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To: Jonathan Rowley
Date: 6/8/2006 1:34:01 PM
Subject: Fwd: DPS hearing Request

I am sending you the DPS hearing request in pieces. Here is the first piece.

<<PetInterveneFINAL.pdf>> <<Cover Ltr, NOA, COS.pdf>>
<<DeclarationOfWKS.wpd>> <<ShermanResume.pdf>>

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Cover Ltr, NOA, COS.pdf	778608	6/8/2006 1:33:06 PM
DeclarationOfWKS.wpd	63163	6/8/2006 1:33:07 PM
ShermanResume.pdf	9795	6/8/2006 1:33:07 PM

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**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

**In Re: Entergy Nuclear Vermont Yankee)
 LLC and Entergy Nuclear)
 Operations, Inc.)**

**Docket No. 50-271
(License Renewal)**

**VERMONT DEPARTMENT OF PUBLIC SERVICE
NOTICE OF INTENTION TO PARTICIPATE
AND PETITION TO INTERVENE**

Filed on May 26, 2006

**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

In Re: Entergy Nuclear Vermont Yankee)	
LLC and Entergy Nuclear)	Docket No. 50-271
Operations, Inc.)	(License Renewal)

**VERMONT DEPARTMENT OF PUBLIC SERVICE
NOTICE OF INTENTION TO PARTICIPATE
AND PETITION TO INTERVENE**

NOTICE OF INTENT TO PARTICIPATE

Pursuant to 10 C.F.R. §2.309 and the Notice of Consideration of Issuance of A Renewed License for Operating Vermont Yankee Nuclear Power Station (for an additional twenty (20) years) and Opportunity for a Hearing (Notice) Petitioner, the Vermont Department of Public Service (DPS) hereby submits contentions regarding Vermont Yankee Nuclear Power Station's (VY) application for renewal of its license to operate VY for an additional 20 years, or until 2032. As demonstrated below, these contentions should be admitted because they satisfy the NRC's admissibility requirements in 10 C.F.R. § 2.309.¹ Also, the State requests, and is entitled to a full adjudicatory hearing with all the rights of discovery and cross-examination provided by 10 CFR Subpart G. At a later date, to be set by the Atomic Safety and Licensing Board (ALSB) DPS will demonstrate that it meets the requirements of 10 CFR 2.310 (d).²

¹ Although these contentions meet the requirements of 10 CFR §2.309, DPS does not concede the procedures are lawful and reserves the right to challenge, in an appropriate legal forum, these procedures, as applied to DPS in this case, should that be necessary to permit DPS to present and fully adjudicate the important nuclear safety and environmental issues raised in its contentions.

² Although DPS meets the requirements of 10 CFR §2.310(d) for a full adjudicatory hearing on all contentions it raises, DPS does not concede the procedures of 10 CFR §2.310 which restrict use

Vermont Yankee is located within the boundaries of the State of Vermont. DPS is the single representative of the State of Vermont for this Hearing. Therefore, pursuant to 10 CFR §2.309(d)(2), DPS is deemed to have standing for purposes of this proceeding and no further showing is required by DPS on that issue.

I. PARTICIPATION AS A MATTER OF RIGHT

The Atomic Energy Act, 42 U.S.C. §2021(l) specifies that “[w]ith respect to each application for Commission license authorizing an activity as to which the Commission’s authority is continued pursuant to subsection (c) of this section”, which subsection includes a license authorizing, *inter alia*, “the construction and operation of any production or utilization facility”³ the NRC “shall afford reasonable opportunity for State representatives to offer evidence, interrogate witnesses, and advise the

of full adjudicatory hearing procedures are lawful and reserves the right to challenge, in an appropriate legal forum, these procedures, as applied to DPS in this case, should that be necessary to permit DPS to fully adjudicate the important nuclear safety and environmental issues it raises.

³ There cannot be any serious question that the application now pending to extend the operating life of Vermont Yankee by 20 years is a request to authorize operation of the plant at and falls within the scope of 42 U.S.C. §2021(c)(1) and (l). There is no need at this time to address the question of whether this language applies equally to all operating license amendments regardless of whether they seek to extend the operating license. In addition, the provisions of 10 CFR §50.91, which impose certain restrictions on state participation, are inapplicable here. That Section is limited to a Notice of Proposed Action under 10 CFR §2.105 which is deemed by the Commission to present no significant hazards. This is a Notice of Hearing for Consideration of Issuance of Amendment under 10 CFR §2.104.

Commission as to the application". 42 U.S.C. §2021(c)(1) and (l).⁴ 10 CFR §2.315(c) acknowledges these rights of a state in those cases where a hearing is being held. However, the statute extends the right to offer evidence and interrogate witnesses to all applications, even if pursuant to 10 CFR §2.309 no hearing will otherwise be held. Thus, in the case of a State and/or its designated representative, NRC must provide these rights of participation regardless of the existence of any "admissible contention" and include the right to present evidence and interrogate witnesses as to matters relevant to the application. DPS recognizes that without pre-filed contentions, witnesses may have difficulty preparing to answer questions posed and the Applicant, and Staff, if it participates, may have difficulty focusing their attention on the issues of concern to the State. For that reason DPS is submitting a statement of the contentions it now believes should be examined at the hearing and will supplement that list of contentions when and if new evidence becomes available.

DPS believes the most efficient manner by which these statutory rights can be exercised is to allow both depositions and live testimony to the extent the issues are not fully developed in the deposition, but should the NRC conclude all state interrogation must be conducted at a Board supervised hearing, DPS will conduct all of its interrogation of witnesses at that time. Although not specifically mentioned in §2021(l), DPS also believes that cross-examination of witnesses by it will be

⁴ Thus, DPS should not be required in this case to separately demonstrate that the provisions of Subpart G should apply to any Contentions which are admitted. Nonetheless, out of an abundance of caution, DPS will provide that demonstration at an appropriate time.

more efficient if DPS submits cross-examination outlines, five days before the examination, to alert each witness to the subjects which DPS will explore. Similarly, DPS should have the right to seek production of documents if for no other reason than that production of documents will facilitate interrogation of witnesses and narrow the scope of their examination. Otherwise, witnesses will be asked questions about issues which are addressed in documents which either are not present during the interrogation or the analysis of which will require a hiatus in the interrogation.

DPS realizes that it may have information which Applicant, Staff or any other parties which may be permitted hearing status will want to see and although not required to do so by statute, will respond to reasonable requests for production of documents and is willing to have its witnesses cross-examined by Applicant, Staff or any admitted party provided outlines of cross-examination are submitted at least five days in advance for the witness to be prepared to fully answer the questions posed.

The following discussion follows the provisions of 10 CFR §§2.309 and 2.310 for purposes of simplicity and to demonstrate that even if DPS were not entitled to an adjudicatory hearing as a matter of right as to all of its contentions, it would nonetheless be entitled to an adjudicatory hearing on all these contentions under the provisions relevant to other parties.

PETITION TO INTERVENE

I. INTRODUCTION

The State of Vermont has consistently pursued issues of nuclear safety and environmental

protection before the Nuclear Regulatory Commission (NRC) and other appropriate state and federal agencies. Among the issues of greatest concern to the State is the wise management of the energy resources to best advance the interests of Vermont residents and energy consumers in Vermont. To this end the State has enacted significant legislation addressed to its concern regarding the development of energy resources in Vermont. Among these measures are two recently enacted statutes that bear directly on the pending proceeding.

In the last month Vermont has adopted Senate Bill 124, An Act Relating to a Certificate of Public Good for Extending the Operating License of a Nuclear Power Plant. That legislation mandates a process of public engagement and fact-finding that includes assessing all practical alternatives to license extension that may be more cost effective or better promote the general welfare. Additionally, House Bill 859, An Act Relating to the Energy Security and Reliability Act, was passed. H.859 provides for a comprehensive statewide public engagement process focused on electric energy supply choices facing the state. In the last year Vermont has adopted two other bills that look to renewable energy alternatives. The first established the Vermont Clean Energy Development Fund, 10 V.S.A. § 6523, with money from Entergy to the State of Vermont established under a Memorandum of Understanding regarding the creation of a dry fuel storage facility at Vermont Yankee. The fund was created in large part to support investment in clean energy resources in order to ensure that the state's future power supply would be diverse, reliable, economically sound and environmentally sustainable.

10 V.S.A. § 6521. Also, last year the General Assembly passed legislation promoting renewable energy. 30 V.S.A. § 8001 et. seq. These four statutes combined with existing state legislation demonstrate that Vermont has a strong preference for developing those energy resources that have the least impact on the environment and are the most economical. For example, 30 V.S.A. §248(b)(2) requires that prior to issuance of a certificate of public good for any generating facility, including a merchant plant like Vermont Yankee, the Public Service Board must make an affirmative finding that:

[the proposed facility] is required to meet the need for present and future demand for service which could not otherwise be provided in a more cost effective manner through energy conservation programs and measures and energy-efficiency and load management measures, including but not limited to those developed pursuant to the provisions of sections 209(d), 218c, and 218(b) of this title;

An example of the steps being taken by Vermont to carry out these obligations, is the ongoing Vermont PSB proceeding on the potential for and benefits of a greater commitment to energy efficiency measures in the state. *See* Energy Efficiency Utility Budget Recommendation Hearings (Vermont PSB).

The Nuclear Regulatory Commission (NRC) recognizes the primacy of the concerns of each state for the economic cost and generating mix of power facilities in that state and correctly leaves it to each state to determine whether an otherwise safe and environmentally acceptable nuclear power plant should be allowed to extend the operation of its facility beyond the originally approved license period:

The final amendment also eliminates NRC's consideration of the need for generating capacity and the preparation of power demand forecasts for license renewal applications. The NRC acknowledges the primacy of State regulators and utility officials in defining energy requirements and determining the energy mix within their

jurisdictions. Therefore, the issue of need for power and generating capacity will no longer be considered in NRC's license renewal decisions.

Environmental Review for Renewal of Nuclear Power Plant Operating Licenses (61 FR 28467 at 28468).

Nonetheless, the NRC, in individual proceedings, does make findings in which it evaluates environmental impacts of alternatives to the proposed extended license operation:

- (1) Neither the rule nor the GEIS would contain a consideration of the need for generating capacity or other issues involving the economic costs and benefits of license renewal and of the associated alternatives;
- (2) The purpose and need for the proposed action (i.e., license renewal) would be defined as preserving the continued operation of a nuclear power plant as a safe option that State regulators and utility officials may consider in their future planning actions;
- (3) The only alternative to the proposed action would be the "no-action" alternative, and the environmental consequences of this alternative are the impacts of a range of energy sources that might be used if a nuclear power plant operating license were not renewed;
- (4) The environmental review for license renewal would include a comparison of the environmental impacts of license renewal with impacts of the range of energy sources that may be chosen in the case of "no action"; and
- (5) The NRC's NEPA decision standard for license renewal would require the NRC to determine whether the environmental impacts of license renewal are so great that preserving the option of license renewal for future decisionmakers would be unreasonable.

Environmental Review for Renewal of Nuclear Power Plant Operating Licenses (61 FR 28467 at 28472).

There is a potential problem with this approach. First, in considering alternatives to the proposed license extension, the NRC considers the merits of a number of energy generation alternatives

and energy efficiency and demand side management. *See e.g.* Generic Environmental Impact Statement for License Renewal of Nuclear Plants Regarding Monticello Nuclear Generating Plant (Draft NUREG-1437 (Supplement 26) at 8-45 to 8-52 (January 2006)). Second, because DPS is a party to this proceeding, other litigants in the future could try to assert that the DPS could be bound by any findings made either by the Board or the Staff on these issues. Although such a result would be contrary to the NRC's clear statement that it is up to each state to decide the issue of whether an alternative is preferable to the proposed extended license, absent some ruling to that effect DPS would subject itself to a risk of collateral estoppel.

However, at this time, the Staff has yet to develop a draft supplemental environmental impact statement (SEIS) and Entergy's presentation on alternatives does not take into account the State's position on alternatives. Thus, the State is unable to determine whether any findings proposed to be made on these issues will be contrary to the position the State believes is best or whether Entergy and the Staff would agree that no finding by the Board on the issues of alternative energy viability or impacts would be binding on the State in a proceeding before the PSB. For that reason the State cannot, at this time file any contentions related to energy alternatives but reserves the right to do so should filings by Entergy or the Staff require such action.

First Contention (Safety)

The Application must be denied because the Applicant has failed to provide the necessary information with regard to age management of primary containment concrete in accordance with 10 C.F.R. §54.21 such that the Commission cannot find that 10 C.F.R. §54.29(a) is met.

Basis

As shown by the supporting evidence below, the Applicant improperly excludes the attribute of *reduction of strength and modulus of the primary containment structure due to elevated temperature*. The Applicant claims this attribute is not an aging effect requiring management. However, the primary containment normal operating temperature limit is above the limit for excluding this attribute from consideration. The lack of consideration means the Commission cannot make the finding of acceptability in accordance with 10 C.F.R. §54.29(a).

Supporting Evidence

1. At 3.5-8 of the License Renewal Application (LRA), the Applicant includes the following statement:

3.5.2.2.1.3 Reduction of Strength and Modulus of Concrete Structures due to Elevated Temperature

ASME Code, Section III, Division 2, Subsection CC indicates that aging due to elevated temperature exposure is not significant as long as *concrete general area temperatures do not exceed 150°F* and local area temperatures do not exceed 200°F. During normal operation, areas within primary containment are within these temperature limits. Therefore, reduction of strength and modulus of concrete structures due

to elevated temperature is not an aging effect requiring management for VYNPS containment concrete.

Emphasis added.

2. At 2.4-3 of the LRA, the Applicant refers to Sections 5.1.2 and 5.2 of the UFSAR for a description of the primary containment.

3. At 5.2.-8 of the UFSAR, the Applicant has the following statement:

Normal environment in the drywell during plant operation is approximately 2 psig pressure and an ambient temperature of about 135°F to 165°F.

4. Since the normal environment maximum of 165°F is above the cut off limit of 150°F, and since the concrete surface behind the steel shell will closely match the drywell ambient temperature, the statement at 3.5-8 of the LRA is not accurate, and reduction of strength and modulus of concrete structures due to elevated temperature is an aging effect requiring management.

5. Using 3.5-18 of the LRA, the Applicant may hold that reduction of strength and modulus of concrete structures due to elevated temperature is not applicable because VYNPS is a Mark I steel containment. However, this also is not accurate. In the UFSAR, the Applicant takes credit for the strength and integrity of containment walls in a number of manners.

6. At 5.2-7 of the UFSAR, the Applicant states:

The drywell is enclosed in reinforced concrete for shielding purposes and to provide additional resistance to deformation and buckling of the drywell over areas where the concrete backs up the steel shell.

7. At 5.2-23 of the UFSAR, the Applicant states:

The space between the containment vessel and the concrete is controlled such that in areas which are backed up by concrete and are subjected to jet forces, the integrity of the containment will not be violated.

8. Another example of crediting concrete stress is found at 12.2-23 of the UFSAR:

The concrete stresses and welding stresses were checked against the allowable stresses to determine if the skirt and the surrounding concrete can withstand the horizontal forces. The concrete stress is 638 psi, which is less than the 1,000 psi allowed by ACI 318, 1963. The unit shear stress on the skirt weld is 488 psi, which is small in comparison with the load-carrying capability of the weld.

9. Since the Applicant takes credit for containment wall concrete integrity and since the normal operating temperature may exceed 150°F, the attribute, *reduction of strength and modulus of the primary containment structure due to elevated temperature*, requires an age management program. The Commission cannot approve the LRA without such a program.

Second Contention (Environmental)

The Application must be denied because Applicant has failed to comply with the requirements of 10 CFR §51.53(c)(3)(iv) by failing to include new and significant information regarding the substantial likelihood that spent fuel will have to be stored at the Vermont Yankee site longer than evaluated in the GEIS and perhaps indefinitely and thus has failed to provide the necessary environmental information with regard to onsite land use in accordance with 10 C.F.R. §54.23 such that the Commission

cannot find that the applicable requirements of Subpart A of 10 C.F.R. Part 50 have been satisfied (10 C.F.R. §54.29(b)).

Basis

1. 10 CFR §51.53(c)(3)(iv) provides that the “[t]he environmental report must contain any new and significant information regarding the environmental impacts of license renewal of which the applicant is aware.”

2. 10 C.F.R. §54.23 requires the Applicant to submit an environmental report that complies with Subpart A of 10 C.F.R. Part 51.

3. New and significant information exists regarding the time for which onsite land will be removed from other uses, and whether such land use is irretrievable, which was not provided in the ER by the Applicant in accordance with 10 C.F.R. §51.53(c)(3)(iv). The current estimate in the Generic Environment Impact Statement (GEIS) is on-site storage of spent fuel will not last beyond 30 years after the end of the license period (including an extended license period). GEIS, Sections 6.4.6.2, 3.

4. The GEIS evaluates the impacts associated with onsite land use as Category 1, SMALL. The basis for this assessment is the assumption that the land used for storage of nuclear wastes at the reactor site will not exceed 30 years after the end of the license term. GEIS, Section 3.2 (referring to GEIS Chapter 6). That assumption, in turn, relies upon the assumption that a permanent high level waste repository, and perhaps even a second repository, will be in place by that time to receive the reactor wastes. GEIS, Section 6.4.6.2 Based on those assumptions the use of the reactor site for

storing spent fuel, in this case for a period ending in 2062, has been deemed to be a small impact.

GEIS, Section 3.2.

5. However, as the evidence summarized below demonstrates, these assumptions are flawed. Recent evidence, not evaluated previously in the GEIS, now discloses that: 1) the likelihood that a permanent high level waste repository will be in place by 2062 is slight due to unanticipated technical problems uncovered at the Yucca Mountain site coupled with changes in national policy; 2) the only currently contemplated high level waste repository can accommodate the quantity of spent nuclear fuel expected to be produced by Vermont Yankee through the end of its originally licensed life, but it would not have space for at least a part of the additional spent nuclear fuel generated by VY during extended licensing; 3) no present plans exist for building a second high level waste repository nor has any site been identified for consideration for such a facility; 4) the United States is now embarking upon a changed policy for waste disposal which will make all the current schedules obsolete and for which there is no reliable time frame for its implementation; 5) there is not now nor has there been any reasonable prospect that the federal government or any third party will take title to the license-renewal spent fuel waste and remove it from the site; and 6) it follows that it is reasonable to expect that at least a part of spent fuel to be generated at VY during the period of an extended license will remain at the site for a much longer time than evaluated in the GEIS and perhaps indefinitely.

6. Since this new information, not available at the time of development of the GEIS,

demonstrates that the commitment of onsite land for storage/disposal of spent nuclear fuel from license renewal will be substantially longer than assumed in the *GEIS*, and may be indefinite, this results in an irretrievable commitment of onsite land with a MODERATE or LARGE impact.

7. As demonstrated by the evidence below, Vermont and its communities have firmly established values associated with land use such that the long-term or indefinite use of a portion of the VY site for spent nuclear fuel storage should clearly be evaluated as a MODERATE or LARGE impact in the VY supplement to the *GEIS*.

Supporting Evidence

1. There is new and significant information which the Applicant should have identified and described in its Environmental Report. If this information had been provided and evaluated properly, it would have changed the *GEIS* conclusions regarding onsite land use impacts.

2. The Applicant should have reported that the nation's policy with regard to spent fuel management has changed. The current administration and Congress have announced a major shift in policy called the Global Nuclear Energy Partnership (GNEP). Refer in general to the Administration's GNEP website - <http://www.gnep.energy.gov/> - which contains the announcement and much information regarding this new policy direction. Proponents of this new policy hope this new approach will not separate out plutonium products. The home page of the website referenced above contains the following statement:

Demonstrate More Proliferation-Resistant Recycling

Accelerate the development, demonstration and deployment of new technologies to recycle nuclear fuel that do not result in separated plutonium —a key proliferation risk of existing recycling technologies.

As shown by this statement, this policy is a shift to reprocessing of spent fuel that hopes to use a technique which has neither been developed nor demonstrated.

3. Further, this shift in policy will remove attention and resources from repository development such that the basis and conclusions that spent fuel will not have to be stored on site beyond 2062 are no longer valid. For example, see the report of comments below from Sen. Pete Domenici:

MOVEMENT OF SPENT FUEL IN THE US COULD BE FURTHER DELAYED, according to Senator Pete Domenici, the New Mexico Republican who chairs the Energy and Natural Resources Committee. Domenici indicated during a status hearing on DOE's repository program at Yucca Mountain, Nevada that it was unrealistic to proceed with a status-quo repository project and later factor in spent fuel reprocessing waste and recycling activities associated with DOE's new fuel-cycle initiative, the Global Nuclear Energy Partnership. It ought to be pretty clear to everyone that spent fuel rods won't be put into Yucca Mountain, Domenici said in an apparent reference to GNEP, which is aimed, in part, at closing the nuclear fuel cycle in the US and abroad. Recycling will determine what kind of repository the US needs, he added. "It's a mess," Domenici said, of the Yucca Mountain program as reporters approached him after the hearing. He said that he believes any legislation on Yucca Mountain would have to include language on spent fuel recycling. Draft legislation DOE sent to Congress last month did not include language on spent fuel reprocessing.

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4. In addition, the Applicant should have reported that the previous assumption regarding the suitability of Yucca Mountain as a permanent waste disposal site is no longer valid. At Yucca Mountain, contrary to the assumptions underlying the GEIS, it has been discovered that the disposal area is subject to water in-leakage. Therefore the design must be changed from that previously assumed and it is not clear a new design can be developed which will meet dose and integrity requirements. Partially in response to this discovery, DOE has abandoned previous cask designs and now proposes a concept called the TAD (transportation, aging and disposal) standard canister for which there is not presently even a preliminary design. Exhibit Vermont-2⁵.

5. Further, the Applicant should have stated that these changes have occurred in an increasingly hostile political environment. Senate minority leader Harry Reid (D-NV) strongly opposes development of Yucca Mountain and is able to use his position as minority leader effectively to advance this opposition and would do so even more forcefully as majority leader if the Senate leadership changes parties. And, the Western Governor's Association (WGA) has the following active resolution (03-16):

On December 1, 1989, the Western Governors' Association adopted Resolution 89-

⁵ Exhibit Vermont-2 consists of are slides from a recent presentation by Jay Jones of the Department of Energy's Office of Civilian Radioactive Waste Management that identify that DOE is, at this late date, changing its canister approach.

024 which stated that spent nuclear fuel should remain at reactor sites until a state has agreed to storage and DOE provides reasonable transportation, safety, and emergency response assurances to the western states. The resolution was readopted in 1992, 1995, 1997, and 1999.

All of the new information identified above provides additional arguments and evidence to bolster the opposition of Senator Reid and the WGA and undercut the assumed completion date for a usable high level waste repository.

6. In addition, the Applicant should have reported that, because the GEIS was prepared before September 11, 2001, it does not factor in the impact of viable terrorist threats into an evaluation of the socioeconomic impacts of indefinitely storing spent fuel at the reactor site. The extended long-term or indefinite presence of spent nuclear fuel at Vermont Yankee after permanent shutdown means a defined terrorist target will be present for the long-term or indefinitely. In its news release No. 03-053 (April 29, 2003) (Exhibit Vermont-3), NRC stated:

The Commission believes that this DBT [Design Basis Threat] represents the largest reasonable threat against which a regulated private security force *should be expected to defend* under existing law.

(Emphasis added). The phrase, *should be expected to defend*, means there is a limit on the expectation on the Applicant, and the state resources will be expected to provide additional security responses beyond the Applicant's capability. The very presence of this target creates an effect on that land, contiguous lands, and the surrounding area, creating the need for continuous augmented emergency preparedness plans and security response from the State.

7. The statute sets the storage limit of Yucca Mountain to 70,000 metric tons of disposed quantity:

(d) Commission action. The Commission shall consider an application for a construction authorization for all or part of a repository in accordance with the laws applicable to such applications, except that the Commission shall issue a final decision approving or disapproving the issuance of a construction authorization not later than the expiration of 3 years after the date of the submission of such application, except that the Commission may extend such deadline by not more than 12 months if, not less than 30 days before such deadline, the Commission complies with the reporting requirements established in subsection (e)(2). *The Commission decision approving the first such application shall prohibit the emplacement in the first repository of a quantity of spent fuel containing in excess of 70,000 metric tons of heavy metal* or a quantity of solidified high-level radioactive waste resulting from the reprocessing of such a quantity of spent fuel until such time as a second repository is in operation. Nuclear Waste Policy Act,

as amended, Sec. 114 (d), emphasis added. Entergy has stated that all of the spent fuel projected to be generated by Vermont Yankee through the end of its current operating license (including increases of spent fuel from power uprate) will be within the 70,000 metric tons storage limits of the "first" repository. See Entergy's response to the DPS Discovery Request 1-11 in PSB Docket No. 7082 (Exhibit Vermont-4). Therefore, the Applicant should have identified that at least some part of the spent fuel from license renewal will exceed the 70,000 metric ton limit (when all spent fuel being generated nationally is considered) and must go into a second repository.

8. While many believe that the first repository can dispose of more than the statutory 70,000 MTHW, this presumption cannot be relied upon until and unless the law is changed.

9. Similarly, some may believe DOE will removed spent fuel from the Vermont Yankee site to an interim storage location, thus eliminating the MODERATE or LARGE onsite land-use impact. Vermont strongly supports this outcome. Vermont will show at hearing that attempts in Congress to create such interim storage failed three times in the 1990's, and that this presumption cannot be relied upon until law is created to allow such interim storage.

10. Since VY's initial operation, when perpetual tank storage was envisioned, the federal government's attempts to fulfill its obligation to develop spent fuel disposal have been abysmal. For the past nineteen years efforts have focused at Yucca Mountain, but due to the changes identified above, the Administration currently does not even have a schedule for the completion of the first repository. The Massachusetts Institute of Technology (MIT), in 2003, performed a study: *The Future of Nuclear Power: An Interdisciplinary MIT Study*. The Applicant should have identified that it sponsored the co-chair of the study, Dr. Ernest Moniz, Director of Energy Studies, Laboratory for Energy and the Environment, MIT Department of Physics, as a witness in PSB Docket No. 7082, regarding authorization for dry cask storage. In that docket, Dr. Moniz testified:

[T]he MIT Study argues that "interim" storage of spent fuel (which can be carried out either at reactor sites or in consolidated facilities, possibly under federal control) for fifty to seventy years is in any case a preferred approach for design of an integrated spent fuel management system.

Prefiled direct testimony of June 16, 2005 at 13. The implication of the Applicant's testimony through

Dr. Moniz is that the first repository will not be available for “fifty to seventy years.” If the schedule for the first repository is “fifty to seventy years,” a time period greater than evaluated in the GEIS, then the schedule for a second repository is indefinite at best, if such a repository could ever be built.

10. Vermont assigns a high value to land and its use within the state. The values are codified in the form of environmental protections in permitting criteria in 10 V.S.A Chapter 151, State Land Use and Development Plans (see Exhibit Vermont-5).

11. Criteria No. 7 of 10 V.S.A §6086 (a) states:

[Before granting a permit, the district commission shall find that the subdivision or development:]

(7) Will not place an unreasonable burden on the ability of the local governments to provide municipal or governmental services.

The long-term or indefinite storage of license renewal spent fuel at VY would trigger long-term burdens on local governments for emergency management and security services. It is highly likely that long-term or indefinite storage of the spent fuel created by license renewal would not comply with Criteria No. 7. Therefore, this would suggest the impact of the proposed onsite land use should be determined to be **LARGE** in the VY supplement to the GEIS.

12. Criteria No. 8 of 10 V.S.A §6086 (a) states:

[Before granting a permit, the district commission shall find that the subdivision or development:]

(8) Will not have an undue adverse effect on the scenic or natural

beauty of the area, aesthetics, historic sites or rare and irreplaceable natural areas.

Under this criteria, the the District Environmental Commission would evaluate the effect of spent nuclear fuel being left long-term or indefinitely on a riverbank site that would otherwise be fully returned to greenfield condition. It is highly likely the long-term or indefinite presence of spent nuclear fuels following decommissioning of VY would be deemed to create an undue adverse effect. Considering this criteria, the proposed onsite land use should be evaluated as MODERATE or LARGE in the VY supplement to the GEIS.

13. In addition, Vermont's land use law requires a finding that land uses are in conformance with local or regional plans:

(10) Is in conformance with any duly adopted local or regional plan or capital program under chapter 117 of Title 24. In making this finding, if the district commission finds applicable provisions of the town plan to be ambiguous, the district commission, for interpretive purposes, shall consider bylaws, but only to the extent that they implement and are consistent with those provisions, and need not consider any other evidence.

10 V.S.A. §6086 (a)(10).

14. The Windham Regional Plan of October 30, 2001, which is applicable to VY, establishes land use requirements, and has the following provision:

LAND USE POLICIES

Rural Residential Lands

1. Ensure that any development of rural residential lands will be at densities that will

serve to contain rural sprawl, and that are compatible with existing land uses and sensitive to the limitations of the land.

Once the bulk of the site is returned to a greenfield condition, it is doubtful that long-term or indefinite presence of spent nuclear fuel from license renewal would be considered "compatible with existing land uses". This provision suggests the onsite land use impact should at least be evaluated as MODERATE in the VY supplement to the GEIS.

15. The Windham Regional Plan also has the following provision:

COMMUNITY RESOURCE POLICIES

High Level Radioactive Waste

1. Encourage a requirement that permanent spent nuclear fuel (SNF) storage be resolved prior to any consideration of extending or reviewing the operating license of Vermont Yankee.

It is highly likely that a land use evaluation under 10 V.S.A. §6086 (a)(10) would find the proposal for long-term or indefinite storage of spent nuclear fuel from license renewal did not conform with the regional plan with regard to the item above. Thus, this provision suggests a LARGE impact from the onsite land use from the proposed license renewal.

16. There is also a Vernon Town Plan, Nov. 3, 2003, which is applicable to VY. This plan contains the following:

Section III: Resource and Economic Development

Recommendations:

#3 The Town should pursue discussions with appropriate representatives of the Vermont Yankee Nuclear power Company regarding the possible re-use of the power plant site for other commercial and industrial development following decommissioning.

The long-term or indefinite presence of spent nuclear fuel from license renewal has the potential for preventing "other commercial and industrial development following decommissioning." If the spent fuel storage completely prevented the use of the site for other developments, it is highly likely the impact from license-renewal onsite land use would be LARGE. If the spent fuel storage allowed some additional development but hindered other possible commercial and industrial uses, the impact would likely be MODERATE.

17. The extended long-term presence of spent fuel will prevent use of the immediate land it occupies and will deter other possible uses of larger contiguous areas because of societal and commercial concerns regarding the proximity of radioactive material. From the foregoing, it is seen that Vermont has existing land use evaluation criteria, which establish the basis under which the impact from additional long-term or indefinite onsite land use resulting from the spent nuclear fuel generated from license renewal should be evaluated as MODERATE or LARGE in the VY supplement to the GEIS.

18. Even at the time of development of the GEIS Vermont urged the NRC to give greater credence to the real possibility that spent fuel generated by license extension would have to be stored at the reactor site more than 30 years after power generation had ceased. As noted above, that possibility has now risen to a probability. The failure of the NRC, during the GEIS development

process, to even address the possibility that spent fuel would have to remain at the reactor site indefinitely, underscores the need to address those issues at this time in light of the new and significant evidence cited above. The following history of Vermont's participation in the GEIS process demonstrates this point:

A. The *Vermont GEIS Comments* (Exhibit Vermont-1), stated in Comment 13 (p. 10):

The permanence of land committed for radioactivity disposal deserves a separate categorization with different weighting than other permanent land uses. Land committed for radioactivity is essentially removed from use forever. Other "permanent land uses" can eventually be reclaimed with effort or after an amount of time. This separate categorization would make it clear that, for example, a small amount of land used for radioactivity disposal may be significantly less preferable than a larger amount of land disturbed by local strip mining which can be reclaimed if desired. . . . Finally, as evidenced by the difficulties and delays in both the high- and low- level radioactive waste disposal programs, it is not clear that such land for radioactive waste disposal is really available.

B. The *Vermont GEIS Comments* , stated in Comment 15 (p. 12):

Spent fuel issues cannot be considered resolved until covered by public laws and the disposal site is chosen and evaluated. This may be accomplished generally but is Category 3 at this time.

Land-use issues must be compared against specific alternatives. Thus, land-use issues must be evaluated as Category 3 for this reason.

Overall, the uranium fuel cycle categorization must be Category 3 because of unresolved spent fuel and land use issues.

C. The *Vermont GEIS Comments*, stated in Comment 19 (pp. 15-6):

This section [6.5] evaluates the impacts of temporary storage of spent fuel instead of permanent storage. For permanent storage, it is stated that a second high-level radioactive waste repository would be required (GEIS p. 6-35). The radiological and land-use issues surrounding this second repository are not evaluated clearly in GEIS, but these are central issues.

The effects of creation of 50% more spent fuel is evaluated incorrectly as a Category 1 issue (GEIS p. 6-36). While the spent fuel is properly generic, rather than plant specific, the issue cannot be considered resolved until a disposal location is selected and evaluated (and included within the scope of Public Laws). Lacking this, environmental impacts of spent fuel must be considered Category 3, not resolved for any plant.

D. The *Vermont GEIS Comments*, stated in Comment 29 (p. 23):

This assessment of commitment of resources [which stated in Section 10.2, p. 10-2: *Additional land and materials may be required for the storage of the additional spent fuel and low-level waste that are generated*] is inadequate for the purposes of NEPA. First, additional land will be required for high- and low-level radioactive waste disposal. For NEPA purposes, this section must:

- a. Assess the likelihood that such resources are available. It is not yet clear that locations can be found for present quantities of high- and low-level radioactive waste.
- b. Evaluate the aspect that such land, if located, is removed from social usefulness essentially forever. The permanency of this environmental impact must be considered to weigh heavily, when compared to more short-term impacts.

19. Vermont provided the *Vermont GEIS Comments* at the generic review stage both to convince the NRC to see that its optimistic view of the future was unwarranted and in order to preserve its rights of challenge at the site specific stage of license renewal.

20. As explained below, the NRC does not directly address, and therefore does not directly reject, Vermont's comments regarding land use associated with the spent fuel generated in license renewal either in its notes of consideration for the final rule for Environmental Review for Renewal of Nuclear Power Plant Operating Licenses (June 5, 1996, 61 FR 28467) or in its final GEIS, Section 3.2 (On-Site Land Use and Section 6.4.6 (Spent Fuel)).

21. At 61 FR 28479, it is stated:

Table S-3 does not take into account long-term onsite storage of . . . spent fuel assemblies for longer than 10 years . . . The environmental impacts of these aspects of onsite storage are also addressed in Chapter 6 of the final GEIS.

Therefore, Table S-3 does not consider Vermont's concern regarding onsite land use for spent fuel management for extended periods.

22. At 61 FR 28479, it is stated:

The only nonradiological effluent from waste storage is additional heat from the plant that was found to have a negligible effect on the environment.

While the only nonradiological effluent may be additional heat, this is not the only nonradiological effect resulting from the potential indefinite on-site land use from spent fuel management. This comment does not address Vermont's concerns.

23. At 61 FR 28479-28480, it is stated:

The environmental impacts of allowing onsite dry cask storage under a general license were assessed in an EA . . . Potential impacts that were assessed include . . . land use.

This statement is inadequate to address Vermont's concerns. While land use in general might have been considered in generic dry cask approvals, these generic approvals did not consider the impacts from potential indefinite land use associated with the spent fuel management problems caused by license renewal.

24. The GEIS further provides:

The GEIS addresses extended onsite storage of spent fuel during a renewal period of up to 20 years. (61 FR 28479)

* * *

Trends in onsite spent fuel storage capacity and the volume of spent fuel that will be generated during an additional 20 years of operation are considered in the GEIS. (61 FR 28480).

However, as the following statements in the GEIS demonstrate Vermont's comments regarding on-site land use were not addressed.

25. GEIS Section 3.2, On-Site Land Use states:

Changes in on-site land use at a nuclear plant could result if additional new spent fuel . . . facilities were required (Waste generation, handling, and disposal are discussed in Chapter 6). . . The U.S. Nuclear Regulatory Commission (NRC) has written a number of environmental assessments for on-site dry cask storage facilities and has reached a "finding of no significant impact" (FOSNI) for each. The FONSI was reached considering the amount of land actually disturbed, the range of possible environmental impacts, and alternatives uses of the land. On- site land use impacts are expected to be of small significance.

From the first part of the above assessment, the NRC recognizes that license renewal may create

changes in on-site land use for spent fuel management. Further comment in that regard is deferred to Chapter 6. Regarding the manner in which land use is described in the environmental assessments for dry cask storage, the GEIS gives the following example:

Using the Calvert Cliffs Nuclear Power Plant Site ISFSI EA as typical, the following impacts are evaluated. Land use is about six acres, which is within the owner-controlled area of 2300 acres. . . . The Commission believes that the impacts discussed above reasonably describe the impacts from existing dry cask storage facilities, as well as the likely impacts from those dry cask storage facilities that are expected to be constructed as a result of license renewal.

No part of this evaluation addresses Vermont's comments regarding onsite land use and the possible indefinite commitment of this land in Vermont.

26. The GEIS makes a statement about emergency preparedness:

From the standpoint of emergency preparedness, the impacts of dry cask storage installations should be minor for three reasons. First, because of the reduced radioactive inventory in the fuel stored in dry cask facilities, accidents involving such storage facilities are likely to develop more slowly than those involving the nearby operating reactors. Second, accident impacts should be low, again because of the reduced inventories of radioactive materials in the stored fuel but also because of the correspondingly reduced level of decay heat compared with fuel still in-reactor. Thus, emergency plans formulated for operating reactors should encompass accidents at dry cask storage facilities. Third, it is NRC policy that plants with dry cask storage facilities incorporate the potential sources of hazard from these storage facilities in their emergency plans, as well as the potential hazard from all radiological source terms at the plant site.

GEIS Section 6.4.6.1. This statement does not address Vermont's concerns regarding the indefinite nature of the commitment of land for spent fuel management, nor the threat from terrorist activities

which was greatly increased after September 11, 2001.

27. The evaluation in GEIS Section 6.4.6 uses 2010 as the date a geologic repository will be available. The GEIS recognizes the need for a second repository:

Possible extensions or renewals of operating licenses also need to be considered in assessing the need for and scheduling the second repository. It now appears that unless Congress lifts the capacity limit on the first repository – and unless this repository has the physical capacity to dispose of all spent fuel generated under both the original and extended or renewed licenses – it will be necessary to have at least one additional repository. Assuming that the first repository is available by 2025 and has the capacity on the order of 70,000 MTHM, additional disposal capacity would probably not be needed before about the year 2040 to avoid storing spent fuel at a reactor for more than 30 years after expiration of reactor operating licenses.

GEIS Section 6.4.6.2.

28. Above we have shown that Vermont's comments about land use were not adequately addressed in the comment phase for the GEIS. On July 5, 1996, DPS commented:

The effect of . . . spent nuclear fuel generated from license renewal is ruled a resolved issue which cannot be raised in site-specific applications. This is lamentable . . . Congress has not appointed requested amounts for the federal spent nuclear fuel program. We have seen no progress in the spent nuclear fuel program which gives us confidence that a repository will become a reality. . . [R]adioactive waste disposal issues should not be sealed so they cannot be revisited by states in site-specific applications.

29. The Commission responded in part:

Also from a regulatory policy perspective, the Commission disagrees with the view of one state that each renewal applicant should come forward with an analysis of the HLW storage and disposal environmental effects. This is a national problem of essentially the same degree of complexity and uncertainty for every renewal application

and it would not be useful to have a repetitive reconsideration of the matter.

61 FR 66538. Vermont agrees in concept with the Commission's statement. Vermont's concerns regarding disposal of spent fuel and the concomitant effect on land use in Vermont have not be adjudicated in any hearing. While this matter may not require adjudication in each application, the Commission must allow adjudication at least once to create fairness and public process. Since such adjudication has not been done heretofore, it should be granted in the instant proceeding.

Third Contention (Safety)

The Application must be denied because the Applicant has failed to fully identify plant systems, structures and components that are non-safety-related systems, structures, and components in the security area whose failure could prevent satisfactory accomplishment of any of the functions of safety-related systems, structures and components in accordance with 10 C.F.R. §54.4(a)(2), such that the Commission cannot find that 10 C.F.R. §54.29(a) is met.

Basis

As shown by the supporting evidence below, the Applicant does not identify, for screening, security systems, structures and components required by 10 C.F.R. Part 73. These systems, structures, and components provide physical security and protect against terrorist activities which, if they fail, could result in the prevention of safety systems, structures and components to perform their safety functions. Among the systems, structures and components required by 10 C.F.R. Part 73 are those which require aging management review. The lack of this screening and aging management review prevents the Commission from completing its review of the requested license renewal in

accordance with 10 C.F.R. §54.29(a).

Supporting Evidence

1. In the LRA, the Applicant does not identify security related systems, structures and components in its equipment screening in Chapter 2.
2. Plant systems, structures, and components within the scoping criteria of 10 C.F.R. §54.4 are not limited to systems, structures, and components required in accordance with 10 C.F.R. Part 50. Within the definition of current licensing basis in 10 C.F.R. §54.3, numerous Parts of 10 C.F.R. are identified, including 10 C.F.R. Part 73.
 3. 10 C.F.R. Part 73 requires the Applicant to provide systems, structures and components for physical protection of plant and materials. Specifically, systems, structures and components are required under Sections:
 - 73.40 Physical protection: General requirements at fixed sites.
 - 73.45 Performance capabilities for fixed site physical protection systems.
 - 73.46 Fixed site physical protection systems, subsystems, components, and procedures.
 - 73.51 Requirements for the physical protection of stored spent nuclear fuel and high-level radioactive waste.
 - 73.55 Requirements for physical protection of licensed activities in nuclear power reactors against radiological sabotage.
 4. At least some of the systems, structures and components required by 10 C.F.R. Part 73

meet the definition of 10 C.F.R. §54.4(a)(2)⁶. The failure of security systems, structures and components to fulfill their function of physical protection against terrorist activity can directly result in the prevention of safety systems to accomplish their functions⁷.

5. The Applicant must perform the 10 C.F.R. §54.4 screening for these systems and perform the required aging management review required by 10 C.F.R. §54.21.

6. Vermont realizes identification of Part 73 systems, structures and components will include safeguards information (see 10 C.F.R. §73.21).

CONCLUSION

The issues raised in the State's contentions are material to the findings the NRC must make to support the applicant's request. For all the reasons stated, the State of Vermont, acting through its Department of Public Service requests that its contentions be admitted and the State be granted party status.

⁶ Vermont has not identified specific systems, structures and components required by 10 C.F.R. Part 73 in order to avoid a Nuclear Safeguards Information designation. Vermont reserves its rights, under a rebuttal of lack of specificity on this contention, to file a list of systems, structures and components required by 10 C.F.R. Part 73 that require aging management review under 10 C.F.R. §54.21. Petitioner has access as identified by 10 C.F.R. §73.21(c)(iii).

⁷ It would be reasonable to expect that a terrorist, upon successful intrusion, would disable safety-related systems.

Respectfully submitted,

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STATE OF VERMONT
DEPARTMENT OF PUBLIC SERVICE

May 26, 2006

Office of the Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Attention: Rulemaking and Adjudications Staff

Re: Docket No. 50-271 - Application for License Renewal of Vermont Yankee
Nuclear Power Station

Dear Sir/Madam:

Please find enclosed for filing an original and two copies of the Vermont Department of Public Service Notice of Intention to Participate and Petition to Intervene with Exhibits, Declaration of William K. Sherman, Notice of Appearance from Sarah Hofmann and Anthony Z. Roisman, and Certificates of Service.

Service may be made on the Vermont Department of Public Service at the following:

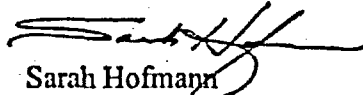
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May 25, 2006

If you have any questions about this filing, please call me at 802-828-3088.
Thank you for your assistance in making this filing.

Very truly yours,



Sarah Hofmann
Director for Public Advocacy
Vermont Department of Public Service

cc: Office of the General Counsel
Terrence A. Burke, Esq.
Jay E. Silberg, Esq.
Anthony Z. Roisman, Esq.

**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

In Re: Entergy Nuclear Vermont Yankee) LLC and Entergy Nuclear) Operations, Inc.)	Docket No. 50-271 (License Renewal)
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NOTICE OF APPEARANCE

Pursuant to 10 CFR §2.314(b) Sarah Hofmann and Anthony Z. Roisman file this Notice of Appearance on behalf of the Vermont Department of Public Service, which is the single designated representative for the State of Vermont for the above-entitled proceeding:

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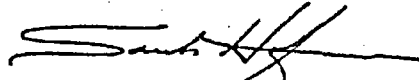
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Ms. Hofmann is an employee of the State of Vermont as the Director for Public Advocacy to the Department of Public Service. She is a an attorney at law in good standing admitted to practice in Vermont. Mr. Roisman is in private practice and is in

May 26, 2006

retained by the Department of Public Service to assist in this matter. He is a member in good standing admitted to practice in New York, the District of Columbia and Vermont.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Sarah Hofmann', written over the printed name.

Sarah Hofmann
Director for Public Advocacy
Department of Public Service
112 State Street - Drawer 20
Montpelier, VT 05620-2601

Anthony Z. Roisman
National Legal Scholars Law Firm
84 East Thetford Rd.
Lyme, NH 03768

Dated: May 26, 2006

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	
)	Docket No. 50-271
ENTERGY NUCLEAR VERMONT)	(License Extension)
YANKEE LLC AND ENTERGY NUCLEAR)	
OPERATIONS, INC.)	
(Vermont Yankee Nuclear Power Station))	

CERTIFICATE OF SERVICE

I hereby certify that copies of the Vermont Department of Public Service Notice of Intention to Participate and Petition to Intervene; Notice of Appearance; Declaration of William K. Sherman; and Cover Letter in the above captioned proceeding has been served on the following by electronic mail where indicated by an asterisk on this 26th day of May, 2006, and will be mailed by deposit in the United States Mail, first class, postage prepaid, on the 26th day of May, 2006.

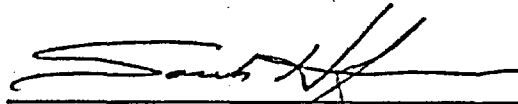
Office of the Secretary of the Commission*
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
Attention: Rulemaking and Adjudications
Staff
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Sarah Hofmann, Director for Public Advocacy

**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

**In Re: Entergy Nuclear Vermont Yankee)
 LLC and Entergy Nuclear)
 Operations, Inc.)**

**Docket No. 50-271
(License Renewal)**

DECLARATION OF WILLIAM K. SHERMAN

William K. Sherman states as follows under penalties of perjury.

Introduction

1. My name is William K. Sherman. I am employed by the Vermont Public Service Department. My title is Vermont State Nuclear Engineer. I have held this position since November of 1988. My duties include ongoing State regulatory oversight of the Vermont Yankee Nuclear Power Station ("Vermont Yankee"), as well as advising the Department and other state agencies on issues related to Vermont Yankee and nuclear power. My professional and educational experience is summarized in the resume attached to this Declaration.
2. I am providing this Declaration in support of the Vermont Department of Public Service Notice of Intention to Participate and Petition to Intervene ("VDPS Petition").
3. I am familiar with the license amendment application for a license extension of twenty years submitted by Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc.
4. I assisted in the preparation of the VDPS Petition.
5. The facts provided in my declaration are true and correct to the best of my knowledge and belief, and the opinions expressed herein are based on my best professional judgment.

6. The Exhibits attached to the VDPS Petition are true and correct copies of the documents represented.

Primary Containment Concrete

7. The Applicant improperly excludes the attribute of *reduction of strength and modulus of the primary containment structure due to elevated temperature*. The Applicant claims this attribute is not an aging effect requiring management. However, the primary containment normal operating temperature limit is above the limit for excluding this attribute from consideration. The lack of consideration means the Commission cannot make the finding of acceptability in accordance with 10 C.F.R. §54.29(a).
8. Since the normal environment maximum of 165°F is above the cut off limit of 150°F, and since the concrete surface behind the steel shell will closely match the drywell ambient temperature, the statement at 3.5-8 of the LRA is not accurate, and reduction of strength and modulus of concrete structures due to elevated temperature is an aging effect requiring management.
9. Using 3.5-18 of the LRA, the Applicant may hold that reduction of strength and modulus of concrete structures due to elevated temperature is not applicable because VYNPS is a Mark I steel containment. However, this also is not accurate. In the UFSAR, the Applicant takes credit for the strength and integrity of containment walls in a number of manners.
10. Since the Applicant takes credit for containment wall concrete integrity and since the normal operating temperature may exceed 150°F, the attribute, *reduction of strength and modulus of the primary containment structure due to elevated temperature*, requires an age management program.

Spent fuel storage

11. New and significant information exists regarding the time for which onsite land will be removed from other uses, and whether such land use is irretrievable, which was not provided in the ER by the Applicant in accordance with 10 C.F.R. §51.53(c)(3)(iv). The current estimate in the Generic Environment Impact Statement (GEIS) is on-site storage of spent fuel will not last beyond 30 years after the end of the license period (including an extended license period). GEIS, Sections 6.4.6.2, 3.
12. The GEIS evaluates the impacts associated with onsite land use as Category 1, SMALL. The basis for this assessment is the assumption that the land used for storage of nuclear wastes at the reactor site will not exceed 30 years after the end of the license term. GEIS, Section 3.2 (referring to GEIS Chapter 6). That assumption, in turn, relies upon the assumption that a permanent high level waste repository, and perhaps even a second repository, will be in place by that time to receive the reactor wastes. GEIS, Section 6.4.6.2 Based on those assumptions the use of the reactor site for storing spent fuel, in this case for a period ending in 2062, has been deemed to be a small impact. GEIS, Section 3.2.
13. These assumptions are flawed. Recent evidence, not evaluated previously in the GEIS, now discloses that: 1) the likelihood that a permanent high level waste repository will be in place by 2062 is slight due to unanticipated technical problems uncovered at the Yucca Mountain site coupled with changes in national policy; 2) the only currently contemplated high level waste repository can accommodate the quantity of spent nuclear fuel expected to be produced by Vermont Yankee through the end of its originally licensed life, but it would not have space for at least a part of the additional spent nuclear fuel generated by VY during extended licensing; 3) no present plans exist for building a second high level waste repository nor has any site been identified for consideration for such a facility; 4) the United States is now embarking upon a changed policy for waste disposal which will

make all the current schedules obsolete and for which there is no reliable time frame for its implementation; 5) there is not now nor has there been any reasonable prospect that the federal government or any third party will take title to the license-renewal spent fuel waste and remove it from the site; and 6) it follows that it is reasonable to expect that at least a part of spent fuel to be generated at VY during the period of an extended license will remain at the site for a much longer time than evaluated in the GEIS and perhaps indefinitely.

14. Since this new information, not available at the time of development of the GEIS, demonstrates that the commitment of onsite land for storage/disposal of spent nuclear fuel from license renewal will be substantially longer than assumed in the *GEIS*, and may be indefinite, this results in an irretrievable commitment of onsite land with a MODERATE or LARGE impact.
15. Vermont and its communities have firmly established values associated with land use such that the long-term or indefinite use of a portion of the VY site for spent nuclear fuel storage should clearly be evaluated as a MODERATE or LARGE impact in the VY supplement to the GEIS.
16. There is new and significant information which the Applicant should have identified and described in its Environmental Report. If this information had been provided and evaluated properly, it would have changed the GEIS conclusions regarding onsite land use impacts.
17. The Applicant should have reported that the nation's policy with regard to spent fuel management has changed. The current administration and Congress have announced a major shift in policy called the Global Nuclear Energy Partnership (GNEP). Refer in general to the Administration's GNEP website - <http://www.gnep.energy.gov/> - which contains the announcement and much information regarding this new policy direction.

Proponents of this new policy hope this new approach will not separate out plutonium products. The home page of the website referenced above contains the following statement:

Demonstrate More Proliferation-Resistant Recycling

Accelerate the development, demonstration and deployment of new technologies to recycle nuclear fuel that do not result in separated plutonium—a key proliferation risk of existing recycling technologies.

As shown by this statement, this policy is a shift to reprocessing of spent fuel that hopes to use a technique which has neither been developed nor demonstrated.

18. Further, this shift in policy will remove attention and resources from repository development such that the basis and conclusions that spent fuel will not have to be stored on site beyond 2062 are no longer valid.
19. In addition, the Applicant should have reported that the previous assumption regarding the suitability of Yucca Mountain as a permanent waste disposal site is no longer valid. At Yucca Mountain, contrary to the assumptions underlying the GEIS, it has been discovered that the disposal area is subject to water in-leakage. Therefore the design must be changed from that previously assumed and it is not clear a new design can be developed which will meet dose and integrity requirements. Partially in response to this discovery, DOE has abandoned previous cask designs and now proposes a concept called the TAD (transportation, aging and disposal) standard canister for which there is not presently even a preliminary design. Exhibit Vermont-2¹.
20. Further, the Applicant should have stated that these changes have occurred in an increasingly hostile political environment. Senate minority leader Harry Reid (D-NV)

¹ Exhibit Vermont-2 consists of slides from a recent presentation by Jay Jones of the Department of Energy's Office of Civilian Radioactive Waste Management that identify that DOE is, at this late date, changing its canister approach.

strongly opposes development of Yucca Mountain and is able to use his position as minority leader effectively to advance this opposition and would do so even more forcefully as majority leader if the Senate leadership changes parties. And, the Western Governor's Association (WGA) has the following active resolution (03-16):

On December 1, 1989, the Western Governors' Association adopted Resolution 89-024 which stated that spent nuclear fuel should remain at reactor sites until a state has agreed to storage and DOE provides reasonable transportation, safety, and emergency response assurances to the western states. The resolution was readopted in 1992, 1995, 1997, and 1999.

All of the new information identified above provides additional arguments and evidence to bolster the opposition of Senator Reid and the WGA and undercut the assumed completion date for a usable high level waste repository.

19. In addition, the Applicant should have reported that, because the GEIS was prepared before September 11, 2001, it does not factor in the impact of viable terrorist threats into an evaluation of the socioeconomic impacts of indefinitely storing spent fuel at the reactor site. The extended long-term or indefinite presence of spent nuclear fuel at Vermont Yankee after permanent shutdown means a defined terrorist target will be present for the long-term or indefinitely. In its news release No. 03-053 (April 29, 2003) (Exhibit Vermont-3), NRC stated:

The Commission believes that this DBT [Design Basis Threat] represents the largest reasonable threat against which a regulated private security force *should be expected to defend* under existing law.

(Emphasis added). The phrase, *should be expected to defend*, means there is a limit on the expectation on the Applicant, and the state resources will be expected to provide additional security responses beyond the Applicant's capability. The very presence of this target creates an effect on that land, contiguous lands, and the surrounding area, creating the need for continuous augmented emergency preparedness plans and security response from the State.

20. The statute sets the storage limit of Yucca Mountain to 70,000 metric tons of disposed quantity:

(d) Commission action. The Commission shall consider an application for a construction authorization for all or part of a repository in accordance with the laws applicable to such applications, except that the Commission shall issue a final decision approving or disapproving the issuance of a construction authorization not later than the expiration of 3 years after the date of the submission of such application, except that the Commission may extend such deadline by not more than 12 months if, not less than 30 days before such deadline, the Commission complies with the reporting requirements established in subsection (e)(2). *The Commission decision approving the first such application shall prohibit the emplacement in the first repository of a quantity of spent fuel containing in excess of 70,000 metric tons of heavy metal or a quantity of solidified high-level radioactive waste resulting from the reprocessing of such a quantity of spent fuel until such time as a second repository is in operation.*

Nuclear Waste Policy Act, as amended, Sec. 114 (d), emphasis added. Entergy has stated that all of the spent fuel projected to be generated by Vermont Yankee through the end of its current operating license (including increases of spent fuel from power uprate) will be within the 70,000 metric tons storage limits of the "first" repository. See Entergy's response to the DPS Discovery Request 1-11 in PSB Docket No. 7082 (Exhibit Vermont-4). Applicant should have identified that at least some part of the spent fuel from license renewal will exceed the 70,000 metric ton limit (when all spent fuel being generated nationally is considered) and must go into a second repository.

21. While many believe that the first repository can dispose of more than the statutory 70,000 MTHW, this presumption cannot be relied upon until and unless the law is changed.
22. Similarly, some may believe DOE will removed spent fuel from the Vermont Yankee site to an interim storage location, thus eliminating the MODERATE or LARGE onside land-use impact. Vermont strongly supports this outcome. Vermont will show at hearing that attempts in Congress to create such interim storage failed three times in the 1990's, and that this presumption cannot be relied upon until law is created to allow such interim

storage.

23. Since VY's initial operation, when perpetual tank storage was envisioned, the federal government's attempts to fulfill its obligation to develop spent fuel disposal have been abysmal. For the past nineteen years efforts have focused at Yucca Mountain, but due to the changes identified above, the Administration currently does not even have a schedule for the completion of the first repository. The Massachusetts Institute of Technology (MIT), in 2003, performed a study: *The Future of Nuclear Power: An Interdisciplinary MIT Study*. The Applicant should have identified that it sponsored the co-chair of the study, Dr. Ernest Moniz, Director of Energy Studies, Laboratory for Energy and the Environment, MIT Department of Physics, as a witness in PSB Docket No. 7082, regarding authorization for dry cask storage. In that docket, Dr. Moniz testified:

[T]he MIT Study argues that "interim" storage of spent fuel (which can be carried out either at reactor sites or in consolidated facilities, possibly under federal control) for fifty to seventy years is in any case a preferred approach for design of an integrated spent fuel management system.

Prefiled direct testimony of June 16, 2005 at 13. The implication of the Applicant's testimony through Dr. Moniz is that the first repository will not be available for "fifty to seventy years." If the schedule for the first repository is "fifty to seventy years," a time period greater than evaluated in the GEIS, then the schedule for a second repository is indefinite at best, if such a repository could ever be built.

24. Vermont assigns a high value to land and its use within the state. The values are codified in the form of environmental protections in permitting criteria in 10 V.S.A Chapter 151, State Land Use and Development Plans (see Exhibit Vermont-5).
25. Criteria No. 7 of 10 V.S.A §6086 (a) states:

[Before granting a permit, the district commission shall find that the subdivision or development:]

(7) Will not place an unreasonable burden on the ability of the local governments to provide municipal or governmental services.

The long-term or indefinite storage of license renewal spent fuel at VY would trigger long-term burdens on local governments for emergency management and security services. It is highly likely that long-term or indefinite storage of the spent fuel created by license renewal would not comply with Criteria No. 7. Therefore, this would suggest the impact of the proposed onsite land use should be determined to be LARGE in the VY supplement to the GEIS.

26. Criteria No. 8 of 10 V.S.A §6086 (a) states:

[Before granting a permit, the district commission shall find that the subdivision or development:]

(8) Will not have an undue adverse effect on the scenic or natural beauty of the area, aesthetics, historic sites or rare and irreplaceable natural areas.

Under this criteria, the the District Environmental Commission would evaluate the effect of spent nuclear fuel being left long-term or indefinitely on a riverbank site that would otherwise be fully returned to greenfield condition. It is highly likely the long-term or indefinite presence of spent nuclear fuels following decommissioning of VY would be deemed to create an undue adverse effect. Considering this criteria, the proposed onsite land use should be evaluated as MODERATE or LARGE in the VY supplement to the GEIS.

27. In addition, Vermont's land use law requires a finding that land uses are in conformance with local or regional plans:

(10) Is in conformance with any duly adopted local or regional plan or capital program under chapter 117 of Title 24. In making this finding, if the district commission finds applicable provisions of the town plan to be ambiguous, the district commission, for interpretive purposes, shall consider bylaws, but only to the extent that they implement and are consistent with those provisions, and need not consider any other evidence.

10 V.S.A. §6086 (a)(10).

28. The Windham Regional Plan of October 30, 2001, which is applicable to VY, establishes land use requirements, and has the following provision:

LAND USE POLICIES

Rural Residential Lands

1. Ensure that any development of rural residential lands will be at densities that will serve to contain rural sprawl, and that are compatible with existing land uses and sensitive to the limitations of the land.

Once the bulk of the site is returned to a greenfield condition, it is doubtful that long-term or indefinite presence of spent nuclear fuel from license renewal would be considered “compatible with existing land uses”. This provision suggests the onsite land use impact should at least be evaluated as MODERATE in the VY supplement to the GEIS.

29. The Windham Regional Plan also has the following provision:

COMMUNITY RESOURCE POLICIES

High Level Radioactive Waste

1. Encourage a requirement that permanent spent nuclear fuel (SNF) storage be resolved prior to any consideration of extending or reviewing the operating license of Vermont Yankee.

It is highly likely that a land use evaluation under 10 V.S.A. §6086 (a)(10) would find the proposal for long-term or indefinite storage of spent nuclear fuel from license renewal did not conform with the regional plan with regard to the item above. Thus, this provision suggests a LARGE impact from the onsite land use from the proposed license renewal.

30. There is also a Vernon Town Plan, Nov. 3, 2003, which is applicable to VY. This plan contains the following:

Section III: Resource and Economic Development

Recommendations:

#3 The Town should pursue discussions with appropriate representatives of the Vermont Yankee Nuclear power Company regarding the possible re-use of the power plant site for other commercial and industrial development following decommissioning.

The long-term or indefinite presence of spent nuclear fuel from license renewal has the potential for preventing “other commercial and industrial development following decommissioning.” If the spent fuel storage completely prevented the use of the site for other developments, it is highly likely the impact from license-renewal onsite land use would be LARGE. If the spent fuel storage allowed some additional development but hindered other possible commercial and industrial uses, the impact would likely be MODERATE.

31. The extended long-term presence of spent fuel will prevent use of the immediate land it occupies and will deter other possible uses of larger contiguous areas because of societal and commercial concerns regarding the proximity of radioactive material. From the foregoing, it is seen that Vermont has existing land use evaluation criteria, which establish the basis under which the impact from additional long-term or indefinite onsite land use resulting from the spent nuclear fuel generated from license renewal should be evaluated as MODERATE or LARGE in the VY supplement to the GEIS.
32. Even at the time of development of the GEIS Vermont urged the NRC to give greater credence to the real possibility that spent fuel generated by license extension would have to be stored at the reactor site more than 30 years after power generation had ceased. As noted above, that possibility has now risen to a probability. The failure of the NRC, during the GEIS development process, to even address the possibility that spent fuel would have to remain at the reactor site indefinitely, underscores the need to address those issues at this time in light of the new and significant evidence cited above. The history of Vermont’s participation in the GEIS process demonstrates this point.
33. Vermont provided the *Vermont GEIS Comments* at the generic review stage both to convince the NRC to see that its optimistic view of the future was unwarranted and in order to preserve its rights of challenge at the site specific stage of license renewal.
34. As explained below, the NRC does not directly address, and therefore does not directly

reject, Vermont's comments regarding land use associated with the spent fuel generated in license renewal either in its notes of consideration for the final rule for Environmental Review for Renewal of Nuclear Power Plant Operating Licenses (June 5, 1996, 61 FR 28467) or in its final GEIS, Section 3.2 (On-Site Land Use and Section 6.4.6 (Spent Fuel).

35. At 61 FR 28479, it is stated:

Table S-3 does not take into account long-term onsite storage of . . . spent fuel assemblies for longer than 10 years . . . The environmental impacts of these aspects of onsite storage are also addressed in Chapter 6 of the final GEIS.

Therefore, Table S-3 does not consider Vermont's concern regarding onsite land use for spent fuel management for extended periods.

36. At 61 FR 28479, it is stated:

The only nonradiological effluent from waste storage is additional heat from the plant that was found to have a negligible effect on the environment.

While the only nonradiological effluent may be additional heat, this is not the only nonradiological effect resulting from the potential indefinite on-site land use from spent fuel management. This comment does not address Vermont's concerns.

37. At 61 FR 28479-28480, it is stated:

The environmental impacts of allowing onsite dry cask storage under a general license were assessed in an EA . . . Potential impacts that were assessed include . . . land use.

This statement is inadequate to address Vermont's concerns. While land use in general might have been considered in generic dry cask approvals, these generic approvals did not consider the impacts from potential indefinite land use associated with the spent fuel management problems caused by license renewal.

38. The GEIS further provides:

The GEIS addresses extended onsite storage of spent fuel during a renewal period of up to 20 years. (61 FR 28479)

* * *

Trends in onsite spent fuel storage capacity and the volume of spent fuel that will be generated during an additional 20 years of operation are considered in the GEIS. (61 FR 28480).

However, as the following statements in the GEIS demonstrate Vermont's comments regarding on-site land use were not addressed.

39. GEIS Section 3.2, On-Site Land Use states:

Changes in on-site land use at a nuclear plant could result if additional new spent fuel . . . facilities were required (Waste generation, handling, and disposal are discussed in Chapter 6). . . The U.S. Nuclear Regulatory Commission (NRC) has written a number of environmental assessments for on-site dry cask storage facilities and has reached a "finding of no significant impact" (FOSNI) for each. The FOSNI was reached considering the amount of land actually disturbed, the range of possible environmental impacts, and alternatives uses of the land. On-site land use impacts are expected to be of small significance.

From the first part of the above assessment, the NRC recognizes that license renewal may create changes in on-site land use for spent fuel management. Further comment in that regard is deferred to Chapter 6. Regarding the manner in which land use is described in the environmental assessments for dry cask storage, the GEIS gives the following example:

Using the Calvert Cliffs Nuclear Power Plant Site ISFSI EA as typical, the following impacts are evaluated. Land use is about six acres, which is within the owner-controlled area of 2300 acres. . . . The Commission believes that the impacts discussed above reasonably describe the impacts from existing dry cask storage facilities, as well as the likely impacts from those dry cask storage facilities that are expected to be constructed as a result of license renewal.

No part of this evaluation addresses Vermont's comments regarding onsite land use and

the possible indefinite commitment of this land in Vermont.

40. The GEIS makes a statement about emergency preparedness:

From the standpoint of emergency preparedness, the impacts of dry cask storage installations should be minor for three reasons. First, because of the reduced radioactive inventory in the fuel stored in dry cask facilities, accidents involving such storage facilities are likely to develop more slowly than those involving the nearby operating reactors. Second, accident impacts should be low, again because of the reduced inventories of radioactive materials in the stored fuel but also because of the correspondingly reduced level of decay heat compared with fuel still in-reactor. Thus, emergency plans formulated for operating reactors should encompass accidents at dry cask storage facilities. Third, it is NRC policy that plants with dry cask storage facilities incorporate the potential sources of hazard from these storage facilities in their emergency plans, as well as the potential hazard from all radiological source terms at the plant site.

GEIS Section 6.4.6.1. This statement does not address Vermont's concerns regarding the indefinite nature of the commitment of land for spent fuel management, nor the threat from terrorist activities which was greatly increased after September 11, 2001.

41. The evaluation in GEIS Section 6.4.6 uses 2010 as the date a geologic repository will be available. The GEIS recognizes the need for a second repository:

Possible extensions or renewals of operating licenses also need to be considered in assessing the need for and scheduling the second repository. It now appears that unless Congress lifts the capacity limit on the first repository – and unless this repository has the physical capacity to dispose of all spent fuel generated under both the original and extended or renewed licenses – it will be necessary to have at least one additional repository. Assuming that the first repository is available by 2025 and has the capacity on the order of 70,000 MTHM, additional disposal capacity would probably not be needed before about the year 2040 to avoid storing spent fuel at a reactor for more than 30 years after expiration of reactor operating licenses.

GEIS Section 6.4.6.2.

42. Above we have shown that Vermont's comments about land use were not adequately

addressed in the comment phase for the GEIS. On July 5, 1996, DPS commented:

The effect of . . . spent nuclear fuel generated from license renewal is ruled a resolved issue which cannot be raised in site-specific applications. This is lamentable . . . Congress has not appointed requested amounts for the federal spent nuclear fuel program. We have seen no progress in the spent nuclear fuel program which gives us confidence that a repository will become a reality. . . [R]adioactive waste disposal issues should not be sealed so they cannot be revisited by states in site-specific applications.

43. The Commission responded in part:

Also from a regulatory policy perspective, the Commission disagrees with the view of one state that each renewal applicant should come forward with an analysis of the HLW storage and disposal environmental effects. This is a national problem of essentially the same degree of complexity and uncertainty for every renewal application and it would not be useful to have a repetitive reconsideration of the matter.

61 FR 66538.

Security

44. The Applicant does not identify, for screening, security systems, structures and components required by 10 C.F.R. Part 73. These systems, structures, and components provide physical security and protect against terrorist activities which, if they fail, could result in the prevention of safety systems, structures and components to perform their safety functions. Among the systems, structures and components required by 10 C.F.R. Part 73 are those which require aging management review. The lack of this screening and aging management review prevents the Commission from completing its review of the requested license renewal in accordance with 10 C.F.R. §54.29(a).
45. In the LRA, the Applicant does not identify security related systems, structures and components in its equipment screening in Chapter 2.
46. Plant systems, structures, and components within the scoping criteria of 10 C.F.R. §54.4 are not limited to systems, structures, and components required in accordance with 10 C.F.R. Part 50. Within the definition of current licensing basis in 10 C.F.R. §54.3,

numerous Parts of 10 C.F.R. are identified, including 10 C.F.R. Part 73.

47. 10 C.F.R. Part 73 requires the Applicant to provide systems, structures and components for physical protection of plant and materials. Specifically, systems, structures and components are required under Sections:
73.40 Physical protection: General requirements at fixed sites.
73.45 Performance capabilities for fixed site physical protection systems.
73.46 Fixed site physical protection systems, subsystems, components, and procedures.
73.51 Requirements for the physical protection of stored spent nuclear fuel and high-level radioactive waste.
73.55 Requirements for physical protection of licensed activities in nuclear power reactors against radiological sabotage.
48. At least some of the systems, structures and components required by 10 C.F.R. Part 73 meet the definition of 10 C.F.R. §54.4(a)(2). The failure of security systems, structures and components to fulfill their function of physical protection against terrorist activity can directly result in the prevention of safety systems to accomplish their functions.
49. The Applicant must perform the 10 C.F.R. §54.4 screening for these systems and perform the required aging management review required by 10 C.F.R. §54.21.
50. Vermont realizes identification of Part 73 systems, structures and components will include safeguards information (see 10 C.F.R. §73.21).

I declare under penalty of perjury that the foregoing is true and correct.

Executed on May 26, 2006.

William K. Sherman
State Nuclear Engineer

William K. Sherman

Mr. Sherman has a broad range of policy, public relations, economic and technical experience in the nuclear area over a thirty five-year career.

Professional Employment

1988 - Present	Vermont Department of Public Service State Nuclear Engineer
1973 -1985	Stone & Webster Engineering Corporation Senior Power Engineer
1971 - 1973	EDS Nuclear, Inc. Senior Engineer
1967 - 1971	U.S. Naval Nuclear Power Program Lieutenant

Experience

Vermont Department of Public Service

Cognizance of the daily status of operation of the Vermont Yankee Nuclear Plant.

Periodic inspections at the Vermont Yankee Nuclear Plant.

Liaison with the federal regulator of the Vermont Yankee Nuclear Plant.

Responsibility for monitoring and evaluating physical plant conditions during nuclear emergencies.

Maintains cognizance of issues and activities related to nuclear power in support of the Commissioner's position as NRC State Liaison Officer.

Expert witness testimony for the Department for issues associated with Vermont Yankee and nuclear power.

Serves as Vermont's Member on the Texas Low-level Radioactive Waste Disposal Compact Commission.

Serves as a member of the Nuclear Waste Strategy Coalition, a coalition of state public utility commission, attorney general and nuclear utility representatives, acting to effect a solution for the disposal of nuclear high-level radioactive waste.

Serves as a member and past-chairman of the Northeast High-Level Radioactive Waste Transportation Task Force.

Testifies before legislative committees on nuclear power issues.

Serves as principal staff for the Vermont State Nuclear Advisory Panel (VSNAP).

Experience - (continued)

Stone & Webster Engineering Corporation

Environmental Qualification Manager for a nuclear power plant under construction (May 1985 - Jan 1986). Supervised compliance with the requirements for environmental qualification of Class 1E electrical equipment.

Lead Power Engineer (Mar 1982 - May 1985) for a nuclear power plant under construction. Responsible for the overall technical and administrative direction of the power-related engineering and design activities associated with the 1200 MW pressurized water reactor in the construction phase. Direction of ongoing efforts such as preparation of System Descriptions and the Final Safety Analysis Report.

Principal Nuclear Engineer (Feb 1981 - Apr 1982) for a nuclear power plant under construction. Responsible for nuclear-related engineering and design activities during the construction phase. Supervised the activities of Engineers responsible for the NSSS contract, nuclear systems, nuclear-related buildings, and major specifications.

Power Engineer, assigned to the Nuclear Engineering Group (Feb 1980 - Feb 1981) for a nuclear power plant under construction. Coordinated all activities for the fuel building and fuel handling systems, and for the auxiliary building and component cooling water system. Responsible for safety-related specifications for pumps, heat exchangers, and cranes.

Lead Licensing Engineer (Mar 1973 - Jan 1980). Responsible for project activities toward obtaining construction permits for three nuclear projects. Supervised the preparation of the Safety Analysis Reports and Environmental Reports. Responsible for evaluation of plant design to ensure compliance with NRC licensing requirements. Responsible for liaison with federal and state regulatory agencies.

EDS Nuclear, Inc.

Licensing and engineering consulting work for a number of nuclear utilities.

U.S. Naval Nuclear Power Program

Instructor at U.S. Naval Nuclear Power School in the areas of Reactor Physics, Heat Transfer, and Physics.

Education

1963 - 1967

The University of Michigan
Bachelor of Science (Mechanical Engineering)

Licenses

Registered Professional Engineer - California, Massachusetts, Connecticut