A231	Kirsling, Mary-Ann	ML13346A344
Killen, Sandy Adler	ML13344A961	Kirsling, Mary-Ann	ML13347A796
Killpack, Gary	ML13351A192	Kirtz, Aaron	ML13337B302
Kim, Blakeley	ML13347A015	Kiser, Allison	ML13347A087
Kim, Ji-Young	ML13338B284	Kittrell, Donna	ML13339B000
Kimball, Jimmy	ML13344A893	Klafta, Kevin	ML13346A347
Kimball, Linda Musmeci	ML13336A837	Klassen, David	ML13331C028
Kimball, Toni	ML13344A744	Klauscher, Valerie	ML13339B360
Kimber, Greg	ML13337B443	Klausing, Michael	ML13347A881
Kimble, Dawn	ML13331B996	Klecker, Janet	ML13336B703
Kimble, Dawn	ML13337B368	Kleckner, Kathleen	ML13343A834
King, Amie	ML13331B765	Klein, Anne and Joseph	ML13343A341
King, Barbara	ML13338B452	Klein, Anne and Joseph	ML13344A895
King, Barbara	ML13347A424	Klein, Carl	ML13346A855
King, Barry	ML13344A768	Klein, James	ML13344A682
King, Bob	ML13343B031	Klein, Linda	ML13344A148
King, Laurie	ML13336B115	Klein, Randi	ML13343A230
King, Marguerite	ML13331C153	Klein, Robert	ML13338A049
King, Marguerite	ML13346A594	Klein, Thomas	ML13331B734
King, Maria	ML13346A605	Klein, Toby	ML13336B593
King, Mary	ML13337A760	Klein, V. Joseph	ML13343A405
King, Nancy	ML13339B161	Kleine, Walt	ML13336B301
King, Stephen	ML13331B718	Kleine, Walt	ML13343A740
King-Miller, Charlie	ML13347A233	Klepack, Carol	ML13346A691
Kinish, Korinne	ML13338A833	Klerer, Leona	ML13331C030

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Kliche, Diana	ML13340A568	Kohlhafer-Regan, Glenda	ML13346A903
Klick, Jay	ML13346A588	Kohn, Frank	ML13339B442
Kline, Connie	ML13347B024	Kohn, Joseph	ML13337B473
Kline, Jeff	ML13343B130	Kohn, Steve	ML13344A246
Kline, Paula	ML13337B183	Koivisto, Ellen	ML13336B326
Kline, Stacy	ML13339A285	Koizumi, Yayoi	ML13331B971
Kline, Stacy	ML13347B012	Koizumi, Yayoi	ML13338B140
Klinkman, Paul	ML13336B155	Kolb, Jack	ML13337B260
Klock, William	ML13331B964	Kolb, Stephen	ML13339A131
Klock, William	ML13340A731	Koldys, William	ML13347A493
Klopp, Basey	ML13339B701	Kolkebec, Robert	ML13337A097
Kloster, Robert	ML13347A201	Kollmar, Richard	ML13336B358
Kluchko, Kyra	ML13340A442	Kolodziejczyk, Dorota	ML13338A770
Knablin, Richard	ML13337B197	Komara, Jr., Paul A.	ML13336B093
Knapp, Arthur	ML13343A749	Komisarof, Jeff	ML13346B414
Knapper, Karl	ML13347A415	Konrad, Gilda	ML13339A134
Knauer, Dean	ML13343A305	Konzelman, Daniel	ML13346B328
Knickerbocker, Deanna	ML13331C318	Koo, Rebecca	ML13338B456
Knight, Franklin	ML13346B138	Koon, David	ML13351A182
Knight, Megan	ML13340A242	Koons, Charlotte	ML13336B639
Knipp, Donna	ML13331B573	Koons, Kimberly	ML13340A625
Knipp, Donna	ML13343A987	Koors, Tom	ML13338B189
Knohl, Lee	ML13344A692	Koory, Wanda	ML13347A043
Knoop, J. Justin	ML13339B113	Kopczynski, Jennifer	ML13339B719
Knops, Jr., Reynold W.	ML13336B662	Koponen, Emmy	ML13331C187
Knotek, Ann Marie	ML13336B720	Korda, Sebastian	ML13346B456
Knotek, Ann Marie	ML13338A743	Kormanik, Kathy	ML13338A785
Knowles, Gail	ML13347A667	Korn, Meryle A.	ML13338B134
Knox, Mayumi	ML13339B231	Kornbluh, Martin	ML13343A306
Knueven, Judy	ML13331C085	Kornbluh, Martin	ML13347A736
Kob, Tricia	ML13343B107	Kornfeld, Susan	ML13337B309
Koblenz, Ruth	ML13336B511	Kornmann, Christopher	ML13338A964
Koblenz, Ruth	ML13344A199	Korovilas, Kostas	ML13344A039
Koch, C.	ML13337B489	Kortenhoff, Ewoud	ML13347A494
Koch, C.	ML13338B431	Kortge, Walter	ML13339A095
Koch, Cindy	ML13343A690	Kosec, Dawn	ML13347A051
Koch, Joann	ML13339A190	Koskinen, GerriAnne	ML13346B304
Koch, Victoria	ML13339B215	Koslovsky, Christopher	ML13347A388
Kochan, Barbara	ML13338B332	Kosowicz, Aleks	ML13339A255
Kochert, Marlene	ML13336A856	Kost, Dennis	ML13337A775
Kochmeister, Sharisa	ML13336B398	Kotch, Brant	ML13346B130
Kocsis, Joan	ML13347A672	Koteen, Merle	ML13346A681
Koelling, Keith	ML13336B498	Kourda, Terry	ML13339B291
Koelling, Margie	ML13336B497	Kouzel, Lynn	ML13346A679
Koelling, Ruth	ML13336B496	Kovitz, Johanna	ML13331A592
Koessel, Karl	ML13331C279	Kovitz, Johanna	ML13337B015
Koessel, Karl	ML13340A634	Kovler, Abraham	ML13340A536
Kohl, Dendrobia	ML13347A985	Kozanitas, Cheryl	ML13346B103
Kohl, Sybil	ML13337A681	Kozinski, Stefan	ML13344A193
Kohlhafer-Regan, Glenda	ML13336B618	Kozinski, Stefan	ML13347A088

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

ADAMS		ADAMS	
Commenter	Accession #	Commenter	Accession #
Kozlik, James M.	ML13343A420	Ku, Michelle	ML13338A763
Kozlosky, Donald	ML13346A328	Kubiak, M. C.	ML13346B430
Kozlowski, Thaddeus	ML13336B240	Kubick, Stephen	ML13340A600
Kozminski, Daniel	ML13344A572	Kubota, Ria Tanz	ML13331B801
Kraimer, Rebecca	ML13343B043	Kubzdela, Kashka	ML13331B806
Kram, Ruth	ML13338B039	Kuczynski, Kathleen	ML13344A087
Kramer, John	ML13344B047	Kudatsky, Dinah	ML13347A503
Kramer, Julie	ML13343A585	Kuecker, Kenneth	ML13331B675
Kramer, Laura	ML13343A297	Kuehn, Richard	ML13346B228
Kramer, Merrill	ML13344A526	Kuestner, William	ML13337B499
Kramer-Dodd, Gay	ML13346B023	Kuhn, Peter	ML13339A130
Krassenstein, Diane	ML13346B503	Kuhn, Rosemarie	ML13338B411
Kratzer, Theresa	ML13339B136	Kukkonen, Holly	ML13336B159
Kraus, Andrea	ML13347A827	Kukkonen, Holly	ML13338B083
Kraus, Irene	ML13339B472	Kula, Jeff	ML13344A190
Krause, Doug	ML13336A846	Kulakofsky, Rob	ML13337A063
Krausnick, Kevin	ML13344A636	Kuligowski, Rebecca	ML13340A439
Krausnick, Kevin	ML13346B051	Kulseth, Kyle	ML13344A716
Krauss, Dan	ML13346A371	Kunig, Christian	ML13344A739
Krawisz, Bruce	ML13338B453	Kuntz, Laurie	ML13331B653
Kreager, Anita	ML13343A266	Kunz, James	ML13343A261
Kreider, C. Fuji	ML13344A971	Kurach, Sharon	ML13346A296
Kreisman, Jane	ML13337B478	Kurowski, Hilda	ML13346B156
Kreisman, Leslie	ML13337B461	Kurtz, Maya	ML13343A686
Kreklow, Rebel	ML13346A816	Kurtz, Nancy	ML13337A032
Krell-Bates, Diane	ML13340A520	Kurz, Carol	ML13336B637
Kriegler, Bertha	ML13336A849	Kurz, Richard	ML13347A710
Kriegler, Bertha	ML13337B043	Kurzweil, Andrew	ML13336B390
Krimsky, Pam	ML13336B562	Kurzweil, Andrew	ML13343A965
Krindel, Margo	ML13351A190	Kustra, Christopher	ML13331B887
Krishnamurthy, Nagarajan	ML13344A271	Kutch, Ron	ML13339A548
Kriss, Evan Jane	ML13344B094	Kutchen, Jan	ML13338B032
Kroeger, Amelia	ML13336B628	Kuto, Catherine	ML13338B141
Krokonko, Vera	ML13340A345	Kutzschbach, Sharon	ML13339B454
Krone, Jeannene	ML13338B397	Kuzma, Robert	ML13338A011
Krone, Zack	ML13339B135	Kuznier, Janys	ML13337A929
Kronlokken, Naomi	ML13339A056	Kwitt, Michael	ML13344B104
Kronquist, Ray	ML13338A116	Kyne, James J.	ML13338A091
Krueger, Becky	ML13340A510	Kyne, James J.	ML13338A827
Krueger, Mary	ML13337A919	L., A.	ML13338A012
Krueger, Robert	ML13331C255	L., Carla	ML13338B292
Kruger, Suzanne	ML13331B733	L., Vince	ML13355A301
Kruhmin, Linda	ML13337B001	La Fleur, Gloria	ML13347A074
Krupnick, Wendy	ML13340A538	La Fleur, Gloria	ML13347A550
Kruse, Barbara	ML13339B612	Labay, Alice	ML13331C313
Kruse, Jason	ML13339B106	Laberge, Jason	ML13344B120
Kruszynski, Yasiu	ML13336B421	Laborowicz, Richard	ML13337B331
Kruszynski, Yasiu	ML13343B142	LaBrecque, Cheryl	ML13346B507
Krutak, Anna	ML13346A867	Lachance, Marcey	ML13338B036
Ksczanowicz, Donna	ML13339A103	Lackey, Mercedes	ML13339A142

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Lacy, Sharon	ML13346B151	Lane, Sandra	ML13337B317
Laddy, brian	ML13346A497	Lane, Sandra	ML13343B158
Laddy, Brian	ML13347A611	Lane, Sandra	ML13343B160
Lafond, David J	ML13347A531	LaNew, Maryann	ML13344A095
LaForge, John	ML13347A698	Lanfranchi, L.J.	ML13346A996
Lagas, Jane	ML13339B721	Lang, Lynn C.	ML13331A650
LaGasse, Dr. Jeffrey Paul	ML13338A908	Lang, Sue	ML13336B589
Lahey, Michael	ML13337B093	Lange, Chris	ML13338A768
Lai, Molly	ML13340A375	Lange, Marlena	ML13343A331
Laifer, Steven	ML13336A872	Langelan, M.	ML13331C149
Laifer, Steven	ML13337A734	Langelan, M.	ML13338A870
Laine, Alexis	ML13346A357	Langford, Jill	ML13336A924
Laing, David	ML13339B681	Langford, Wayne	ML13346A337
Laing, Judi	ML13337A968	Langlois, Cheri	ML13339B644
Laird, David	ML13340A461	Langlois, Donna	ML13344A363
Laird, Linda	ML13339B456	Langmeyer, Bill	ML13340A336
Laiti, Jared	ML13331B937	Lank, Tim	ML13340A703
Laiti, Jared	ML13347A799	Lanton, Ruth	ML13336B568
Lakatos, Marion	ML13344A447	Lanton, Ruth	ML13337A824
Lalime, Brian	ML13347A962	Lanton, Ruth	ML13347A349
Lamb, John	ML13338B449	Lanum, Glenn	ML13339B212
Lamb, Lisa	ML13343A627	Lapetino, Carol	ML13336B489
Lambart, Eric	ML13347A648	Lapetino, Carol	ML13347A682
Lambert, George	ML13336B551	Lapeyre, Elisabeth	ML13340A356
Lambert, Gwen	ML13339B013	Lapidus, Paul	ML13346A820
Lambert, Jerrell	ML13346A471	LaPointe, Drena	ML13339B637
Lambert, Lakshmi	ML13339B341	LaPointe, Keith	ML13338A798
Lambert, Maria	ML13338A933	LaPointe, Larry	ML13343B030
Lambeth, Larry	ML13331A612	Lara, Dan	ML13339B278
Lanagan, Pamela	ML13340A559	Laris, Marcia	ML13339B185
Lancaster, Donald	ML13336B340	Larkin, Kay	ML13337B378
Lancaster, Donald	ML13347A475	Larkin, Timothy	ML13339B522
Landa, Martin	ML13336B502	Larsen, Craig K.	ML13336B707
Landa, Martin	ML13340A429	Larsen, Jane	ML13339B313
Landau, Doug	ML13331C125	Larsen, Pamela	ML13347A627
Landau, Doug	ML13337A917	Larson, Janet	ML13346A312
Landau, Doug	ML13340A393	Larson, Mary	ML13340A316
Landau, Doug	ML13340A475	Larson, Matt	ML13344A994
Landau, Judith	ML13339B517	Larson, Wendy	ML13346A719
Landes, Hale	ML13338B106	Larsson, Ingrid	ML13337A778
Landman, Thomas	ML13336B330	LaSchiava, Dona	ML13336B295
Landon, Joann	ML13347A653	Laske, Margaret	ML13339B238
Landrau, Lillian	ML13344A944	Laskin, Martin	ML13339B640
Landrau, Lillian	ML13344B000	Lasko, Judith	ML13343A796
Landress, Judy	ML13338B241	Lasman, Lauri	ML13343B102
Lane, Adam	ML13337B057	Laspisa, Cecilia	ML13339B457
Lane, Apryl	ML13337B111	Lassiter, Kathleen	ML13336B623
Lane, Charles	ML13331C199	Laste, Melissa	ML13331A679
Lane, Jerry	ML13344A923	Lathrop, Lesley	ML13337A984
Lane, Lama	ML13346B154	Lathrop, Lesley	ML13339B387

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Latierra, Carolyn	ML13336A979	Leda, Marian	ML13344A877
Latour, Maribou	ML13336B598	Ledden, Dennis	ML13336B596
Latus, Jane	ML13331B945	Ledden, Dennis	ML13344A345
Lau, Pamela	ML13343B042	Lederman, Jessica	ML13347A160
Lau, Victor	ML13331B950	Lederman, Robert	ML13331B902
Laubach, Matt	ML13343A699	Ledesma, David	ML13339B689
Lau-Enright, Lily	ML13338A754	Leduc, Lorraine	ML13343A833
Laughon, Char	ML13340A468	Lee, Billie	ML13339A256
Laura, Cheryl	ML13343A510	Lee, Chiyoung	ML13346B171
Lautaro, Gabriel	ML13338B291	Lee, Christopher	ML13343B053
Lautner, Sharon	ML13336A986	Lee, Dorothy	ML13331B569
Laux, David	ML13344B089	Lee, Jonathan	ML13346A579
Laverdiere, Marc	ML13340A606	Lee, Judith Dunn	ML13338A777
LaVerne, David	ML13331B897	Lee, Kathi	ML13336B396
Laverty, Annamaria	ML13336A871	Lee, King	ML13340A546
Lavery, E.	ML13337B322	Lee, Marie	ML13340A645
Lavy, Fred	ML13331C136	Lee, Matthew	ML13346A491
Lavy, Fred	ML13337B259	Lee, Mishwa	ML13346B202
Lawler, John	ML13337B456	Lee, Patricia	ML13337A762
Lawrence, Alan	ML13331C306	Lee, Peter	ML13336B590
Lawrence, Betty	ML13344A859	Lee, Peter	ML13343A667
Lawrence, Janice	ML13346B563	Lee, Serena	ML13337B458
Lawrence, Jim	ML13344A621	Lee-Figueroa, Karyl	ML13346B499
Lawrence, Kathleen	ML13346A525	Leeper, Sam	ML13343A880
Lawrence, Rhett	ML13347A779	Lees, Jhan	ML13344A412
Lawrence, Sandra L.	ML13339B743	Lees, Teresa	ML13343A643
Lawrie, Arline	ML13346B415	Leet, Cassia	ML13331B797
Lawson, Esther	ML13339A102	Leete, Constance	ML13343A366
Lawson, Joan	ML13337B447	Lefever, John	ML13346A542
Lawson, Joseph	ML13339B422	Leger, Magaly	ML13344A509
Lawton, Kelley	ML13331B624	Legleitner, Scott	ML13338A890
Layman, Alison	ML13337A736	Lehan, Marjory	ML13331A651
Layman, Erik	ML13337A744	Lehman, Hugh	ML13343A944
Layne, Lenora	ML13336B453	Lehman, Scott	ML13347A851
Layton, Jean	ML13343B050	Lehn, Kathleen	ML13337A144
Lazell, James	ML13344A298	Lehr, Doris	ML13346A823
Le, Luan	ML13331B657	Lehrer, Susan	ML13338B109
Le Sieur, Esther	ML13344A003	Leibowitz, Celeste	ML13339A257
Leachman, David	ML13343A844	Leibowitz, Susan	ML13343A714
Leahy, Martha	ML13343A257	Leicester, Al	ML13336B180
Leas, Rebecca	ML13336B669	Leiden, Charles	ML13347A669
Leather, Rose Marie	ML13336B371	Leiden, Charles	ML13347B007
Leavitt, Donna	ML13343A901	Leigh, Frey	ML13346A807
Lebell, Michael	ML13339A584	Leigh, Lynda	ML13339B237
LeBlanc, Candy	ML13331C202	Leija, Phillip	ML13343B035
LeBlanc, Candy	ML13339B079	Leinen, John	ML13331B558
Lebo, Harlan	ML13339A224	Leisner, Roger	ML13339B225
LeBrun, Roanne	ML13340A187	Leitch, Carmen	ML13343A639
Lebwohl, Naomi	ML13336A993	Leiva, Miranda	ML13343A815
Leck, Chris	ML13331B876	Lembeck, Helen	ML13355A302

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Lemoine, Kathryn	ML13337A886	Lewin, Tekla	ML13336A830
Lemos, Larry	ML13331B880	Lewis, Ashley	ML13337B032
Lempert, Bobbi	ML13346A361	Lewis, Donna	ML13338A917
Lenchner, Nicholas	ML13338B462	Lewis, Erma	ML13336B567
Lenore, Lucile	ML13347A532	Lewis, Erma	ML13347A156
Lenox-Krug, A.J.	ML13347A251	Lewis, Erma	ML13347A225
Lent, Patricia L.	ML13336B014	Lewis, Francesca	ML13344A815
Lent, Patricia L.	ML13340A176	Lewis, George M.	ML13331A626
Lentz, Suzanne	ML13338A825	Lewis, George M.	ML13337A795
Lenz, Andrew	ML13338B231	Lewis, Kathleen	ML13347A173
Leon, Heriberto	ML13346A482	Lewis, Marvin	ML13344A331
Leonard, Christopher	ML13344A643	Lewis, Natalie	ML13346B139
Leonard, Richard	ML13344A947	Lewis, Neil	ML13337B553
Leonardi, Val	ML13336B253	Lewis, O.	ML13339B429
Leppala, Patricia	ML13344A530	Lewis, Patrick	ML13338B195
Lepzelter, Howard	ML13343B156	Lewis, Rena	ML13338B353
Lerman-Hahn, Samuel	ML13343B133	Lewis, Selden	ML13346A435
Lerner, Barry	ML13339B763	Leyendecker, Billie	ML13344A471
Lerner, Kathy	ML13347A819	Lian, Joseph	ML13337A854
Lerner, Lynne	ML13339B308	Libbares, Georgia	ML13344A584
LeRoy, Greg	ML13339B087	Libman, Diane	ML13343B037
Lesko, Robert	ML13331B562	Lichtenbert, Bob	ML13338A065
Leslie-Dennis, Donna	ML13336B080	Lichter, Russell	ML13337B534
Lessard, Wayne	ML13331B671	Liddle, Bill	ML13347A128
Lesser, Gerson	ML13331B919	Liddle, William	ML13347A154
Leszczynski, M.	ML13331C150	Lieberman, Andrea	ML13337B089
Leszczynski, M.	ML13337B324	Lieberman, Sharon	ML13344A953
Lett, Steve	ML13331A684	Liedike, Robert	ML13338B244
Lettieri, Tammy	ML13340A512	Lienhard, Judith	ML13338B009
Letton, Frank	ML13331C107	Light, John	ML13338A070
Leuchtag, Alice	ML13337A069	Light, Victoria	ML13343A637
Leung, Kiu	ML13344A626	Lightner, S.	ML13337B325
Lev, Marjorie	ML13336B070	ligmann, Mike	ML13343B085
Lev, Marjorie	ML13343A892	Likens, Barbara	ML13347A831
LeVan, Patricia	ML13346B419	Likes, Susan and Philip	ML13339B696
Leven, Marie	ML14002A305	Likovich, Andrea	ML13344A275
Leventhal, Ruth	ML13338B215	Liles, David	ML13346A916
Leverich, Joseph	ML13344A386	Lilienkamp, Bryan	ML13338A822
Leverich, Judge	ML13337B241	Lilienthal, David E.	ML13331C112
Levi, Arnold	ML13337B468	Lilith, Ms.	ML13343A804
Levine, Eleanor	ML13331B832	Lilleberg, Allen	ML13343A601
Levine, Marci	ML13336B047	Lillie, Vanessa	ML13344A508
Levine, Marci	ML13339B294	Lilly, Carolyn	ML13331B863
Levine, Marilyn	ML13343A388	Lily, Deb	ML13331B934
Levitsky, Howard	ML13343B108	Lim, Olivia	ML13346B216
Levrant, Melvyn	ML13340A174	Limbach, John	ML13346A761
levy, carol	ML13346B277	Limberg, Leslie	ML13336B659
Levy, Loren	ML13337B022	Lin, James	ML13343A888
Levy, Louise	ML13340A280	Lind, Scott	ML13339B315
Levy, Valerie	ML13336B704	Linda, Lauren	ML13343A838

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Lindberg, Chris	ML13347A055	Locker, Kelly	ML13344B031
Lindberg, John	ML13344A501	Lockwood, Michael	ML13338B263
Lindeman, Thomas and Joan	ML13347A697	Lockwood, Ronald	ML13331B775
Linden, Ruth	ML13337B381	Loeb, Albert	ML13344A937
Lindgren, Jean	ML13343A855	Loew, Dana	ML13340A367
Lindhorst, Gerald	ML13336B605	Loftness, Kim	ML13346B426
Lindner, Bill	ML13339B555	Lofton, Saab	ML13331C188
Lindner, Jan	ML13339B764	Lofton, Saab	ML13346A517
Lindquist, Janice	ML13344A823	Loftus, M.	ML13343A693
Lindsley, Ann	ML13340A371	Logan, Christopher	ML13331B984
Lineback, Jerry	ML13344A790	Logan, Marilyn	ML13347A366
Lineberger, Gary	ML13339B329	Logan, S.	ML13337B314
Liniman, Cheryl	ML13347A880	Loget, Roxanne	ML13337A001
Link, Virgene	ML13339A565	LoGiudici, John	ML13338B458
Linnerson, Gail	ML13331C012	Lomas, Judith	ML13347A320
Linzmeier, Robert	ML13331A644	Lomas, Leslie	ML13331B994
Linzmeier, Robert	ML13338B028	Lombardi, Margaret	ML13344A622
Lionetti, Marc	ML13338B234	Lombardi, Michael	ML13343B171
Lipari, Mitchell	ML13337A016	Long, Carol	ML13343A691
Lipchik, Gay	ML13347A721	Long, Douglas	ML13340A317
Lipkind, DDS, Lawrence	ML13331C206	Long, Jeanne and Vern	ML13343A846
Lipman, David M	ML13347A939	Long, Marilyn	ML13340A368
Lippert, Timothy	ML13346A446	Long, Mary	ML13343B090
Lips, Stu	ML13331B922	Long, Michael	ML13338B254
Lipschik, Matthew	ML13336A895	Long, Ned	ML13347A063
Lipschik, Matthew	ML13347A509	Long, Robert	ML13344A196
Lipson, Daniel	ML13340A525	Longley, Richard	ML13338B438
Lipson, Susan	ML13339B619	Longo, Valerie	ML13344B002
Lique, Kathleen	ML13343A408	Longworth, Jon	ML13343A925
Liske, Patricia	ML13346B000	Longworth, Jon	ML13343A926
Lisowski, Bernard	ML13344A661	Longworth, Carol	ML13331C165
Liss, Cynthia	ML13338B299	Loomba, Mary	ML13346B305
Liss, Mary	ML13337B017	Loomis, Cindy	ML13338A051
Lite, Elaine	ML13344A290	Loomis, Margaret	ML13338B317
Lithman, Alan	ML13340A335	Loosier, Carla	ML13336B008
Litman, Laurie	ML13337A961	Lopes, Chris	ML13344A387
Litteken C.PP.S., Sister Clare Ann	ML13346A373	Lopes, Mark	ML13331C226
Little, Wendy	ML13337A035	Lopez, Alberto	ML13337B361
Littlefield, Jim	ML13338B389	Lopez, Lonnie	ML13338A057
Litwin, Ralph	ML13331C010	Lopez, Rocio	ML13346A879
Liu, Mini	ML13343A739	Loquet, Hugo	ML13346A314
Livesey-Fassel, Elaine	ML13337B174	Lorca, Maria	ML13331B859
Llewellyn, Thomas	ML13331B923	Lorch, William	ML13331C204
Lloyd, George	ML13339B058	Lorenz, Margaret	ML13347A693
Lloyd, Mina	ML13338B207	Lorenz, Nancy	ML13337A037
Loach, Matt	ML13331B615	Lorenz, Ruth	ML13340A521
Loan Nguyen, Kim	ML13347A913	Loring, Lloyd	ML13331B700
Loch, Christopher	ML13343A362	Lotterman, Patricia	ML13338B030
Lochhead, John	ML13336B564	Loudis, Catherine	ML13343B149
		Loughlin, R. Lance	ML13339B418

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Louis, Dorothy	ML13337A135	Lutz, Gordon	ML13339B310
Love, Vera	ML13344A416	Lutz, Nancy L.	ML13331B669
Lovejoy, Carlen	ML13337B417	Lutz, Nancy L.	ML13338B040
Lovell, Darlene	ML13336B158	Lutz, Winifred	ML13339B211
Lovell, Lyn	ML13336B552	Luu, Thao	ML13346B169
Lovell, Lyn	ML13339B667	Luzzi, Gina	ML13337B013
Lovell, Stephanie	ML13339A065	Lykins, Jim	ML13343B118
Lovins, Hunter	ML13336A890	Lyle, Elizabeth	ML13347A168
Low, Sammy	ML13339B729	Lyles, Nancy	ML13337A024
Lowans, Jennifer	ML13339A275	Lyman, Lesley M.	ML13344A014
Lowe, Carol	ML13344A581	Lynch, Dennis	ML13339B023
Lowenthal, Steven	ML13340A732	Lynch, Erin	ML13340A554
Lowery, Mike	ML13344A394	Lynn, John	ML13338B372
Lowry, Marsha	ML13343A377	Lyon, Janet	ML13346B530
Lowry, Pamela Anne	ML13336A921	Lyons, Jonathan	ML13339B194
Loy, David	ML13331A698	Lyons, Lynn	ML13331B989
Lozano, Donna	ML13347A922	Lyons, Mike	ML13331C120
Lozano, Susan	ML13343A310	Lythos, Laura	ML13336B550
Lubin, Dana	ML13351A184	Lytle, Denise	ML13346B423
Lubin, Diana	ML13344B122	Lytle, Denise	ML13347A041
Lubin, Stephen	ML13346B211	M, Domenico	ML13344A068
Lucas, Janie	ML13344A753	M, Madelaine	ML13343A692
Lucas, Mary	ML13344A523	M, P.	ML13343A745
Lucas, Philip	ML13340A320	Ma, Symone	ML13346A351
Lucchesi, Annmarie	ML13338B429	Maas, Joan	ML13331C271
Luddecke, Jane	ML13336A888	Maas, Joan	ML13347A649
Ludlam, Catherine	ML13344A100	Mabie, Jared	ML13331B534
Ludolphi, Nicolette	ML13336B697	MacAdam, Iain	ML13346B341
Ludwig, Carolyn	ML13337A099	MacAlpine, Barbara	ML13347A448
Luecke, Bruce	ML13346B572	Macartney, Bill	ML13347A571
Luening, Rebecca	ML13331B790	Macdonald, BC	ML13331C276
Luening, Rebecca	ML13331B791	Macdonald, Leo	ML13343A774
Luis, Jose	ML13344A089	MacDonald, Manolo Segura	ML13331C283
Luisella, Guadalupi	ML13337A724	Macdonald, Nina	ML13344A544
Lukasiewicz, Judy	ML13346A726	MacDougall, John	ML13331A654
Luke, Robert	ML13346B143	MacDougall, Scott	ML13339A235
Lundgren, Norma	ML13340A735	Macek, Barbara	ML13339B542
Lunn, Christopher	ML13337B328	Macfarland, Janie	ML13331B828
Lunn, Kate	ML13347A739	MacGregor, Allan	ML13347A940
Lunsford, Jimmie	ML13344B066	MacInnes, Ramsay	ML13337A819
Lupenko, Andy	ML13336B328	MacKenzie, Joanne	ML13337A868
Lupenko, Andy	ML13346A718	MacKenzie, Quinn	ML13344A140
Lusak, Stephanie	ML13336B444	Mackin, Rich	ML13337A726
Lusby, Lindsay	ML13337A843	MacKinnon, Genevieve	ML13336A967
Lusch, Mark	ML13338B387	Macks, Vic	ML13347A726
Lushchik, Alex	ML13346B146	Macmillan, Eileen	ML13346A535
Lustgarten, Jay	ML13339B692	macmillan, marty	ML13346A467
Lusthaus, Dan	ML13331A709	MacPhail, Kristyn	ML13347A321
Luth, Sarah	ML13337B106	MacRaith, Bonnie	ML13338B374
Lutterman, Lloyd	ML13337B098	Macy, Fran	ML13336B335

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Macy, Michelle	ML13331B948	Mandzuk, Maggie	ML13347A486
Madarasz, Paul	ML13337B289	Manetas, Mike	ML13331C229
Madary, Kathy	ML13347A615	Mangan-VanHam, Juanita	ML13343A223
Madero, Mario	ML13351A169	Mangels, Melanie	ML13347A662
Madison, Mary	ML13347A737	Manghelli, Don	ML13331B520
Madison, Mary	ML13347A879	Maniscalco, Peter	ML13338A846
Madison, N. J.	ML13340A452	Mann, Carolyn	ML13336B168
Madon, Sandra	ML13343A433	Mann, D.K.	ML13336B303
Madrid, Concha	ML13347A311	Mann, Renee	ML13338A852
Madrugá, Philip	ML13344A179	Mann, Richard and Carol	ML13339B074
Maehr, Carol	ML13336A875	Mannering, Natalie	ML13339B178
Magargee, Ian	ML13347A874	Manning-Brown, Helen	ML13331C026
Magbee, Max	ML13338A888	Mannion, Michael	ML13331B591
Magee, Susan	ML13338A968	Manno, Sarah	ML13337A000
Magers, Ronald	ML13338A104	Mantas, Nick	ML13331A641
Maghakian, Carol	ML13331C137	Manuel, James	ML13347A334
Magid, Joseph	ML13346A550	Manzano, Carola Garcia	ML13339B244
Magrath, Pat	ML13344A176	Marantz, Mady	ML13346B084
Maguire, Joel	ML13344A248	Marashinsky, Amy Sophia	ML13337B343
Maguire, Terrill	ML13331B753	Marcos, Mekk	ML13339B504
Maher, Linda	ML13339A113	Marcus, David	ML13338A889
Maheu, Vicki	ML13339B059	Marcus, Jack David	ML13331B737
Mahon, Donal	ML13346B404	Marcus, Jack David	ML13337B027
Mahoney, Br. John	ML13339B163	Marcus, Marilyn	ML13340A373
Mahoney, Krista	ML13336B064	Marcus, Martin	ML13347A707
Mahony, Debra	ML13339A213	Marcus, Merle Ziporah	ML13338B460
Maia, Maia	ML13346A794	Marcussen, Mia	ML13346B549
Maijala, Ann	ML13337B203	Margason, Carol	ML13346A524
Main, Nancy	ML13346A359	Margolis, Margo	ML13339A140
Mainland, Edward	ML13331C083	Margolis, Martin	ML13336B408
Maires, Allison	ML13336B200	Margulies, Lee	ML13337B071
Maizel, Joshua	ML13338A053	Mari, Mike	ML13331C129
Majors, Carol	ML13339B124	Marian, Bert	ML13331C307
Malachowsky, Ron	ML13346A884	Maricque, Mitchell	ML13336B045
Maldonado, Melissa	ML13338B021	Marida, Patricia	ML13346B522
Maldonado, Robert	ML13343A580	Marie, Christine	ML13339A266
Malik, Rosalie	ML13351A175	Marie, Lily	ML13347A760
Malina, Matt	ML13344A310	Marie, Sara	ML13344A809
Malnati, Rev. Peggy	ML13344A446	Marincheva, Zoya	ML13343A955
Malone, Constance	ML13347A231	Marino, Barbara	ML13340A466
Malone, Evelyn	ML13331C023	Marino, Patricia	ML13344A834
Malone, Evelyn	ML13337A870	Marinsik, David	ML13344B118
Malone, Sue	ML13336B104	Mariotte, Jeffrey	ML13337A817
Maloney, Matthew	ML13331B693	Mariotte, Michael	ML13336B147
Malus, Peter	ML13339B531	Mark, Leslie	ML13336B239
Maly, Peter	ML13338B367	Markgraf, Steven	ML13346B335
Malyon, Hilary	ML13347A449	Markham, Joyce	ML13338B440
Mammarella, James	ML13331B817	Markic, Michael	ML13343A756
Mancini, Francis	ML13347A921	Markis, Phillip	ML13340A360
Mandell-Rice, Bonnie	ML13339A273	Markley, Jane	ML13347A037

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Markoff, Luba	ML13346B552	Martin, Susan	ML13337B391
Markowitz, John	ML13337B172	Martin, Suzanne	ML13339B252
Marks, Deborah	ML13344A769	Martin, Will	ML13343A350
Marks, Dr. Richard B.	ML13344A517	Martinez, Casey	ML13346A486
Marks, Luan	ML13339A026	Martinez, Claudia	ML13336B133
Markus, Mary	ML13331C036	Martinez, Claudia	ML13340A699
Markus, Mary	ML13338B307	Martinez, Claudia	ML13344A494
Markus, Mary	ML13346A455	Martinez, Gilbert	ML13339B367
Marling, Nick	ML13343A264	Martinez, Gilbert	ML13339B380
Marlowe, Margaret	ML13339B493	Martinez, Gilbert	ML13339B423
Maroney, Terry	ML13347A761	Martinez, Gilbert	ML13339B431
Marquardt, Jeanette	ML13343A571	Martinez, J.	ML13344B033
Marquardt, Michael	ML13338A819	Martinez, Janie	ML13346A821
Marr, Sandra	ML13337A698	Martinez, Kathleen	ML13336B715
Marrs, Cynthia	ML13337B549	Martinez, Melissa	ML13337B041
Marsalis, Diane	ML13344A605	Martini, Rich	ML13343A635
Marsden, Jesse	ML13355A304	MartinJerryM, Jerry	ML13343A701
Marsh, Carol	ML13346B028	Martinson, Tim	ML13339B496
Marsh, Joann	ML13331B547	Martire, R.	ML13346B575
Marsh, Marilyn	ML13336B036	Martocci, Gerry	ML13331B526
Marsh, Paul	ML13343A255	Martorano, Joan	ML13344A366
Marsh, Sherry	ML13331B519	Martucci, Janet	ML13344A295
Marsh, Sherry	ML13338B342	Maruffo, Jacquelynn	ML13344A894
Marshalek, Thomas	ML13338B321	Marx, Mary Alice	ML13344A551
Marshall, Laurel	ML13336B199	Maschke, Nicole	ML13346A520
Marshall-Edwards, Virginia	ML13344A761	Mashevcich, Anna	ML13347A223
Marston, Anne	ML13346A349	Mason, Douglas	ML13331B665
Marston, Mary	ML13337B318	Mason, Kathleen	ML13344A030
Martel, Mary	ML13331C228	Mason, Marcia	ML13344A773
Marten, Sandrine	ML13336A961	Mason, Pamela	ML13347A117
Marti, R.	ML13331C269	Masotti, Katherine	ML13337B547
Martin, Becca	ML13343A579	Masser, Joel	ML13338B163
Martin, Bill	ML13338B303	Massey, Carolyn	ML13343A442
Martin, Chas	ML13339B272	Massey, Janie	ML13346A561
Martin, Craig	ML13344A270	Massey, Jenifer	ML13343A298
Martin, Dawn	ML13338A860	Massie, Priscilla	ML13347A482
Martin, Drew	ML13336B702	Massie, Priscilla	ML13347A484
Martin, Edith	ML13336B100	Massman, John	ML13344A339
Martin, Gayle	ML13336A912	Massoli, Ron	ML13339B466
Martin, H. Celeste	ML13343A850	Masters, Mary	ML13339B102
Martin, Jerry	ML13336B391	Masters, Pearly	ML13338A804
Martin, Joy	ML13337A107	Masterson, Rik	ML13336B719
Martin, Joy	ML13339A218	Mastro, Cynthia	ML13344A381
Martin, Martha E.	ML13337A119	Mastroianni, Rob	ML13338A077
Martin, Martha E.	ML13346A990	Materson, Melanie	ML13336B559
Martin, Michael	ML13339B705	Mates, Ben	ML13344A812
Martin, Michael	ML13346A619	Matheny, Jenna	ML13343B187
Martin, Patrice	ML13339B647	Mathews, Carole	ML13331C258
Martin, Patricia	ML13340A228	Mathews, Carole	ML13337A818
Martin, Sue	ML13339B044	Mathews, Carole	ML13339B668

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Mathews, Christine	ML13339A281	Mayers, Katherine	ML13344A207
Matlock, Dale	ML13331B920	Mayes, Kathy	ML13340A639
Matrix, James	ML13337B104	Mayes, Peter	ML13343A945
Matson, Margaret	ML13343A531	Mayes, Steven and Susan	ML13331B939
Matsuda, Laurel	ML13346B188	Mayeux, Jerry	ML13336B622
Matsuda, Thomas	ML13336B060	Maynard, James	ML13347A702
Matsuda, Thomas	ML13343A321	Maza, Tasunka	ML13331C301
Matsui, Vicky	ML13347A791	Mazer, Linda	ML13344A525
Matthews, Janet	ML13346B510	Mazias, Melissa	ML13343A404
Matthews, Larissa	ML13343A967	Mazurek, James	ML13344A318
Matthews, Mark	ML13331B670	Mazza, Penelope	ML13344B062
Matthews, Nancy	ML13346B524	Mazza, Penelope	ML13347A803
Matthews, Thomas	ML13338B099	Mazzola, Lisa	ML13331B622
Matthiessen, Barbara	ML13343A356	McAlister, Vickie	ML13346A694
Matthijssen, Henriette	ML13347A626	mcallister, helen	ML13347A844
Mattingly, Georgia	ML13339A119	McAvoy, Meghan	ML13346B442
Mattingly, Laurie	ML13336A972	McBride, Diana	ML13338B151
Mattison, Stephen	ML13338B392	Mccain, Karma	ML13338A824
Mattson, Tim	ML13331A695	McCalister, Janet	ML13331B609
Mattson, RN, Sandra	ML13331B655	McCall, Chuck	ML13346B578
Matusow, Steve	ML13343A351	McCall, Jan	ML13336B668
Mauermann, Wiltrude	ML13346A305	McCalley, Toni	ML13338B042
Maupin, Edward	ML13339B727	McCamon, Liz	ML13344A172
Maurer, Denise	ML13347A205	McCann-Sayles, Alan	ML13347A947
Maurer, James	ML13339B521	McCann-Sayles, Daniel	ML13347A945
Maurer, Rold	ML13331B936	McCarron, Patti	ML13347A505
Maurer, William	ML13336B666	McCarthy, Bebe	ML13344A350
Maurer, William	ML13337A087	McCarthy, Debbie	ML13343A820
Mawhorter, Carol	ML13346B558	McCarthy, Elizabeth	ML13331C281
Mawhorter, Jerry	ML13336B619	McCarthy, Michael	ML13336A949
Mawhorter, Jerry	ML13344A687	McCarthy, Richard	ML13338A834
Max, Judith	ML13344B004	McCartney, Kim	ML13340A727
Maxfield, Bruce	ML13338A073	McCarty, Chris	ML13346B388
Maxfield, Casee	ML13339B193	McCauley, Brandi	ML13346B157
Maxson, Ronald	ML13346B185	McChrystal, Karen	ML13337B345
Maxson, Sharon	ML13340A508	McClain, Jack-	ML13337A073
Maxson-Marecek, Connie	ML13344A697	McCleary, Harriet	ML13331A696
May, Carl	ML13347A367	McCleary, Harriet	ML13340A407
May, Dana	ML13338B394	McClintock, B.A.	ML13344A169
May, Dave	ML13344B114	McCloskey, Deborah	ML13340A246
May, Geraldine	ML13331C042	McClurg, Daviann	ML13331C230
May, Lana	ML13331C209	McClurg, Daviann	ML13343A514
Maybury, John	ML13337B229	McCobb, Wendy	ML13339A025
Mayeda, Lynn	ML13337B147	McComb, Sandy	ML13336B101
Mayer, George Louis	ML13338A895	McCombs, Annie	ML13347A855
Mayer, Marita	ML13347A469	McCombs, Genie	ML13344A774
Mayer, Paul	ML13346A534	McCombs, Leith	ML13337B496
Mayer, Richard	ML13343A337	McCombs, Robert	ML13336A959
Mayer, Todd	ML13337B240	McCombs, Robert	ML13338A986
Mayerat, Robin	ML13347A622	McConkey, James	ML13343B047

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
McConnaughey, Evelyn	ML13337A139	McGlocklin, David	ML13338B280
McConnell, Catherine	ML13344A763	McGlone, Colleen	ML13339B284
McConnell, Ellen	ML13347A038	McGlone, Gail	ML13346B512
McConnell, Kelly	ML13338A779	McGoldrick, William	ML13346A689
McConnell, Vicki	ML13346B516	McGonagle, Richard	ML13338A891
McCormick, Lyle	ML13340A696	McGough, Alice	ML13344A026
McCormick, Mike	ML13331B805	McGovern, Donlon	ML13336B404
McCormick, Shanna	ML13338B174	McGovern, Laurie	ML13346B313
McCormick, Trevor	ML13338B006	McGowan, Gail	ML13344A675
McCown, Meredith	ML13339A583	McGowan, James	ML13336A962
McCoy, Allen	ML13347A878	McGowan, Richard	ML13338B382
McCraven, Dennis	ML13344A850	McGowan, Wendy	ML13339B585
McCready, Edwin	ML13343A493	McGrath, Carol	ML13346A366
McCreary, Melissa	ML13346B569	McGrath, Joanne	ML13337A939
McCue, J.G.	ML13336B535	McGrath, Joanne	ML13343A713
McCullam, Jane	ML13331C155	McGuffin, B.	ML13339B444
McCullam, Jane	ML13338B340	McGuire, James	ML13346A802
McCullough, Denali	ML13339B266	McGuire, James	ML13346A818
McCullough, Justin	ML13343A913	McGuire, Laura	ML13339B259
McCullough, Nancy	ML13337B301	McGuire, Peggy	ML13340A318
McCune, Sylvia	ML13338A030	McHugh, Margaret C.	ML13343A390
McDade, Ed	ML13331A711	McHugh, Michael	ML13337B243
McDermott, John	ML13347A479	McHugh, Patricia	ML13344B081
McDonald, Colleen	ML13339B574	McIlroy, Katherine	ML13338B352
McDonald, Michael	ML13347A932	McInnis, Anita	ML13343B121
McDonald, Patricia	ML13339B506	McIntosh, Patrick	ML13347A872
McDonald, Richard	ML13336B393	McIntyre, Misty	ML13343A712
McDonald, Tracy	ML13347A193	Mckay, Barbara	ML13331B893
McDonnell, Robert/LaVerne	ML13343A624	Mckay, Barbara	ML13336B726
McDonnell, Wendy Williams	ML13346B353	Mckay, Barbara	ML13338A066
McDonough, John	ML13346A388	McKee, Jerry	ML13347A283
McDonough, Rebecca	ML13347A530	McKelvey, Don	ML13336B347
McDougall, Joan	ML13344A527	McKelvey, Don	ML13343A647
McDowell, Cheryl	ML13346A706	McKelvey, Gerald	ML13343A319
McDuffie, Holly	ML13347A197	McKelvie, Patricia	ML13346B031
McElvany, Doreen	ML13337A780	McKenna, Charles	ML13337A774
McEnerney, Molly	ML13338B118	McKenna-Cooper, Kathleen	ML13339B168
McEnerney, Molly	ML13338B119	McKennon, Mark	ML13336B554
McEvoy, Aileen	ML13344A352	McKeon, Sheila	ML13347A332
McFall, Donald	ML13338B336	McKim, Tina	ML13338B121
McGee, Maureen	ML13347A952	McKinlay, Michael	ML13344A154
McGee, Nettie	ML13336B572	McKinney, Kathy	ML13343A688
McGee, Nettie	ML13347A529	McKinney, Laura	ML13346A699
McGeehan, Carol	ML13336B219	McKitrick, Marshal	ML13339A246
Mcgettigan, James	ML13347A644	McLane, Kathleen	ML13338A020
McGill, Linda	ML13346A880	McLane II, Richard	ML13338A040
McGillicuddy, Elaine G.	ML13331B711	McLaughlin, Laurie	ML13339B355
McGilvra, Mary	ML13344A662	McLaughlin, Luella	ML13331C190
McGinty, Alison	ML13340A438	McLean, Heidi	ML13355A306
McGlashan, Maria	ML13340A670	McLean, Sean	ML13347A554

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
McLemore, Alan	ML13337B386	Meek, Steve	ML13346B233
McMahan, Alexa	ML13339B014	Meeller, Dunja	ML13344A666
McMahan, Michael	ML13339B199	Mehl, Mark W.	ML13344A404
McMahon, Annie	ML13338A962	Mehling, Christopher	ML13344A807
McMahon, Arnold	ML13343A542	Mehrotra, Siddharth	ML13346B312
McMahon, Douglas	ML13338B337	Meier, Nicholas	ML13338B427
McMahon, Pam	ML13339B057	Meier, Ron	ML13337A962
McManus, Bryan	ML13343B165	Meintsma, Ruth	ML13337A956
McManus, Eric	ML13347A425	Meisel, Myron	ML13344A001
McManus, Mara	ML13347A378	Meislin, Barbara	ML13344A138
McMaster, Mary	ML13338B069	Meislin, Barbara	ML13344A139
McMillan, GeneAnna	ML13339B274	Meisse, Edward	ML13344A064
Mcmillan, Reba	ML13344B011	meissner, Peter	ML13347A659
McMillian, C.C.	ML13346B319	Meissner-Jackosn, Margit	ML13347A608
McMullen, Colleen	ML13339A012	Melchior, Hilda	ML13347A083
McMullen, Evelyn	ML13339B376	Melegari, Lois	ML13339B354
McMullin, William	ML13346B539	Melina, Catherine	ML13346B180
McMurray, Kirsten	ML13339B190	Melloh, MD, James	ML13343A920
McNair, Robert	ML13346A329	Melton, B.L.	ML13339B054
McNamara, Cynthia	ML13346B490	Meltzer, Joel	ML13346A909
McNamara, Laurence	ML13336B157	Melville, Terri	ML13346B531
McNea, Randy	ML13346B161	Melvin, Mael and Sophia	ML13343A995
McNeil, Daniel	ML13339B445	Memmert, Jonathan	ML13339B524
McNeill, Douglas	ML13331B952	Menapace, Richard	ML13340A610
McNeill, Douglas	ML13338B273	Menard, Jana	ML13346A346
McNeill, Katherine	ML13339B226	Menard, Rose Marie	ML13346B091
McNutt, Andy	ML13347A458	Mencik, Jitka	ML13346A870
McNutt, Robert	ML13346A379	Mendel, Chris	ML13339B580
McPherson, James and Leslee	ML13339B078	Mendelsohn, Marji	ML13331A658
McPherson, Joseph	ML13343A653	Mendelson, Debra	ML13339A115
McPherson, Tracy	ML13344A872	Mendenhall, R. Miles	ML13336B034
McQuillen, Sarah	ML13336B476	Mendez, Katherine	ML13337A850
McRae, Nancy	ML13338A840	Mendieta, Barbara	ML13347A609
McTaggart, Ian	ML13344B070	mercado, Sharon	ML13347A605
McVey, Emilie	ML13338B152	Mercer, Michele	ML13347A757
McVey, Kelly	ML13339B342	Meredith, Mairi	ML13346A850
Mead, Frances	ML13343A467	Merkel, Jane	ML13337A959
Meade, John	ML13343A826	Merkel, Karynn	ML13337B395
Meade, Pattie	ML13346A806	Merrick, Nancy	ML13343A755
Meckley, Faith	ML13336B089	Merrill, Heather	ML13347A547
Medeiros, Kimberly	ML13337A878	Merriman, John	ML13339B377
Mediano, Manor	ML13337B405	Merry, Nicholas	ML13331C284
Medina, Brian	ML13340A418	Merry, Nicholas	ML13346B072
Medina, Kathleen	ML13344A907	Mershon, Loretta	ML13344A676
Medlock, Richard	ML13331B908	Mertan, Brian	ML13337B451
Mednick, Jared	ML13337B312	Mertely, William	ML13339A112
Mee, Jim	ML13338B350	Mertz, Glen	ML13339B532
Meehan, Maureen	ML13347A637	Merz, Jonathon	ML13340A343
Meek, June	ML13344A305	Meseck, Fred	ML13337B341
Meek, June	ML13347A723	Meserkhani, Sarinea	ML13337B399

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Messick, Scott	ML13339B358	Miller, Doreen	ML13344A562
Messina, Annette	ML13336B462	Miller, Ed	ML13338B410
Messina, Anthony	ML13331B911	Miller, Edwin	ML13331C033
Messina, Ronald	ML13337B486	Miller, Eileen	ML13343B112
Methvin, Barbara	ML13346A546	Miller, Eric	ML13331B776
Metje, Melodie	ML13336B210	Miller, Geoffrey	ML13343B024
Metz, Emily	ML13339B703	Miller, J.	ML13339A571
Metz, Lindy	ML13339B067	Miller, Jack	ML13337A794
Metz, T	ML13337B038	Miller, James	ML13338A839
Metzger, Eileen	ML13347A339	Miller, Jill	ML13336B626
Metzger, Elinor	ML13346A381	Miller, Joan	ML13337B457
Metzger, Harvey	ML13344A681	Miller, John	ML13344A243
Meuer, Rita	ML13343A675	Miller, John	ML13344A724
Meyer, Ari	ML13340A169	Miller, Karen	ML13344A541
Meyer, Colonel	ML13336B501	Miller, Ken	ML13338A913
Meyer, Colonel	ML13343A744	Miller, Kenneth	ML13337B150
Meyer, Elizabeth	ML13343A811	Miller, Laurie	ML13347A122
Meyer, Eric	ML13343A296	Miller, Louise	ML13346B179
Meyer, Leonard	ML13343A682	Miller, Marlene	ML13340A194
Meyer, Paul	ML13344A145	Miller, Mary	ML13337A926
Meyer, Jr., Harold	ML13336B627	Miller, Michael	ML13339B438
Meyers, Cindy	ML13340A296	Miller, Mike	ML13343A470
Meyers, Phillip	ML13339B706	Miller, Nancy	ML13337B480
Meza, Joel	ML13331B751	Miller, Natalie	ML13339A161
Meza, Joel	ML13337B170	Miller, Pamela	ML13346B528
Mican, Frances	ML13347A423	Miller, Phyllis	ML13337A802
Michaels, Christopher	ML13337A996	Miller, Rebecca	ML13337B383
Michaels, Patricia	ML13336A910	Miller, Robert	ML13331A714
Michel, Bill	ML13338A934	Miller, Robert	ML13339B273
Michel, Coky	ML13336B397	Miller, Sandra	ML13346A297
Michetti, Susan	ML13337B062	Miller, Sara	ML13346B167
Michlin, Laurry	ML13337B500	Miller, Scott	ML13347A496
Middleton, Richard	ML13337B269	Miller, Steven	ML13346B436
Miele, Frank	ML13343A576	Miller, Suzanne	ML13336B022
Mieyal, Timothy	ML13339B131	Miller, Suzanne	ML13339B254
Mihaly, Robert	ML13343B136	Miller, Suzanne	ML13347A751
Miiller, Victor	ML13344B099	Miller, Tim	ML13343A971
Mika, Gaia	ML13331B572	Miller, Todd	ML13344B109
Mikkelson, Greg	ML13344A224	Miller, Virginia	ML13343A916
Milam, Tim	ML13331B673	Milliken, Gerry	ML13336B260
Milark, Hollis	ML13344A422	Milliken, Jane	ML13331B886
Milburn, Judith	ML13336B426	Milliken, Rosalind	ML13338B233
Miles, Dori	ML13337B159	Milliman, Aileen	ML13347A936
Miletta, Lara	ML13339A288	Miller, Victoria	ML13337B100
Milkowski, George E.	ML13339B621	Mills, Larry	ML13344A187
Miller, Ben	ML13338A920	Millstone, Burris	ML13340A337
Miller, Brad	ML13344A454	Milne, Martha	ML13346A448
Miller, Charles	ML13336B015	Milrod, Bonnie	ML13347A606
Miller, D.	ML13339A016	Milton, Jack	ML13337B132
Miller, David	ML13347A728	Mims, Roy	ML13347A949

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Minch, Allen	ML13344A307	Montes, Ben	ML13340A655
Minic, Marija	ML13347B016	Montford, Lawrence	ML13344A411
Minnerly, Don	ML13344A153	Montgomery, Edith	ML13339B579
Minton, Mark	ML13343A914	Montgomery, F. Michael	ML13339A991
Minton, Mark	ML13347A522	Monton, Paula	ML13344A178
Mintz, Crystal	ML13337A042	Moon, Rick	ML13344A813
Mira, Ginger	ML13337B305	Moon, Sue	ML13339B558
Miralia, Quilla	ML13339B219	Moore, Alan	ML13336A945
Miranda, Claudia	ML13344A759	Moore, Debra	ML13340A700
Mirell, Douglas	ML13343A703	Moore, Eric	ML13340A582
Miron, Kurt	ML13343B010	Moore, Howard	ML13346A667
Mirsky, Seth	ML13343A449	Moore, Hugh	ML13346A893
Misale, Joseph	ML13339B757	Moore, Janet	ML13339B405
Missimer, Jr., Robert D.	ML13344A871	Moore, Janine	ML13340A516
Mitchell, Darius	ML13331C273	Moore, Jeannine	ML13344A897
Mitchell, David	ML13337A971	Moore, Kristine	ML13344A047
Mitchell, Julie	ML13339B268	Moore, L.C.	ML13344A465
Mitchell, Michael	ML13347A167	Moore, Lawrence	ML13344B057
Mitchell, Mike	ML13339B724	Moore, Nancy	ML13339B672
Mitchell, Phillip	ML13337B488	Moore, Nicole	ML13347A477
Mitchell, Shirley	ML13347A024	Moore, Paul	ML13336B649
Mitton, Darren	ML13346B256	Moore, Robin	ML13344B111
Miyashiro, Stephanie	ML13340A646	Moore, Thomas	ML13344B021
Mizelle, Eileen	ML13343A551	Moorman, Linda	ML13338B129
MJ, Ltlt	ML13344A025	Morado, Carolyn	ML13344A792
Modjeski, Jan	ML13336B384	Morales, Diana	ML13346A396
Modjeski, Jan	ML13343A790	Moran, James	ML13339B535
Moeser, Donald	ML13347A428	Moran, Judy	ML13344A123
Mogollon, Mar	ML13346B257	Moran, Patricia	ML13347A533
Moidja, Nick	ML13346A901	Moran, Sharon	ML13337B544
Moldovan, Lori	ML13336B553	Morehead, Maria	ML13339A553
Molgora, Bianca	ML13343A840	Moreira, J.	ML13347A370
Molinu, Rosella	ML13344A898	Moreno, Alejandro	ML13347A866
Monbureau, Margaret	ML13340A697	Moreno, Donna	ML13343A374
Mondazze, Gina	ML13346B199	Morez, Sherry	ML13344B097
Mondazze, Gina	ML13346B200	Morgan, Ann	ML13346A742
Mone, Carol	ML13343A809	Morgan, Charles	ML13331B804
Mongere, Anne	ML13346B131	Morgan, Michael	ML13336A926
Moniz, Mark	ML13331B721	Morgan, Seth	ML13338B388
Monroe, Edwin Jeffrey	ML13331B755	Morgan, Shayne	ML13343A201
Monroe, James	ML13338B247	Morganti, Anthony	ML13338A036
Monroe, Michael	ML13347A754	Mork, Stuart	ML13336B705
Monson, Dennis	ML13339B025	Mork, Stuart	ML13343B062
Monson, Dennis	ML13339B026	Morningstar, Samuel	ML13346B417
Montague, Katherine	ML13331C203	Moros, Melinda	ML13338B359
Montague-Judd, Danielle	ML13347A602	Morotti, Gloria	ML13336B432
Montapert, Anthony	ML13331B578	Morotti, Gloria	ML13338B138
Montelione, Kate	ML13338B430	Morphew, Karol	ML13347A346
Montemayor, Jaron	ML13338A797	Morring, Oweni	ML13343A671
Montero, Deborah	ML13347A596	Morris, Christen	ML13343A370

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Morris, Chrys	ML13339B180	Mountain, Dan M.	ML13338B335
Morris, David	ML13337B158	Mountain, Dan M.	ML13338B361
Morris, Deirdre	ML13344A369	Mourant, Wanda	ML13344B045
Morris, Donald	ML13339B356	Movsesyan, Greg	ML13343A461
Morris, Edith	ML13346B142	Mowell, John	ML13338A944
Morris, Eric	ML13338B123	Mower, Amy	ML13343B019
Morris, Eric	ML13338B219	Moy, Cary	ML13338B288
Morris, Jackie	ML13337B234	Moy, Cary	ML13347A642
Morris, Jamie	ML13339A086	Moycik, Mary	ML13344A803
Morris, Kathleen	ML13336B663	Moyer, Anita	ML13340A292
Morris, Linda	ML13337A946	Mramor, Andrew	ML13347A390
Morris, Markley	ML13339A201	Mrkvicka, Edward G.	ML13340A605
Morris, Nancy	ML13336A845	Mrozek, Barbara	ML13347A640
Morris, Sue and John	ML13331A704	Mudrick, Stephen	ML13331A632
Morris, Sue and John	ML13339B589	Mudrick, Stephen	ML13340A398
Morrison, Abi	ML13346B518	Mueller, Helmut	ML13337B511
Morrison, Carol	ML13336B601	Mueller, Kay	ML13347A575
Morrison, Christina	ML13346A412	Mugge, John	ML13344A410
Morrison, Donald	ML13331B756	Muise, Robert	ML13337A733
Morrison, Gloria	ML13331C008	Mujica, Bernardo Alayza	ML13331C162
Morrison, Gloria	ML13339B615	Mujica, Bernardo Alayza	ML13331C233
Morrison, Margaret	ML13338B407	Mujica, Bernardo Alayza	ML13331C314
Morrissey, Susan	ML13343A660	Mulberry, Prem	ML13339A101
Morrow, Myrna	ML13347A813	Mulcahy, Susan	ML13344B063
Morrow, Randy	ML13343A212	Mulcare, James	ML13331B744
Morr-Wineman, Steven	ML13344A969	Mulcare, James	ML13337A885
Morsberger, Grace	ML13331B917	Mulcare, James	ML13337A925
Morse, Bob	ML13336B584	Mulder, Brandy	ML13344A112
Morse, Paul	ML13343B116	Mulder, James	ML13343A237
Mortenson, Dan	ML13337A076	Mulder, Joel	ML13337A932
Mosca-Clark, Vivianne	ML13331C272	Mull, Cynthia	ML13336B130
Moschini, Suzanne	ML13339B626	Mullane, Danny	ML13347A402
Moschopoulos, Charity	ML13337A707	Mullen, Carrie	ML13347A629
Moser, Janet	ML13336A829	Mullen, Timothy	ML13339B120
Moser, Joyce and Henry	ML13337A891	Mullens, Gary	ML13347A064
Moser, Rich	ML13339B096	Muller, Christine	ML13336A874
Moses, Ann	ML13343A732	Muller, Mary Anne	ML13336B016
Mosgofian, Jan	ML13338B205	Mullins, Kate	ML13344A668
Mosgofian, Seth	ML13336B148	Mulloy, C.	ML13338B136
Mosher, Holly	ML13339B614	Mulloy, Carleen	ML13336B007
Mosley, James	ML13347A413	Mulrennan, William	ML13346A277
Moss, Anguss	ML13337A782	Mulvey, Linda	ML13337A680
Moss, Gerald	ML13339A545	Mulvey, Lori	ML13347A118
Moss, Glenn	ML13344A480	mumford, jeffrey	ML13346B407
Moss, Kathleen	ML13337B075	Mummery, Alexandra	ML13347A350
Moss, Marjorie	ML13343B195	Mummery, Donna	ML13340A470
Moss, Paul	ML13344A244	Munger, Doris	ML13331B576
Moss, Sharon	ML13339B040	Munger, Doris	ML13338A056
Mossman, Sue Lee	ML13343A709	Munger, Martha	ML13339B322
Moszyk, John	ML13337A683	Munoz, Angela	ML13346B245

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Munro, Karen	ML13344A973	Nahill, Brad	ML13346A438
Murakami, Hideyuki	ML13344A614	Nahman, Jaime	ML13346A938
Muralidharan, Sashi	ML13344A725	Nahrin, Zima	ML13344A044
Murbach, Randy	ML13337B262	Nakadegawa, Judy	ML13346B438
Murdock, Lauren	ML13336B171	Nakashima, Mira	ML13338A069
Murdock, Lauren	ML13339B039	Nakisher, Warren	ML13346A936
Murphy, Bill	ML13338B087	Nakosteen, Deanna	ML13337A038
Murphy, Charles	ML13347A187	Nalbandian, Dikran	ML13344B100
Murphy, Cindy	ML13343A517	Nam, S.	ML13347A743
Murphy, John	ML13336A999	Napoleon, Alexandra	ML13343A704
Murphy, John Kelly	ML13339B003	Napoleon, Laura	ML13339B188
Murphy, Joy	ML13344A156	Napoli, Robert	ML13338B314
Murphy, Judy	ML13343A500	Naranjo, Arlene	ML13344A806
Murphy, Karen	ML13339B214	Nardell, Jason	ML13339A241
Murphy, Linda	ML13331C239	Nash, Jonathan	ML13346B058
Murphy, Michael	ML13344A170	Nass, MD, MPA, Scott	ML13331B551
Murphy, Roy	ML13337B122	Nasser, Yogi	ML13337A892
Murray, Barbara	ML13337A058	Nathan, Janice	ML13346A458
Murray, Cristy	ML13343A735	Naughton, Cherilyn	ML13331C322
Murray, M. Jean	ML13339A132	Naujokas, Deborah	ML13338A808
Murrow, Gary	ML13337B429	Navarro, Eleanor	ML13346B408
Murti, Vasu	ML13339A159	Naylor, John	ML13337B390
Muser, Stephen	ML13338B256	Neale, Joanne	ML13343A620
Music, Michael	ML13336B106	Neaves, Betsy	ML13346B089
Mutch, Mary	ML13344A992	Nedderman-Eaton, Linda	ML13338B120
Myers, David	ML13344A752	Needham, Meredith	ML13346A338
Myers, Derald	ML13344B029	Needleman, Larry	ML13337A909
Myers, Diana	ML13347A267	Needleman, Larry	ML13338A745
Myers, Jay	ML13344A121	Needler, Gavin	ML13343A918
Myers, Leslie	ML13344A592	Neihart, Janet	ML13331C212
Myers, Linda	ML13343A768	Neihart, Janet	ML13337A883
Myers, Nathan	ML13347A825	Neihart, Janet	ML13338A998
Myers, Robert	ML13340A710	Neil, Michael	ML13346B164
Myerson, Alan	ML13347A473	Neill, James	ML13346B267
Mylott, Sharon	ML13339B263	Neill, William	ML13346B252
Mylott, Sharon	ML13339B323	Neiman, E.	ML13344A892
N, L.	ML13344A857	Neiman, Laura	ML13343A292
N, Mary	ML13347A047	Nelligan-McGarry, Nancy	ML13346A808
N, Sandy	ML13347B028	Nelms, Zachary	ML13343B173
Nabors, Rosalie	ML13344A004	Nelson, Brad	ML13343A938
Nadelman, Fred	ML13337A800	Nelson, C.	ML13337A081
Nadelman, Fred	ML13337A801	Nelson, Carol	ML13336B356
Nader, Connie	ML13347B001	Nelson, Carol	ML13336B392
Nadle, Jon	ML13339B076	Nelson, Dency	ML13336B455
Nadolny, Michael	ML13344A880	Nelson, Dennis R.	ML13347A207
Naftaly, Stanley	ML13343A842	Nelson, Joseph	ML13346B217
Naftaly, Stanley	ML13343B096	Nelson, L.	ML13343B023
Nagarya, Joseph	ML13339B209	Nelson, Nicola	ML13344A481
Nagel, Margaret	ML13331B749	Nelson, Pam	ML13336B266
Nagy, Dennis	ML13339B186	Nelson, Priscilla	ML13339B479

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Nelson, Scott	ML13337A808	Nicholson, Carol	ML13340A302
Nelson, Thomas	ML13336B369	Nick, Jean	ML13344A241
Nelson, Thomas Scott	ML13339B771	Nickels, Stephen	ML13336A836
Nelson-Rogers, Karin	ML13337A807	Nickerson, Marita	ML13347A185
Nenon, Eloise	ML13347A553	Nickerson, Mike	ML13336A964
Neria, Ruben	ML13338B318	Nicola, Susan	ML13337B433
Nesja, Mark	ML13346B092	Nicoletti, Michael	ML13339A037
Nesline, Rebecca	ML13343B164	Nidess, MD, Rael	ML13338A044
Ness-Lira, Carole	ML13339A194	Niederhoffer, Valerie	ML13331B836
Neste, Lisa	ML13347A365	Niederman, Beth	ML13343A221
Nester, Renee	ML13343A325	Niedner, Sylvia	ML13343A265
Nettleton, John	ML13339B770	Nieland, Thomas	ML13337B382
Netusil, Paul	ML13344A976	Nielsen, David	ML13339B224
Neuber, Chirsta	ML13343A881	Nielsen, Erik	ML13346B316
Neuberg, Pam	ML13339A296	Nielsen, Nathan	ML13339B529
Neuert, Michael	ML13346B069	Nielsen, Randi	ML13346A839
Neuhauser, Alice	ML13344A641	Niemann, Josephine	ML13337A141
Neumann, Donna	ML13340A412	Niemi, Carol	ML13343A211
Neumann, Nancy	ML13336B638	Niesman, Diane	ML13343A750
Neumann, Pamela	ML13336B153	Nieves, Leslie	ML13338B381
Neumeister, John	ML13338A988	Nihipali, Michele	ML13337A017
Neville, Paula	ML13346A439	Nihipali, Michele	ML13339B179
Newberg, Stephen and Robin	ML13336A892	Nikiforov, Dmitry	ML13347A585
Newberg, Stuart	ML13339A997	Nikiforov, Dmitry	ML13347A586
Newcombe, Mae	ML13344A638	Nikiforov, Dmitry	ML13347A587
Newell, Nancy	ML13331B898	Nilsson, Lena	ML13344A717
Newell, Scott	ML13340A404	Nina, Donna	ML13344A440
Newlin, Virginia	ML13347A625	Nishman, Alan J.	ML13337A720
Newman, Ricki	ML13344A006	Nix, Debra	ML13346B100
Newman, Scott	ML13344A041	Nix, John	ML13346B101
Newsham, Brad	ML13331B786	Noble, Nina	ML13338B399
Newton, Alice	ML13344A776	Nobles, Timothy	ML13346A301
Newton, Heather	ML13331B694	Nobriga, Mark	ML13344A911
Newton, Heather	ML13338B005	Nochman, Joe	ML13338B101
Newton, Jane	ML13337A708	Nodurft, Shane	ML13343A630
Newton, Lucile	ML13344A778	Noel, Kristin	ML13336B583
Nez, David	ML13343B074	Noel, Philip	ML13339A188
Ng, Carol	ML13346B175	Nolting, Sharon	ML13336B332
Nghe, Keefe	ML13337B208	Nonemaker, Elizabeth	ML13347A481
Ngo, Ann	ML13346A502	Noone, Molly	ML13344A101
Nguyen, Dylan	ML13337B294	Noonkester, Dale	ML13347A249
Niblack, Janice	ML13340A167	Noonkester, Dale	ML13347A312
Niccolini, Dianora	ML13343B077	Nord, Felice	ML13336A932
Nichols, Carmen	ML13339B333	Nordhof, Pamela	ML13337A927
Nichols, David S.	ML13331B811	Norgrove, Jamesn	ML13339B599
Nichols, David S.	ML13339A105	Norr, Carolyn	ML13337B304
Nichols, Julia	ML13346A752	Norris, Enid	ML13347A666
Nichols, Stephen	ML13343A661	Norris, Linda	ML13346A798
Nicholson, Allan	ML13339B767	Norton, Oak	ML13338A082
Nicholson, Calista	ML13331C265	Norton-Jones, Joyce	ML13344A930

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Novitski, B.J.	ML13337A948	Ognjanovic, Michelle	ML13336A952
Novkov, Russell	ML13343A771	OGrady, Liz	ML13347A143
Nowack, James	ML13337B419	O'Grady, Andrea	ML13346B386
Nowell, Anita Cannata	ML13337B073	Oguz, sebnem	ML13346A700
Nowlin, Linda	ML13344A332	Oh, Geno	ML13347A778
Nucci, Britney	ML14015A232	Ohanian, Laura M.	ML13346B380
Nuernberg, Susan	ML13336B362	Ohland, Andreas	ML13337B251
Nuesch, Raymond	ML13331B649	Ohlinger, Earl	ML13331B968
Nuesch, Raymond	ML13331B713	Ohlinger, Earl	ML13347A408
Nuesch, Raymond	ML13337A826	Ohm, Rick	ML13339A036
Nuesch, Raymond	ML13337A828	oinos, Javier	ML13346B527
Nuesch, Raymond	ML13337B296	Okulam, Frodo	ML13344A143
Nuesch, Raymond	ML13337B315	Olafson, Meghan	ML13347A748
Nuesch, Raymond	ML13337B330	Olavarri, Kathy	ML13346B134
Nunez, Albert	ML13353A196	Olcsvary, Michael	ML13336B410
Nunez, Carlos	ML13337A950	Olcsvary, Michael	ML13346B212
Nusbaum, William	ML13337A833	Older, Martha	ML13336B403
Nussbaum, Laureen	ML13339A073	Oldershaw, Susan	ML13339A195
Nussbaum, Laureen	ML13339A216	Oldham, Kevin	ML13331C311
O, Greg	ML13336B473	Oldham, Kevin	ML13346B038
Oakes, John	ML13338A093	Oleachea, Jim	ML13339A992
Oboruemuh, Abraham		O'Leary, Patricia	ML13336B006
Omorenimwen	ML13346B183	O'Leary, Patricia	ML13337B554
O'Brien, Dennis	ML13337B048	Oleynikov, Karina	ML13347A938
O'Brien, Floyd	ML13331B778	Olivier, Larry	ML13346B345
O'Brien, Kathy	ML13343A536	Olsen, Andrew	ML13338A010
O'Brien, Monica	ML13344A842	Olsen, Donna	ML13339A080
O'Brien, Robert	ML13336B341	Olsen, Earl	ML13339B699
O'Brien, William	ML13338B448	Olsen, Hebard	ML13343A942
Obuszewski, Max	ML13346B573	Olsen, Jeremy	ML13340A654
O'Byrne, Nancy	ML13340A563	Olsen, Jeremy	ML13346A737
Ocean, Kiilani	ML13347A296	Olsen, Jon	ML13331C217
Ochs, Richard	ML13336A935	Olson, Joseph	ML13343A822
O'Connell, Bill	ML13343A210	Olson, K.	ML13343A501
O'Connor, Bette	ML13343A633	Olson, K.	ML13343A524
O'Connor, Robert	ML13336B689	Olson, Richard	ML13338A813
O'Connor, Siochain	ML13339B129	Olson, Shawn	ML13337B364
O'Dea, Pamella	ML13336B508	OMalley, Polly	ML13346A423
O'Dea, Pamella	ML13344A120	Omans, Jeff	ML13340A704
ODear, Elizabeth	ML13344A452	Omans, Jeff	ML13340A726
Odell, Norma	ML13336B264	Omori, Akio	ML13347A255
Odes, Joan	ML13344B041	Oneal, Barbara	ML13336B258
Odezynskyj, Maria	ML13347A212	Oneal, Michael	ML13336B515
O'Donnell, Richard	ML13346A441	O'Neal, Maureen	ML13336B012
O'Dowd, Dolores	ML13336B664	O'Neil, Eric	ML13331C135
O'Dowd, Dolores	ML13344B007	O'Neil, Terri	ML13336A977
Oehler, Susan	ML13343A615	O'Neill, Cathy	ML13338B232
Oetken, W.	ML13340A590	Ong, Ming	ML13343B051
Oftedahl, Carol	ML13340A707	Onweller, Victor	ML13343A506
Ogilvie, Dave	ML13337B365	O'Quinn, Blake	ML13344A194

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Oravetz, Nancy	ML13347A183	Overmyer, Luann	ML13331C074
Orcholski, Gerald	ML13343A658	Oversteyns, Annemie	ML13331C295
Ordas, Annette	ML13344A808	Overstreet, Caitlin	ML13344A881
Ordway, Paul	ML13343A736	Oviatt, Stephen	ML13336B700
O'Reilly, Maureen	ML13339A092	Owen, Joseph	ML13337B501
O'Reilly, Phyllis	ML13346B160	Owen, Ken	ML13331B587
Orion, Lynn	ML13343A488	Owens, Delila	ML13340A638
O'Riordan, Sharen	ML13347A351	Owens, Richard	ML13338B443
Orlinski, Patricia	ML13336B400	Owens, Sharon E.	ML13346B102
Orlinski, Patricia	ML13343B122	Owens, Theresa	ML13343A781
Orloff, Paula and Jerome	ML13339A027	Ower, Geoff	ML13331B944
Orme, Kevin	ML13347A979	Oxyer, Jim	ML13343A670
O'Rourke, Walter	ML13339A046	Ozer, Nilgun	ML13337B136
Orozco, Rafael	ML13343B146	P., J.	ML13337B204
Orozco, Stephanie	ML13346A284	P., Octavia	ML13344A491
Orozco, Stephanie	ML13347A883	P., S.	ML13337B087
Ortega, Franco	ML13346B230	P., U.	ML13343A996
Ortego, Sybil	ML13339B603	P.G., Amber	ML13346B579
Ortiz, Lionel	ML13331C240	Pa, Larry	ML13338B197
Ortiz, Lionel	ML13337B344	Pace, Lisa	ML13337A764
Osborn, Carole	ML13344A679	Pacheco, Andrés	ML13347A485
Osborn, L.	ML13337B541	Packard, Roger	ML13331C116
Osborne, Amanda	ML13347A199	Packard, William	ML13346A451
Osborne, Leslie	ML13339B279	Packer, Patti	ML13343A284
Osborne, Roger	ML13347A340	Paddon, Christopher	ML13337A832
Oser, Wendy	ML13331B910	Page, Charles	ML13343A515
Oshiro, Alex	ML13339B450	Page, Garril	ML13347A427
Osinga, David	ML13343B072	Page, Nicholas	ML13344A204
Oskamp, Stuart	ML13336B482	Page, Peggy	ML13337B191
O'Somachain-Price, Emily	ML13331C260	Painter, PhD, Carol J.	ML13337A012
Ospa, Nick	ML13347A438	Pais, Gregory	ML13343A657
Oster, Bruce	ML13346B289	Pakurar, Thomas	ML13336B102
Oster, Phyllis	ML13337A067	Paleiaa, Linda	ML13331C285
Osterhoudt, David	ML13331C105	Palenchar, Jessica	ML13336B220
Osterhoudt, David	ML13338B056	Palla, Paul	ML13346A832
Osterman, Norm	ML13339B061	Palladine, Michelle	ML13331B583
Ostrer, Allison	ML13337A779	Palma-Glennie, Janice	ML13336B734
Ostro, Linda	ML13339B573	Palmer, Carol	ML13338B043
Ostrosky, Kathie	ML13346B332	Palmer, R. Brent	ML13347A135
Ostrow, Hillary	ML13337B533	Palmer-Fortune, Joyce	ML13331A579
O'sullivan, John	ML13346A569	Palmisono, Angela	ML13337B146
Ott, Jean	ML13339B616	Palmiter, Dick	ML13337B531
Otten, Eve	ML13346B213	Palmquist, Elaine	ML13344A484
Ottenbrite, Shelley	ML13344A216	Paltin, Sharon	ML13343B184
Otto, Patricia	ML13336B536	Panciera, Jeffrey	ML13339B754
Ottoman, Tom	ML13337A771	Pangborn, Della	ML13346B452
Ouai, Dalila	ML13344A021	Pann, Robert	ML13346A631
Oure, N.	ML13331C131	Pannaman, Stanley	ML13343A680
Outlaw, Gail	ML13346B096	Panther, Rich	ML13339B311
Overmann, Laura	ML13344A236	Panzica, Greg	ML13337A015

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Paoli, Cassie	ML13343A676	Patamia, Steven	ML13343B111
Paoli, Devon	ML13346A741	Patch, Rashid	ML13343B126
Paoluzzi, Sara	ML13346B384	Patenaude, Richard	ML13338B217
Papadopoulou, Maria	ML13344A171	Paterline, Deb	ML13344A245
Papandrea, John	ML13336B228	Patrick, Jane	ML13344A438
Papke, L. and family	ML13339B379	Patrick, Jane	ML13347A635
Pappas, George	ML13344A915	Patrick, Kay	ML13338B208
Pappas, Mark	ML13337B444	Patrick, Paul	ML13338B274
Papscun, Alan	ML13331A586	Patrie, Dr. Lewis	ML13336B542
Papscun, Alan	ML13339A282	Patterson, Carol Joan	ML13337A923
Paquet, Annette	ML13346A390	Patterson, Jennifer	ML13343B181
Paradis, Kate	ML13331C115	Patti, Vincent	ML13344A958
Paravola, Alicia	ML13347A876	Paul, K.L.	ML13343A603
Parcells, Julie	ML13338B080	Paulsen, David	ML13344A073
Pardi, Marco	ML13337B034	Paulson, Susan	ML13338B384
Pardini, Jenny	ML13346A422	Paulson, Thomas	ML13365A122
Parent, Charles	ML13346A824	Paviour, Ernest	ML13331C134
Paris, Melina	ML13343A426	Pavlic, Anne	ML13339A108
Parisi, Julie	ML13344A414	Pavlock, Janice	ML13346B284
Park, Dr. Denise	ML13337B515	Paxson, Elizabeth	ML13331C210
Parker, Deborah	ML13331A601	Payne, Grace	ML13339B716
Parker, Deborah	ML13343A578	Pazdziorko, Stephen	ML13338B065
Parker, Eric	ML13343A220	Peacock, Bruce	ML13343A550
Parker, Greg	ML13344A678	Peake, Marina	ML13346A882
Parker, James	ML13337B412	Pearce, Linda L.	ML13340A323
Parker, L.	ML13343B172	Peariso, Craig	ML13347A663
Parker, Sharon	ML13346B471	Pearl, Dana	ML13346B205
Parker, Susan	ML13347A978	Pearlman, Betty	ML13346A927
Parkhurst, Gena	ML13351A178	Pearlman, Emily	ML13346A501
Parkins, April	ML13344A124	Pearlman, J.	ML13344A470
Parks, Warren	ML13339B407	Pearsall, Judith	ML13346B399
Parlette, Karen	ML13344A104	Pearson, Hetty	ML13346B035
Paro, Roberta	ML13336B324	Pearson, Judith	ML13347A419
Paro, Roberta	ML13343A406	Pearson, Julie	ML13344A197
Parra, Dolores	ML13346A773	Pearson, Rae	ML13331B807
Parral, Marya	ML13338A939	Pearson, Tia	ML13346B346
Parrish, Dave	ML13347A483	Peavy, Jerry	ML13339A232
Parrott, Leila	ML13331A593	Pech, Eileen	ML13344A238
Parry, John	ML13344A653	Peck, Laura	ML13339B249
Parsley, Adina	ML13340A208	Peck, Sarah	ML13344B080
Parsneau, Michelle	ML13344A106	Pedersen, John	ML13343B071
Parsons, Ron	ML13340A636	Pederson, Andrew Esa	ML13337A960
Partington, Kevin	ML13338B047	Pederson, Mary Helen	ML13336B184
Partridge, Ronald	ML13339B731	Peha, David	ML13340A594
Partschi, Michael	ML13339A015	Peha, John	ML13331B731
Pasetta, Stacy	ML13338B110	Peirce, Susan	ML13339A136
Pasholk, Robin	ML13338B054	Pelakh, Susan	ML13347A828
Passante, John	ML13343A295	Pelc, Joan	ML13347A539
Pastore, Mary Ann	ML13339A094	Pelham, Christopher	ML13331B861
Pasvankias, Dean	ML13339A555	Pelham, Greg	ML13339B404

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Pelizzari, Roger	ML13338A061	Peters, Gene and Dori	ML13331B742
Pellegrini, Darryl	ML13331B935	Peters, Gene and Dori	ML13343B066
Pelletier, Lisa	ML13331B540	Peters, Gene and Dori	ML13343B117
Pena, Suzanne	ML13336A948	Peters, Henry	ML13331C142
Pena, Suzanne	ML13338B246	Peters, Sheryl	ML13339A163
Pendergast, Jerry	ML13336B359	Petersen, Patricia	ML13346B542
Pendleton, Jay	ML13346A992	Petersen, Stella	ML13336B694
Penfold, Kathy and Jim	ML13331B907	Peterson, Becky	ML13337B509
Peniazek, Anne	ML13343A924	Peterson, Carl	ML13331A634
Penn, Constance	ML13343A689	Peterson, David	ML13343A751
Penney, Darby	ML13338A006	Peterson, Davin	ML13331B870
Pennington, Richard	ML13337B230	Peterson, Jeanne	ML13339B587
Pennisi, Andrea	ML13344A046	Peterson, Joan	ML13347A182
Pepitone, Michelle	ML13344A324	Peterson, Leslie	ML13340A173
Pepper, Melita	ML13343A921	Peterson, Nancy	ML13340A595
Perales, Teresa Masia	ML13337A901	Peterson, Robin	ML13344A879
Peralta, Karen	ML13337A691	Peterson, Sandra and Roger	ML13344A701
Pereira, Bruce	ML13347A861	Peterson, Stanley	ML13347A029
Pereira, Bruce	ML13347A981	Petlock, Kyle	ML13344A464
Peres, Todd	ML13337B292	Petmezas, Terri	ML13346B513
Perez, John	ML13337B218	Petranto, Nancy	ML13344A059
Perez, Susan	ML13339A231	Petri, Claire	ML13337B523
Perinchief, Jana	ML13338A970	Petroni, John	ML13338A114
Perini, Louise	ML13347A975	Petroski, Edward	ML13347A683
Perkins, E.	ML13339A249	Petrulis, Bryan	ML13346B446
Perkins, Jean	ML13344B112	Petrus, Veronica	ML13343A835
Perkins, Mike	ML13344A105	Pettingill, N.	ML13343A218
Perkins, Robert	ML13346B260	Pettis, Carolyn	ML13346B387
Perkins, V.E.	ML13331C086	Pettlon, Archee	ML13336A938
Perkins, V.E.	ML13347A963	Pettus, David	ML13338B148
Perl, Richard C.	ML13346B554	Pew, Stephen J.	ML13340A313
Perlman, Janet	ML13338A115	Pezzi, Monia	ML13343A674
Perlmutter, Martha D.	ML13340A247	Pfeifer, Nezka	ML13339B175
Perna, Martin	ML13340A253	Pharo, Lou	ML13338B289
Perras, Richard	ML13339B439	Phi, Jimmy	ML13347A937
Perricelli, Claire	ML13344B013	Philip, Diana	ML13336A885
Perrin, Amy	ML13346A592	Philip, Diana	ML13338A113
Perrine, Stephen	ML13337B470	Phillips, Robert P.	ML13343A638
Perron, Sara	ML13347B017	Phillips, Charles	ML13347A555
Perry, Joy	ML13336B262	Phillips, Cheryl	ML13344B096
Perry, P.	ML13340A532	Phillips, Craig	ML13347A405
Perry, Randall	ML13336B654	Phillips, Danny	ML13344A573
Persico, Yuka	ML13339A019	Phillips, George	ML13343A649
Persky, William	ML13331B824	Phillips, Janice	ML13347A259
Person, Concerned	ML13347A247	Phillips, Joe	ML13347A567
Perszyk, Kim	ML13347A722	Phillips, Joseph	ML13347A394
Petencin, Thomas	ML13347A459	Phillips, Judy	ML13331C292
Peters, MD, Allen	ML13338B011	Phillips, Regina	ML13344A993
Peters, Freya	ML13346A334	Phillips, Robert	ML13347A093
Peters, Gene and Dori	ML13331B577	Phillips, Sandra	ML13346A768

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

ADAMS		ADAMS	
Commenter	Accession #	Commenter	Accession #
Phillips, Susan	ML13338A795	Pohl, Barbara	ML13338A930
Phillips, Thomas	ML13344A413	Poinelli, Carolyn	ML13337A114
Phillips-Calapai, Jean	ML13347A155	Poinelli, Carolyn	ML13347A278
Philpott, Rita	ML13347A282	Poire, Norman	ML13339B728
Phipps, Cyrille	ML13339B183	Poklar, John	ML13346B014
Phipps, Don	ML13331B866	Polacinski, Kelly Benson	ML13347A444
Piccone, Matt	ML13346A701	Polczynski, Eric	ML13347A017
Pickles, Tomm	ML13346A509	Polet, Jim	ML13339B601
Pickwell, Lynn	ML13331C193	Polish, Bret	ML13337B437
Pielaszczyk, Donna	ML13347A435	Polk, Nora	ML13338B007
Pier, Mollie	ML13338A924	Pollak, Jeannie	ML13336A915
Pierce, Brian	ML13339B022	Pollak, Jeannie	ML13340A548
Pierce, Robert	ML13340A570	Pollinzi, Rebecca	ML13347A647
Pierson, Gary	ML13346B008	Pollock, Maud N.	ML13343A498
Pillinger, Hal	ML13344A488	Polsgrove, Pete	ML13346A778
Pillow, Jami	ML13343A652	Polychronis, Jan	ML13344A442
Piltz, Kathy	ML13344A265	Pomeroy, Susan	ML13343A705
Pinckert, Mary	ML13344A608	Pomies, Jackie	ML13346B115
Pinckert, Mary	ML13344A609	Pommer-Siegel, Debra	ML13344A559
Pincus, Arlene	ML13338B221	Pompa, Linda	ML13344A492
Pineda, Cecile	ML13331C002	Pond, Andrew	ML13338B281
Pineda, Rachel	ML13343A473	Pons, Vivian	ML13343A557
Pineda, Rene	ML13344A943	Pontius, Diane	ML13339B041
Pinezich, John	ML13331C197	Pool, Deborah McElroy	ML13340A647
Pinkham, Michael	ML13343A858	Pool, Robert	ML13340A199
Pinkus, Walter	ML13336B357	Poole, John	ML13347A053
Pinter, Carol	ML13336B242	Pooler, Carole	ML13344A736
Pinto, Suzanne	ML13347A832	Pope, Anne	ML13343A929
Piotrowska, Monika	ML13339B149	Pope, Anne	ML13346A687
Piper, Janna	ML13338A848	Pope, Brian	ML13343B123
Pipke, Wayne	ML13339B312	Pope, Donna	ML13346B144
Piranian, Margaret	ML13336B141	Pope, Karen	ML13343A234
Pirch, Charlotte	ML13331C291	Pope, Stina	ML13343A928
Pisano, Christopher	ML13338A871	Porath, Marna	ML13346A858
Pitale, Alison	ML13346A487	Porta, N.M.	ML13343A229
Pitman, Tom	ML13337B024	Porter, Barbara	ML13340A449
Pitt Taylor, Laura	ML13347A941	Porter, David	ML13344A223
Pittenger, John	ML13337A133	Porter, Joel	ML13336A835
Pittenger, John	ML13344A125	Porter, Susan	ML13338B193
Plattner, Martin and Connie	ML13344B009	Porter-Steele, Nancy	ML13337B348
Plaxen, Barry	ML13344A360	Posey, Grant	ML13337A841
Plaza, Minette	ML13346B194	Poss, Joan	ML13331C267
Plitt, Kathryn	ML13331B610	Poss, Stanley	ML13337A851
Ploger, James	ML13346B224	Postgate, George	ML13343A431
Plourde, Carole	ML13347A224	Potamites, John	ML13344A556
Plourde, Stephen	ML13344A840	Potter, Elizabeth	ML13337B414
Podber, Alan	ML13346A775	Potter, Jo	ML13338B094
Poe, Franklin	ML13336B271	Potter, Kristen	ML13337B313
Pogell, Sarah	ML13346A897	Potthoff, Rick	ML13331B932
Poggi, Patricia	ML13337A020	Pottle, Susan	ML13346A729

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Poulsen, Robert	ML13339A035	Pringle, Bruce and Virginia	ML13331B651
Poulson, Judi	ML13331B516	Pringle, Bruce and Virginia	ML13337A911
Poulson, Judi	ML13346B182	Prinz, Johni	ML13347A343
Poulson, Judi	ML13347A628	Priola, Kathy	ML13337B118
Poulton, Marijane	ML13347A619	Prior, Eleanor	ML13347A810
Pound, Renee and Robert	ML13336B078	Priskich, Fiona	ML13344A252
Powell, Caleb	ML13336A844	Pritchard, Jeff	ML13344A587
Powell, Christine	ML13339A242	Pritchard, John	ML13331B529
Powell, Joseph	ML13344A277	Pritchard, John	ML13338A776
Powell, PhD, Judith	ML13346A769	Pritchett, Tracey	ML13347A466
Powell, Larry	ML13347A725	Pritikin, Joshua	ML13331B537
Powers, Mark	ML13346A372	Probst, John	ML13344B117
Powers, Martin	ML13346A466	Proe, Steven	ML13337B463
Powter, Dorothy	ML13344A473	Pronio, Micaela	ML13336B387
Poxon, Judith	ML13338B433	Pronio, Micaela	ML13343A899
Poza, Jr., Hernan and Fran	ML13338B211	Prosperie, Johnnie	ML13344A327
Prael, Felix	ML13346B024	Prostko, Linda	ML13347A527
Prakash, Avril	ML13365A132	Provost, Lin	ML13331C065
Pratt, L.D.	ML13344A151	Provost, Lin	ML13337B059
Pratt, Sheila	ML13336B308	Prudente, Vincent	ML13340A630
Pray, Daniel	ML13344A402	Pruitt, Patricia	ML13340A692
Prchal, Steve	ML13338A911	Pruner, Paula	ML13337A989
Pre, Car	ML13339B519	Prychodko, Nicholas	ML13337B129
Prentiss, Alex	ML13339B141	Pryor, Diane	ML13346A751
Presley, Bette	ML13337A716	Pucak, Carol	ML13339B559
Presley, Elizabeth	ML13343B008	Puente, Tobias	ML13347A411
Presley, Michael	ML13337B171	Puerta, Jeanne	ML13337B070
Presnall, Verne	ML13344A152	Pundt, Nathan	ML13347A264
Press, Ansula	ML13336B040	PunKay, Dianne	ML13337B550
Press, Roland	ML13336B124	Purcell, Patricia	ML13331B820
Presson, Andrea	ML13343B138	Purcell, Patricia	ML13338B017
Preston, Lynne	ML13337A039	Putnam, Carol	ML13337A787
Preston, Lynne	ML13346A375	Putney, Moseley	ML13336B215
Preuss, G.	ML13344A925	Pyburn, Susan	ML13337A723
Prewitt, Paul	ML13346B498	Quellas, Matthew	ML13331B947
Prexl, Esther	ML13346B506	Quick, Jennifer	ML13346B090
Pribanic, Carl	ML13347A452	Quilty, Chuck	ML13338B158
Price, Boris	ML13343A508	Quinlivan, Garrett	ML13336A955
Price, Elisabeth	ML13340A621	Quinlivan, Garrett	ML13338B364
Price, L.	ML13339A563	Quinn, Clark	ML13337B272
Price, Mary	ML13339B282	Quinn, Colleen	ML13336B075
Price, Michael	ML13347A967	Quinn, Joan	ML13347A877
Price, Natalie	ML13346A786	Quinones, Susan	ML13344A932
Price, Robert	ML13331B961	Quirk, Joseph	ML13339B492
Price-LaFace, Marge	ML13347A460	Quock, Dorothy G.C.	ML13347A570
Prieto, Manuel	ML13337B295	R, Ana	ML13347A680
Prillaman, Dale	ML13346B457	R, N.	ML13347A161
Primerano, Maureen	ML13331B729	R., Katy	ML13346A489
Prince, Annie	ML13347A420	Raab, Elke	ML13343A767
Pringle, Bill	ML13343A841	Raaby, Inger	ML13346B500

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

ADAMS		ADAMS	
Commenter	Accession #	Commenter	Accession #
Raben, Hubertus	ML13338A005	Raup-Kounovsky, Pamela	ML13344A952
Rabinowitz, Leslie	ML13336B487	Ravenhorst, Marita	ML13347A933
Rabl, Gerald	ML13344B069	Ravitz, Evan	ML13336B522
Raby, Joyce	ML13338B081	Ravnitzky, Jerry	ML13336B112
Race, Margery	ML13339B520	Ravnitzky, Jerry	ML13343A343
Racine, Robert	ML13346B275	Ray, Ellas	ML13346B422
Raczka, Robert	ML13344A443	Ray, Rebecca	ML13339A198
Radens, David	ML13340A273	Ray, Tina	ML13331A662
Radke, Irene	ML13331C050	Rayhill, Hilary	ML13337B491
Radwany, Julia	ML13337B173	Raymond, Al	ML13336B541
Rae, Brad	ML13346B007	Raymond, Becky	ML13346B176
Raeder, Agnes	ML13336B671	Raymond, Danielle	ML13340A581
Rahim, Deborah Abdul	ML13339B671	Raymond, Mike	ML13338A773
Rainey, Dorli	ML13339B246	Raynor, Margaret	ML13339A164
Rainey, Terryll	ML13340A451	Razo, Joseph	ML13339B690
Rainie, James	ML13346B018	Rea, Corde	ML13344A619
Raiser, A. Lynn	ML13338A792	Read, Helen	ML13339B447
Rakay, Susan	ML13337A757	Read, Jon	ML13344A889
Ralicke, David	ML13343B029	Read, Laura	ML13337B246
Ralston, Valerie	ML13347A239	Read, Lynne	ML13336B191
Ramirez, Carmen	ML13344A567	Reader, Charlene	ML13338A810
Ramirez, Jessica	ML13337A906	Reader, Stephanie	ML13336B711
Ramlow, Bob	ML13339B670	Reader, Stephanie	ML13344A008
Ramos, Joann	ML13346A464	Reading, Harvey	ML13331B951
ramos, Judith	ML13347A329	Rearden, Chance	ML13339B221
Ramos, Miguel	ML13331B723	Reardon, Betty A.	ML13336B712
Ramos, Miguel	ML13338A949	Reback, Mark	ML13331A628
Rampe, Anthony	ML13346B172	Reback, Mark	ML13339A034
Ramsay, Colin	ML13337B264	Redalia, Barbara	ML13343A930
Ramsey, Betty	ML13338B204	Redden, Michaela	ML13331B726
Ramsey, Elizabeth	ML13339B122	Reddig, Joyce	ML13337B088
Ramsey, Walter	ML13339B502	Redfield, Rick	ML13336A903
Ramstead, Jorgen	ML13339B024	Redgrave, Ginny	ML13337B116
Rand, Sherry	ML13339A219	Redhawk, Janet	ML13337B532
Randall, Phillip	ML13343A697	Redish, Maryellen	ML13336B321
Rando, Sandra	ML13331B528	Redish, Maryellen	ML13344A096
Randolph, Gerald	ML13344B124	Reed, Andrea	ML13337B279
Rankin, Holly	ML13347A059	Reed, Carol	ML13343A875
Rankin, James	ML13340A556	Reed, Jason	ML13339A074
Rankin, James	ML13347A690	Reed, Jennifer	ML13338A001
Ranney, Keith	ML13346A586	Reed, Jennifer	ML13339B364
Raphael, Ravid	ML13346B125	Reed, Laurie	ML13347A335
Rasich, Sandy	ML13339B121	Reed, Mary S	ML13347A930
Raskin, Dorri	ML13331C324	Reed, Michele	ML13337A882
Ratcliff, Philip	ML13346B529	Reed, Michelle	ML13339A226
Ratner, Ronald	ML13343B106	Reed, Mike	ML13339A138
Rattner, Ron	ML13336B081	Reed, Robert	ML13340A339
Rattner, Ron	ML13338A910	Reese, Janet	ML13336B293
Ratzlaff, Karen	ML13340A299	Reese, Joy	ML13336B621
Raup-Kounovsky, Pamela	ML13337A837	Reeser, Lynn	ML13336B029

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

ADAMS		ADAMS	
Commenter	Accession #	Commenter	Accession #
Reeves, Diane	ML13339B662	Rhine, Wallace	ML13339B195
Reeves, Douglass	ML13344A359	Rhodes, Michael	ML13347A798
Reeves, Lenore	ML13339A183	Rhymer, Joseph	ML13344A259
Reeves, Sheila	ML13339B468	Rials, Jennifer	ML13338A845
Refes, N.	ML13347A277	Rice, Beverly	ML13338A003
Regan, David	ML13336B675	Rice, Brian	ML13344A037
Rehkugler, Angelica	ML13331A608	Rice, Chris	ML13347A624
Rehn, Debra	ML13331C148	Rice, Kathryn	ML13331A697
Reichow, Debbie	ML13344A486	Rice, Megan	ML13340A365
Reid, Jena	ML13339B539	Rice, Nancy	ML13336B285
Reid, John	ML13337A684	Rice, William	ML13338A063
Reid, Matthew	ML13337B389	Rich, Sharon	ML13339B372
Reid, Sarah	ML13344A801	Richards, J.	ML13347A853
Reillo, Hector	ML13347A243	Richards, Jay	ML13344A092
Reinhart, Robin	ML13339B016	Richards, Peggy Sue	ML13347A875
Reiss, Tess	ML13331B589	Richardson, Cindy	ML13339B645
Reiss, Tess	ML13346A395	Richardson, M.	ML13347A845
Reitz, James	ML13343A532	Richardson, Ronald	ML13343A293
Remelman, Nicholas	ML13343A733	Richardson, MD, Don	ML13336B580
Remkus, Ann	ML13346A313	Richey, Sylvia	ML13343B091
Remy, Deborah	ML13344A826	Richkus, John	ML13331B990
Rena Childs, Connie	ML13347A868	Richkus, John	ML13344A712
Reneau, Roxanne	ML13339A549	Richmond, Deena	ML13339B390
Rengers, Edward	ML13346A545	Richmond, Lonna	ML13338B248
Rennacker, Ann	ML13331C039	Ricker, Janice	ML13337B340
Rennacker, Ann	ML13344B024	Ridder, Catherine	ML13343A202
Renner, Annabel	ML13337B423	Rider, Barbara	ML13346A707
Renzoni, Dante	ML13336B195	Rider, Marcia	ML13346B223
Reskin, Charles	ML13344A742	Ridley, P.J.	ML13343A448
Reslink, Paul	ML13344B036	Ridlon, Jim	ML13340A724
ressler, mary	ML13346B201	Riel, Tricia	ML13344A083
Rettig, Jan	ML13343B063	Rietzel, Marilyn	ML13343A789
Reuscher, F. Carlene	ML13339B495	Rigano, Kimberly	ML13337B007
Reuther, Kerstin	ML13336B218	Riggleman, Nancy	ML13346A662
Revilla, Oscar	ML13336B503	Riggs, Bob and Carmen	ML13344A343
Revilla, Oscar	ML13336B504	Riggs, Garland	ML13344A455
Revilla, Oscar	ML13347A114	Riggs, George	ML13347A125
Revilla, Oscar	ML13347A115	Riley, Callie	ML13338A942
Reyer, Thomas	ML13347A418	Riley, Jean	ML13347A430
Reyes, Christian	ML13347A502	Riley, Kevin	ML13346B294
Reyes, R.	ML13337A131	Riley, Russell	ML13336B389
Reyes, Robert	ML13339A064	Rincon, D.	ML13346B214
Reynolds, Dale	ML13339B375	Rings, Sally	ML13343B018
Reynolds, Kaileen	ML13347A597	Rios, Melanie	ML13336B114
Reynolds, Peter	ML13347A974	Ripper, Jody	ML13344A824
Reynolds, Peter	ML13353A191	Rippetoe, Robert	ML13343A695
Reynolds, Peter	ML13353A193	Ritchey, Jr., Albert	ML13337B063
Reynolds, Thora	ML13346B123	Ritchie, Priscilla	ML13331C041
Rhazi, Carolyn	ML13338B200	Ritter, Brian	ML13351A198
Rheder, Richard	ML13344A791	Ritter, Lynn	ML13347A123

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Riupley, Paul	ML13337B508	Rocks, Brent	ML13336B245
Rivas, Titus	ML13337A036	Rockwell, Jenny S. K.	ML13338A002
Riveland, Deryk	ML13344A890	Rod, Vreni	ML13338A786
Rivera, Alberto	ML13347A677	Rodack, Soretta	ML13347A758
Rivera, Javier	ML13339B475	Rodarte, Ron	ML13343A976
Rivera, Mario	ML13331B709	Rodgers, Christy	ML13346A552
Rivera, Paco	ML13346B377	Rodgers, Patricia	ML13339B460
Rivero, Jose Ricardo	ML13338A935	Rodgers, Ron	ML13343A837
Rivers, Jordan	ML13346B536	Rodin, Nick	ML13347A700
Rivers, William	ML13344A506	Rodin, Nick	ML13347A951
Riznyk, Cheri	ML13336B419	Rodine, Jean	ML13339A155
Riznyk, Cheri	ML13339B673	Rodine, Jean	ML13340A465
Rizzo, Paul	ML13339A129	Rodman, Joan	ML13344B121
Roane, Christine	ML13331B879	Rodrigues, Sharon	ML13338A791
Robb, Aaeron	ML13331C227	Rodriguez, Mary	ML13336B412
Robbin, Valerie	ML13336A996	Rodriguez, Mary	ML13339B123
Robbins, Karen	ML13344A528	Rodriguez, Pedro	ML13344A975
Robbins, Norrie	ML13340A295	Rodriguez, Ramcey	ML13338A983
Roberson, Julaine	ML13346A321	Rodriguez, Sylvia	ML13344A437
Robert, Claude	ML13337A739	Roe, R. Richard	ML13338B223
Roberts, Anne	ML13336B555	Roeber, Nancy	ML13346B411
Roberts, Darrett	ML13336B657	Roemer, Megan	ML13336B446
Roberts, Francis	ML13346A547	Roffey, Nancy	ML13346B375
Roberts, J.	ML13339B643	Roffey, Nancy	ML13347A943
Roberts, James	ML13331C286	Rogal, Michael	ML13339A110
Roberts, James	ML13338A796	Rogalski, Marjorie	ML13365A127
Roberts, Julie	ML13344A076	Rogan, Patricia	ML13343A861
Roberts, Katherine	ML13339A143	Rogan, Robert	ML13338A906
Roberts, Kim	ML13344A377	Rogers, Dirk	ML13331B869
Roberts, Lee	ML13336B310	Rogers, Dorieta	ML13337B276
Roberts, Rodney	ML13336B558	Rogers, Karen	ML13337A873
Roberts-Moneir, Nancy	ML13344A373	Rogers, Katherine	ML13344A219
Robertson, Ed	ML13340A656	Rogers, Kathleen	ML13339A014
Robertson, S.	ML13346B432	Rogers, Susan L.	ML13343B065
Robey, Eddy	ML13340A262	Rogers, Thomas	ML13346A939
Robins, Jack	ML13343A845	Rogovin, Lawrece	ML13344A162
Robinson, Amy	ML13346B229	Rohrbach, Terry	ML13344A698
Robinson, Caroline	ML13344A019	Rojeski, Mary	ML13340A733
Robinson, Caroline	ML13344A020	Rokas, John	ML13344A017
Robinson, Darrell	ML13338A812	Roland, Jelica	ML13344A838
robinson, joyce	ML13336B523	Roland, Jelica	ML13347A824
Rocco, Priscilla	ML13346A709	Roland, Lorinda	ML13347A817
Rocha, Nidia	ML13331B981	Rolfes, Kevin	ML13336A994
Roche, Joan	ML13337A075	Rolfes, Kevin	ML13337A860
Roche, Maureen	ML13343A417	Rolfes, Kevin	ML13344A267
Roche, Pauline	ML13343A700	Roll, Angelika	ML13339A158
Roche, Peter	ML13337B332	Roll, Angelika	ML13346A544
Rocke, Janice	ML13340A489	Rollins, Holly	ML13338B059
Rockey, Marilyn and Phil	ML13336B380	Rolsky, Bob	ML13347A159
Rockeymoore, Hazel Brown	ML13339B340	Romain, David	ML13336B252

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Romaine, Stanley	ML13346B114	Rosenthal, Patricia	ML13337A004
Roman, Donna	ML13331A642	Rosenthal, Patricia	ML13346B337
Roman, Matthew	ML13344A075	Rosenthal, Rima	ML13338A047
Romaniuk, Yuri	ML13339B301	Rosin, Mark	ML13337B237
Romaniuk, Yuri	ML13339B302	Rosinski, Katrin	ML13337A863
Romaniuk, Yuri	ML13339B303	Rosinski, Katrin	ML13337B154
Rome, Alyse	ML13331C201	Ross, Bruce	ML13343A452
Romesburg, Denise	ML13339A996	Ross, Donna	ML13336B154
Rondum, Knute	ML13331B868	Ross, Elliot	ML13346B077
Rondum, Knute	ML13344A531	Ross, Janice	ML13347A958
Rood, D.C., Doyle	ML13343A905	Ross, Jerry	ML13347A371
Roorbach, John	ML13337B060	Ross, Linda	ML13336B134
Root, Barbara	ML13347A002	Ross, Robert	ML13346A924
Root, Sharon	ML13331B949	Ross, Victoria	ML13337A128
Root, Sharon	ML13337B186	Rossen, Edna	ML13337B542
Rosanelli, Donald	ML13338A876	Rosser, Grif	ML13343B057
Rosas, Brittany	ML13343A301	Rossi, Daniela	ML13347A517
Rosas, Greg	ML13343A810	Rossi, Gregory	ML13343B179
Rosas-Latour, Deborah	ML13347A188	Rossi, Patricia	ML13339B064
Roscoe, Lee	ML13337A074	Rossmann, Jeremy	ML13336B557
Roscoe, Lee	ML13346A911	Rossmann, Jeremy	ML13347A746
Rose, B.	ML13340A445	Rossum, Deborah	ML13346A504
Rose, Kathryn	ML13339B371	Rosten, David	ML13337A958
Rose, Tim	ML13346B112	Roston, Ronald	ML13346A397
Roseberry, Bill	ML13337A978	Rot, Clifford	ML13339A271
Rosen, Keith	ML13339A233	Rotcher, Michael	ML13336B052
Rosen, Maria Catrambone	ML13338A050	Rotcher, Michael	ML13346B515
Rosen, Paul	ML13331B872	Rotermund, Kristy	ML13339A192
Rosenberg, Ernest	ML13331C300	Roth, Doris	ML13337B400
Rosenberg, Harriet	ML13346B206	Roth, Erik	ML13344A435
Rosenberg, Larry	ML13337B311	Rothman, Emily	ML13339B564
Rosenberg, Robert	ML13339B181	Rott, Katherine	ML13339A122
Roseberry, Gayle B.	ML13344A338	Rotter, Ronald	ML13344A157
Rosenblad, Kenneth	ML13347A206	Rough, Veronica	ML13331A591
Rosenblatt, Nathan	ML13339B203	Rouse, Rebecca	ML13343B103
Rosenblum, Barri	ML13337B223	Rouse, Susan	ML13343A937
Rosenblum, Fred	ML13339B094	Rousselot, Patrik	ML13343A324
Rosene, Juanita	ML13344A861	Rousu, Dwight	ML13336A825
Rosenfeld, Alice D.	ML13336B300	Rovno, Joanne	ML13336B319
Rosenfeld, Paul	ML13331B564	Rowe, D.	ML13343A650
Rosenlund, Tracey	ML13344B087	Rowe, Erin	ML13344A995
Rosenstein, Carl	ML13344A835	Rowinski, Wojciech	ML13344A289
Rosenstein, Richard and Carolyn	ML13331C250	Rowland, Lorene	ML13337B363
Rosenstock, Sean	ML13338B023	Roy, E. C.	ML13337A814
Rosenstock, Sean	ML13338B446	Roy, Joe	ML13344A555
Rosenthal, Bill	ML13331B683	Royer, Allen	ML13340A603
Rosenthal, Bill	ML13343A611	Rozelle, Allen	ML13337B481
Rosenthal, Blaise	ML13343B124	Rozett, Bob and Ella	ML13344A723
Rosenthal, Felix	ML13331C139	Rozner, Jay	ML13340A216
Rosenthal, Leah	ML13331A706	Rroot, Henriette	ML13343A602

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Ruberto, Gina	ML13339A099	Ryan, Bryn	ML13346A695
Rubin, Edward	ML13339A146	Ryan, Jennifer	ML13339B378
Rubin, Joan	ML13344A334	Ryan, Judith	ML13337B086
Rubin, Linda	ML13340A181	Ryan, Kathleen	ML13343A678
Rubin, Rochelle	ML13336B620	Ryan, Kim	ML13339B669
Rubin, Susan	ML13346A541	Ryan, Paul	ML13347A086
Rubino, Sandra	ML13339B036	Ryan, Sarah	ML13347A759
Rubino, Vince	ML13347A730	Ryan, Theresa	ML13346A788
Rubinstein, Joseph and Bette	ML13336B317	Ryan, Therese	ML13346A633
Rubio, Ana	ML13344A313	Ryan, Tim	ML13346B545
Ruby, Kenneth	ML13336B514	Rynberg, Dan	ML13331B536
Ruby, Kenneth	ML13344A250	Rynberg, Dan	ML13343A253
Ruck, Claudia	ML13365A125	Ryneerson, Mark	ML13339B508
Rudan, Alan	ML13337A897	Ryon, Virgil	ML13346A411
Rudin, K.	ML13346A557	S, Babs	ML13344A461
Rudisill, Jeff	ML13340A472	S, Bern	ML13347A134
Rudman, Linda	ML13338B296	S, Greg	ML13346B447
Rudolph, Daina	ML13347A568	S, Ira	ML13347A537
Ruiz, Kathleen	ML13337B479	S, Michael	ML13343B175
Ruiz, Kathleen	ML13347A379	S., Bonnie	ML13343A589
Ruiz, Margarita	ML13340A698	S., D.	ML13338B346
Ruiz, Margarita	ML13343B192	S., J.	ML13337B127
Ruiz, O.	ML13337B422	S., Jonathan	ML13343A588
Ruiz, Raul	ML13339A254	S., Pace	ML13339A150
Rumiantseva, Elena	ML13337B514	S., Ravi	ML13338B012
Rummel, Regina	ML13347A733	S., Robin	ML13336B615
Rummel, Thomas	ML13336B072	S., Will	ML13339B760
Rundlett, Frances	ML13336B625	Saba, Diana	ML13336B539
Runnalls, Jacob	ML13344A569	Sable, Rosalie	ML13347A873
Ruona, Matthew	ML13346A363	Sacco, Ed	ML13336B094
Rupert, Jeff	ML13347A581	Sachs, Gary	ML13338B225
Ruppe, Lorraine	ML13337A693	Sachs, Nikki	ML13343A346
Rushfeldt, Diana	ML13346B095	Sachs, Oren	ML13339B245
Rushton, Ann	ML13337B003	Sachs, Rachel	ML13343B189
Russ, Lee	ML13346B282	Sachs, Stephen	ML13347A383
Russell, Chyrl A.	ML13340A416	Sachs, Stephen	ML13347A384
Russell, Eugene	ML13344A797	Sachs, Stephen	ML13347A385
Russell, Mike	ML13337B379	Sachs, Susan	ML13339B139
Russell, Patrick	ML13337B493	Sadowsky, Nancy	ML13344A576
Russell, sandra	ML13346B074	Saeger, Ron	ML13340A369
Russo, Beth	ML13331B867	Saenz, Robert	ML13344A920
Russo, Beth	ML13337B351	Saffier, Kenneth	ML13344A620
Russo, Helen	ML13347A847	Safken, Melody	ML13339B307
Ruth, Lucymarie	ML13343A730	Safron, Mark	ML13339B045
Rutherford, Jay	ML13337A995	Sager, Tom and Helen	ML13336B298
Rutherford, Matt	ML13339B382	Sagheb, Nina	ML13338A960
Rutkowski, Roland	ML13344A935	Safer, Roland	ML13339B620
Rutland, Mary	ML13337B079	Sain, Joe	ML13347A364
Rutledge, Grace	ML13347A665	Saint-Amour, Jeanne	ML13340A409
Rutledge, Seth	ML13336A891	Saint-Amour, Jeanne	ML13340A425

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Sak, Myrna	ML13337B349	Santen, Christopher	ML13346B184
Sakai, Keiko	ML13331B885	Santiago, Quannah	ML13336A971
Sakai, Keiko	ML13336B377	Santonas, Gina	ML13336A970
Sakai, Keiko	ML13337A046	Santora, Marc	ML13346A456
Saks, Joshua	ML13344A901	Santos, Eloy	ML13347A142
Salas, Peggy	ML13331B546	Santos-Oyama, Rita	ML13347A569
Salata, Brad	ML13344A498	Sapier, Sherry	ML13347A020
Salazar, Alicia	ML13338B404	Sarabia, Michael	ML13344A949
Salazar, Isaac	ML13339B488	Sarcinello, Carole	ML13346B307
Salcedo, Alfonso	ML13347A105	Sardellitto, Peter	ML13347A401
Salerno, Louis	ML13344A163	Sargent, Shawn	ML13331B710
Salgado, Frida	ML13344A027	Sarovec, William E.	ML13343A235
Salhus, Jennifer	ML13347A694	Sarraille, Marijeanne	ML13337A934
Sall, Gloria	ML13343A352	Sarricks, David	ML13344A856
Sallberg, Penelope	ML13338B421	Sato, Nancy	ML13338B154
Salstrom, Fredric	ML13338B019	Satter, John	ML13346A452
Saltzen, JoAn	ML13337A030	Sauber, Nicole	ML13337A140
Saltzen, JoAn	ML13339B590	Saude, Debra	ML13331C110
Saltzman, Susan	ML13337A933	Saude, Debra	ML13338B027
Salyer, Allen	ML13346B086	Sauer, Annmarie	ML13343B177
Salzberg, Harry	ML13336B725	Sauer, Annmarie	ML13343B178
Salzman, Judith	ML13331B621	Sauer, Dan	ML13338A009
Salzmann, Michael	ML13340A456	Saunders, Andrea	ML13346A781
Samek, Daniel	ML13343A205	Saunders, Drummond	ML13346B107
Sameshima, Stan	ML13347A507	Saunders, Suzanne	ML13347A337
Sampson, Kelsey	ML13344A680	Sause, Maria	ML13340A326
Sampson, Robert	ML13331C309	Savage, Patricia	ML13338B060
Sampson, Samuel	ML13338B320	Savely, Kara	ML13339B373
Samuels, Barbara	ML13346A789	Savett, Adam	ML13347A190
Sanchez, Noahdm	ML13340A400	Savic, Lis	ML13346B359
Sanchez, Sergio	ML13346B178	Sawaya, Linda	ML13337B257
Sanchez, Tom	ML13343B166	Sawdon, Rosemarie	ML13343A204
Sandage, David	ML13331C089	Sawicki, Benjamin	ML13339B455
Sandel, Morris	ML13338A007	Sawyer, Jerry	ML13336B042
Sanderell, Rchard	ML13344A503	Saxton, Jan	ML13340A730
Sanders, Kathleen	ML13347A285	Scafidi, Frances	ML13336B202
Sandhu, Harbhajan	ML13336A976	Scales, S.	ML13340A252
Sandler, Blair	ML13331C029	Scales, S.	ML13336B235
Sandoval, Gustavo	ML13331A603	Scaltrito, Marietta	ML13346A278
Sandoval, Raul	ML13344A928	Scanlon, Kelley	ML13336B085
Sandoval, Richard	ML13344A615	Scanlon, Kelley	ML13339B052
Sandstrom, Kathe	ML13343A727	Scarabin, James	ML13346A998
Sanfilippo, Val	ML13331B541	Scarfone, Anthony	ML13346B150
Sanfilippo, Val	ML13346A582	Scarfone, Louise	ML13343A466
Sanford, Julie	ML13331C109	Scarlata, Rachel	ML13344A032
Sangster, Carol	ML13347A434	Scarlett, Christine	ML13337A999
SanMiguel, Dagny	ML13331C080	Scena, Marian	ML13346B577
SanMiguel, Dagny	ML13340A544	Schabel, Hans-Jörg	ML13331B743
Sanocki, Susan	ML13339B288	Schachne, David	ML13331B660
Santanna, Cristine	ML13344A489	Schacht, Timothy	ML13337B464

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

ADAMS		ADAMS	
Commenter	Accession #	Commenter	Accession #
Schacht, Timothy	ML13340A435	Schmalenberger, Manfred	ML13344A077
Schachter, Steve	ML13331C244	Schmeder, Nadya	ML13344A084
Schachterle, Russell	ML13338A781	Schmeisser, Frank	ML13339B632
Schader, Kevin	ML13344A337	Schmertzler, Alvin	ML13337B109
Schaef, Dennis	ML13337A052	Schmid-Miller, Alice	ML13344A052
Schaef, Robin	ML13347A229	Schmidt, Bob	ML13344A132
Schaefer, Monika	ML13331C319	Schmidt, Christine	ML13331B567
Schaeffer, Michael	ML13339B715	Schmidt, David	ML13344A839
Schaeffer, Thomas and Barbara	ML13339B538	Schmidt, E.	ML13339A149
Schaem, Kristin	ML13344A914	Schmidt, Frederick	ML13344A533
schaem, suzanne	ML13346B249	Schmidt, John	ML13336B342
Schafer, Helen	ML13331C146	Schmidt, Marisa	ML13346B285
Schafer, Judith	ML13346B109	Schmidt, Roger	ML13339B567
Schafer, Steven	ML13340A673	Schminke, Molly	ML13346B373
Schaffer, Phillip	ML13343B176	Schmitt, John	ML13339B140
Schaible, Michael	ML13338B218	Schmitt, Lana	ML13331B590
Schaktman, Harvey	ML13336B591	Schmitt, Walter	ML13331B585
Schaktman, Harvey	ML13344A430	Schmittauer, John	ML13344A777
Schanzle, Victoria	ML13331B691	Schmitz, Gladys	ML13336B647
Schatz, Vivian	ML13344A515	Schmuck, Sister Mary	ML13337A792
Schaut, Matthew	ML13339A013	Schnabel, Erik	ML13331B645
Schavone, Tracey	ML13336B488	Schneider, Cathie	ML13339B481
Scheck, Nancy	ML13339B459	Schneider, Dan	ML13343A457
Schechter, Mark	ML13331B884	Schneider, Dror	ML13343A785
Scheelen, Robert and Dolores	ML13339B677	Schneider, Lynn	ML13336B544
Scheffler, Brenda	ML13339B290	Schneider, Sarah	ML13346B191
Schegloff, Myra	ML13344A852	Schneider, Seth	ML13339B232
Schelbert, Kirsten	ML13337B467	Schneller, Paul	ML13344A734
Schenck, Stephen	ML13336B149	Schoch, Doug	ML13346B254
Scher, MD, Sarah	ML13347A946	Schock, Katherine	ML13339A033
Scherba, George	ML13340A448	Schoenberg, Arnie	ML13331C254
Scherbak, Elizabeth	ML13347A191	Schoenberg, Marc	ML13340A728
Scherick, Carol	ML13346B054	Schoenberg, Marc	ML13347A836
Schermer, Linda	ML13338A802	Schoenwetter, Ellen	ML13339B486
Scherzer, Caroline	ML13331B927	Scholl, Barbara Sue	ML13343B190
Scheunemann, Anita	ML13331B605	Scholten, Betty	ML13347A372
Schiesser, Cathryn	ML13346B535	Scholz, Fraeda	ML13331C215
Schiffer, Kathy	ML13346B557	Schomp, William	ML13346A612
Schildgen, Bob	ML13339B197	Schonbachler, Jacki	ML13343A369
Schilling, Kenneth	ML13337A761	Schonemann, Roberta	ML13347A753
Schimanek, Michael	ML13346B358	Schoner, Mara	ML13346B424
Schintone, Karl	ML13339A247	Schorling, Douglas	ML13336B402
Schlafke, Bernie	ML13337B267	Schreiber, David	ML13347A270
Schlapfer, Edwin	ML13347A852	Schremmer, Alain	ML13339B359
Schleifer, E.M.	ML13337A767	Schriebman, Judy	ML13339B513
Schleimer, Sylvia	ML13347A797	Schrier, Barbara	ML13339B309
Schlesinger, Jo	ML13338A771	Schruender, Dan	ML13343A866
Schlitz, Barbara	ML13344A593	Schuchart, Lawrence	ML13336B732
Schloss, E.S.	ML13331C071	Schucking, Ivor	ML13347A058
Schloss, E.S.	ML13339A060	Schudda, Carrie	ML13347A495

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Schueth, Steve	ML13338B203	Scuder, Amanda	ML13343A851
Schulman, Jason	ML13339A093	Scull, Brian	ML13337A983
Schultz, Jef	ML13336A978	Scully, Rosemary	ML13344A237
Schultz, Stephanie	ML13343A577	Seaborg, Dave	ML13331B757
Schulz, Amy	ML13336B686	Seaborg, Dave	ML13337A969
Schumacher, Brandy	ML13338A972	Seabrook, Sharonq	ML13331C256
schumacher, james	ML13346A766	Seager, Michael	ML13336B173
Schumacher, Pat	ML13347B006	Seal, Kathy	ML13336B039
Schur, Michael	ML13338A835	Seals, Donny	ML13344A816
Schwab, Arnold T.	ML13340A443	Searing, Ann	ML13346A477
Schwab, David	ML13347A462	Searing, Dr. Robert	ML13337A026
Schwan, Bettina Bowers	ML13347A116	Sears, Julie	ML13346A783
Schwank, Eleanor	ML13340A497	Sears, Steve	ML13338B209
Schwartz, Angela	ML13344A451	Seaton, Chris	ML13340A555
Schwartz, Barbara	ML13331C257	Sebastian, Roberta	ML13338B272
Schwartz, Beryl	ML13331C024	Seegars, Eloise	ML13339A120
Schwartz, Brian	ML13338B003	Seek, Brad	ML13346B015
Schwartz, Don	ML13331C021	Seeley, Linda	ML13331C247
Schwartz, Don	ML13339B115	Seeley, Linda	ML13337A064
Schwartz, Elizabeth	ML13339B709	Seff, Joshua	ML13340A569
Schwartz, Eric	ML13336B474	Seftel, Steven	ML13336B388
Schwartz, Greg	ML13337A710	Segal, Evalyn	ML13340A352
Schwartz, Phebe	ML13340A423	Segnitz, Lisa	ML13343A758
Schwartz, Professor Daniel	ML13340A662	Sego, Christopher	ML13346B336
Schwartz, Ronlyn	ML13336B005	Segrestan, Patricia	ML13343A776
Schwartz, Susan	ML13339B206	Segur, Amanda	ML13344A866
Schwartzberg, Jenny	ML13336B227	Seibel, Erika	ML13340A310
Schwarz, Diane	ML13347A706	Seidel, Brenda	ML13337A108
Schwarzbach, Leslie	ML13336A975	Seidenberg, Ariella	ML13343A236
Schwinberg, Jean	ML13337A981	Seifert, David	ML13347A400
Scibilia-Carver, Mark	ML13338B041	Seiler, Helen	ML13339B255
Scofidio, Allana Jeanne	ML13336A897	Selander, Spencer	ML13347A497
Scotese, Karen	ML13346B544	Selbin, Joel	ML13338A831
Scott, Catherine	ML13338B406	Selbin, Susan	ML13346B210
Scott, David	ML13343A570	Selden, Pat	ML13344A483
Scott, Dorinda	ML13337B011	Seligman, Linda	ML13343B038
Scott, J.	ML13339A577	Seligman, Tchira	ML13339B089
Scott, Jan	ML13338A821	Sellers, Jennifer	ML13339B043
Scott, Jennifer	ML13331A611	Sellers, Margaret	ML13343B005
Scott, Jennifer	ML13347A610	Selleseth, Richard	ML13344A912
Scott, K.	ML13346A917	Sells, Greg	ML13338B385
Scott, K.	ML13337A122	Selph, Sarah	ML13346A280
Scott, Marilyn	ML13339B525	selquist, donna	ML13346A499
Scott, Pamela	ML13338A894	Selquist, Donna	ML13346B397
Scott, Raeann	ML13339B494	Seltzer, Elizabeth	ML13346B465
Scott, Sidney Ramsden	ML13337A875	Seltzer, Elizabeth	ML13347A169
Scotti, Lucille	ML13336B543	Seltzer, Rob	ML13331C027
Scoville, P.	ML13331B909	Seluga, Jake	ML13346B376
Scribner, Theodore	ML13336B737	Selverston, Sylvia	ML13340A573
Scripp, Margaret	ML13338B216	Senarighi, Rae	ML13346B308

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Sendrowitz, Mitchell	ML13337B555	Sheggeby, Stan	ML13331B746
Senegal, Aaron	ML13346A315	Sheinfeld, Susan	ML13340A396
Senhen, Elizabeth	ML13343A917	Sheldon, Anne	ML13346A762
Sennhauser, Robert	ML13339A091	Sheldon, Sam	ML13343A608
Sepulveda, Christine	ML13347A686	Shelley, Betty	ML13336A877
Sequichie-Kerchee, Debbie	ML13337A129	Shelley, Ian	ML13331C235
Sercombe, Sarah	ML13339A200	Shelley, Martha	ML13337B393
Sereque, Richard	ML13338A999	Shepherd, Marilyn	ML13337B376
Serpico, Joe	ML13336A884	Shepherd, Nancy	ML13337A820
Service, Kinsey	ML13337A060	Shepler, Jeanne	ML13344A702
Service, Kinsey	ML13346B418	Sheppard, William	ML13331C007
Sevilla, June	ML13331A675	Sherber, Michael	ML13336B581
Seymour, Stephanie	ML13344A301	Sheridan, Jim	ML13346B303
Shaak, Susan	ML13338A760	Sheridan, Lenore	ML13336A824
Shabazian, Paul	ML13347A815	Sheridan, Leslie	ML13336B616
Shadbera, Dennis	ML13347A755	Sheridan, Paul	ML13331B571
Shadout, Amalie	ML13339A293	Sherman, David	ML13344A181
Shafchuk, Patsy	ML13339B117	Sherman, Marcia	ML13331C102
Shafer, Carolyn	ML13344A640	Sherman, Marcia	ML13339B548
Shafer, Grant	ML13347A455	Sherman, Richard and family	ML13337B216
Shaffer, Michael	ML13343A795	Sherman, Richard and family	ML13347A258
Shahri, Homayoun	ML13337B185	Sherman, Tom	ML13337A104
Shaia, Gerald	ML13338B201	Shero, Dale	ML13343B046
Shaknis, Virginia	ML13346A937	Sherpa, James	ML13344A514
Shallman, Elsy	ML13344A235	Sherwood, Lorraine	ML13337B209
Shaloum, Tami	ML13339B562	Shetland, Colleen	ML13343A484
Shames-Rogan, Julie	ML13338A106	Shevis, Aron	ML13337A066
Shanahan, Timothy	ML13331B977	Shevis, Aron	ML13347A670
Shanahan, Timothy	ML13339B187	Sheythe, Susan	ML13346B468
Shane, Jennifer	ML13344A433	Shields, Alice	ML13337A006
Shanker, Jennie	ML13344A078	Shields, James	ML13346B166
Shaouy, Pam	ML13339B737	Shifferd, Kent	ML13336B573
Shapiro, Claudia	ML13343A546	Shimata, Kathy	ML13346B149
Shapiro, Madeline	ML13343A434	Shimer, Sue	ML13340A528
Shapiro, Matthew	ML13338A847	Shkiele, Jonathan	ML13344A070
Sharee, Donna	ML13346B379	Shoats, Zoe	ML13337B275
Sharfman, William	ML13338A000	Shober, Elizabeth	ML13344A549
Shargel, Neil	ML13344A860	Shoham, Amit	ML13339B463
Shaughnessy, Mary	ML13344A351	Sholinsky, Laurie	ML13331B550
Shaw, Anore	ML13338B179	Shomer, Forest	ML13331C106
Shaw, Kevin	ML13347A145	Shook, Emma	ML13346A495
Shaw, Madeline	ML13346B071	Shook, Mary C.	ML13337A121
Shaw, Raymond	ML13336B038	Shook, Philip	ML13338A023
Shaw, Stuart R.	ML13337A735	Shoop, Pamela	ML13347A396
Shaw, Thomas	ML13336B065	Shore, David	ML13337B513
Shawver, James	ML13344A637	Shores, Michael	ML13343B078
Shays, Penny	ML13346A634	Shortway, Greg	ML13347A577
Shearer, Steve	ML13337B092	Shotwell, Ansi	ML13344A713
Shedd, Karen	ML13336A850	Shotwell, Ansi	ML13344A714
Sheets, Pat	ML13336B613	Shoun, Ellen	ML13336B633

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Showalter, James	ML13338A990	Simon, Philip	ML13331C294
Shown, Sherrie	ML13336B281	Simon, Sandy	ML13337A692
Shrader, Gerald	ML13343B147	Simon, Thomas	ML13336B401
Shreve, Rick	ML13336B053	Simone, Devon	ML13337B439
Shrewsbury, Wayne	ML13339B606	Simonian, Tom	ML13343A839
Shugarts, Robert	ML13344A269	Simpson, Donn	ML13336B582
Shuler, Heidi	ML13340A374	Simpson, James	ML13343B036
Shulman, J.	ML13338B432	Simpson, Loerna	ML13336B521
Shulman, Joseph	ML13336A882	Simpson, Sheri	ML13339A576
Shuman, Carolyn	ML13339B210	Simrell, Louise	ML13344A033
Shuput, Steve	ML13336B209	Sims, Bruce	ML13340A500
Shutkin, Sara	ML13343A600	Sims, Cindy	ML13347A084
Shy, Winnie	ML13340A290	Sims, Millicent	ML13336A998
Siamis, Korby	ML13337B026	Sims, Millicent	ML13337A957
Sica, Joyce	ML13339B412	Sinacore, Paul	ML13343A411
Siedman, Eileen	ML13344B085	Sinclair, Rose	ML13336B077
Siegel, Andrew	ML13343A992	Sines, Charlotte	ML13344A688
Siegel, Ann	ML13339A085	Singdahlsen, Paul	ML13343A422
Siegel, Larry	ML13336B017	Singer, Kim	ML13344A571
Siegel, Larry	ML13339A251	Singer, Steve	ML13347A137
Siegel, Lori Jo	ML13343A862	Singh, Joanne	ML13343A720
Siegfried, Mary	ML13347A573	Singh, Susan	ML13331C091
Siegmann, Eric	ML13346B121	Singwi, Veena	ML13347A991
Sigel, Liz	ML13343A759	Sipp, peter	ML13346B385
Sigman, Michelle Salerno	ML13338A869	Sircar, Subrata	ML13337B161
Signer, B.	ML13346A988	Sirgo, Joe	ML13337A715
Sikand, Vikram	ML13338A107	Sisson, Ed	ML13343A520
Sills, Carol	ML13331C180	Sitnick, Joan	ML13337B512
Silodor, Steven	ML13337A118	Sivesind, Torunn	ML13344A847
Silva, Nicole	ML13336B679	Six, John	ML13338A863
Silver, Dean	ML13339A087	Six, John	ML13339B634
Silver, Geraldine	ML13344B065	Skal, Steven	ML13344A180
Silver, Paula	ML13346B093	Skala, Lorraine	ML13336B127
Silver, Ron	ML13331B654	Skalsky, James	ML13346B406
Silverman, Bernard B.	ML13344A650	Skarada, Darcy	ML13338B418
Silverman, Jane	ML13339B321	Skaret, Mark	ML13344A291
Silverman, Laura	ML13331B543	Skeel, Joy	ML13338A937
silverman, marc	ML13347A971	Skelton, Julie	ML13331B995
Silverman, Marc	ML13347B014	Skelton, Julie	ML13339B547
Silvers, Margaret	ML13337B175	Skibinski, Jean P.	ML13340A533
Silverstein, David	ML13346A382	Skidmore, Sue	ML13336B442
Silverstein, Mr and Mrs	ML13346B349	Skirvin, Laurence	ML13346B064
Simic, Vesel	ML13338B160	Skog, Judy	ML13344A945
Simmons, Scotty	ML13336A900	Skolnick, Kate	ML13331B603
Simmons, Will	ML13337B570	Skolnick, Kate	ML13338B329
Simon, Cindy	ML13337A942	Skotnes, Darren	ML13338B298
Simon, Daniel	ML13344A658	Skowronski, Monika	ML13344A227
Simon, Daniel	ML13347A643	Skutches, Lynn	ML13336B207
Simon, Jill	ML13336B405	Sky, Gwendolyn	ML13331B858
Simon, Nancy	ML13339B240	Sky, Kate	ML13347A521

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Slack, Debbie	ML13339B229	Smith, Edwina	ML13347A970
Slack, Dr. Ed	ML13338A961	Smith, Elizabeth	ML13346B039
Sladen, Fred	ML13339B425	Smith, Erin	ML13338B343
Slater, Alice	ML13336B363	Smith, Gaye	ML13339B060
Slater, Alice	ML13337B064	Smith, Gayle	ML13343A444
Slater, Lori	ML13336B087	Smith, Glenn	ML13347A928
Slater-Giglioli, Julie	ML13337B413	Smith, Holly	ML13347A684
Slatkin, Marcia	ML13336B418	Smith, James	ML13331C234
Slauson, Kevin	ML13339B684	Smith, Jay	ML13331C243
Slaven, Joe	ML13347A857	Smith, Jody	ML13347A699
Slavin, Helene	ML13336B721	Smith, Judith	ML13331C118
Slavonic, Gopal	ML13343B011	Smith, Julie	ML13346B029
Slem, Alexa	ML13344A521	Smith, Keelan	ML13346A339
Sloan, Adam	ML13343A989	Smith, Kellie	ML13331B524
Sloan, Crystal	ML13338B265	Smith, Kevin	ML13331C119
Sloan, Griselda	ML13338A085	Smith, Kevin	ML13338A948
Slosky, Ron	ML13346A847	Smith, Lee	ML13346A324
Sloss, Elizabeth	ML13347A095	Smith, Leslye	ML13340A211
Slote, Karen	ML13343A414	Smith, Linda	ML13343A909
Small, David	ML13339A998	Smith, Linda	ML13344A328
Small, Sally	ML13331C062	Smith, Linda	ML13346A914
Smallman, Sassy	ML13344A302	Smith, Michael	ML13338A952
Smallwood, Tracey	ML13344A624	Smith, Mike	ML13347A089
Smaluk-Nix, Kathleen	ML13347A925	Smith, Ralph	ML13346A886
Smarandoiu, Andrei	ML13347A149	Smith, Robert	ML13338A947
Smason, Marc	ML13339B384	Smith, Robert	ML13347A780
Smedley, Calvin	ML13339A227	Smith, Ron and Nancy	ML13343B093
Smerling, Carol	ML13343B080	Smith, Russell	ML13346B032
Smethwyck, Mariah	ML13347A450	Smith, Scott	ML13339B068
Smisson, Claiborne	ML13340A376	Smith, Shereen	ML13346A415
Smith, Angela	ML13337A704	Smith, Shirley	ML13338A081
Smith, Angela	ML13340A667	Smith, Silver	ML13346B174
Smith, Anita	ML13339B208	Smith, Sonya	ML13344A370
Smith, Ann	ML13346A932	Smith, Spencer	ML13337A078
Smith, Barbara	ML13343A289	Smith, Stanley and Maria	ML13344A667
Smith, Barry	ML13337A783	Smith, Stephen	ML13336B062
Smith, Benita	ML13346A462	Smith, Stephen	ML13339A069
Smith, Bret	ML13336B001	Smith, Sue	ML13346B017
Smith, Bret	ML13339B704	Smith-Remick, Donna	ML13343B163
Smith, Bryan	ML13347A738	Smoot, Rolaine	ML13337B176
Smith, Carol	ML13343A485	Smucker, Aaron	ML13347A126
Smith, Casey	ML13346B338	Smyth, Edward	ML13347A655
Smith, Dan	ML13331B750	Smyth, Stephen	ML13339A053
Smith, Daphne	ML13337B117	Snavelly, William	ML13339B177
Smith, David	ML13346B190	Snead, Gordon	ML13339B416
Smith, David	ML13347A696	Sneck, Dr. William J.	ML13336B291
Smith, Dennis	ML13336A995	Sneck, Dr. William J.	ML13343A246
Smith, Diane	ML13339B366	Snedden, Lois	ML13331B767
Smith, Diane	ML13347A966	Snowberger, Vince	ML13346A303
Smith, Don	ML13336A927	Snyder, Brad	ML13338B242

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Snyder, Lynn	ML13346B366	Soyffer, Joel	ML13338B295
Snyder, Margaret	ML13343A906	Spacek, Pamela	ML13338A071
Snyder, Mary	ML13338A803	Spadel, William	ML13344A755
Snyder, Shaun	ML13340A402	Spak, Margaret	ML13340A551
Snyder, Sheri	ML13339A038	Spalding, Wayne	ML13331B958
Snyder, Theodore C.	ML13337B056	Spanski, Linda	ML13338B113
Snyder, Theodore C.	ML13337B066	Sparkman, Gregg	ML13337B394
Snyder, Tina	ML13331C264	Speidel, Barbara	ML13346A518
Snyder, Tina	ML13339B267	Spencer, Aaron	ML13347A036
Snyder, Todd	ML13337B014	Spencer, Allison	ML13343A631
Snyder-Haymond, Delia	ML13331A580	Spencer, D.R	ML13338A058
Sobanski, Sandy	ML13344A548	Spencer, Deborah	ML13344A635
Sodos, Michael	ML13346A295	Spencer, Garry	ML13346B026
Sodrel, John	ML13338A844	Spencer, John	ML13344A208
Sodrel, John	ML13347A942	Spencer, Martha	ML13331B533
Soenksen, Mark	ML13337B199	Spencer, Martha	ML13331B586
Soffler, Judy W.	ML13347A039	Spencer, Martha	ML13344A128
Sokei, L.	ML13338B334	spencer, samuel	ML13346B236
Solberg, Nancy	ML13339B717	Spencer, Sheila	ML13336A981
Soligo, Piero	ML13343A922	Spencer, Sheila	ML13344A686
Sollitto, Alissa	ML13339A197	Spencer, Susan	ML13343A272
Solomon, William	ML13339B477	Spera, Kathy	ML13346B288
Solomon II, M.	ML13338B228	Sperbeck, Elaine	ML13344A728
Somma, Darin	ML13337B046	Sperry, Adam	ML13338B328
Sommer, Curt	ML13331B662	Spicer, Camilla	ML13343A415
Sommer, Kenna	ML13344A695	Spicha, Joe	ML13347A272
Somodevilla, Todd	ML13337B139	Spickler, Julie	ML13343B014
Somps, Diana	ML13346B491	Spiegelberg, Barbara J.	ML13340A315
Sondheim, Steven	ML13331C108	Spiegelman, Robin	ML13346A803
Song, Rebecca Anshell	ML13331B826	Spilsbury, Delaine	ML13336A968
Songalia, Elizabeth	ML13339B738	Spilsbury, Delaine	ML13344A537
Songchild, Stephanie	ML13331B904	Spina, Michael	ML13338A086
Sontag, Cadey	ML13337A920	Spindler, Beth	ML13343A282
Sontag, Cadey	ML13347A574	Spirnak, Michael	ML13346A776
Sood, Lisa	ML13346B198	Spitz, Jon	ML13338B166
Soos, John	ML13347A604	Spivack, Susan	ML13346A378
Sorensen, Keeli	ML13346A533	Spivak, Howard	ML13347A774
Sorensen, Lori	ML13338B001	Spoerl, Tod Alan	ML13347A147
Soto, Carol	ML13343A873	Sprague, Debra	ML13336B566
Sott, Terry	ML13331B966	Springer, Kim	ML13347A209
Soucek, P.P.	ML13346B235	Spurlock, Katie	ML13337B329
Souers, Twila	ML13343B034	Squier, Deborah	ML13338B034
Southard, Mary	ML13346B053	Squire, Julie	ML13343A354
Southers, Randy	ML13344A888	Squires, Cynthia	ML13344A595
Southers, Randy	ML13344A922	Squires, Fred	ML13339A007
Southworth, Winthrop	ML13331C009	St. John, Caitlin	ML13339B435
Southworth, Winthrop	ML13336B534	St. John, Lynne	ML13338A092
Souza, Paul	ML13337A974	St. John, Maryann	ML13331C043
Sovran, Vivian	ML13343A549	St. John, Rick	ML13339A153
Sowards, Patricia	ML13336A956	St. Martin, Darlene	ML13336B483

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
St. Martin, Darlene	ML13337A859	Stein, Beth	ML13346B487
Stabler, Jessica	ML13344A651	Stein, E.	ML13344A633
Stackman, Marshall	ML13336B437	Stein, Gerald	ML13338A067
Stahl, Charlotte	ML13343A281	Stein, Herbert	ML13339B483
Stahl, Frieda	ML13338B355	Stein, Margaret	ML13339B066
Stahl, Hal	ML13346B247	Stein, Nancy	ML13346A417
Stairhime, Tiffany	ML13347A480	Steinberg, Michael	ML13331B602
Stalba, Vincent	ML13347A802	Steinberg, Penni	ML13339B172
Stallone, Craig	ML13339B465	Steinberg, Ruth	ML13343A274
Stambaugh, Ruth	ML13331B925	Steiner, A.L.	ML13331C163
Stambaugh, Ruth	ML13338A068	Steiner, Louise	ML13338B018
Stamos, James	ML13340A221	Steiner, Mark	ML13339B081
Stamp, Barbara	ML13336B658	Steininger, Lorenz	ML13336B270
Stamp, Barbara	ML13337A910	Steininger, Lorenz	ML13344A554
Stanberry, Beth	ML13343B001	Steininger, Robert	ML13343A512
Standard, Steven	ML13336B428	Steinke, Greg	ML13338A809
Standish, Phyllis	ML13338A097	Stellato, Peter	ML13344A344
Standley, Ron	ML13336B701	Stellato, Robert Parker	ML13339B427
Stanfield, Lee	ML13343B022	Stepan, William and Judith	ML13343A910
Stanko, Dawn	ML13347A162	Stepanski, Dusty	ML13336B436
Stanley, David	ML13331B527	Stepansky, June	ML13343A453
Stanley, Deborah	ML13347A588	Stephens, Ellen	ML13344B083
Stanley, Tora	ML13351A174	Stephens, Roderic	ML13337B371
Stansfield, Jack	ML13338B096	Stephens, Sasch	ML13331B629
Stansfield, Jerry	ML13338A873	Stephensen, Scott	ML13338A778
Stanwyck, Kerry	ML13339A995	Steponaitis, John	ML13336B490
Star, Garry	ML13344A864	Steponaitis, John	ML13344B093
Starbuck, Lucy	ML13331C093	Steponaitis, John	ML13344B103
Stargrove, Mitchell	ML13340A433	Sterling, Kaylah	ML13343A412
Stark, V.	ML13339B344	Sterling, Michael	ML13347A293
Starkkey, Carol	ML13344A150	Serman, Loren	ML13353A195
Starr, David	ML13337A740	Stetkiewicz, Chris	ML13337B211
Starr, Karen	ML13336B054	Stetzer, Paul	ML13338B182
Staton, Carrie	ML13346B367	Steuer, Sharon	ML13339B105
Stay, Chris	ML13338A119	Stevens, Andrea	ML13344A347
Stazeski, Theodore	ML13346B061	Stevens, Arin	ML13337A088
Steadmon, Jason	ML13343A207	Stevens, C. Brian	ML13344A848
Stearns, Ruby	ML13344A929	Stevens, Earl	ML13347A987
Stebbins, Barrie	ML13337A813	Stevens, John	ML13344A129
Stebbins, Barrie	ML13347A325	Stevens, Kimberly	ML13343A812
Steck, Barbara A.	ML13339B262	Stevens, Paula	ML13339B663
Steed, Hubert	ML13339A133	Stevens, Ray and Barbara	ML13344A836
Steele, Daniel	ML13343B157	Stevens, Ray and Barbara	ML13336B594
Steele, Joshua	ML13343B059	Stevens, Shawn	ML13344A130
Steele, Karen	ML13343B110	Stevens, Tatyana	ML13343B026
Steele, Karen	ML13346B574	Stevenson, Alice	ML13343A368
Steele, Karen	ML13347A429	Stevenson, Nan	ML13344A458
Steensma, Monica and Hugo	ML13351A183	Stewart, Bob	ML13338B212
Steffy, Heidi	ML13339B523	Stewart, Jeffrey	ML13331A576
Stehlik, Richard	ML13331B539	Stewart, Jim	ML13336B611

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Stewart, Laura	ML13331B643	Stratton, Jewels	ML13344A249
Stewart, Sarah B.	ML13338B103	Straus-Edwards, Lydia	ML13336B450
Stewart, Sharron	ML13344A274	Strauss, Audrey	ML13347A734
Stickel, Ann	ML13339B128	Strausser, Lori	ML13343A772
Stickney, Karen	ML13337B335	Strawn, Michael	ML13353A201
Stieber, Michael	ML13344A408	Streeter, Erik	ML13339B426
Stiefel, Nancy	ML13339B166	Streier, Randall	ML13337A781
Stiefvater, Wayne E.	ML13343A983	Strelec, Susan	ML13344A999
Stiles, Sarah	ML13346B311	Strickland, Phil	ML13343A491
Stillson, Robert	ML13340A714	Strohmayer, Florence	ML13339A066
Stimac, Vickie	ML13344A439	Strom, Kirsten	ML13344A261
Stingle, Karen	ML13337A059	Strom, Russell	ML13346A360
Stipano, Rachel	ML13347A607	Stronati, Stefano	ML13344A082
Stireman-Beyer, Alisha	ML13346B177	Strong, Lynnnda	ML13347A279
Stock, Linda	ML13338A031	Strong, Stormy	ML13331B644
Stock, Sandra	ML13339A040	Stroud, Patrick	ML13344A384
Stocker, Michael	ML13331A590	Strugatsky, Vladimir	ML13337B503
Stocker, Michael	ML13343A832	Stuart, Bud	ML13338A954
Stockstill, Rob	ML13344A960	Stuart, Karen	ML13338A099
Stoessel, Lise	ML13337B528	Stuart, Michael	ML13338A083
Stolternberg, John and Martha	ML13340A357	Stuchly, Ryan	ML13331C290
Stolternberg, John and Martha	ML13346B012	Stuckey, Stephanie	ML13337A054
Stolternberg, John and Martha	ML13346B351	Studt, Patrick	ML13343A340
Stomper, Connie	ML13343A716	Stufflebeam, J.	ML13343A931
Stone, James	ML13336A893	Sturdivant-Daly, Camille	ML13344A849
Stone, Margery	ML13346A298	Sturgeon, Tandy	ML13339A994
Stone, Mary	ML13344A837	Sturgill, Jon	ML13340A717
Stone, William	ML13339B473	Sturm, Richard	ML13344A356
Stonebraker, Robert	ML13346B163	Stutts, Denise	ML13339B191
Stookey, Richard	ML13344A116	Subda, Petet	ML13336B345
Stoops, Sean	ML13347A005	Sucheki, Edward	ML13338B049
Storke, Carol	ML13343A226	Suchy, D.	ML13347A612
Stormer, Gerry	ML13338A784	Sugarman, Steven	ML13346B253
Stoudemire, Sue	ML13336A862	Suidan, Aida	ML13331A677
Stoughton, Rogeer	ML13343A365	Suñr, Lucas	ML13340A422
Stoupis, Dimitri	ML13336B451	Suits, Alan	ML13339A206
Stoupis, Dimitri	ML13343A806	Sullenberger, Nathan	ML13340A350
Stoupis, Dimitri	ML13346B075	Sullivan, Ann	ML13346A690
Stout, Stephanie	ML13338B286	Sullivan, Diane	ML13343B185
Stowe, Mary	ML13331C016	Sullivan, Karen	ML13347A395
Stowe-Longchamp, Joyce	ML13336B213	Sullivan, Mary	ML13343B182
Stradtman, George	ML13331C017	Sullivan, Peter	ML13344A060
Strange, Marisa	ML13338A101	Sullivan, Robert	ML13344A846
Strassberg, Rich	ML13339B747	Sullivan-Greiner, Sadie	ML13339B328
Strasser, David	ML13343A587	Sullivlan, Linda	ML13346A987
Strasser, Susan	ML13336B592	Sullivn, Barbara	ML13344A043
Strassman, Sue	ML13343A474	Sumida, Kathleen	ML13338A899
Strassman, Sue	ML13343A478	Summers, Carolyn	ML13331B661
Strathmann, Nicole	ML13346B043	Summers, Kirstin	ML13347A297
Stratton, Anthony	ML13338B305	Summers, Patrice	ML13343A972

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Sundby, Alan	ML13344A677	Tabatabaie, Tara	ML13344A745
Sunderland, Violet	ML13337A912	Tabb, Linda	ML13346A724
Sunshine, Jane	ML13331A682	Tache, Jan	ML13343B168
Surdyk, Rich	ML13340A372	Tada, Astha	ML13343B174
Surratt, Sher	ML13339A990	Taggart, Carol	ML13340A505
Susinno, Barb	ML13336B695	Tagge, Betty	ML13331C000
Sutherland, Greg	ML13343A898	Taggert, Deborah	ML13344A314
Sutphin, Andrew	ML13347A468	Taglieri, Colette	ML13339A047
Sutphin, Mary	ML13346A536	Tait, Alese	ML13344A851
Sutton, Clarence	ML13338A985	Tait, Ann	ML13344A557
Sutton, Sophia	ML13347A614	Takaro, Mark	ML13331B666
Sutton, Suzanne	ML13346A402	Takhar, Carolyn	ML13340A578
Sutton, MD, M. Kelly	ML13331A683	Talarico, Jennifer	ML13347A724
Svarlien, Diane Arnson	ML13344A887	Talbert, Ronald	ML13339B676
Svendsen, Julie	ML13338B162	Talbot, Susan	ML13339B751
Svensson, Bo	ML13337A947	Tallant, Deenie	ML13338A757
Svetlik, Robert W.	ML13337B177	Tanaka, Elaine	ML13338A807
Swab, Robert and Helen	ML13337B047	Tang, Andy	ML13339B173
Swaim, Lauren	ML13343A769	Tang, Binh	ML13346A291
Swanberg, Gabrielle	ML13337A703	Tangel, Jeff	ML13331B592
Swanson, Mark	ML13337A077	Tanguay, Diane	ML13336B569
Swanson, Michael	ML13336B429	Tanimura, Pam	ML13343B088
Swanson, Victoria	ML13338B282	Tannen, Mark	ML13338B145
Swarthout, Elizabeth	ML13347A062	Tansey, Paulette	ML13346A386
Swedlow, Barry	ML13331B929	Tapley, Dennis	ML13331B759
Sweet, David	ML13343A747	Tapp, Yvette	ML13336B288
Sweetwater, Danda	ML13338A866	Tarbell, Tim	ML13338B063
Swers, Arthur	ML13337B527	Tarman, Jason	ML13338A909
Swiatkowski, Lindsay	ML13346B382	Tarver, Margaret	ML13336B355
Swift, Allen	ML13336A905	Tassone, Louise	ML13346A551
Swift, Allen	ML13337B072	Tate, Debra	ML13331B848
Swift, Nicholas	ML13331B566	Tattu, Georgia	ML13340A552
Swoffer, Thomas	ML13344A485	Tavormina, Erica	ML13347A316
Swyers, Matthew	ML13331C132	Tawa, Brigitte	ML13346A549
Swyers, Matthew	ML13338B100	Taylor, Cathy	ML13344A365
Sydor, Oleh	ML13337A722	taylor, david	ML13347A960
Sygiel, Chet	ML13339A018	Taylor, Dean	ML13346A288
Sylva, Jim	ML13336B111	Taylor, Dr. F.	ML13331B857
Sylva, Jim	ML13339B133	Taylor, Dr. F.	ML13346B561
Symmes, Anne	ML13331B852	Taylor, Elaine	ML13337A930
Syrett, Edward	ML13343A978	Taylor, Elizabeth	ML13339B694
Syrett, Suzan	ML13343A979	Taylor, Elizabeth A.	ML13343A659
Szabo, Joseph	ML13344A240	Taylor, Frances	ML13347A856
Szemenyei, Barbara and Steve	ML13344B040	Taylor, Imogen	ML13346A596
Szwajkos, Dorothy	ML13344A733	Taylor, Jeff	ML13343A590
Szymanowski, Paul	ML13331B747	Taylor, Joan	ML13336B020
Szymanowski, Paul	ML13343B159	Taylor, Judy	ML13346A925
T, Joan	ML13346B152	Taylor, Judy	ML13347A514
T., Carla	ML13343A856	Taylor, Kirk	ML13343B119
T., J.	ML13339B543	Taylor, Larry	ML13344A738

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Taylor, Laura Pitt	ML13338B015	Thibodeaux, David	ML13343A523
Taylor, Laurence and Christine	ML13346A523	Thielking, John	ML13337A112
Taylor, Lisa	ML13340A281	Thoman, Luisa Kim	ML13337B151
Taylor, Llew	ML13343A458	Thomas, Alan	ML13344A371
Taylor, Michael	ML13343A358	Thomas, Arthur	ML13337B485
Taylor, Nick	ML13346A355	Thomas, Caren Cronk	ML13331B682
Taylor, Paul	ML13338B294	Thomas, Carolyn	ML13344A420
Taylor, Rolf	ML13346A894	Thomas, Connie	ML13344A899
Taylor, Ryan	ML13343A619	Thomas, Debbie	ML13343A773
Taylor, Steven	ML13347A157	Thomas, Denise	ML13347A397
Taylor, Timothy	ML13347A959	Thomas, Eva	ML13339B108
Teague, Susan and John	ML13337B270	Thomas, James	ML13338A923
Tedesco, Thomas	ML13339B037	Thomas, James	ML13338B435
Tedesco-Kerrick, Terry	ML13331B883	Thomas, James	ML13344A625
Teegarden, Taylor	ML13331B810	Thomas, Latoya	ML13343A625
Teel, Scott	ML13339A561	Thomas, Mike	ML13344A917
Tegland, Ormand	ML13344A258	Thomas, Mollie	ML13337A731
Temere, Susan	ML13331C200	Thomas, Mollie	ML13343A527
Temple, Debra	ML13347A052	Thomas, P.	ML13344A561
Temple, Michele	ML13339B576	Thomas, Pamala	ML13336B512
Temple, Suzanne	ML13346A756	Thomas, Ralph	ML13347A999
Temple, Vicki	ML13340A613	Thomas, Richard	ML13336B000
Templet, Mel	ML13339B281	Thomas, Robert	ML13339B228
Tendick, Marcia	ML13343A256	Thomas, Scott	ML13343A907
Tendle, Christine	ML13339B414	Thomas, Trevor	ML13340A334
Tennity, Pamela	ML13337A085	Thomas, Tripp	ML13331C177
Tenorio, Robie	ML13337A138	Thompson, Dana	ML13347A244
Tentler, J.G.	ML13343A214	Thompson, Deanne	ML13346B136
Teodori, Carol	ML13346A279	Thompson, Galen	ML13339B326
Teolis, Simon	ML13337A865	Thompson, Gary	ML13338A087
Teolis, Simon	ML13344A529	Thompson, Gordon	ML13340A674
teper, patti	ML13346A640	Thompson, Julia	ML13339B714
Tepper, Martha	ML13337B407	Thompson, Kris	ML13346A354
Tepper, William	ML13347A589	Thompson, Owen	ML13344B090
Tepper, William	ML13347A591	Thompson, S.	ML13351A179
Tepperman, Jean	ML13346B065	Thompson, Susan	ML13344A819
Terpstra, Jake	ML13331B814	Thomson, Robert	ML13338A927
Terrill, Allen	ML13337B374	Thomson, Sophia	ML13344A051
Tethys, Yara	ML13343B083	Thornton, Edward	ML13337B525
Tezla, Michael	ML13338B045	Thurich, Kimba	ML13344A597
Thabit, Nick	ML13336B441	Thurston, Leslie	ML13331B973
Tharp, Rod	ML13336B373	Tibbs, Pat	ML13346A325
Tharsing, Dorothy	ML13339B260	Tibshirani, Cheryl	ML13344A869
Thayer, Jeff	ML13339B357	Tice, Janet	ML13336B229
Theard, Nikki	ML13339B223	Tice, Janet	ML13346A919
Thelander, Donna	ML13346B488	Ticotsky, Alan	ML13347A189
Thelen, Deborah	ML13331A699	Tidwell, Amber	ML13344B030
Thelen, Deborah	ML13337A848	Tidwell, Marion	ML13343A897
Therault, Richard	ML13338B243	Tieger, Audrey	ML13343A889
Thibodeau, William	ML13331B839	Tierney, Catherine	ML13343A865

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Tiessen, Grace	ML13343A382	Toth, Joseph	ML13344A205
Tignanelli, Doreen	ML13331A713	Totton, Patricia	ML13339B588
Tillinghast, Audrey	ML13338A098	Totton, Thomas	ML13337A151
Tillman, Hoyt	ML13346A457	Touchstone, Lana	ML13338A072
Tindel, David	ML13344A445	Tousignant, Chantal	ML13340A541
Tine, Tina	ML13344A294	Tousignant, Chantal	ML13340A542
Tioran, Joanne	ML13331C045	Touster, Helen	ML13340A690
Tioran, Joanne	ML13347A369	Tovar, John	ML13339A044
Tippin, Robert	ML13344A704	Towne, Gary	ML13344A829
Tischler, Barbara	ML13340A672	Townsend, Alan	ML13338B016
Tischler, Mark	ML13340A623	Townsend, Carlos	ML13347A843
Tite, Cori	ML13346B374	Townsend, Pat	ML13347A119
Titone, Theresa	ML13337B002	Toyohara, Karen	ML13344A783
Titus, Dr. Kate	ML13343B153	Traband, Lenore	ML13337A110
Tivol, David	ML13339B646	Trammell, Rebecca	ML13346A801
Tizard, Thomas	ML13336B066	Tramposh, Debora	ML13343A636
Tobias, Alice	ML13347A026	Tran, Loan	ML13346A676
Tobias, Christopher	ML13344A322	Tran, Pat	ML13343A320
Tobias, Michael	ML13339B070	Tran, Robert	ML13344A830
Tobin, Sandra	ML13346B391	Trapp, Charlie	ML13344A502
Tocci, Carmine	ML13338A941	Tratolatis, Denise	ML13347A132
Tocher, Beatrice	ML13339B304	Traum, Norman	ML13343B082
Todd, A.	ML13338B422	Travaline, Robert	ML13331B799
Todd, Janis	ML14015A235	Travis, Barb	ML13343B003
Todd, Sacha	ML13347A102	Traxel, Walter	ML13331B972
Todd-Dennis, Patricia	ML13343A475	Traxler, Marsha	ML13331C183
Tofel, Thomas	ML13337B380	Treacy, Carol	ML13340A205
Tokay, Hale	ML13343A999	Treadway, Carolyn	ML13331C296
Tokuda, Tlaloc	ML13331A643	Treadway, Carolyn	ML13353A197
Toli, James	ML13340A493	Treadway, Roy	ML13337A746
Tollefson, Todd	ML13339B658	Treadway, Roy	ML13343A560
Tolley, Mark	ML13343A642	Treat, Lynne	ML13336B163
Tolman, Kathy	ML13338B237	tree, Elderberry	ML13346A754
Toman, Julianne	ML13339B655	Tregidgo, Richard	ML13337B286
Tomasello, Pela	ML13343A723	Treichel-Mascolino, Janice	ML13331B688
Tomassi, Jennifer	ML13338A896	Trembly, Dennis	ML13336B164
Tomczyszyn, Michael	ML13330A726	Trent, Gina	ML13347A204
Tomczyszyn, Michael	ML13339A051	Trevillian, Linda	ML13343A391
Tomjack, Travis	ML13344A623	Trevino, Oscar	ML13346A891
Tomjack, Travis	ML13344A654	Trichilo, Diana	ML13337A811
Tonelli, Giovanna	ML13339A574	Trichilo, Diana	ML13337A874
Toobert, Michael	ML13347A136	Trichter, Vivien	ML13346A300
Toor, Mithi	ML13344A007	Triff, Asdur	ML13340A269
Toro, Euripides	ML13340A189	Trimble, Ursula	ML13340A410
Torres, Tatiana	ML13340A576	Trimm, James	ML13343A962
Torres, Tatiana	ML13347A616	Tringo, Ruth	ML13343A566
Torres, Tatiana	ML13347A766	Trinkaus, Emily	ML13331B860
Torretta, Ron	ML13346B037	Trione, David	ML13336B586
Torrey, Dameon	ML13346B330	Triplett, Tia	ML13331B596
Toste, Jeff	ML13337B235	Tripp, Anthony	ML13346A367

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Tripp, Rodger	ML13344A543	Tyndall, Steve	ML13339A220
Trivisonno, Susan	ML13339A250	Tyree II, James	ML13339B165
Troglin, Sharon	ML13339B153	Tyrie, Elaine	ML13346A490
Troup, Brenda	ML13331B689	Uhing, Nicole	ML13343A911
Trowell, Ute	ML13336B183	Ulm, Les	ML13336B150
Trozzo, Ray	ML13331B704	Ulman, Barry	ML13343B092
Trudnich, J.	ML13339B762	Ulmer, Gene	ML13346B459
TRUE, Mary	ML13337B359	Ulrey, Larry	ML13339B107
Trufan, Hal	ML14015A237	Ulrey, Timothy	ML13340A478
Trujillo, Robert	ML13344A938	Underbakke, Bonita	ML13337B181
Trumbull, Mark	ML13339B269	Ungaro, Francine	ML13337A083
Trupin, Joel	ML13344A577	Ungaro, Francine	ML13346A494
Tryggeseth, Jackie	ML13331B714	Ungaro, Francine	ML13347A166
Tsang, Tony	ML13346A908	Unger, Art	ML13337A751
Tsien, Wendy	ML13347A732	Unger, Jay	ML13343A640
Tuck, Frederick	ML13343B143	Unger, John	ML13337B404
Tucker, David	ML13337B233	Unkenholz, Jim	ML13331C251
Tucker, Jennifer	ML13346B509	Upton, Elizabeth	ML13347A769
Tucker, Leanne	ML13336B495	Utterback, Pamela	ML13337B067
Tucker, Sandra	ML13340A198	Vaardal, Rolf	ML13331B891
Tucker, Stefan	ML13344A683	Vakili, Janice	ML13340A266
Tucker, William	ML13337B196	Valdivia, Susan	ML13347A685
Tuddenham, Anne	ML13343B145	Valek, Jolana	ML13347A786
Tuley, Trish	ML13347A582	Valencia, Albert	ML13331A595
Tullock, Mary	ML13338A872	Valencia, Albert	ML13338A117
Tumarkin, Alexandra	ML13340A278	Valentine, J.	ML13331B998
Tuomi, R.G.	ML13337A907	Valentine, Jennifer	ML13339A259
Tupper, Steven	ML13346B057	Vallone, Eric	ML13344A103
Turco, Diane	ML13331C194	Van Arsdale, Juliana	ML13331B822
Turco, Diane	ML13331C195	van Arsdale, Juliana	ML13343A655
Turk, RN, Lawrence	ML13331B815	van Bloemen, Dona	ML13343A481
Turnage, Jim	ML13343A545	Van Den Blink, Kieren	ML13347A044
Turner, D.	ML13339B230	van der Kamp, Dixie	ML13331B598
Turner, Darlys	ML13331C259	Van Dinter, James	ML13337B121
Turner, David	ML13338A940	Van Egmond, Timothy	ML13338B169
Turner, Glenyth	ML13346A353	Van Gerven, Claudia	ML13336B709
Turner, Ian	ML13346A617	Van Grouw, Steven	ML13343A424
Turner, Irene	ML13343B170	Van Leekwijck, Natalie	ML13331C052
Turner, Jake	ML13346A736	Van Leekwijck, Natalie	ML13338A105
Turner, Keith	ML13338B262	Van Leekwijck, Natalie	ML13338A929
Turner, Richard	ML13346B339	Van Nosstrand, Montie	ML13337B078
Turrentine, Rogers	ML13336A843	van Oppen, Rose	ML13337A759
Turrentine, Rogers	ML13339B406	van Sitteren, Jacoba	ML13340A547
Tuttle, Marshall	ML13338B214	Van Stone, Carolina	ML13346A653
Tuxen, Ardelle	ML13338A993	Van Tassell, Kristen	ML13337A056
Twombly, Glen A.	ML13338B132	Van Wey, Charles	ML13331B630
Tyler, Barbara	ML13336B250	Van Wicklen, Betty J.	ML13340A515
Tyler, John	ML13337A773	Vance, Lola	ML13347A859
Tyler, Michael	ML13346A915	Vandel, Diana	ML13338A043
Tyndall, Carl	ML13346B363	Vanden Heuvel, Richard	ML13337A685

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

ADAMS		ADAMS	
Commenter	Accession #	Commenter	Accession #
VandenBosch, Etta Jon	ML13338B206	Verburg, Nichole	ML13338A823
Vanderborg, Susan	ML13337B090	Verde, Rachel	ML13344B073
Vanderkooi, Lois	ML13338B000	Versenyi, Adam	ML13338B058
Vanderlan, Kelly	ML13347A432	Vertel, Ana	ML13346B011
Vandermeer, Denise	ML13346B237	Viacrucis, John	ML13339B167
Vandevere, Gwyn	ML13346A876	Viale, Paula	ML13346A717
Vandevere, Joyce R.	ML13343A882	Vicaro, Linda	ML13346B416
Vandiver, Diane	ML13340A401	Vicento, Robert	ML13343A238
Vaneck, Dona	ML13346A995	Victor, Joseph	ML13339B413
VanGorkom, Kristie	ML13344A538	Victor, Robert	ML13346B504
Vanhorn, Barbara	ML13347A671	Victour, Patricia	ML13336B529
Vanne, Solenne	ML13339A222	Vidt, James	ML13340A184
Vanoni, Tony	ML13339B768	Vie, Phoenix	ML13351A172
Vanore, Teri	ML13344A771	Vieira, John	ML13346A433
Vanthaneeyakul, Angela	ML13337B530	Viereck, Jennifer	ML13331B819
Varcoe, Donna D.	ML13344A425	Vieth, Janice	ML13347A031
Varellas, Dorothy	ML13336A878	Vigneault, Paula	ML13337A149
Vargas, Marian	ML13340A366	Viken, Barbara	ML13339A181
Vartnaw, Bill	ML13346B547	Vilas, Michel	ML13338B349
Vas Dias, Todd	ML13347A404	Vilen, Sydney	ML13351A187
Vasek, Cheri	ML13347A980	Villarreal, Regina	ML13339B664
Vasey, Adrienne	ML13340A519	Vinett, William	ML13347A357
Vasquez, Anthony	ML13344A022	Vinick, Martha	ML13331B631
Vassos, Angelo	ML13347A407	Vining, Sue	ML13346B393
Vaughan, James	ML13344B032	Vipond, James	ML13337B052
Vaught, Kevin	ML13337B102	Vischulis, Jean	ML13337B476
Vayu, Satya	ML13331C124	Viselli, Theresa	ML13339B091
Vayu, Satya	ML13338A100	Visioli, Lori	ML13339B362
Vazquez, Felipe	ML13346A698	Visscher, William	ML13343A628
Vazquez, Patricia	ML13336B379	Vitela, Shirley	ML13346B119
Vázquez, Sonia	ML13339B154	Viveros, Joy	ML13339A564
Vecchio, Irene	ML13337B459	Vivian, David	ML13338A992
Vedova, Alice	ML13346A425	Vivian, Nick	ML13338A749
Vedovi, Mary	ML13339A289	Vlasiadis, Andreas	ML13336B433
Vee, Ordell	ML13343A371	Voelker, Roger	ML13331C158
Veenstra, David	ML13344A186	Vogelsong, Patrick	ML13339B159
Veghts, Joseph	ML13346B300	Vogt, Axel	ML13337A866
Veiga, Linda	ML13344A951	voith, Linda	ML13347A740
Veijalainen, Pertti	ML13336B162	Voitzuk, Pablo	ML13343A798
Veilleux, Lisa	ML13331C122	Volen, Michael	ML13331B813
Velez, Marcos	ML13347A471	Voli, Carlo	ML13331B633
Velner, John	ML13344A417	Volk, Shelley	ML13343A401
Velner, John	ML13344A431	Volpe, Joe and Mary	ML13339A191
Venezia, Richard	ML13343A831	Volz, A.M.	ML13340A358
Venezia, Sherri	ML13337B519	von Kampen, Michele	ML13336B204
Vengco, Ron	ML13338A938	von Moltke, Ulrike	ML13338A022
Ventre, John	ML13331B732	Vorachek, Mary	ML13337B453
Ventre, John	ML13347A006	Voronov, Maxim	ML13346A589
Veraldi, Anne	ML13331C025	Vose, Nathaniel	ML13347A289
Veraldi, Anne	ML13338A907	Vosik, Tom	ML13344A231

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Vossoughi, Siamak	ML13340A444	Walker, Martha	ML13336B713
Voth III, Theodore	ML13343B154	Walker, Martha	ML13336B714
Vrana, Peggy	ML13346B296	Walker, Sandra	ML13339B110
Vreman, Frances	ML13343A728	Wall, Deborah	ML13344A287
Vrtis, Jeffrey	ML13344A648	Wallace, Bruce	ML13337B133
Vultaggio, Richard	ML13336A879	Wallace, Charles	ML13340A712
Vuyas, Victor	ML13337B134	Wallace, Jane	ML13343A765
W, Natasha	ML13347A302	Wallace, Margaret	ML13346B365
Wacaser, Carolyn	ML13343A441	Wallace, Sarah	ML13340A463
Wachob, William	ML13339B034	Wallace, Wayne	ML13331B575
Wachowiak, Michael J	ML13331C088	Waller, Julia	ML13336B560
Wachowiak, Michael J	ML13347A564	Wallin, M.	ML13347A784
Wade, Reuben	ML13337B225	Wallin, Michael	ML13343A903
Waggoner, Susan	ML13337A949	Wallingford, Harlan	ML13343B004
Wagner, Deborah	ML13331B900	Wallitt, Roberta	ML13340A297
Wagner, Esther	ML13338B269	Wallop, Hunter	ML13331B607
Wagner, Jim	ML13336B731	Walls, Greg	ML13331B667
Wagner, Joanne	ML13331B521	Walls, Jan	ML13338A886
Wagner, John	ML13339B320	Walp, Susan	ML13343A586
Wagner, Sandra	ML13331A599	Walsh, Donald	ML13336B290
Wagner, Tanya	ML13346A591	Walsh, Donald	ML13340A619
Wagner, Timothy	ML13355A303	Walsh, Ellen	ML13343A737
Wahle, Patricia Aileen	ML13339A121	Walsh, Inez	ML13343A513
Wahosi, Mare	ML13336B457	Walsh, Jacqueline	ML13337B273
Wakefield, Marie	ML13336B425	Walsh, Maureen	ML13347A050
Wakefield, Marie	ML13339B365	Waltasti, Marilyn	ML13331C070
Wald, Aloysius	ML13344A694	Waltasti, Marilyn	ML13344A255
Walden, Deborah	ML13347A356	Walters, Betty	ML13336B727
Walden, Margaret	ML13337A009	Walters, Dan	ML13331B628
Walden, Sue	ML13347A446	Walters, Jo	ML13338A747
Walding, Rebecca	ML13337B372	Walters, Michael	ML13331C160
Waldman, Annamay	ML13339B216	Walters, Patricia	ML13337A068
Waldman, Michael	ML13338B111	Walters, Patricia	ML13346A906
Waldo, Richard	ML13336B519	Walters, Ronald	ML13344A260
Waldorf, Jack	ML13340A659	Walton, Bryan	ML13336B145
Waldron, Chip	ML13340A618	Walton, Darnell	ML13344A583
Waldron, Elizabeth	ML13343B040	Walton, Janet	ML13343B045
Waldron, Lynn	ML13331C237	Walton, Kenneth	ML13336B672
Walek, Kathleen	ML13339B629	Walton, T.S.	ML13346A714
Wales, Ruth	ML13336B003	Walzem, L.	ML13339B348
Walgis, Diane	ML13347A929	Wang, Flora	ML13347A318
Walker, Aurea	ML13337B016	Wang, Hope	ML13338A987
Walker, Barbara	ML13344A828	Wang, Tze-Koong	ML13346B306
Walker, Brad	ML13339A029	Ward, Aurelie	ML13344A904
Walker, James	ML13344A735	Ward, Colleen	ML13344B084
Walker, Joan	ML13336B276	Ward, Diana	ML13337A822
Walker, Joan	ML13337A914	Ward, Diana	ML13344A962
Walker, Joan	ML13347A387	Ward, Jean Marie	ML13337B484
Walker, Jonathan	ML13337A993	Ward, Jeffrey	ML13338A832
Walker, Kevin	ML13338A989	Ward, Marvin J.	ML13346A376

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Ward, Rosemary	ML13347A261	Weaver, Judyth O.	ML13331B982
Ward, Jr., Tedd	ML13347A639	Weaver, Kathleen	ML13343A805
Ward, Jr., Tedd	ML13346A748	Weaver, Laird	ML13339B682
Ward, Victoria	ML13331C034	Weaver, Matthew	ML13337B518
Ware, Christopher	ML13346B049	Webb, Chris	ML13340A635
Warfield, Laura	ML13340A708	Webb, Glenn	ML13347A578
Warner, Barbara	ML13336A886	Webb, Greg	ML13339A185
Warner, Barbara	ML13344A211	Webb, Kristin	ML13344A699
Warner, Charles	ML13340A695	Webb, Mary	ML13337A834
Warner, Chezna	ML13347A281	Webb, Randall	ML13336B315
Warner, Elizabeth	ML13339B740	Webb, T. Ed.	ML13346B076
Warner, Ollie	ML13340A349	Weber, Charles	ML13340A566
Warner, Thomas	ML13337A815	Weber, George	ML13337B212
Warner, Tim	ML13337B506	Weber, John	ML13347A032
Warren, Craig	ML13347A756	Webster, Robert	ML13331B758
Warren, RN, Donald	ML13331C075	Webster, Robert	ML13339A229
Warren, Janette	ML13337A970	Wechter, Michael	ML13338B185
Warren, Mark	ML13340A282	Wecker, Judith	ML13336A939
Warren, Richard	ML13336B232	Wedow, Nancy	ML13340A722
Warren, Ronald	ML13346A722	Weebr, Nicole	ML13331C090
Warren, Roxanne	ML13337A847	Weed, Ken	ML13339B600
Warwick, Scott	ML13346A578	Weehler, Cynthia	ML13347A823
Wasfi, Ellen	ML13343A729	Weid, Magan	ML13347A076
Wasfi, MD, Dahlia	ML13331B680	Weil, Emily	ML13331B794
Washington, Chris	ML13347A839	Weinberg, Henry	ML13331B674
Washington, Leslie	ML13336B176	Weinberg, Henry	ML13337A821
Wasielewski, Alison	ML13339B636	Weinberg, Henry	ML13339B385
Wasserman, Joseph	ML13336B730	Weinberg, Ron	ML13338B013
Watchempino, L.	ML13331B652	Weiner, Judi	ML13343A288
Waters, James H.	ML13331B627	Weiner, Margaret	ML13347A542
Waters, Jennifer	ML13340A319	Weiner, Martin	ML13344A266
Waters, Julie	ML13340A567	Weiner, Nona	ML13339B750
Waters, Michelle	ML13338B004	Weinstein, David	ML13343A722
Waters, Mr. Anje	ML13331B563	Weinstein, Elyette	ML13343B169
Watkins, Hollis	ML13346A601	Weinstein, Gary	ML13339B660
Watkins, Hollis	ML13346B047	Weinstock, Stuart	ML13346B162
Watson, Bob	ML13338A818	Weir, Rhonda	ML13346B555
Watson, Danny	ML13347A718	Weis, Marie	ML13340A702
Watson, Donna	ML13343A496	Weisel, Jef	ML13339B202
Watson, Kathleen	ML13338A946	Weisend, Jeff	ML13338B360
Watson, Nancy	ML13343A752	Weisfeldt, Evan	ML13331B774
Watson, Peter	ML13337B023	Weiske, Lynne	ML13339B097
Watts, Heather	ML13344A441	Weiss, Anne	ML13331C121
Wayne, Randall	ML13336B095	Weiss, Clifford	ML13343A333
Weatherly, Tammy	ML13337B058	Weiss, Daniel	ML13347A181
Weaver, Arthur	ML13346B299	Weiss, Elinor	ML13331B650
Weaver, Carol	ML13339A180	Weiss, Kenny	ML13338B153
Weaver, Eric	ML13343A797	Weiss, Norman	ML13340A571
Weaver, Esther	ML13338B457	Weiss, Stuart	ML13331B835
Weaver, Joan	ML13338A766	Weissglass, Roberta	ML13347A833

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Weisz, Russell	ML13339B198	Whipple, L.	ML13346B455
Weitz, Stephen	ML13343B048	Whitaker, Kim	ML13343A609
Welch, Christopher	ML13347A242	Whitaker, Maria	ML13347A030
Welch, Dennis	ML13336A988	White, Bruce	ML13331C123
Welch, Dennis	ML13347A765	White, Cathy	ML13343A273
Welch, Eileen	ML13331B783	White, Charles	ML13337A730
Welch, MaryJane	ML13331A607	White, Charles	ML13346A573
Welkowitz, William	ML13338A074	White, Helen	ML13331C020
Wells, Cathy	ML13336B570	White, James	ML13337A924
Wells, Holly	ML13343A974	White, Jeffrey	ML13340A644
Wells, Jim	ML13336B314	White, Jusef	ML13343A335
Wells, Kim	ML13346A750	White, Kaiba	ML13337A719
Wells, R.	ML13346A627	White, Kaiba	ML13346B477
Welsh, John	ML13347A130	White, M.	ML13346B097
Welters, Sjon	ML13331B962	White, Martha	ML13343A200
Welters, Sjon	ML13338A996	White, Mary	ML13339B297
Weltman, Mike	ML13338B259	White, Ryan	ML13337B306
Welton, Deborah Ann	ML13337A033	White, Steven	ML13347A489
Welton, Thomas	ML13336B325	White, Sylvia	ML13337B353
Welton, Thomas	ML13343A399	White, Tim	ML13336B160
Weltsch, Deborah	ML13336B710	White, Tim	ML13343A876
Wendell, John	ML13339B160	White, Valerie	ML13337A061
Wendl, Dorthée	ML13337A772	White, Vicky	ML13346A343
Wenzel, Tom	ML13337B261	Whitefield, Anne	ML13337A725
Werber, Barry	ML13338B267	Whitehead, Mary	ML13339B773
Wert, Kirsten	ML13343B161	Whitehead, Nancy	ML13344A166
Wesley, F. Robert	ML13346B453	Whitehouse, Judy	ML13346A828
Wessman, Eric	ML13336B530	Whitfill, Elizabeth	ML13331B535
West, Eric	ML13336A913	Whiting-Broeder, Pamela	ML13339B253
West, Eric	ML13339B642	Whiting-Broeder, Pamela	ML13346A610
West, Kevin	ML13339A248	Whitmore, Rosemary	ML13344A496
West, Marla	ML13339B461	Whitney, Denise	ML13346B546
West, Meredith	ML13346A413	Whitney, Ellie	ML13336B696
West, Sara	ML13344A822	Whitton, Erika	ML13337A928
West, Stephen	ML13344A766	Wlce, Lisa	ML13346B243
Westerly, Suzanne	ML13331B864	Wicht, Dan	ML13344A789
Westley, Charlene	ML13338A045	Wickham, Gary	ML13346B467
Westrich, Jennifer	ML13346B221	Wickwire, Mary	ML13340A420
Wetherhold, John	ML13331C308	Widmeyer, Allan	ML13337B195
Wetstein, Steven	ML13338B324	Widmeyer, Allan	ML13340A482
Wixelbaum, Stuart	ML13336B414	Wiebe, Tobey	ML13343A708
Wexler-Romig, Stevan	ML13343A344	Wiebenson, Sarah	ML13347A094
Weyand, Michael	ML13338A851	Wiedemer, Grant	ML13339A264
Whalen, Lisa	ML13338B348	Wieder, Robin	ML13337A799
Wharton, Elizabeth	ML13343A372	Wiener, Margaret	ML13347A392
Wharton/Putzier, Jerry and Lois	ML13337A831	Wiener, Robert	ML13336A958
Wheeler, Carolyn	ML13347A499	Wiesmeyer, Roger	ML13337B427
Wheeler, Mark	ML13331A657	Wiggin, Margaret	ML13343A553
Wheeler, Mark	ML13344A765	Wight, Christine	ML13344A756
Wherry, LuAnn	ML13344A760	Wigon, Joseph	ML13340A586

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Wiig, Dave	ML13347A236	Williams, Penelope	ML13331B728
Wilansky, Laura Sue	ML13346A409	Williams, R.	ML13347A033
Wilber, Heather	ML13346A311	Williams, R.Terra	ML13344A053
Wilborn, Beth	ML13344A957	Williams, Rebecca	ML13339B233
Wilbur, Margaret	ML13331B853	Williams, Reed	ML13337B180
Wilbur, Margaret	ML13344A232	Williams, S. E.	ML13343A483
Wilcox, Dorothy J.	ML13337B377	Williams, Sheryl	ML13343A528
Wilcox, Georgeanne	ML13344A354	Williams, Suzanne	ML13338B048
Wild, Ellen	ML13340A484	Williams, Terrie	ML13344A786
Wilder, Ed	ML13347A344	Williams, Terry J.	ML13331B912
Wilder, Flo	ML13336B692	Williams, Tom	ML13344A964
Wilder, Lillian	ML13331B766	Williamson, James	ML13344A843
Wildman, William R.	ML13346A735	Williamson-Pecori, Beverly	ML13343A857
Wildwood, Sarah	ML13331C067	Willis, Jen	ML13346A514
Wilensky, Sharon	ML13336B409	Willis, Jen	ML13346A515
Wiles III, John	ML13331B637	Willis, Jennifer	ML13343A436
Wiley, David	ML13338B370	Wills, Jada	ML13346A655
Wiley, Diana	ML13343A746	Wilmoth, Charles	ML13339A109
Wiley, Joseph	ML13343A946	Wilpan, Seth	ML13346B357
Wiley, Kimberly	ML13336B282	Wilscam, Linda	ML13346B389
Wiley, Kimberly	ML13338A932	Wilscam, Linda	ML13347A353
Wiley, Patricia	ML13343A878	Wilsey, Lynn	ML13336B609
Wilhelmi, James	ML13336B174	Wilsey, Lynn	ML13346B302
Wilkerson, Chris	ML13336B518	Wilson, Alex	ML13336A908
Wilkerson, Gillian	ML13347A560	Wilson, Alex	ML13347A440
Wilkerson, Robert	ML13343B125	Wilson, Antoine	ML13337B194
Wilkin, Sue	ML13344A731	Wilson, Bridget	ML13347A846
Wilkins, John	ML13344A974	Wilson, Claudia	ML13344A586
Wilkins, Richard	ML13339B047	Wilson, Claudia	ML13344A607
Wilkinson, Billy	ML13346A686	Wilson, David	ML13339B134
Wilkinson, Daniel	ML13338A740	Wilson, Debra	ML13336B338
Wilkinson, Dorothy	ML13347A894	Wilson, Diana	ML13344A751
Wilkinson, Marie	ML13336B578	Wilson, Elaine	ML13331B928
Williams, Adam	ML13337A810	Wilson, Elaine	ML13338B172
Williams, Barry	ML13339A114	Wilson, Eric	ML13344A841
Williams, Charlie	ML13331B595	Wilson, Gin	ML13336A934
Williams, Donna	ML13347A584	Wilson, J.B.	ML13344A114
Williams, Jr., Eddie	ML13343A964	Wilson, Jane	ML13340A191
Williams, Felicia	ML13344A409	Wilson, Jane	ML13340A332
Williams, Freddie	ML13346A555	Wilson, Jen	ML13331C005
Williams, Glen	ML13346B401	Wilson, Joy	ML13344A599
Williams, Heather	ML13338B300	Wilson, Joyce	ML13336B667
Williams, Jesse	ML13336A941	Wilson, Karen	ML13344B043
Williams, Jim	ML13344A456	Wilson, Kathy	ML13347A315
Williams, Joanna	ML13340A283	Wilson, Orpha Dess	ML13340A346
Williams, Joe	ML13339A089	Wilson, Patricia	ML13331C040
Williams, John	ML13337B300	Wilson, Richard S.	ML13336B318
Williams, Marie	ML13343A859	Wilson, Richard S.	ML13343B006
Williams, Patricia M.	ML13343B094	Wilson, Ronald	ML13346A878
Williams, Patrick	ML13340A359	Wilson, Steve	ML13346A661

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Wilson, Steven	ML13344A200	Wojtalik, Alan	ML13336A870
Wilson, Susan	ML13337B050	Wojtalik, Nikki	ML13347A490
Wilson, Todd	ML13343A783	Wolf, Darlene	ML13344A996
Winant, Howard	ML13343A980	Wolf, Elisabeth	ML13346B046
Winburn, William	ML13347A045	Wolf, Mark	ML13344A137
Windberg, Thomas	ML13344A376	Wolf, Rachel	ML13337B320
Windel, Herbert	ML13343B180	Wolf, Robert	ML13336B013
Windham, Annette	ML13338B270	Wolf, Sari	ML13346B262
Windrum, Ken	ML13338B024	Wolf, Victoria	ML13331C159
Wineburgh-Freed, Maggie	ML13331C087	Wolfe, Charles	ML13340A725
Wineland, Larry	ML13344A545	Wolfe, Jay	ML13343A786
Winfrey, James	ML13337B123	Wolfe, Jon-Paul	ML14002A304
Wingard, Greg	ML13331B926	Wolfe, Laura	ML13344A490
Wingard, Michel	ML13344A787	Wolfe, Lorena	ML13331C175
Wingeier, Douglas	ML13347A461	Wolfe, Mary R.	ML13337A718
Wingerd, Bruce & Mala	ML13339B453	Wolff, Ann	ML13344A254
Wingfield-Ritter, Susan	ML13331C275	Wolff, Dennis	ML13339B484
Winholtz, Betty	ML13344A009	Wolfson, Betty	ML13331C181
Winkel, Matthew	ML13347A079	Woll, Mathew	ML13340A498
Winkelhake, Marjorie	ML13340A492	Wollman, Michael	ML13331C211
Winkels, Philip	ML13337A823	Wollman, Michael	ML13344A188
Winn, Laraine	ML13346A568	Wollman, Nan	ML13340A685
Winston, Judith	ML13339B518	Wolney, Mary	ML13344A596
Winston, Judith	ML13340A327	Wolowicz, Patricia	ML13338B122
Winston, Leslie	ML13331C325	Wolpe, Katharine B.	ML13344A432
Winters, Raymond	ML13346A705	Wolter, Manuela	ML13339B391
Wirth, Theodore	ML13338A862	Wong, Michelle	ML13344A091
Wirtz, Patricia	ML13347A373	Wonner, Mark	ML13338B439
Wisboro, Judy	ML13336B009	Wood, Cynthia	ML13343B152
Wisdom, Joyce	ML13340A175	Wood, Dian	ML13346B534
Wisemessenger, Angyl	ML13351A176	Wood, Gordon	ML13339B755
Wish, Ron	ML13340A476	Wood, Gregory	ML13343A741
Wishingrad, Barbara	ML13338B260	Wood, John and Polly	ML13336A831
Wishingrad, Shirley	ML13337B200	Wood, Joyce	ML13347A773
Wisniewski, Robert	ML13336B724	Wood, Lauren	ML13346A904
Witham, Lisa	ML13344B058	Wood, Richard	ML13343A584
Witheld, Name	ML13343A794	Woodard, Sandra	ML13337A003
Witka, Susan	ML13344B039	Woodbury, Michael	ML13338B327
Witkowski, Lee	ML13336B165	Woodcock, Charlene	ML13336B411
Witmer, John	ML13339B630	Woodcock, Charlene	ML13347A025
Witt, Jeff	ML13346B403	Woodford, Laura	ML13336B125
Witt, JoAnn	ML13336B352	Woodhull, J.	ML13339B563
Wittenborn, Andrew and Kathleen	ML13339A139	Woodruff, James	ML13337A148
Wittenstein, Andreas	ML13331B632	Woods, Maryvirginia	ML13339B137
Wittenstein, Andreas	ML13344A202	Woods, Roth	ML13343A463
Wittle, Donald	ML13346B269	Woods, Zion	ML13337A690
Wittner, Judith	ML13331B552	Woodward, Laurie	ML13347A180
Woersching, Marc	ML13339B710	Woodward, Shirley Jean	ML13347A747
Woitkoski, Andrew	ML13331B642	Woodworth, Kevin	ML13344A802
Woitkoski, Andrew	ML13337A931	Woolard, Ken	ML13338B107

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Wooley, Barbara	ML13340A539	Yater, Jane	ML13347A990
Woolford, Polk	ML13344A903	Yater, Jane	ML13347A992
Wootan, Cathy	ML13336B563	Yater, Joan	ML13331C293
Wootan, Cathy	ML13347A324	Yater, Joan	ML13339B032
Worcester, Chris	ML13336B452	Yates, Paula	ML13344A934
Worcester, Chris	ML13344A875	Yates, Paula	ML13347A950
Workman, Michele	ML13346B409	Yates, Robert	ML13336A899
Wortendyke, Janet	ML13346A688	Yeager, Jerry	ML13347A426
Woudstra, Gerrit	ML13344A693	Yeager, Will	ML13336B480
Wozniak, John	ML13331B798	Yeatts, Jordan	ML13344A780
Wozniak, John	ML13344A630	Yee, C.	ML13337B250
Wrbican, Matt	ML13344A424	Yenoki, George	ML13337B169
Wright, Abigail	ML13331B913	Yeomans, Kathy	ML13339B008
Wright, Ed	ML13339A581	Yerena, Jr., Julian	ML13331B941
Wright, Emma	ML13344A133	Yerena, Jr., Julian	ML13339B217
Wright, Helen	ML13343A863	Yeske, Susan	ML13337A858
Wright, Jonno	ML13340A399	Yoder, Paul	ML13339B319
Wright, Katherine	ML13346A784	Yokoyama, Holly	ML13346B331
Wright, MD, Lara	ML13336B246	York, Jennifer	ML13346B448
Wright, MD, Lara	ML13339A269	York, Nancy	ML13336B434
Wright, Paul	ML13336B304	York, William	ML13346A608
Wright, Sharon	ML13336B588	You, Lucia	ML13340A557
WrightHardman, Beth	ML13346A810	Young, Chad	ML13346A306
Wu, Ailsa	ML13339B157	Young, Derek	ML13346B485
Wu, Dillon	ML13338A902	Young, Eric	ML13337B358
Wulfsohn, Aubrey	ML13346B329	Young, Ginger	ML13343B052
Wunsch, Rrosemarie	ML13343A564	Young, Landon	ML13344A845
Wuthrich, Katherine	ML13339B111	Young, Leslie	ML13343B162
Wyatt, Aimee	ML13338B033	Young, Lisa	ML13344A468
Wyatt, Darlene	ML13340A222	Young, Lowell	ML13339B723
Wyatt, Francis	ML13347A526	Young, Madonna	ML13331C246
Wygall, Melanie	ML13347A417	Young, Margaret	ML13343A224
Wylie, Mary	ML13340A650	Young, Robert	ML13346A453
Wynn, Eleanor	ML13337A967	Young, Susan	ML13337B207
Wyrick, Brenda	ML13338B131	Young, William	ML13336B076
Wyrostok, Charles	ML13339A578	Younkin, Robert	ML13337B005
Wyse, Frank	ML13344B034	Yourke, Oliver	ML13338A806
Xavier, Zita	ML13337B375	Yoye, Martin	ML13346B197
Xiberras, Paula	ML13346B344	Yurchikov, Denis	ML13344A362
Yaffee, Steve	ML13331C299	Yurchuck, Ruth	ML13339B507
Yahm, Elinor	ML13338A943	Yurman, Rich	ML13337A872
Yakovakis, Andrea	ML13344A547	Zablow, Leonard and Ellen	ML13340A713
Yamamoto, Doug	ML13340A517	Zadaca, Joy	ML13337B214
Yamanaka, Yosh	ML13337B438	Zagone, Michael	ML13344A941
Yarbrough, Jim	ML13343A567	Zahller, Guy	ML13340A259
Yarkin, Parma	ML13336B277	Zahos, John	ML13344A160
yarrobino, erin	ML13347A716	Zahos, John	ML13347A613
Yashirin, Nick	ML13344A398	Zahra, Raymond	ML13340A522
Yasko, Rick	ML13337B490	Zakrzewski, Joseph	ML13338A775
Yassi, Esther	ML13338A758	Zalinski, Eddy	ML13337B110

Table 6. Individuals Submitting the Form E-Mail with Correspondence ID 491 and Representative ADAMS Accession No. ML13330A726 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Zalon, Susan	ML13337A694	Zimmermann, Cindy	ML13347A704
Zamagni, Mary	ML13344A870	Zinavage, Lois	ML13331C152
Zamora, Esther	ML13336B265	Zinck, Kathleen	ML13331B722
Zampedro, Val	ML13338A893	Zinn, Andrea	ML13347A336
Zanto, Aaron	ML13338B290	Zipay, Joanne	ML13339B300
Zarch, Naomi	ML13344A710	Zirasri, Ran	ML13331A597
Zarek, Elizabeth	ML13344A182	Zirasri, Ran	ML13346B001
Zarnoch, JoAnn	ML13344A175	Ziring, Sidney	ML13346A743
Zatkin, Dalia	ML13337A944	Zook, Caryl	ML13331B924
Zavala, Catherine	ML13338A742	Zook, Theodore	ML13339A083
Zavala, David	ML13344A000	Zorach, Tim	ML13346B113
Zawadzki, C.	ML13339B530	Zorn, Glen	ML13344A086
Zawaski, Joan	ML13338B076	Zornesky, Jerome	ML13346B519
Zayac, Sr. Sharon	ML13337A041	Zox, David	ML13339B050
Zechory, Avi	ML13344B060	Zucker, Marguery Lee	ML13343A725
Zeeman, David	ML13339B623	Zuefeldt, Mark	ML13340A233
Zeiger, Susan	ML13344A423	Zukoski, Katie	ML13347A867
Zelazny, Bernie	ML13331B600	Zulch, Ramona	ML13339A214
Zeller, Rudy	ML13338A885	Zumhagen-Krause, Paul	ML13340A351
Zelman, Steve	ML13339A005	Zurbrick, Dale Alan	ML13337B221
Zemel, Judy	ML13346B342	Zure, Jessaiah	ML13347A935
Zeth-Sciulli, Cindy	ML13337B402	Zure, Lisa	ML13331A587
Zevian, Shannin	ML13346B576	Zure, Lisa	ML13339A252
Ziegler, Robert	ML13344A885	Zwingelberg, Sandra M.	ML13336A852
Ziemer, Scott	ML13336B538	Zwirner, Rod	ML13331C055
Zimdars, Richard	ML13340A285	Zylberman, Sandra	ML13340A338
Zimmer, Susan	ML13339B505	Zynda, Judith	ML13347A809
Zimmer, Thomas	ML13331C186	C.S.	ML13339B368
Zimmer, Tom and Judy	ML13336A898	Chip	ML13339B103
Zimmerman, Christine	ML13344A069	Zentura	ML13331C015
Zimmerman, Don	ML13338A867		

Table 7. Individuals Submitting the Form Postcard Sponsored by Radiation.org with Correspondence ID 537 and ADAMS Accession No. ML14055A035

Commenter
Lee, Steven
McGlone, Emilie
Meyer, Alfred
Schaffner, Constance
Tanaka, Yasuyo
Tonohira, Yuko

Table 8. Individuals Submitting the Form E-Mail to Proceed with Rulemaking with
Correspondence ID 555 and Representative ADAMS Accession No. ML13354C040

Commenter	ML Number	Commenter	ML Number
Abernethy, Marth	ML13355A193	Carter, Thomas	ML13355A224
Acierno, Laura	ML13355A215	Cassar, Robert	ML13355A242
Ackley, Frank J.	ML13355A025	Caveney, Frank	ML13355A129
Aitken, Keith	ML13355A244	Champlin, Paul	ML13365A099
Allison, Tim	ML13355A240	Chapman, Peggy	ML13355A052
Armendariz, Hugo	ML13355A150	Chase, B. L.	ML13355A185
Arnold, Alan	ML13355A161	Clements, John	ML13355A127
Ashley, William	ML13355A113	Cline, Ronnie	ML13355A074
Baird, Eldred	ML13355A227	Colaizzi, Donald	ML13355A182
Baker, Rodney	ML13355A180	Connolly, John	ML13355A186
Baker, William	ML13355A167	Contakos, Beverly	ML13355A141
Bandy, David	ML13355A145	Contreras, Raquel	ML13354C040
Barayasarra, Eileen	ML13355A121	Cook, Jack	ML13365A105
Barker, Terry	ML13355A203	Cottrell, Ronald	ML13365A102
Bauer, Berenice	ML13355A114	Cowan, Andrew	ML13355A256
Baughman, Nancy	ML13355A070	Coyne, Patrick	ML13355A282
Baxter, Crystal	ML13355A156	Craw, Douglas	ML13355A154
Beans, Moreland	ML13355A176	Croker, Shane	ML13365A109
Beddy, Susan	ML13355A059	Cross, James	ML13355A017
Beebe, Allen	ML13355A246	Cubero, Edward	ML13355A033
Beemer, Chris	ML13355A216	Curtis, Gary	ML13355A234
Belden, Charlotte	ML13355A268	DaCosta, Donald	ML13355A168
Berkowitz, Richard	ML13355A101	David, Melssen	ML13355A273
Berns, Carol	ML13355A110	De Vizio, Robert J.	ML13365A107
Berns, Carol	ML13355A155	DeAlessio, John	ML13355A149
Bise, Ken	ML14015A222	Deis, Esq. III, Hon. & Mrs. Paul	ML13355A126
Bishop, Jess	ML13355A171	D'Ercole, John	ML13355A115
Bishop, Jess	ML13355A207	Diaspro, Timothy	ML13355A202
Blackford, Rick	ML13355A035	DiLuvio, John	ML13355A077
Bohr, Bill	ML13355A269	DiRocco, Arlene	ML13355A086
Boyd, Andrew	ML13355A123	Discuillo, Peter	ML13355A270
Bradley, Pat	ML13355A174	Doane, George	ML13355A032
Bradshaw, Beverly	ML13355A057	Donahue, Leon	ML13355A288
Brewer, Gary	ML13355A170	Elliott, Clark David	ML13355A230
Brisker, Morton	ML13355A112	Empric, Brian	ML13355A279
Brown, Dennis	ML13355A046	Erickson, Rev. Patrick	ML13355A088
Brown, Jacqueline	ML13355A023	Fangmeyer, Dennis	ML13355A179
Brown, William	ML13355A146	Fish, Larry	ML13355A063
Brunner, Richard	ML13355A272	Fitch, John	ML13355A175
Buechler, Anthony	ML13355A280	Flint-Bozeman, Tobias	ML13355A162
Burk, Thomas	ML13355A038	Fournier, Thomas	ML13355A061
Burrow, Fred	ML13355A140	Fulton, Jim	ML13355A172
Butters, Robert	ML13355A252	Furman, Robert	ML13365A097
Byrne, John	ML13355A184	Garland, Gary	ML13365A113
Cabrera, Bill	ML13355A260	Gibson, Richard	ML13355A109
Cameron, Bruce	ML13355A152	Godin, Allen	ML13355A041
camp, thomas	ML13355A108	Gramm, Ben	ML13355A076
Carfano, Kerry	ML13365A114	Grantham, Danny	ML13355A251
Carlstroem, Philip	ML13355A222	Grey, William	ML13355A078
Carnevale, Assunta	ML13355A258	Griffith, Virginia	ML13355A159
Carnevale, Daniela	ML13355A257	Hampton, James	ML13355A219
Carnevale, Dominick	ML13355A259	Hanson, Terry	ML13355A241
Carnevale, Luigino	ML13355A261	Hapner, William	ML13355A181

Table 8. Individuals Submitting the Form E-Mail to Proceed with Rulemaking with Correspondence ID 555 and Representative ADAMS Accession No. ML13354C040 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Harlander, Tom	ML13355A139	McAllister, William	ML13355A122
Harpster, Charles	ML13355A027	McCormack, Michael	ML13355A143
Harris, Alan	ML13355A019	McGowan, Marcia A.	ML13355A157
Harsch, Douglas	ML13355A204	McHugh, John	ML13355A218
Hartman, Martha	ML13355A248	Mckinney, Ron	ML13355A166
Helberg, Dean	ML13355A021	Medlock, Ronnie	ML13355A274
Hendrick, Gene	ML13355A034	Medvetz, Robert	ML13355A099
Hendricks, Jeffery	ML13355A228	Menne, Michael	ML13355A097
Henning III, John L.	ML13355A235	Meskill, Gerard	ML13355A283
Hetro, Richard	ML13355A117	Metcalf, James	ML13355A148
Hilterman, Cy	ML13355A124	Meyer, Colonel	ML13355A238
Hiser, James	ML13355A020	Miler, Shirley	ML13355A026
Hite, Raymond	ML13355A263	Miller, Jerome	ML13355A214
Hodapp, Natalie	ML13355A079	Miller, Kal	ML13355A206
Horne, Shirley	ML13355A194	Miller, Pamela	ML13355A055
Hornig, Carl	ML13355A153	Moen, Thomas	ML13355A030
Hunter, Jeffrey	ML13355A107	Mossbarger, John	ML13355A164
Husser, James	ML13355A205	Mouton, Patrick	ML13355A096
Inghram, Richard	ML13355A210	Murdock, Lauren	ML13355A212
Jadlowski, Sally	ML13355A281	Murphy, Susie	ML13355A196
Jensen, David	ML14015A225	Murtha, Donna	ML13355A191
Johnson, Jerry	ML13355A028	Neal, Cindy	ML13355A254
Johnson, Mark	ML13355A024	NeVille, Barton	ML13355A051
Jones, Glenn	ML13355A195	Newcomer, Tom	ML13355A105
Kahle, Jerald	ML13355A042	Nolen, S. Kaye	ML13355A211
Kalka, Steven	ML13365A111	Nordine, James	ML13355A116
Keilholz, Vernon	ML13355A047	Norton, Margaret	ML13355A177
Kelly, Carol	ML13355A037	Oldre, Kelmer	ML13355A084
Kelly, Patricia	ML13355A022	Olright, Thomas	ML13355A120
Kelly, Paul	ML13355A039	Olsen, Donald	ML13355A178
Kenney, Gene and Denois	ML13355A130	O'Neil, Rexford	ML13355A044
Kintner, Thomas	ML13355A135	Page, Emily	ML13355A118
Kopecky, Steve	ML13355A249	Palmer, Rickey	ML13355A236
Kulley, Michael	ML13355A163	Pancoast, Russell	ML13355A131
Kuzyk, Robert	ML13355A075	Parker, Jack	ML13355A275
Kyle, David	ML13355A087	Payne, Chester	ML13355A062
Lambert, Katie	ML13355A221	Perkins, Terrance	ML13355A158
Lance, Diane	ML13355A093	Perrin, Amy	ML13355A103
LeBoeuf, Warren	ML13355A192	Perry, Loretta	ML13355A056
Lee, Brian	ML13355A104	Pietras, Thomas	ML13355A072
Leishear, Jack	ML13355A200	Pitts, Linda	ML13355A132
Liffengren, Donald	ML13365A116	Powers, Paula	ML13365A115
Lindall, Robert	ML13355A102	Prabulos, Joseph	ML13355A267
Loving, James	ML13355A100	Puckett, Nan	ML13355A045
Lund, Alva	ML13355A262	Puma, Vincent	ML13365A100
Madi, Michelle	ML13355A083	Ragsdale, Mr. & Mrs. James S.	ML13355A160
Majerus, Philip	ML13355A264	Ramos, Maggie	ML13355A223
Marino, Dave	ML13355A151	Rauen, Mark	ML13355A199
Markoff, Randy	ML13355A137	Real, Rob	ML13355A286
Marriott, Virginia	ML13355A066		
Matzke, Erick	ML13355A053		

Table 8. Individuals Submitting the Form E-Mail to Proceed with Rulemaking with Correspondence ID 555 and Representative ADAMS Accession No. ML13354C040 (continued)

Commenter	ADAMS Accession #	Commenter	ADAMS Accession #
Reddick, Larry	ML13355A265	Spataro, David	ML13355A068
Reece, Naomi	ML13355A187	Spinelli, David	ML13355A229
Reece, Richard	ML13355A190	Sternal, Ron	ML13355A237
Reece, Teresa	ML13355A189	Stetson, John	ML13355A133
Reece, Weldon	ML13355A188	Susswein, Malka	ML13355A250
Rees, Ronald	ML13355A065	Sweetser, Clark	ML13355A287
Reichardt, David and Karen	ML13355A125	Szymanski, Mark	ML13355A243
Reid, Greg	ML14015A224	Taglia, Anthony	ML13355A165
Rescott, Lyle	ML13355A277	Tanious, Nader	ML13355A233
Richer, Eugene	ML13355A031	Taylor, Andrew	ML13355A144
Rittenhouse, Virgil	ML13355A080	Taylor, Henry	ML13355A201
Rittenhouse, Virgil	ML13355A082	Thompson, Dennis	ML13355A226
Robert, Rene	ML13355A111	Travers, George	ML13355A231
Robeson, Neville	ML13355A136	Trodden, Ronnie	ML13355A018
Robinson, Joseph	ML13355A089	Trotter, Kimberly	ML13355A239
Rolf, Robert	ML13355A253	Turner, Jeanice	ML13365A108
Ross, William	ML13355A284	Vegt, Kurt	ML13365A103
Rossi, Richard	ML13355A142	Veik, Roger	ML13355A071
Roush, John	ML13355A169	Visco, Robert	ML13355A098
Rueckl, Mark	ML13355A095	Visco, Robert	ML13355A138
Rusko, Robert	ML13355A050	Walburn, John	ML13355A285
Russel, Eugene	ML13355A247	Weatherly, Tammy	ML13355A092
Russell, Stephen	ML13355A213	Weber, Charles	ML13355A147
Saadian, Jay	ML13355A043	Webster, Ronald	ML13355A208
Schild, William	ML13355A058	Whitehead, Donald	ML13355A276
Schimmel, David	ML13355A220	Whitley, Albert	ML13355A290
Schmitz, Mike	ML13355A067	Whorton, John	ML13355A173
Schoonmaker, Robert	ML13355A069	Wick, Albert	ML13355A209
Schroeder, Paul	ML13355A048	Wiggily, Piggily	ML13355A094
Schwanke, Ruby	ML13355A255	Williamson, Patrick	ML13365A117
Schwartz, Mike	ML13355A081	Willingter, Jenny	ML14015A229
Scott, Walter	ML13355A225	Wischmann, Andreas	ML13355A198
Selbman, Nancy	ML13355A060	Wischmann, Ines	ML13355A197
Senior, Jonathan	ML13355A073	Wright, Jr., Edward	ML13355A183
Shamonsky, Charles	ML13355A128	Yang, Wilson	ML13355A217
Shannon, Terri	ML13355A232	Yingling, Cyndi	ML13355A064
Shea, Patrick	ML13355A289	Youngberg, Dwight	ML13355A036
Shira, Harold	ML13355A271	Zaleski, Henryk	ML13355A049
Shively, Douglas	ML13355A054	Zarecor, Herschel	ML13355A091
Simpson, Albert	ML13355A029	Zatyko, Richard	ML13355A266
Sisson, Carol	ML13355A090	Zentgraf, Richard	ML13355A119
Skaro, Kim	ML13355A245	Zmistowski, Jr., William	ML13355A106
Smiley, Edith	ML13355A278	Anonymous	ML13355A134
Smith, David	ML13355A085		
Smith, Robert	ML13355A040		

Table 9. Individuals Submitting the Charlotte, North Carolina Public Meeting Form Comment with Correspondence ID 946 and ADAMS Accession No. ML14027A510

Commenter	Commenter
Adams, Mike	Middleton, Loela
Alexander, Geoff	Miles, David
Ameen, Hannah	Miller, Justin
Avila, Lizbeth	Morven, Andre
Bisesi, Phil	Narron, Tiffany
Breeks, Anne	Ndiaye, Mamadou
Busbee, David	Nelson, Dawn
Byer, Nancy	Newkirk, Colin
Champoullion, David	Norris, Steven
Chotkowski, Matt	Patrie, Dr. Lewis
Clark, Brita Lansen	Pineda, Mike
Clark, Terrence	Rasketron, Josh
Coller, Cameron	Richards, Eleanore
Collins, Marsha	Rose, Dina
Connors, Frank	S., Carol
Dane, Arrow	S., D.
Davis, Wayne	Sandler, Timothy
Drenst, Dr. Stanley	Saver, Robert
Dunnogan, Kate	Scott, Cathy
Eddington, James	Sherbony, Shannon
Eldrisge, Rachael	Silver, Meredith
Embrey, Monica	Sloan, Katie
Emrys, Arida	Smith, Kathryn
Estes, Maggie	Song, Sulkiro
Foodeger, R.	Stcpewich, M.
Foster, Shaw	Sticpowich, John
Friedman, Avrain	Stuetzel, Amelia
Garces, Jorge	Sublett, Mary
Genz, Debby	Tomlins, Brandi
Gilman, Steve	Vaughan, Sharon
Goettling, Marissa	Wade, Teri
Grear, Katie	Warren, Valerie
Hail, Dana	Williams, Jarvis
Hearner, Ray	Wood, Nick
Holt, Cathy	Wright, Suzanne
Houck, David	Yost, Greg
Jacobs, Ashley	Zenz, Melissa
Kane, Kathy	Zielinski, Anna
Kittredge, Ellen	Zinich, Joe
Larson, Jean	J.
M., David	Jonico
Martinez, Lezly	Nanautteuman
McAllister, Jean	
McNabb, Alicia	

Table 10. Individuals Submitting the Form Regulations.gov Comment with Correspondence ID 947 and ADAMS Accession No. ML14027A588

Commenter	Commenter
Abbott, Sandra	Hafer, Sarah
Anonymous, Jill	Kalama, Laura
Bandfield, Gary	Pratt, Curtis
Bennett, Mary	Turner, D.
Clancy, Stephan	Van Leekwijck, Natalie
Clig, George	Wigglesworth, Marilyn
Evans, Michael W.	Yarrobino, Erin
Faunce, Stephanie	Anonymous
Ferreira, Raul	Anonymous
Foster, William	

Table 11. Individuals Submitting the Form Letter from Members of the North American Young Generation in Nuclear with Correspondence ID 948 and ADAMS Accession No. ML14027A612

Commenter	Commenter
Addington, David	Nordan, Richard
Barrios, Jr., Robert	Pittman, Amy
Coulon, Dewey	Rivera, Orlando
Hennen, James	Russell, Theresa
Jordan, Carter	Tiwari, Sital
Laborde, James	Villareal, Gabriel
Lofton, Daniel	Wood, Natalie
Miller, Shonique	

Table 12. Individuals Submitting the Form Letters in Support of PG&E with Correspondence ID 949 and ADAMS Accession No. ML14027A632

Commenter	Commenter
Anderson, Joni	Langford, Cheryl
Brown, Joanie and William	Morawski, Joan E.
Burton, Fletcher	Pinard, Jim
Cohen, Rick	Plouffe, Helen
Dawson, Douglas	Seastrand, Andrea
Foppiano, Mary	Silva, Maynard
Gilbert, Ted	Sterling, Duke
Green, Larry	Stricklin, Terri
Jaworski, David	Texeira, John
Jones, Robert	

Table 13. Individuals Submitting the Form Postcard Sponsored by the Sierra Club with Correspondence ID 950 and ADAMS Accession No. ML14043A331

Commenter	Commenter
(?), Harry	Burlingham, Helen G.
Abell, Kara	Burnite, Mary
Ackerson, Dorothy A.	Bush, Waldo
Adderley, Jerry	Calvani, Dorothy
Adderley, Jerry	Campbell, Bruce
Ahasteen, Jack	Cappolot, Larry
Ami-Holback, Ariana	Carberry, Mike
Amos, Pat	Carignan, Stacy
Amos, T. J.	Carlson, Pat
Anderson, Janet M.	Carpenter, Dixie
Apfelberg, Elizabeth	Carranza, Victoria
Armer, Sunny	Carter, Jean
Arnebeck, Sibilly	Carter, Joan
Ataman, Val	Cassady, Gloria
Bagdes-Canning, Karen	Caulfield, Lee A.
Baham, Don	Cercone, Sarah
Bailey, Alfred	chamberlain, Lora
Bakula, Lynn	Chambers, Gwendolyn
Barnes, Kathryn	Chavez, Tim
Baudart, Jan	Chenoweth, Jonathan
Bauman, Albert S.	Chmielewski, C.A.
Beer, Eugene	Christie, Andrew
Benally, Dorena	Church, Sebastian
Bentley, Nan	Ciccarelli, Nick
Bergier, Kim	Clark, Rachel
Bidre, Robert	Clemons, Victoria
Bilenko, Stephanie	Cline, Evan D.
Billie, Jane	Collins, Anetria
Billie, Levi	Collins, Jessie P.
Billie, Rosita	Comer, Gail
Billie, Thomas M.	Comilleti, Margo
Bisbee, William	Conglan, Katherine
Blackburn, Lee	Contini, James
Blakeney, S.	Cooper, Kevin
Bold, William A.	Costanza, Frank J.
Bookless, Vicki	Crow, Valerie
Bookless, Vicki	Crume, Philip
Bookless, Vicki	Curran, Christine
Bradt, Rachelle	Cypress, Mitchell
Brehim, Laura	Davis, Adrienne
Brennan, Coln	Davis, Frances P.
Brightman, Julianna	De Brito, Leticia
Britton, Eric D.	deCamp, Amy
Brookes, Ralf	Delk, David
Brousse, Elizabeth M.	Deragon, Kathleen
Brousse, Elizabeth M.	Deutsch, E.
Brown, James F.	Devean, Elizabeth
Buchhait, Andrea	Deverick, Blaine
Buller, Melonie L.	Didra, Kadiahov
Burbank, Marilyn	Dillon, Meredith
Burger, Charlie	Doolittle, Leah
Burgher, Eric	Doud, Lindi

Table 13. Individuals Submitting the Form Postcard Sponsored by the Sierra Club with Correspondence ID 950 and ADAMS Accession No. ML14043A331 (continued)

Commenter	Commenter
Durkon, Ray	Habserd, Ken
Eaddy, Carol	Hachtel, Joanne
Edwards, Pam	Haggard, Ken
Eister, Mary	Hall, Grace
Ela, S.W.	Hallock, Rachel
Eldridge, Irene	Hammond, Connie
Ereline, Anne	Hanchan, Clare
Evans, Gail	Hans, D
Evans, Patricia	Hansen, Marilyn
Everett, Connie	Hargood, George
Farris, Mark	Harmon, Heidi
Fernandez, Delia	Harrigan, Rita
Fertschneider, M.	Harris, Anne
Fink, F.	Hays, Pamela R.
Fitiakis, Robert	Hays, R. Allen
Foote, Theresa	Henderson, Nancy
Fox, Bobbie	Henry, Chris
Fradin, Paul	Henry, Sierra
Fraley, Anita	Heron, Sean
Fraley, Mike	Hespinhton, Vincent
Frank, Fred	Hewitt, Bonnie
Frank, Pat	High, Steve
Frank, Patricia	Hillingas, R.
Franz, Jeffrey	Hirai, Ayumi
Freeman, Nora	Hirsch, Daniel
Freshwater, K.	Holback, Carl
Friedman, Hal	Holmgren, Karin Lubker
Friedman, Lynn	Horton, Joan
Furuyashi, Yoshie	Howarth, Irma
Futornick, Jody	Huber, Jeanne
Gadell-Newton, Connie	Hummel, Susan
Gallagher, EJ	Hummingbird, Charles
Gammage, Lynn	Hunt, Douglas
Geist, Sheila	Hunt, Meleesa A.
Gellert, Sally Jane	Hunter, J.
Georgi, David	Ibarra, Diane
Gilbert, Petuuche	Ihnen, Gary
Gloye, Nancy	Ihnen, Lorraine
Godwin, Christian	Inderton, Mary
Gonzales, Celina	Inserra, Marie
Good, Joyce	Isaac, DeShawn
Gordon, Ellie	Izzo, Elizabeth
Gordon, Marcia	Jambard-Sweet, Carole
Gordon, Marcia	Jambard-Sweet, Doug
Gott, Elizabeth	Janney, Caroline
Gott, Yael	Jimenez, Riva
Gragert, Jeremy	Johnsen, Krista
Greimer, Marley	Johnson, Anna
Groot, Henriette	Johnson, Molly
Gross, Gregory	Johnson, Pete
Grossman, Amy	
Gutierrez, Ingrid	

Table 13. Individuals Submitting the Form Postcard Sponsored by the Sierra Club with Correspondence ID 950 and ADAMS Accession No. ML14043A331 (continued)

Commenter	Commenter
Jones, Malcolm	Martinez, Lauren
Justensen, Evelyn	Mattsan, Vicky
Kakuris, Phil	Mauter, Nancy
Kanard, Kenneth	Mayes, Scott
Kantrowitz, Edith	Mazzant, Colleen
Karches, Jennifer	McArdle, Ed
Kaufman, Hedwig	McClanahan, Heather
Kaune, Mary	McClenaghaw, Dr. Judy
Keehner, Jr., Joe	McCraney, Richard
Keith, Amanda	McCrinkle, Beth
Kelley, Wilo	McDonald, Peter
Kellogg, Anne	McFee, Alan
Kelly, Susan	McLaughlin, Janet
Kemp, Helen	McLosker, Loraine
Kendzierski, Alyx	McMartin, Nyle
Kilcep, Greg	McNaughton, James J.
Kindel, Maria	McRee, Marie
Kinsel, Steve	M'Custain, Francelita
Klein, George	Meek, Dan
Klingtus, Lori	Melville, Alaina
Kochheiser, Lisa	Mendez, Josiah
Koebel, Suzanne	Merriam, Karen
Krantz, Paul	Merrion, Lydia
Kroehling, Kelli	Meyers, Marcee
Kwapinski, Cathy	Michelson, Erro A.
Lassaw, Don	Migibrey, Patrick
Lassaw, Julie	Miller, Charles
Laughlin, Laurie	Miller, Patricia
Lechick, Alex	Miskena, Jessica
Leifer, Susan	Moazed, Kristina
Lens, Kathy	Moglen, Damon
Leonard, Karin	Mohling, Lynda
Lewis, Sherry	Montana, Frank
Likes, Philip H.	Moore, Jen
Likes, Susan	Morgen, Simone
Livingston, RT	Morrow, Brenda
Long, Gordon	Morry, Pat
Long, Jovita	Mortensen, Sue
Long, Jude	Mozzant, Amos
Lor, Vapan	Mulberry, Alice
Lorbeski, Chris	Mullins, Carol A.
Lubler, James	Myers, Kathryn A.
Ma, Symore	Myrucle, Jessica
Mackey, Pam	Nackerman, Colin
Malboeuf, Simone	Napua, Sandra
Malboeuf, Simone	Narek, Karen
Malotte, Mary	Nelson, Natalia
Manata, Gerald	Niang, Tahirah
Mandeville, Leonard	Norwood, Tom
Maphet, Sheila	Nosh, Sandra
Marashlian, Maria	
Martin, Sieglinde	

Table 13. Individuals Submitting the Form Postcard Sponsored by the Sierra Club with Correspondence ID 950 and ADAMS Accession No. ML14043A331 (continued)

Commenter	Commenter
O'Connell, Michael	Roller, Dianne
O'Dea, Karla	Root, Allen
Ogier, Mayrene	Roseman, David
Ogvendo, Jennifer	Rutgers, Donna
O'Neill, Mary	Ryan, Chris
Ost, John	Sabdal, Krystal
O'Toole, John P.	Sack, Renata E.
Owen, Linde	Salana, Ahmed
Oyuela, Claudia	Saltzman, Ellen
Pace, Greg	Salvatoriello, Julie
Palm, Dennis	Sanderman, Brian
Pardo, Jaime A.	Sanderman, Kim
Park, Calandra	Sanders, Barbara
Parker, Catherine	Sanderson, Harriet
Partos, Bvictoia	Sanderson, James
Patzer, Suzanne M.	Sandler, Andrea
Perry, Jonathan	Sarbe, Margaret
Perryman, Cheryl	Sarkman, Samantha
Persinko, Michelle	Saunders, Marie J.
Petrie, Philip S.	Saunders, Robert T.
Pfatzgraf, Elaine	Schmidt, John
Plante, Diane	Schnabel, JoAnn
Pokrajae, John	Schneck, Tammerlane
Poppe, Kate	Schornstein, Emily
Popratzhy, Nancy	Schrader, Don
Porebski, Arthur	Scoby, Courtney
Porebski, Katherine	Seeley, Linda
Poroi, Mike	Segal, Elizabeth C.
Posterli, Tina	Selznick, Kim
Press, Robert	Sepe, Nikki
Pryce, Oneil	Shank, Billie L.
Putnam, Cecilia	Shankle, Kent
Qirtha, Glenn V.	Sharp, Liz
Quintaw, V.	Shepherd, Mary N.
Racano, Joe	Shields, Robert F.
Raekear, Nancy	Shohoney, Hilary
Rands, Janine	Siezel, Roberta
Rant, Carol	Sihler, K.
Ray, Gisela S.	Simon, Vitalah
Reagan, Allison	Simpson, Bob
Redmond, Joe	Smiler, Gerry
Reeves, James T.	Smiler, K.
Renshaw, Patricia	Smith, Glaucia
Richards, Katherine	Smith, Greg
Ripponer, Sharon A.	Smith, Peg
Ritter, Marueen	Smith, Talia
Rivard, Betsey	Snow, Patt
Rodriguez, Anthony	Sohafer, Soguel
Rodriguez, John	Soler, Eileen
Rodriguez, Russ	Spitzberg, John
Roehm, Robert C.	
Rogers, Johanna	

Table 13. Individuals Submitting the Form Postcard Sponsored by the Sierra Club with Correspondence ID 950 and ADAMS Accession No. ML14043A331 (continued)

Commenter	Commenter
Stansdery, Mark	Webster-Vore, Joan
Stapleton, Elizabeth	Weinstein, David
Staub, Joshua	Whiting, Margaret
Stein, Pamela B.	Wilbert, Rosemary
Stevens, Bev	Willette, Carin
Stobbart, Pat	Williston, M. Katherine
Streed, Crit	Wilson, Annie
Sy, Melanie C.	Wilson, Charlie
Szilagye, Anthony	Wilson, Tyler
Taylor, C. L. Andree	Wilver, Calvin
Taylor-Laguan, Tekla	Witt, William
Teaford, Jan	Wohlert, Samantha
Teankin, Gabriella	Wolf, Victoria
Thorensen, Kristen	Wood, John
Thurston, Jennifer	Wright, D. Rosh
Tiger, Manuel	Wright, Margaret Z.
Todd, Doug	Wright, Stuart
Tohe, Robert	Yazzie, Henry
Tolkin, Dan	Yazzie, Peter Lee
Totty, Lia	Yelda, Peter
Tribbey, Charles	Zamek, Jill
Trojay, Liz	Zhang, Li
Tsinhnahjinnie, Auberon	Zimmerman, Doug
Tsosie, Rebecca	Zimmerman, Joyce
Utter, Donald F.	Abigail
Van Reusner, Lucia	Cecile
Van Thillo, Eric	Daniel
Vanstone, Carolina	Lorena
Varma, Amity	Randall
Vassar, David	Scott
Veneer, Sue	Sherwin
Vertal, W.S.	Stephen
Vincent, Joni	Susan
Vodnik, James	VLAD
Waddell, Kathleen	William
Walter, Roger	
Watkins, C. L. Andree	
Watkins, S.	

Table 14. Individuals Submitting the Form E-Mail with Correspondence ID 951 and ADAMS Accession No. ML14027A648

Commenter	Commenter
Adams, Jay	Martin, Leonide
Balckwell, Jeanne	Nikken, Nancy
Greensfelder, Jean	Scott, Barbara
Gregston, Marguerite	Smith, Raymond
Juck, Edna M.	Vignocchi, Carmela
Kerr, Muriel L.	Wright, D. Rosh
Macro, Maggie	