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Consideration of Environmental Impacts on Temporary Storage of Spent Fuel After Cessation of Reactor Operation

Comment On: NRC-2012-0246-0361

Waste Confidence - Continued Storage of Spent Nuclear Fuel

Document: NRC-2012-0246-DRAFT-1273

Comment on FR Doc # 2013-21708

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General Comment

See attached file(s)

Attachments

NRCWasteConfidence

Tami Thatcher
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December 19, 2013

Nuclear Regulatory Commission

Re: Waste Confidence Draft Generic Environmental Impact Statement and Proposed Rule
Docket ID No. NRC-2012-0246

The US Nuclear Regulatory Commission's new Waste Confidence Generic Environmental Impact Statement (NUREG-2157) was developed in response to the 2010 court ruling that some aspects of its Waste Confidence rulemaking did not satisfy NEPA in facility licensing and license extensions. The NRC has for years simply stated that it was confident that permanent disposal would be available "when necessary." The court held that the NRC needed to evaluate the environmental effects of failing to secure permanent disposal and also needed to adequately examine the risk of spent fuel pool leaks and spent fuel pool fires.

So, the NRC's new Waste Confidence Generic Environmental Impact Statement acknowledges prolonged above-ground storage and a multitude of issues including ground water contamination from spent fuel pools, severe accident consequences, and terrorism. The NRC considers "reasonably foreseeable" events including a severe accident that may result in evacuating millions of people, vacating thousands of square miles, rendering expansive areas of land unsuitable for agriculture, and costing billions of dollars not including replacement power costs. With evacuation, the NRC emphasizes that radiological doses to the public should be low. The NRC declares that the impact of indefinitely continued spent fuel storage is "SMALL" with a probability-weighted determination that almost sounds reasonable until you consider multi-year operation of multiple plants which makes a severe accident likely.

This draft EIS is reasonable only if the promotion of the nuclear industry is our country's highest priority, above national security and stability, health, and prosperity. The NRC knows that promotion of the nuclear industry requires the NRC to keep pretending that finding long term solutions for spent nuclear fuel will magically get easier as time goes on. It requires the NRC to keep pretending that the costs of repackaging spent fuel or building a repository that generated our electricity will not be a burden for future generations. And it requires the NRC to keep pretending that nuclear catastrophes are simple mundane affairs that may cause some unenlightened people to experience depression because they've had to vacate their homes permanently, their country and community may be bankrupt, and they and their land are being poisoned by widespread radionuclide contamination.

BACKGROUND ON SPENT FUEL

Commercial nuclear power in the US has generated over 68,000 metric tons heavy metal (MTHM) in spent nuclear fuel.¹ This spent fuel storage poses high costs, severe accident risks

¹ J. C. J. Wagner et al., Categorization of Used Nuclear Fuel Inventory in Support of a Comprehensive National Nuclear Fuel Cycle Strategy, ORNL/TM-2012/308 (FCRD-FCT-2012-00232), Oak Ridge National Laboratory, Oak Ridge, Tenn., December 2012.

and technical challenges both above and below ground. Despite the common description of the volume of spent fuel from the entire US commercial nuclear fleet fitting on a football field, there is already enough fuel to fill one Yucca Mountain repository that spans miles and will contaminate the water below ground.

Is spent nuclear fuel waste? The Department of Energy has determined that the vast majority of the nation's spent fuel inventory should be disposed of without the need for retrieval. Only a small portion is needed for research and possible feedstock for potential closed cycle operation,² should the significant hurdles of cost and safety of fast reactors be overcome in a few decades.

It is often suggested that the US should reprocess spent fuel despite the high cost and the fact that this multiplies the volume of waste that requires storage in a geologic repository by 6 times, not to mention the extensive pollution of air and water that accompanies reprocessing.

Are partitioning and transmutation going to solve the spent fuel problem? Not any time soon nor without significant financial investment, according to the DOE.³

While some of the nation's spent fuel is stored in dry cask storage, most is stored in vulnerable, overcrowded spent fuel pools.

HIGHER RISK DUE TO SPENT FUEL POOL CROWDING

One study for the NRC of spent fuel pool storage compares the accident consequences of high density and low density spent fuel storage. The "generic" consequences of a low probability but severe accident of high density fuel pool storage, the report states, could result in 9400 square miles of land interdiction, meaning people cannot live there, and 4,100,000 people relocated due to the accident. Many more thousands of square miles may be unsuitable for agriculture for years. The consequences for the low density storage accidents were estimated typically at about 50 times less than high density storage, a mere 170 square miles evacuated and 81,000 people displaced.

The local and national economic costs of a severe accident were not calculated.⁴ The economic cost estimates of a spent fuel pool accident in the draft generic EIS appear to be very low, perhaps because it is assumed that spent fuel pool accidents will not occur along with reactor accidents or other events. The actual costs of the Fukushima Daiichi nuclear accident will not be known for decades. The costs of cleanup could be limited to the amount the unlucky country can pay before its economy collapses.

The NRC emphasizes that the consequences to focus on are the radiological doses to humans which the report states are low in both cases because of the modeled successful evacuation and sheltering that limit the radiological doses. The nuclear plants have to transition to dry storage anyway to retain space in the pool. The NRC focuses on accident rem dose to the public as the health indicator of accident severity rather than miles of land uninhabitable, acres of farm land unusable, and dollar cost of the catastrophe. The NRC concludes that there is no significant safety benefit from reducing high density spent fuel pool storage to low density storage. Thus,

² *ibid.*

³ SRS Citizens Advisory Board May 21, 2013 recommendation and DOE's response regarding partitioning and transmutation to reduce the burden of spent nuclear fuel, July 10, 2013, from David C. Moody, Manager, Department of Energy. http://cab.srs.gov/recommendations_2013.html.

⁴ U.S. Nuclear regulatory Commission, Office of Nuclear regulatory Research, Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor Draft Report June 2013

NRC rationalizes that transitioning to low density spent fuel pool storage is unnecessary. Likewise, the NRC also rationalizes that expediting the transition to dry cask storage which is significantly safer than pool storage is unnecessary. The NRC is serving the nuclear industry well. You and me? Not so much.

CONSOLIDATED INTERIM STORAGE AND A DEEP GEOLOGIC REPOSITORY

While the NRC keeps pretending that the spent fuel is just not a problem, the Department of Energy has reported that “The current inventory of domestic [spent fuel] is massive, diverse, dispersed and increasing . . . [and] it represents a significant financial liability.”⁵ There are 137 variations of commercial spent fuel, each requiring specific research for storage design that the taxpayers will be paying for.

In 2012, the National Academy of Sciences raised concern about the increasing use of high-burnup fuels currently being discharged because of reduced cladding integrity.⁶ This complicates storage and transport, as does aging. And it is not the NRC’s or the nuclear industry’s problem because the ownership of the fuel is transferred to the DOE and will be funded by taxpayers.

A consolidated interim storage just requires “concrete, steel and fences” according to some nuclear boosters. But even predominantly Republican Utah would not accept an interim spent fuel storage facility in their state despite one being licensed by the Nuclear Regulatory Commission in Skull Valley. And symbolically, the DOE’s Citizens Advisory Board at the Savannah River Site in South Carolina recently voted against being a potential interim storage site, fearing their site could become the permanent home for the waste.⁷

Siting an interim repository is next to impossible because of the uncertainty that a permanent deep geologic repository will ever open in this country despite the assurances that the NRC is confident that one will. Without a deep geologic repository, the enormous costs of repackaging spent fuel every hundred years at various sites on into infinity is not taken into consideration in the NRC’s EIS even though the draft EIS works hard to make the impression that it has taken into account all costs.

In geologic repository designs such as the cancelled Yucca Mountain project where the waste containers are expected to corrode over time, the prediction of how much and how fast radionuclides are transported is necessary to estimate the level of groundwater contamination. It came as a surprise to repository designers that low-solubility radionuclides such as plutonium could mobilize and move long distances underground. The cancelled Yucca Mountain repository design did not confine the waste and over time water supplies become contaminated. No community that loves their land or cares about future generations will accept a geologic repository. At the very least, siting a geologic repository will remain politically difficult to achieve.

SUMMARY

⁵ Wagner et al.

⁶ National Academy of Engineering, Managing Nuclear Waste, Summer 2012, pp 21, 30.
<http://www.nae.edu/File.aspx?id=60739>

⁷ “Advisory panel votes not to store nuclear waste at Savannah River Site”
<http://www.timesfreepress.com/news/2013/jul/24/advisory-panel-votes-not-store-nuclear-waste-savan/> and more discussion at <http://www.nukewatch.org/media2/postData.php?id=2873>

The fact is that a spent fuel nuclear catastrophe that may destroy many people's livelihoods, their health, and perhaps the nation is acceptable to the NRC. That the NRC ranks these accident consequences (and likelihood) as a SMALL impact says more about the mentality of the NRC than the impacts of indefinite spent fuel storage. Because the NRC places the health of the nuclear industry ahead of this nation's health and will state they have confidence that safely storing spent nuclear fuel and obtaining a repository is technically feasible while keeping a straight face, I suggest that citizens should not place any confidence in the NRC.

There are better, cheaper and safer ways to fight global warming and provide electricity. While it will be expensive and unpopular to take care of the existing spent nuclear fuel, we must stop adding to the problem of spent nuclear fuel. The NRC needs to make prudent decisions regarding safety: it must expedite the thinning of overcrowded spent fuel pools and expedite the transition to dry cask storage. And, the NRC must not be allowed to license new nuclear reactors or relicense existing reactors.

CLOSING

Submitted because I believe it's time for people to understand that despite assurances from the nuclear industry, spent nuclear fuel poses serious health and economic risks to this country. The waste confidence decision is still an emperor with no clothes and it's time for people to understand the truth, despite the bland and distorted conclusions of NRC's generic waste confidence EIS.

Sincerely,
Tami Thatcher