

STATE OF VERMONT  
PUBLIC SERVICE BOARD

Docket No. 7082

Petition of Entergy Nuclear Vermont Yankee, LLC and )	Hearings at
Entergy Nuclear Operations, Inc. for a certificate of )	Montpelier, Vermont
public good to construct a dry fuel storage facility at the )	January 30-31,
Vermont Yankee Nuclear Power Station, in Vernon, )	February 1-2, and
Vermont )	February 6-10, 2006

Order entered: 4/26/2006

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## I. INTRODUCTION

Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc. (collectively "Entergy VY") have asked the Vermont Public Service Board ("Board") to issue a Certificate of Public Good ("CPG") authorizing Entergy VY to construct a dry fuel storage facility at the Vermont Yankee Nuclear Power Station ("Vermont Yankee") in Vernon, Vermont. The proposed dry fuel storage facility (the "Project") — also referred to as the Interim Spent Fuel Storage Facility ("ISFSI") — would be used to store spent nuclear fuel generated at Vermont Yankee. This storage facility would supplement the existing spent fuel pool in which Entergy VY now keeps the used fuel rods. The Vermont Department of Public Service ("Department") generally supports Entergy VY's proposal.<sup>1</sup>

In today's Order, we find that construction of the dry fuel storage facility will promote the general good of the state. Accordingly, we grant Entergy VY's petition and authorize Entergy VY to construct the dry fuel storage facility at the Vermont Yankee site, subject to a number of conditions set out in this Order.

Entergy VY has shown that construction of the facility can occur without undue harm to the natural environment, without discernable increased safety risk, and without affecting the reliability of Vermont Yankee. As the Department points out, the nuclear industry has had over twenty years of satisfactory experience with dry cask storage;<sup>2</sup> nothing in the evidence that we considered suggested that the outcome at Vermont Yankee would be any different. The evidence also indicates that, at the present time, Entergy VY has made reasonable choices in selecting the location of the facility and opting to screen the facility with a visual barrier. Entergy VY has also made commitments that, in large part, meet the additional requirements established by the legislature for approval of a nuclear waste storage facility.<sup>3</sup>

The most significant factor in our decision is the economic benefit of the facility. Vermont Yankee now provides approximately one-third of the power consumed by the state of Vermont. Vermont's two largest utilities, by contract, will continue to receive this power through

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1. Prior to the initiation of this proceeding, the Department and Entergy VY entered into a Memorandum of Understanding ("MOU") in which they agreed to a number of conditions that would apply to the Project.

2. Sherman pf. at 5.

3. See 10 V.S.A. § 6522(b).

the end of the current federal operating license and deadline in Entergy VY's existing CPG that we issued under Section 231 of Title 30 — March 21, 2012. However, as a result of the federal government's failure to remove the spent nuclear fuel in a timely manner, without construction of a dry fuel storage facility, Vermont Yankee will run out of capacity to store spent nuclear fuel in the spent fuel pool several years before the end of its current authorization.<sup>4</sup> This early shutdown could impose substantial costs on Vermont ratepayers. Without the favorably-priced power from Vermont Yankee, Vermont utilities would need to purchase replacement power from sources that are presently expected to be more expensive over this period. Approval of the dry fuel storage facility provides a direct economic benefit to the state by preserving the power.

In reaching this decision, we have considered the concerns raised by Citizens Awareness Network ("CAN"), the New England Coalition ("NEC"), the Windham Regional Commission ("WRC"), and the Agency of Natural Resources ("ANR"). None of these parties oppose storage of spent nuclear fuel in dry casks; NEC even asks that we direct Entergy VY to use more casks by shifting most of the spent fuel in the pool into dry casks. Instead, both NEC and CAN question the location of the dry fuel facility, contend that there is inadequate screening and protection for the facility, and fault Entergy VY for failure to pursue an option that would have stored the dry casks underground or in a reinforced facility. We find these arguments unpersuasive. Entergy VY has demonstrated that the location and design of the facility are reasonable, particularly considering the present unavailability of underground storage options.

We cannot, however, affirmatively determine that Entergy VY has met all of the statutory criteria (particularly those adopted under 10 V.S.A § 6522(b)) unless we adopt the following conditions:

- Entergy VY must submit additional financial assurances to demonstrate that it can manage the spent nuclear fuel through decommissioning. These assurances shall be in the form of third-party arrangements (or an alternative that we subsequently find satisfactory).
- Entergy VY must amend its Spent Fuel Management Plan to address the plans for removal of the spent nuclear fuel and for management of the spent fuel on the assumption that the United States Department of Energy ("DOE") does not remove

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4. Entergy VY anticipates that it would need to shutdown Vermont Yankee no later than the Fall, 2008, refueling outage.

the fuel as presently scheduled. In addition, the amended Plan should reflect Entergy VY's prior commitment that the decommissioning will not only comply with federal requirements, but will also restore the site to greenfield conditions.

- Entergy VY must submit a study addressing the stability of the bank adjacent to the proposed storage pad based upon the assumption that the Connecticut River experiences the probable maximum flood and an avulsion occurs at Vernon Neck.<sup>5</sup>

Our approval also contains two significant conditions mandated by the legislature. First, we limit the cumulative total amount of spent nuclear fuel stored at Vermont Yankee to the amount derived from the operation of the facility up to, but not beyond, the end of the current operating license, March 21, 2012. Second, Entergy VY is authorized to store only spent nuclear fuel that is derived from the operation of Vermont Yankee. Entergy VY may not store spent nuclear fuel derived from any other source.<sup>6</sup>

## **II. PROCEDURAL HISTORY**

June 22, 2005 – Entergy VY filed its petition for a CPG pursuant to 30 V.S.A. § 248, asking the Board to approve construction of a dry fuel storage facility at Vermont Yankee.<sup>7</sup>

August 8, 2005 – NEC filed a motion requesting that Chairman Volz recuse himself from involvement in the proceedings in this Docket.

August 10, 2005 – At a prehearing conference, the parties agreed to a schedule for the Docket, which the Board adopted in its Prehearing Conference Memorandum dated August 18, 2005. In addition to the statutory parties – the Department and ANR – four other parties sought to

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5. Entergy VY has agreed to this condition.

6. 10 V.S.A. § 6522(c).

7. Prior to filing its Petition, on February 1, 2005, in accordance with 30 V.S.A. § 248(f), Entergy VY provided notice of the Project to WRC and the Vernon Planning Commission ("VPC"). Entergy VY reviewed the Project plans with the WRC Project Review Committee on February 1, 2005, and the VPC on February 10, 2005. The WRC conducted a hearing on the proposed project on March 3, 2005.

intervene in this docket: NEC, CAN, WRC and Associated Industries of Vermont ("AIV").<sup>8</sup> No party opposed permissive intervention of these parties. The Board granted the permissive intervention of NEC at the prehearing conference on August 10, 2005, and the permissive intervention of CAN, WRC and AIV in its Order re: Motions to Intervene on September 14, 2005.

September 15, 2005 – Chairman Volz issued a memorandum stating that he was recusing himself from this case, although not required to do so by Vermont law, to avoid creating a public perception that could detract from a meaningful debate on the merits of Entergy VY's proposal.

September 20, 2005 – The Board held a site visit and public hearing at Brattleboro High School (notices were published in the Brattleboro Reformer on September 3 and September 10, 2005).

November 2, 2005 (supplemented on November 3, 2005 and filed in written form on November 7) – NEC asked for a four-week extension of time to prefile its direct testimony. Entergy VY responded to NEC's motion with a proposal for a two-week extension, to which the Department, ANR, WRC and AIV stipulated.

November 4, 2005 – The Board issued an Order re: Motion to Modify Schedule, adopting Entergy VY's proposal for a two-week delay in prefiling the Department and intervenor direct testimony and discovery thereon.

November 16, 2005 – The Department and intervenors prefiled direct testimony.

December 12, 2005 – Entergy VY prefiled rebuttal testimony.

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8. NEC and CAN requested intervention as a matter of right pursuant to Public Service Board Rule 2.209(A). Neither NEC nor CAN demonstrated that a statute conferred the right of intervention upon them, or that their interests would not be protected by NEC's and CAN's permissive intervention. The Board denied intervention as of right, but granted permissive intervention to NEC and CAN in this Docket.

January 13, 2006 – NEC requested a two-day extension to file surrebuttal testimony, which the Board granted.

January 17, 2006 – The Department and intervenors prefiled surrebuttal testimony.

The weeks of January 30 and February 6, 2006 – The Board held technical hearings.

February 21, 2006 – CAN requested a delay for the due dates of briefs and replies, which the Board allowed.

March 8 – The parties filed briefs, having stipulated to a two-day extension for such filing that was requested by CAN.

March 8, 2006 – CAN filed a Motion to Strike and Sanction. In its Motion, CAN asked that the Board strike a letter filed by Entergy VY on March 3, 2006. In that letter, Entergy VY described a flood study that it had agreed to perform as a compliance filing in this proceeding. Entergy VY further stated that ANR had agreed on the parameters of the study and that these two parties would seek inclusion of a condition requiring such a study as a part of our Order in this proceeding. CAN objected that the study constitutes evidence submitted after the close of the evidentiary record. In addition, CAN asked that we sanction Entergy VY and ANR for seeking to introduce untested evidence after the close of the record.

March 22, 2006 – The parties filed reply briefs, having again stipulated to a two-day extension that was requested by NEC.

March 29, 2006 – the Board denied CAN's Motion because neither Entergy VY's March 3, 2006, letter nor the study to which it referred had been offered into evidence. As a result, the Board ruled that there was nothing to strike. Because no party had asked that we consider the study as evidence, we also did not consider it in rendering our decision in this proceeding.

### **III. POSITIONS OF THE PARTIES**

#### **Entergy Nuclear Vermont Yankee and Entergy Nuclear Operations**

Entergy VY is the petitioner in this proceeding and proposes to construct a dry fuel storage facility at Vermont Yankee. It argues that construction of this facility will enable Vermont Yankee to continue operations from late 2008 until the expiration of Vermont Yankee's current license on March 21, 2012, reducing rates paid by Vermonters for electricity over that period from Vermont Yankee by at least \$61 million. It also argues that continued operation of Vermont Yankee will add millions of dollars to the economy from (1) revenue-sharing for sales resulting from Vermont Yankee's uprate; (2) payments made to the Vermont Clean Energy Development Fund; (3) income, property and other taxes; (4) salary and benefits paid to employees and independent contractors; and (5) other benefits associated with the purchase of goods and services by Entergy VY.

Entergy VY argues further that continued operation of Vermont Yankee provides Vermont with an affordable (below-market), reliable and environmentally-sound source of power. It contends that constructing a dry fuel storage facility within Vermont Yankee's existing Protected Area<sup>9</sup> using Holtec International's HI-STORM 100S system is the only option that is federally-licensed, meets security requirements, and can be built in time to ensure that Vermont Yankee can operate after its refueling outage in the Fall of 2008. Entergy VY asserts that the storage facility meets each of the criteria established by 30 V.S.A. § 248(b) and the four, additional criteria established for a storage facility by legislation amending Chapter 157 of Title 10.

#### **Vermont Department of Public Service**

The Department argued that Entergy VY has met all of the conditions for issuance of a CPG, except for the requirement of Chapter 157 that adequate financial assurance be provided for a period of time reasonably expected to complete decommissioning, and for so long as spent-nuclear fuel is stored in the state. The Department, consequently, has asked that the Board

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9. The Protected Area refers to the portion of the Vermont Yankee site in which Entergy VY has deployed additional security measures as required by the NRC.

condition its approval of this project on Entergy VY's demonstration of financial adequacy through an instrument such as a bond or letter of credit. The Department also sponsored two witnesses from the Vermont Department of Health ("DOH") who addressed the State of Vermont's site-boundary-dose requirement of 20 millirems, including the work that is being done cooperatively by Entergy VY and the DOH to determine how best to measure and apply that standard.

#### Vermont Agency of Natural Resources

ANR took the position that Entergy VY has complied with state law and regulations governing wetlands, erosion control, rare, threatened and endangered plants and animals, significant natural communities, and stormwater discharge.

ANR argued that Entergy VY has not adequately analyzed the potential for a breach of Vernon Dam during a probable maximum flood. ANR maintained that Vernon Neck, to which the Vernon Dam's abutments are connected, might experience a breach that could result in a catastrophic relocation of the Connecticut River's channel near the proposed storage facility. Such a relocation, it contended, could cause scouring that could, in turn, undermine the stability of the bank adjacent to the facility's storage pad.

ANR also ultimately took the position that there is no potential for soil liquefaction at the site of the Storage facility pad.

#### New England Coalition

NEC challenged much of the evidence sponsored by Entergy VY, the DPS, the Department of Health and ANR. NEC also was critical of Entergy VY's plan for spent fuel storage. In view of the uncertainty about Yucca Mountain and the likely lack of any other alternatives for off-site storage, NEC contended that Entergy VY's spent-fuel-management approach should assume that spent fuel will be stored on-site for a long period of time.

According to NEC, Entergy VY's proposal is flawed because it contains only one option: a pad that is not sufficiently large to store all of the spent fuel generated by Vermont Yankee through expiration of its license (and possible renewal). On that basis, according to NEC,

Entergy VY will need to continue to use the existing spent-fuel pool in the reactor building in combination with the storage facility pad for storage of spent fuel. In fact, even if the Board authorizes dry fuel storage, Entergy VY is likely to continue to keep a similar number of spent fuel rods in the pool. NEC maintains that such continued heavy reliance on the spent fuel pool is not reasonable.

Instead of the proposal, NEC contends that Entergy VY should construct a "hardened" or fortified storage facility large enough to store all fuel, including fuel from any renewal of Vermont Yankee's license, move as much fuel into dry storage facility as possible, and then reconfigure Vermont Yankee's spent-fuel pool with low-density racks. To the extent that re-engineering Entergy VY's spent fuel approach would have the effect of preventing Vermont Yankee's continued operation after 2008, NEC states that the Board should permit Entergy VY to load several casks and store them on an interim basis in the Containment Access Building ("CAB") or another temporary location while Entergy VY implements NEC's recommendations.

#### Citizens Awareness Network

CAN also challenged much of the evidence sponsored by Entergy VY, the DPS, the DOH, and ANR. Specifically, CAN took the position that Entergy VY should construct a berm on at least two sides of the storage facility pad to ensure compliance with federal standards. CAN expressed concern about the performance of Vermont Yankee's crane during fuel-handling operations for the storage facility, potentially resulting in severe damage to the spent-fuel pool's walls or to the fuel itself if a cask is dropped. CAN argued that it is important for Entergy VY to maintain, on-site, all equipment necessary to move casks to, from, and around the storage facility.

CAN also argued that Entergy VY could trade its early position in DOE's schedule for off-site transfer of spent fuel to other nuclear plants, which could result in longer-term storage of spent nuclear fuel at Vermont Yankee. CAN asks us to bar such exchanges without Board approval.

Windham Regional Commission

WRC indicates that the proposed project is consistent with the Windham Regional Commission's Regional Plan. Like CAN, WRC also expressed concern with the possibility that Entergy VY could trade its early position in the DOE's queue for off-site transfer of spent fuel to other nuclear plants. WRC supports the imposition of a condition on Entergy VY that would require Entergy VY, before altering its position in the queue, to demonstrate that such selling, trading or otherwise revising its place is in the interest of the State of Vermont. WRC also supports the imposition of a condition that would require Entergy VY to maintain on-site – in operable condition, and at all times – all equipment necessary to load, handle and transport the multi-purpose containers in which the spent fuel will be stored. WRC also wants a condition requiring Entergy VY to operate at all times below the current state-required radiation dose limit at the boundary, and a condition that would require Entergy VY to provide a quarterly report that summarizes fence-line radiation measurements. Finally, WRC supports a condition that would require Entergy VY to optimize transfer of spent fuel from the spent fuel pool to dry storage.

Associated Industries of Vermont

Although granted intervenor status, by Order of 9/14/05, AIV did not participate actively in this investigation.

**IV. PUBLIC COMMENTS**

In addition to hearing from the formal parties, the Board conducted a public hearing in Brattleboro, Vermont, on September 20, 2005, and received almost five hundred written or e-mailed comments from the public. Many of the written comments, while signed by different individuals, were duplicates of the same letters.

Under Vermont law, we must base our decision on evidence presented by parties in the formal hearings. However, public comments play an important role. By raising new issues or offering different perspectives, the many thoughtful comments helped us to frame questions during the hearings and helped inform our evaluation of the factual evidence presented by the parties.

The vast majority of the public comments filed in this Docket highlighted public concerns about the power uprate that we previously approved, and the desire for an independent safety assessment, general nuclear safety concerns, and Vermont Yankee as a terrorist target. A minority of the public comments filed in this Docket addressed dry fuel storage directly. Those that did were almost entirely opposed to dry fuel storage, essentially for the reasons given at the public hearing, which are outlined below (and addressed in Section VII of this Order).

Of the more than one hundred people who attended the public hearing, most who spoke opposed the proposed dry fuel storage facility, while several spoke in favor of it. The positions of those opposed to dry fuel storage fell into the following categories:

The economic benefits will not outweigh the risks or costs associated with storage of the fuel for a long time.

Dry fuel storage is too dangerous in terms of vulnerability to natural or manmade disasters or the ravages of time.

Dry fuel storage should be tied to license expiration, immediate shut down of the facility, or quick removal of the fuel.

Dry fuel storage technology has not been adequately proven, and the proposed dry fuel storage casks are inadequate for long-term storage.

The Board should add conditions to any approval including hardening of the site, constructing a berm or further environmental protections.

The Board has read and considered the comments submitted by the public, all of which are in a public file and available for review by anyone upon request.

## **V. LEGAL FRAMEWORK**

In its petition, Entergy VY seeks a CPG under 30 V.S.A. § 248 for the construction of a dry fuel storage facility to store spent nuclear fuel at Vermont Yankee. Two provisions of State law require Entergy VY to obtain such a CPG. First, Section 248 of Title 30 prohibits site preparation for or construction of an electric generating station within the state unless the Board issues a certificate authorizing the construction.<sup>10</sup> As this Board has consistently found, this prohibition on site preparation or construction applies not only to the initial construction, but also

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10. 30 V.S.A. § 248(a)(2).

to modifications of an existing generating facility except for the replacement of facilities in the normal course of business.<sup>11</sup> Second, 10 V.S.A. § 6522(a) prohibits "construction or establishment of any new storage facility for spent nuclear fuel" unless the owner of Vermont Yankee first obtains a CPG under § 248.

In deciding whether to issue a CPG, we must first find that the construction of the facility will promote the general good of the state,<sup>12</sup> and that the construction of the facility meets ten substantive criteria from Section 248(b):

- (1) the facility will not unduly interfere with the orderly development of the region with due consideration having been given to the recommendations of the municipal and regional planning commissions, the recommendations of the municipal legislative bodies, and the land conservation measures contained in the plan of any affected municipality;
- (2) the facility is required to meet the need for present and future demand for service that could not otherwise be provided in a more cost effective manner through energy conservation programs and measures and energy-efficiency and load management measures;
- (3) the facility will not adversely affect system stability and reliability;
- (4) the facility will result in an economic benefit to the state and its residents;
- (5) the facility will not have an undue adverse effect on aesthetics, historic sites, air and water purity, the natural environment and the public health and safety, with due consideration having been given to the criteria specified in 10 V.S.A. § 1424a(d) and § 6086 (a)(1) through (8) and (9)(K);
- (6) the facility is consistent with the principles for resource selection expressed in the company's approved least cost integrated plan;
- (7) the facility is in compliance with the electric energy plan approved by the department under section 202 of Title 30, or that there is good cause to permit the proposed action;
- (8) the facility does not affect or is not located on any segment of state waters that have been designated as outstanding resource waters, or if so located and an electric transmission facility, the facility does not have an undue adverse effect on those outstanding resource waters;

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11. *See e.g.*, Docket 6812, Order re: Motion to Dismiss of 8/20/03 at 9.

12. This Board has previously held that our determination is not limited to the ten listed criteria, but that we must also consider other factors that may affect the decision as to whether a project promotes the general good. Docket 5330, Order of 10/12/90 at 160–161.

- (9) if the facility is a waste to energy facility, it is included in a solid waste management plan under 24 V.S.A. § 2202a; and
- (10) the facility can be served economically by existing or planned transmission facilities without undue adverse effect on Vermont utilities or customers.

Because Entergy VY's proposal involves the construction of a new storage facility for spent nuclear fuel, 10 V.S.A. § 6522 delineates additional criteria that Entergy VY must meet. In particular, Section 6522(b) provides:

In addition to all other applicable criteria of 30 V.S.A. § 248, before granting a certificate of public good for a new or altered spent nuclear fuel facility, the public service board shall find that:

- (1) Adequate financial assurance exists for the management of spent fuel at Vermont Yankee for a time period reasonably expected to be necessary, including through decommissioning, and for as long as it is located in the state.
- (2) The applicant has made commitments to remove all spent fuel from Vermont to a federally certified long-term storage facility in a timely manner, consistent with applicable federal standards.
- (3) The applicant has developed and will implement a spent fuel management plan that will facilitate the eventual removal of those wastes in an efficient manner.
- (4) The applicant is in substantial compliance with any memoranda of understanding entered between the state and applicant.

Entergy VY argues that, notwithstanding the provisions of 30 V.S.A. § 248 and 10 V.S.A. § 6522, the Board's jurisdiction is "limited to assessing the state's need for the power as well as siting and land-use criteria that do not interfere with the federal government's exclusive authority over plant construction and operation, spent-fuel possession, handling and storage and the attendant issue of radiological safety."<sup>13</sup> Entergy VY adds that this proscription applies even within the Board's traditional areas of regulation. Within this context, Entergy asserts that the Board has no role "in addressing radiological-safety concerns in connection with the facility arising from natural phenomena or potential terrorist or other man-initiated threats."<sup>14</sup>

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13. Entergy VY Brief at 6.

14. *Id.* at 6.

We agree with Entergy VY that federal law places limitations on the state's jurisdiction.<sup>15</sup> The federal government has exclusive jurisdiction over radiological safety concerns (except for enumerated areas expressly ceded to the states, such as the authority to regulate the air emission of radiation).<sup>16</sup> The United States Supreme Court found that this jurisdiction over radiological safety is considered to occupy the entire field.<sup>17</sup> In addition, the Nuclear Regulatory Commission ( "NRC") "was given exclusive jurisdiction to license the transfer, delivery, receipt, acquisition, possession and use of nuclear materials" and "[u]pon these subjects no role was left for the states."<sup>18</sup> Finally, under traditional preemption principles, our jurisdiction over nuclear power plants is limited when it directly conflicts with federal jurisdiction exercised by the NRC or would frustrate the purposes of the federal regulation.

Nonetheless, Entergy VY's characterization of the extent of federal preemption is overbroad. Supreme Court precedent explicitly states that the regulation of nuclear facilities is one of dual jurisdiction, with states retaining significant authority. The Supreme Court has observed that Congress:

intended that the federal government should regulate the radiological safety aspects involved in the construction and operation of a nuclear plant, but that States retain their traditional responsibilities in the field of regulating electrical utilities for determining questions of need, reliability, cost and other related state concerns.<sup>19</sup>

These other areas of state authority encompass traditional state concerns such as land use.<sup>20</sup> This dual regulatory scheme, extends even to matters related to nuclear materials, notwithstanding the broad preemption. The *PG&E* decision notes that federal law explicitly preserves state authority to regulate these activities for other purposes:

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15. See also discussion in Part VI.L., below.

16. *Pacific Gas and Electric Company v. State Energy Resources Conservation & Development Commission*, 461 U.S. 190, 212 (1983)(hereinafter *PG&E*).

17. *Id.*

18. *Id.* at 207.

19. *Id.* at 205.

20. *Id.* at 212.

Nothing in this section shall be construed to affect the authority of any state or local agency to regulate activities for purposes other than protection against radiation hazards.<sup>21</sup>

The Supreme Court's ruling and federal law thus reserves substantial jurisdiction to the state of Vermont over nuclear facilities and the dry fuel storage facility, so long as we are not regulating radiological safety and are acting within the areas of traditional state concern. These areas encompass the criteria in 30 V.S.A. § 248 and 10 V.S.A. § 6522(b). State authority remains unless in direct conflict with federal requirements.

## VI. DISCUSSION

### A. Description of the Project

#### Findings

1. Vermont Yankee supplies approximately one-third of Vermont's electrical requirements under a power-purchase agreement ("PPA") with the Vermont Yankee Nuclear Power Corporation ("VYNPC") (which resells 55 percent of the power to Vermont's two largest utilities). The PPA extends until early 2012, when Vermont Yankee's operating license expires. Thayer pf. at 3.

2. Currently, Vermont Yankee has sufficient spent fuel storage capacity (in the spent fuel pool in the Reactor Building) to operate with full-core discharge capability until the 2007 outage.<sup>22</sup> Without additional storage capacity, such as the ISFSI proposed by Entergy VY, Vermont Yankee would likely shut down no later than 2008. Thayer pf. at 10.

3. If Entergy VY shuts down Vermont Yankee, it is likely that Entergy VY will commence decommissioning, which will require construction of an ISFSI to store the fuel now in the spent fuel pool. Thayer pf. at 10.

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21. 42 U.S.C. § 2021(k).

22. Full-core discharge capability refers to the ability of the spent fuel pool to accommodate all of the fuel rods located within the reactor and place them in the spent fuel pool. As we explained in Docket 6812, loss of full-core discharge capability is an operational, not a safety, issue that creates the risk that, if an event required removal of all of the fuel rods for repair, Vermont Yankee would be unable to off-load all of the fuel and would need to shut down permanently. See Docket 6812, Order of 3/15/04 at 53, n.101.

4. Entergy VY now proposes to install a dry cask storage facility at Vermont Yankee to temporarily store a portion of the spent nuclear fuel generated by Vermont Yankee. The Project consists of a number of modifications to Vermont Yankee that will permit Entergy VY to store spent nuclear fuel in dry casks. Sherman pf. at 3–4; Hoffman pf. at 4.

5. Dry cask storage has been in use at nuclear plants since 1986. There are more than 30 such installations in the United States. As of July 7, 2005, there were 118 loaded HI-STORM dry casks (the type Entergy VY plans to use) at eight nuclear plant sites. Sherman pf. at 5.

6. If construction commences in late April as planned by Entergy VY, construction of the dry fuel storage facilities should be completed in 2007. Entergy VY would then conduct a "dry run" for loading of spent nuclear fuel in the summer and fall of that year and undertake the first loading campaign in early 2008. Exh. Entergy-JH-3 (Revised).

7. During the first loading campaign, Entergy VY expects to move enough spent nuclear fuel to load six dry cask units. Sherman pf. at 4.

8. If Vermont Yankee's operating license is not renewed in 2012 and Entergy VY removed all of the spent nuclear fuel from the spent fuel pool and placed it in casks, 60 casks would be required. However, the proposed ISFSI could only store 36 casks. Tr. 1/31/06 at 50–52, 88–89 (Hoffman).

9. Under the proposed schedule, Entergy VY will not have sufficient capacity in the existing spent fuel pool to maintain full-core discharge<sup>23</sup> until the ISFSI is complete. Entergy anticipates operation of Vermont Yankee without full-core discharge capability will last for approximately twelve months. Thayer pf. at 13.

#### Storage System

10. Entergy plans to store the spent fuel in HI-STORM 100S storage modules produced by Holtec International. These concrete and stainless steel modules are called dry casks. As opposed to wet fuel storage in which water provides the coolant, the dry casks are cooled by air

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23. Full-core discharge capability refers to the ability of the plant operator to remove all of the fuel rods from the reactor vessel and place them in the spent fuel pool.

entering at the bottom of concrete shield cylinders ("overpacks") and exiting at the top of the overpacks. Exh. Entergy-1; Hoffman pf. at 4; Sherman pf. at 3–4.

11. The Holtec HI-STORM cask system is precicensed and preapproved by the NRC. The NRC has performed a safety evaluation of Holtec's final safety analysis report ("FSAR") for the HI-STORM system, and has included Certificate of Compliance No. 1014 in its regulations. 10 C.F.R. §72.214, Certificate of Compliance No. 1014, Amendment 2; Sherman pf. at 4; Singh pf. at 48–59.

12. Entergy still must perform a written evaluation of the actual dry fuel storage installation required by 10 C.F.R. §72.212, which will identify site specific information regarding the proposal. The §72.212 evaluation will be completed later in the project to document the specifics of the design that has been implemented. This written evaluation is maintained on-site and available for NRC inspector review. Sherman pf. at 4; Singh pf. at 48, 53–57.

13. The dry fuel storage system involves three components: (1) the Multi-Purpose Canister ("MPC") in which the fuel is housed; (2) the HI-TRAC "shuttle cask" in which the MPC is placed before loading spent nuclear fuel, and from which the MPC is transferred to the HI-STORM overpack; and (3) the HI-STORM overpack in which the MPC will be stored while located on the ISFSI. A fourth component of HOLTEC's system is the HI-STAR overpack that would be used to transport the spent fuel enclosed in the MPC off-site. Hoffman pf. at 3; Singh pf. at 11–41.

14. The MPC is a welded, stainless steel cylinder, almost sixteen feet tall by nearly six feet in diameter, that is manufactured to the same standards as nuclear-reactor vessels and weighs more than twenty tons. Singh pf. at 19–24.

15. The HI-TRAC system is a layered, steel-lead-steel cylinder with a water jacket attached to its exterior. It is more than seven feet in diameter, sixteen feet tall, and weighs fifty tons when empty. Structural stability is provided by its carbon steel construction, and neutron and gamma shielding is provided by the lead and water. *Id.* at 39, 64.

16. The HI-STORM overpack is slightly over eighteen feet tall by eleven feet in diameter and, when loaded with the MPC, weighs approximately 200 tons. *Id.* at 16, 35; tr. 1/30/06 at 71 (Singh).

17. The HI-STORM overpack is a heavy-walled, steel weldment with more than two feet of high-density concrete installed in the space between inner and outer steel shells to provide radiation shielding. Singh pf. at 31.

18. Each HI-STORM 100S dry cask holds sixty-eight (68) spent fuel assemblies. Sherman pf. at 4; Singh pf. at 46; exh. Entergy-1.

19. Entergy VY also will purchase from Holtec and use a vertical-cask transporter ("VCT"), which is a bulldozer-tracked vehicle capable of lifting and transporting a loaded overpack to transport the loaded overpacks to the dry fuel storage pad. Hoffman pf. at 7; tr. 1/31/06 at 47–48 (Hoffman).

#### Site Modifications

20. The Project involves five major areas at Vermont Yankee: the Reactor Building, the Containment Access Building, the ISFSI pad, the transfer path, and a 50' x 50' concrete pad. Hoffman pf. at 5.

21. To accommodate the HI-STORM 100S dry casks, Entergy VY proposes to construct a highly-engineered 76 by 132 ft. concrete storage pad. The pad must support the loaded overpacks (each weighing about 200 tons) and must ensure that no fuel damage will occur in the event of a "non-mechanistic tip over." The pad will hold up to thirty-six HI-STORM dry cask units. Hoffman pf. at 9–10; Singh pf. at 46; exh. Entergy-1; Sherman pf. at 4.

22. The concrete pad will have a finished elevation two feet above site grade, which will ensure that the cooling air inlets are above the hypothetical, design-basis flood level. Hoffman pf. at 10.

23. The ISFSI storage pad will be constructed by excavating soil from the ground surface to five feet below grade; the excavated soil will be replaced with new soil (which may include some of the removed soil mixed with new soil to provide an "engineered soil" with the required properties) and compacted to a finished grade of one foot below existing grade. *Id.* at 10.

24. In addition, to support the dry cask storage operation, Entergy VY proposes to construct a smaller 50 by 50 ft. pad. This pad will be the site on which Entergy VY will fill the storage overpacks with concrete. The pad will also be used to store equipment, including the MPC

upender — the device used to lift and rotate MPCs. Hoffman pf. at 4, 11; Sherman pf. at 4; exh. Entergy-1.

25. Entergy VY may need to upgrade the transfer path between the Containment Access Building and the ISFSI pad. If upgrading this transfer path is required, to protect the existing underground utilities from the weight of the overpack and transport vehicle, Entergy VY will first undertake trenching, pouring concrete to reinforce underground systems and restoring the trench. There will be no visible evidence of the activity once completed. Hoffman pf. at 6.

26. If the transfer-path surface itself requires re-paving, Entergy VY will install concrete or steel-plate turning pads at appropriate locations as necessary along the transfer path to provide a more durable surface when the tracked transporter needs to change direction. *Id.*

27. All of these construction activities associated with the transfer path will involve standard construction techniques and have been performed in the past as maintenance activities at the plant with no adverse consequences. *Id.*

28. Vermont Yankee's existing access roads are adequate to support construction as well as the ISFSI-operational equipment that will be brought on-site for the Project. *Id.*

29. A temporary work area outside the Protected Area, but within the Owner Controlled Area ("OCA") will also be required for the contractor to mobilize and store construction equipment during the ISFSI-construction period. The exact size and location will be determined when the construction contract is negotiated. *Id.*

30. An area approximately 200 by 200 ft., located at the north end of the OCA and/or an area to the south of the Plant Support Building, will be used to deposit unused soil excavated for the pad. Entergy VY may also temporarily stockpile soil that will be reused in the pad construction in an area closer to the worksite. *Id.* at 6–7; Goodell pf. at 4–5.

31. The soil will not be transported off-site, and all stockpile-soil-storage areas will employ appropriate erosion-control measures. Hoffman pf. at 7; see Goodell pf. at 5.

32. Modifications to the Reactor Building will be minimal, depending on the final fuel-loading procedure selected; a column support is proposed to be located in one corner of the Reactor Building in the truck bay where the MPC and overpack will travel prior to exiting the building. Hoffman pf. at 7.

33. Entergy VY will remove the Containment Access Building and replace it with a rectangular structure to gain full ceiling height across the structure and allow movement of the vertical-cask transporter. The height of the reconstructed Containment Access Building will be no more than 23 feet higher than the existing structure. Hoffman pf. at 7.

34. Within the reconstructed Containment Access Building, Entergy VY also will construct a below-ground concrete-lined chamber to allow transfer of the MPC into the storage overpack. Hoffman pf. at 8.

35. Entergy VY will relocate the buried electrical conduits and stormwater drainpipe in the area where the ISFSI pad will be constructed so that the ISFSI-pad area can be excavated. This process that will consist of trenching, installing new drainpipe and conduit, pulling cables and restoring the ground. Hoffman pf. at 9.

## **B. General Good of the State**

As we explain above, our review under Section 248 requires not only a consideration of the individual enumerated criteria, but also a broader assessment of factors that may affect our decision as to whether a proposal promotes the general good of the state. In this section, we evaluate three issues that are relevant to more than one of the Section 248 criteria or that do not plainly fall within any one of these criterion. These issues are: the location of the proposed storage pad and consideration of alternatives; NEC's request that we adopt a fenceline radiation dose standard; and CAN's request that we require Entergy VY to obtain a site-specific review by the NRC.

### **1. Consideration of Alternatives**

#### **Findings**

36. Entergy VY considered a number of other storage options including: additional re-racking of the existing, wet-storage pool; construction of a new pool; shipment of spent nuclear fuel to another country for reprocessing; consolidation of fuel rods from their fuel assemblies for repackaging in tight-packed, special-storage canisters; shipment to a proposed facility planned by

Private Fuel Storage, LLC ("PFS"); a larger ISFSI; and different locations for the ISFSI pad including locating the ISFSI underground. Hoffman pf. at 20.

37. Options for re-racking the existing spent fuel to increase the density of the racks or add racks to the spent fuel pool will not provide adequate substitutes for dry fuel storage as they will alleviate the space concerns only for a short period. *Id.* at 20–21.

38. Constructing an additional spent-fuel pool would be significantly more expensive than dry fuel storage and would require similar physical changes at Vermont Yankee. It would also be larger than the ISFSI pad and require redundant, active-cooling systems instead of the passive air-cooling of dry fuel storage technology. *Id.*

39. Dry fuel storage has significant benefits over spent-fuel-pool storage from the security perspective. Sherman pf. at 7; tr. 2/10/06 at 94–95 (Sherman).

40. Reprocessing the fuel is not an option because there are no operating reprocessing stations in the United States, and because shipment overseas would not be allowed due to current United States policy discouraging civilian use of plutonium. Hoffman pf. at 22–23; Thompson sur. pf. at 30–31, 39.

41. Shipping the fuel to a private contractor such as private fuel storage facility is not currently an option. *Id.* at 23–24; Thompson sur. pf. at 32–33.

42. An ISFSI with the proposed capacity, up to 36 overpacks, does not commit Entergy VY or the state to plant operation beyond the current licensed life (until March 2012). Hoffman pf. at 24.

43. An ISFSI large enough to accept all of the fuel from plant operations and to accommodate full offload of the spent-fuel pool would require space for approximately 60 overpacks (for a 2012 plant shutdown) and 80 overpacks (for a 2032 plant shutdown); an ISFSI of sufficient size to meet these needs would not fit within the plant's existing, highly-protected security area. *Id.* at 24–25.

44. Holtec's underground system, the "100U," is not presently licensed by the NRC. Until the final, licensed design is available, it cannot be determined whether the system would be suitable for Vermont Yankee. *Id.* at 26–27; tr. 2/2/06 at 111–112 (Thayer); tr. 2/6/06 at 20–21 (Thayer).

45. The delays in licensing and installation of the 100U mean that Entergy VY would lose at least one construction season if it sought to pursue an underground option. As a result, dry fuel storage would not be ready in time to allow Vermont Yankee to resume operations after its refueling outage in late 2008. Vermont Yankee would also have to operate for a longer period without full-core discharge. Hoffman pf. at 26–27; tr. 1/31/06 at 75–76 (Hoffman); tr. 2/6/06 at 18–19 (Thayer); see also exh. Entergy-JH-3 (Revised) (construction schedule); tr. 1/31/06 at 15 (Hoffman) (estimated construction time).

46. Location of the ISFSI as proposed by Entergy VY has the following advantages: (1) the Project is located within the secured Protected Area, for security reasons, and the proposed location results in maximum security for the facility; (2) the proposed location is as far as feasible from Vermont Yankee's boundary, which helps to control radiation-dose impacts at the site boundary; (3) the proposed location minimizes the distance over which the storage overpacks need to be transported from the wet pool to the pad; (4) the proposed Project site is in close proximity to the rail line that may be used for the ultimate transport of the spent fuel to a private or governmental repository; and (5) the proposed Project site will not result in the development of lands that are presently undeveloped or used for agricultural purposes. Hoffman pf. at 25–26; tr. 1/31/06 at 69–72 (Hoffman); tr. 2/6/06 at 54–57 (Thayer); tr. 2/10/06 at 104–105 (Sherman).

### **Discussion**

CAN and NEC challenge Entergy VY for not having adequately considered several alternatives to the Project. CAN argues that Entergy VY's planned location for the storage pad is unreasonable; instead, according to CAN, due to heightened security concerns, the Board should require that Entergy VY relocate the ISFSI farther from the river bank and surround it with an earthen berm. Alternatively, CAN asserts that the facility should be located underground.<sup>24</sup> CAN also suggests that, since Entergy VY plans to build a larger storage facility in the future, we

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24. CAN Brief at 10.

should only grant interim approval of the current project, which would allow us to revisit the construction of a permanent facility.<sup>25</sup>

NEC maintains that Entergy VY did not adequately investigate a full range of alternatives to the Project.<sup>26</sup> NEC argues that the proposed facility, as situated, presents undue security risks. NEC also claims that the location also is exposed to the risk of floods.

Entergy VY responds that the concerns raised by CAN and NEC are preempted by federal law, contending that state authority is very limited. In addition, Entergy VY asserts that the alternative locations and construction of a berm are impractical. Entergy VY maintains, for example, that a redesigned or relocated pad would need to be fully re-engineered, which could not be completed in time to meet the need for added spent fuel storage capacity.<sup>27</sup> Entergy VY also argues that a berm is neither practical nor desirable, while at the same time providing little advantage over the visible barrier.<sup>28</sup>

The evidence persuades us that, on balance, Entergy VY's current proposal, including the location, visual barrier, and decision to pursue above-ground storage is reasonable and should be accepted. The first issue raised by NEC and CAN is the location of the proposed ISFSI. As we explain below in Part VI.G., we discount the likelihood of a design basis flood that might cause channel scouring and the erosion of more than 200 feet of river bank. Moreover, the possibility of external security threats to the proposed ISFSI has not been shown to be strong enough to warrant relocation of the facility. Even if Entergy VY were to construct additional screening at a different site, it is likely that any such security risks would be present at a relocated facility. Moreover, Entergy VY has proposed to install a visual barrier that will eliminate views of the ISFSI pad, thus mitigating the minimal incremental risk that may exist. The dry casks are designed to withstand significant impacts, further reducing the likelihood of safety issues arising.<sup>29</sup> In the unlikely event of a terrorist attack as hypothesized by NEC and CAN, storage in dry casks appears to represent no greater risk than exists today.

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25. CAN Brief at 12.

26. NEC Brief at 21.

27. Entergy VY Reply Brief at 6.

28. Entergy VY Brief at 22–24; Entergy VY Reply Brief at 7.

29. Tr. 1/30/06 at 72–75 (Singh).

Neither CAN nor NEC has demonstrated that feasible alternative locations exist that are superior to Entergy VY's proposal. Certainly, other possible locations exist within the Vermont Yankee site that could accommodate a storage facility. Entergy VY will eventually need to construct a larger storage facility in such a location. However, all of these are located outside the Protected Area, which would require a modification to Entergy VY's security arrangements. In addition, these and alternative locations could not be designed, approved, and constructed in sufficient time to off-load spent nuclear fuel from the spent fuel pool in 2008 — the time at which Entergy VY would have exhausted capacity.<sup>30</sup> Even with these limitations, we would pursue such an alternative if the evidence showed that they would reduce the risks to the facility and spent nuclear fuel arising from a terrorist attack; it does not.

We also do not find it necessary or appropriate to require installation of a berm along the north and eastern sides of the proposed ISFSI or to require Entergy VY to store the dry casks in a hardened facility. It is not clear that such a berm could be constructed within the limited space available, particularly with the location of the transfer path. A berm could be constructed if the pad were located elsewhere on the site, but NEC also has not shown that a berm would provide appreciably greater protection.<sup>31</sup> Similarly, the hardened facility may offer some benefits (similar to the protection offered by the earth in underground storage). But the evidence does not suggest where such a facility could be sited or that it could be constructed in timely manner.

Furthermore, the evidence does not demonstrate that underground storage of the spent nuclear fuel in lieu of the above-ground storage proposed by Entergy VY is a viable alternative. All parties agreed that underground storage had certain benefits compared to Entergy VY's proposal.<sup>32</sup> It would have less of an aesthetic impact than any of the alternatives, since it would be less visible. More significantly, it would also be more secure from potential accidental or

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30. The timing of Entergy VY's proposal raises some concern. Because the Project is the only facility that could be successfully constructed before Entergy VY exhausts capacity in the spent fuel pool, if we had found that one of the alternatives was preferable, timing alone might have rendered that alternative infeasible unless the Board was willing to risk the potential loss of the economic benefits of Vermont Yankee. As we do not find that the alternatives are clearly preferred, this potential dilemma is not before us. However, in the future, Entergy VY must file its requests for approval under Section 248 sufficiently far in advance to ensure an opportunity for meaningful consideration and implementation of alternatives. *See* Docket 6860, Order of 1/28/05 at 11.

31. Tr. 2/10/06 at 104–106 (Sherman).

32. Tr. 2/10/06 at 100 (Sherman); tr. 2/6/06 at 20 (Thayer).

intentional events that could affect above-ground storage.<sup>33</sup> At the same time, the NRC has not authorized any of the underground dry-fuel storage options.<sup>34</sup> This means that, even if it wanted to, Entergy VY could not now opt to install such an underground facility.

Moreover, Entergy VY needed to make a design decision over a year ago to ensure that a facility could be designed, approved, and constructed before the 2008 refueling outage. In the absence of an underground alternative, at that time, Entergy VY could only select some form of above-ground dry fuel storage. Entergy VY has shown that, even if underground storage were approved today, the need for design and construction would render it temporally infeasible because it could not be made operational in time to meet Entergy VY's need for storage capacity.<sup>35</sup> Because the underground option was not available, it also is not known whether the above-ground option may still be preferred because of other site-specific considerations such as the weather.<sup>36</sup>

## **2. Fence-line Radiation Dose**

NEC asked that the Board require Entergy VY to install a berm (presumably on the western side of the ISFSI) to reduce the radiation doses at the fence-line to the Vermont Yankee site. According the NEC, this would help Entergy VY to comply with the standards established by the DOH. Further, NEC and WRC requests that the Board include a CPG condition requiring Entergy VY to adhere to a fence-line radiation standard of 20 mrem annually (the same standard that the DOH has established).

Entergy VY counters that it already has the obligation under state rules to meet the fence-line radiation standard. As a result, contends Entergy VY, the Board should not dictate how that standard is met by mandating a berm; Entergy VY maintains that there are other changes to Vermont Yankee that would be preferable if Entergy VY needed to reduce radiation to meet the standard. In addition, Entergy VY argues that the establishment of a standard lies with the DOH, not the Board.

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33. Tr. 2/10/06 at 102 (Sherman).

34. Tr. 1/30/06 at 87–89 (Singh).

35. Tr. 1/31/06 at 75–76 (Hoffman); tr. 2/2/06 at 110–113 (Thayer).

36. Tr. 2/6/06 at 20–21 (Thayer).

For several reasons, we will not adopt either of the conditions requested by NEC. The regulation of radiation from Vermont Yankee is best handled by the DOH, not the Board. DOH has expertise in setting such standards, which they have already exercised. NEC has not demonstrated why this is inadequate. Moreover, even if we elected to establish a fence-line radiation dose standard, the record provides no guidance as to a reasonable standard. Instead, we would simply be deferring either to the federal standard established by the Environmental Protection Agency (25 mrem) or the DOH standard (20 mrem).<sup>37</sup> We have no basis to evaluate the reasonableness of either of these standards.

Second, we do not find it necessary to order Entergy VY to construct a berm to shield radiation. The responsibility to comply with the fence-line radiation dose standard rests with Entergy VY;<sup>38</sup> under state law and its prior commitments, Entergy VY must meet the fence-line radiation dosage limits. As Entergy VY informed us during Docket 6812, it would reduce power at the facility or take other actions to reduce radiation at the fence-line and ensure that no exceedence occurs. We recognize that the berm represents one means to reduce fence-line dosages, but other options also exist that may be more effective.<sup>39</sup> NEC has not shown why we should prescribe the berm when these other approaches are available.

Finally, WRC has asked that we require Entergy VY to provide a quarterly report that summarizes fence-line radiation measurements. We do not adopt this requirement at the present time. The evidence shows that both Entergy VY and DOH have established systems to measure radiation doses. For regulatory purposes, DOH tracks its monitors (although it may check with Entergy VY for verification if a report from a location appear to be an anomaly). Thus, requiring reports from Entergy VY which may not be used to determine compliance with the DOH standard would be misleading. Moreover, DOH and Entergy VY are still studying the

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37. The DOH standards in Part 5, Chapter 3, Section 5-305(B)(1)(e) require Entergy VY to meet an annual dose limit of 20 mrem at the site boundary (10 mrem quarterly). Due to the fact that the monitoring devices are only accurate within +/- 25 percent at the typical site boundary doses, DOH made a policy decision under which measurements up to 25 mrem annually would not be considered to be a violation. White/Crist pf. at 3-4; tr. 2/9/06 at 96-97, 144 (White)

38. Tr. 2/2/06 at 158 (Thayer).

39. Tr. 1/31/06 at 53-54 (Hoffman).

appropriate measurement techniques. After that evaluation is complete and these parties have settled on appropriate measurement protocols, we can revisit this issue.

### **3. Site-specific Evaluation by the NRC**

In its Brief, CAN asks that we adopt a condition requiring Entergy VY to apply to the NRC for a site-specific Part 72 license for the Project.<sup>40</sup> CAN states that such a review would provide for NRC expertise and an opportunity for state and public input.<sup>41</sup>

We decline to adopt the condition requested by CAN. CAN has not demonstrated why such a condition, which was not discussed during the evidentiary hearings, is appropriate. Moreover, the NRC will already have an opportunity to review the Project in the context of the 10 C.F.R. §72.212 evaluation that will be completed later in the project to document the specifics of the design that has been implemented.<sup>42</sup>

## **C. Orderly Development of the Region [30 V.S.A. § 248(b)(1)]**

### **Findings**

47. The Project will not unduly interfere with the orderly development of the region; this finding is supported by Findings 48–62, below.

48. By letter dated February 1, 2005, Entergy VY provided the Vernon Planning Commission with plans for construction of the Project (as required by Section 248(f)). Entergy VY also reviewed the Project with that commission on February 10, 2005. Vissering pf. at 31.

49. The Vernon Planning Commission found (by letter dated February 14, 2005) that the Project would not unduly interfere with the orderly development of the region or overburden municipal and governmental services in the Town of Vernon. Goodell pf. at 15; Vissering pf. at 31; exh. Entergy-JEV-8 (Letter from Vernon Planning Commission).

50. On February 7, 2005, Entergy VY reviewed the Project with the Vernon Selectboard, which found that the Project will not unduly interfere with the orderly development of the region

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40. CAN Brief at 17.

41. CAN Brief at 15.

42. See Sherman pf. at 4; Singh pf. at 48, 53–57.

or overburden municipal and governmental services in the Town of Vernon. Goodell pf. at 15; Vissering pf. at 32; exh. Entergy-JEV-9 (Letter from Vernon Select Board).

51. The Vernon Town Plan generally views Vermont Yankee as making a positive contribution to the Town. The Vernon Town Plan cites Vermont Yankee as contributing significantly to the community's tax base, and providing varied employment opportunities for its residents, which enables Vernon to function, to a great extent, with a large measure of rural independence and self sufficiency. Vissering pf. at 32, 39; exh. Entergy-JEV-5 at 17 (Portions of Vernon Town Plan).

52. The Vernon Town Plan also expresses concern with the economic impact of Vermont Yankee's license expiration in 2012, noting the potential impact on the local economy and tax base if Vermont Yankee's license is not renewed.<sup>43</sup> Vissering pf. at 32, 39; exh. Entergy-JEV-5 at 17–18.

53. The Vernon Town Plan describes natural resources and recreational, cultural and scenic resources that should be protected. The Project will not affect these resources. Vissering pf. at 33–34; exh. Entergy-JEV-5 at 20–33.

54. The Project is consistent with the Vernon Town Plan's overall goals of maintaining the Town's rural character, its natural resources, its scenic qualities; the Project will not adversely impact Vernon's rural character, scenery and natural resources. *Id.* at 39.

55. The Project will not unduly interfere with the orderly development of the Vernon community and will be in compliance with the Vernon Town Plan. *Id.* at 34, 39; findings 48–54, above.

56. Entergy VY provided plans for the proposed Project to the WRC and reviewed the plans with the WRC Project Review Committee on February 1, 2005. Vissering pf. at 34.

57. The WRC conducted a hearing on the proposed Project on March 3, 2005. *Id.*

58. The Project is consistent with the Windham Regional Plan's land-use policies regarding Villages, Rural Residential Lands and Productive Rural Lands; the Project is located within an existing developed area, is a consistent use in terms of function and scale, and will not impact

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43. These concerns would apply as well to the early shutdown of Vermont Yankee that could arise if dry fuel storage is unavailable.

any natural resources of the surrounding area. *Id.* at 33–37; exh. Entergy-JEV-6 at 99–102 (Portions of Windham Regional Plan).

59. The Project is consistent with the Windham Regional Plan's policies that encourage development in existing villages and on nearby lands that avoids rural sprawl and takes productive lands, such as agricultural lands, out of productive use. The Project will not adversely impact the village centers in Vernon, will not cause rural sprawl and will not take lands that are presently productive out of production. Vissering pf. at 39–40; *see* exh. Entergy-JEV-6.

60. The Windham Regional Plan notes the role that Vermont Yankee plays in providing 33 percent of Vermont's annual electric use at the time the plan was drafted and that Vermont Yankee provides 38 percent and 36 percent of the electricity supplied to Vermont customers by Central Vermont Public Service Corporation ("CVPS") and Green Mountain Power Corporation ("GMP"), respectively. Vissering pf. at 38; exh. Entergy-JEV-6 at 65.

61. The Windham Regional Plan references the Vermont Yankee Economic Study, 1999, by the Department of Public Service, which found that in the mix of power supplies for CVPS and GMP, Vermont Yankee is the lowest-cost, long-term supply. Vissering pf. at 38; exh. Entergy-JEV-6 at 65.

62. The Project will not unduly interfere with the orderly development of the Windham region and is consistent with the Windham Regional Plan. Vissering pf. at 37, 39–40; findings 56–61, above.

### **Discussion**

Section 248(b)(1) requires (in relevant part) that this Board find as follows:

With respect to an in-state facility, will not unduly interfere with the orderly development of the region with due consideration having been given to the recommendations of the municipal and regional planning commissions, the recommendations of the municipal legislative bodies, and the land conservation measures contained in the plan of any affected municipality.

Entergy VY maintains that the proposed power uprate meets the standard in this subsection of Section 248. Entergy VY cites to portions of the Vernon Town Plan and the Windham Regional Plan, asserting that the proposed dry fuel storage uprate is consistent with these plans. No party argues that the Board should reach a different conclusion.

We conclude that the proposed uprate of Vermont Yankee will not unduly interfere with the orderly development of the region. It will have minimal impact outside the immediate area of Vermont Yankee. In addition, as shown by the findings above, it is consistent with the relevant town and regional plans.

#### **D. Need [30 V.S.A. § 248(b)(2)]**

##### **Findings**

63. The Project 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 Title 30. This finding is supported by Findings 64 through 70, below.

64. The generation capacity of Vermont Yankee (without uprate) is 510 MW. Under the PPA between Entergy VY and VYNPC, Entergy VY sells the output of Vermont Yankee, other than the output associated with the potential uprate of the facility, to VYNPC, which, in turn, sells the power to eight utilities throughout New England that own VYNPC. Thayer pf. at 3; Tranen pf. at 6–7, 20; Wigget pf. at 3–4.

65. Under the PPA, two Vermont utilities, CVPS and GMP, purchase 35 percent and 20 percent of Vermont Yankee's pre-uprate output, respectively, which collectively is approximately one-third of Vermont's electrical requirements. The PPA's term extends until expiration of Vermont Yankee's license from the NRC in March, 2012. *Id.*

66. The PPA provides for Entergy VY to sell Vermont Yankee's output to VYNPC between 2008 and 2012 for prices ranging from \$41/MWh to \$45/MWh. This price covers the energy, capacity, and ancillary services, if any, provided by Vermont Yankee. The PPA also contains a low-market-adjustment mechanism under which the price paid to Entergy VY going forward will be the lesser of 105% of market (as defined in the PPA) or the PPA's fixed rates, should prices in New England fall below PPA rates. Thayer pf. at 4; Tranen pf. at 7.

67. The prices in the PPA are expected to remain below the market price for power in New England, so that the continued purchases are cost-effective and provide an economic benefit to

Vermont. Exh. BW-3.

68. Vermont's share of Vermont Yankee's output could not be entirely provided in a more cost-effective manner through energy conservation programs and measures and energy-efficiency and load management measures. The information on energy efficiency in the 2005 Vermont Electric Plan<sup>44</sup> indicates that even with very aggressive assumptions, reductions in energy requirements would be roughly equal to Vermont's projected load growth, or in the range of 1.5 percent or 15 MW at peak annually. Even cumulatively over the period from late 2008 to early 2012, this would amount to approximately 5 percent of the state's energy requirements, or about 50 MW at peak, which only represents approximately 17 percent of GMP's and CVPS's share of energy and capacity of Vermont Yankee. Tranen pf. at 18.

69. Without the additional storage capacity that would be provided by the Project, Vermont Yankee may shut down by 2008. Thayer pf. at 10; *see* Findings 1–9, above.

70. The Project would allow Vermont Yankee to operate through 2012. Hoffman pf. at 24–25.

### **Discussion**

Vermont Yankee now represents a favorably-priced power source for Vermont, supplying approximately one-third of the electrical energy needs of the state. In the absence of the dry fuel storage project, a substantial likelihood exists that Vermont Yankee would shut down by 2008 due to the inability to store the spent nuclear fuel it generates. GMP and CVPS could replace the power with other purchases, but such replacement power would probably cost more (perhaps significantly more) than the Vermont Yankee power. Thus, the Project is needed to assure the continued cost-effective supply of power.

Under Section 248(b)(2), we must also consider whether the power provided by Vermont Yankee could be provided in a more cost-effective manner through energy conservation programs and measures and energy-efficiency and load management measures. Based upon the

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44. Vermont Department of Public Service, 2005 Vermont Electric Plan, January 19, 2005.

above findings, we conclude that this could not occur and that, therefore, the Project is needed.<sup>45</sup>

### **E. System Stability and Reliability [30 V.S.A. § 248(b)(3)]**

#### **Findings**

71. The Project will not adversely affect system stability and reliability. This finding is supported by Findings 72 through 73, below.

72. The Project has no component that could adversely affect the stability or reliability of the bulk-transmission system because the Project does not in any way change or affect transmission-system facilities. Hoffman pf. at 31.

73. The Project's operational activities would occur entirely in areas that would not come into contact with Vermont Yankee's existing substation or transmission lines so that a handling event, such as a tip over of a 100S overpack, would have no effect on reliability. Hoffman pf. at 31.

#### **Discussion**

The Project involves the construction of a dry fuel storage facility, which would not directly change the power output of Vermont Yankee, or otherwise change or affect the manner in which Vermont Yankee interconnects with the electric transmission system. The Project actually indirectly enhances reliability by allowing Vermont's largest electric generation resource to continue to operate past 2008; elimination of more than 500 MW of output at Vernon may negatively affect the reliability of the electrical system.<sup>46</sup>

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45. We note that the Department suggested in testimony that the comparison to energy efficiency component of the need criterion does not apply in the context of a merchant plant. We disagree. Section 248(b)(2) contains no such exception. *See* Docket 6812 Order of March 15, 2004, at 20–22 (discussing the applicability of the Need criterion to a merchant plant).

46. NEC raises one concern that it asserted pertained to reliability. It argues that the potential for harm to the dry casks through external threats could result in diminished reliability. In fact, this argument is unrelated to reliability, but rather concerns the security, location, and screening issues that we have addressed this issue above in Part VI.B.

**F. Economic Benefit [30 V.S.A. § 248(b)(4)]****Findings**

74. The operation of Vermont Yankee represents an economic benefit to Vermont, mostly as a result of its favorably-priced PPA. Lamont pf. at 4.

75. Power sold under the PPA between Entergy VY and VYNPC has been sold to Vermont utilities at prices consistently below the spot-market price of energy in New England. Thayer pf. at 3–4.

76. The PPA contains a low-market-adjustment mechanism under which the price paid to Entergy VY going forward will be the lesser of 105 percent of market (as defined in the Power Purchase Agreement) or the PPA's fixed rates, in the event that prices in New England fall below PPA rates. Thayer pf. at 4; Tranen pf. at 8–9; Wiggett pf. at 6.

77. Vermont utilities also may benefit economically by selling their interest in some of the output of Vermont Yankee energy. Tranen pf. at 13.

78. Wholesale prices of electricity are anticipated to be above the PPA prices between 2008 and 2012. Exh. Entergy-BW-3.

79. Using the Department's forecast, the PPA will reduce energy costs paid by GMP and CVPS by approximately \$61 million over the period from 2008 to 2012. This represents the difference between the PPA prices and projected spot prices during that time. Tranen pf. at 7; Wiggett pf. at 5, 15-16; exh. Entergy-BW-1; Lamont pf. at 2.

80. Entergy VY received NRC approval of a license amendment to uprate Vermont Yankee on March 2, 2006, and Board approval for the uprate on March 15, 2004 (subject to conditions that we found that Entergy VY had met. *See* Order of March 3, 2006). Therefore, together with the CPG to construct a dry fuel storage facility issued concurrently with this Order, the requirements of the MOU in this Docket and Section 6522(c)(4) of Title 10 have been met. Accordingly, Entergy VY will be obligated to make the payments to the State that are associated with the uprate and dry fuel storage. Exh. Entergy-2; 10 V.S.A. §6522(c)(4).

81. 10 V.S.A §6523 requires that Entergy VY pay \$15,625,000 (in quarterly payments of \$625,000) under the June 21, 2005, MOU in this Docket, together with any amounts required pursuant to the Docket 6812 MOU, into the Vermont Clean Energy Development Fund, a fund to

provide long-term benefits to Vermont's electricity consumers through the promotion of "cost-effective and environmentally sustainable electric power resources." Tranen pf. at 12–13, exh. Entergy-2 at ¶11.

82. The payments required by the MOU in this Docket must be made whether Vermont Yankee operates or not. Exh. Entergy-2 at ¶11.

83. The extended power uprate approved in Docket No. 6812, if implemented as planned, could result in payments from Entergy VY to the state under the revenue sharing provisions of the Docket 6812 MOU; these payments are contingent upon uprate power being sold at prices above a strike price. Exh. Entergy-BW-3; Wiggett pf. at 7.

84. If the Vermont Yankee's uprate proceeds as planned, the additional energy produced will be available as baseload energy in the ISO-New England, Inc. ("ISO-NE") market, and the presence of this additional baseload energy in the ISO-NE dispatch may lower the spot price of energy in New England and thus directly benefit Vermont's electricity consumers to the extent Vermont's consumers make net purchases of spot energy from ISO-NE. Tranen pf. at 10; tr. 2/1/06 at 53-54 (Tranen).

85. If Vermont Yankee shuts down between 2008-2012, state and local tax payments will be significantly reduced. Wiggett pf. at 8–9; exh. Entergy-BW-4.

86. Entergy VY employs approximately 495 employees in all aspects of Vermont Yankee operations (based on 2004 actual Vermont Yankee employment), and closure of the plant would result in a reduction in total payroll and medical benefits. Wiggett pf. at 9–10; exh. Entergy-BW-5.

87. The plant also employs a number of long-term contract employees; the closure of the plant could result in an additional loss to the Vermont economy by the loss of payments made to these contractors. Wiggett pf. at 10.

88. The extended power uprate approved in Docket No. 6812, if implemented as planned, will result in a higher generation tax and a higher state education tax to be paid to the State of Vermont each year, for the remainder of Vermont Yankee's existing operating license, and will therefore increase the economic value of Vermont Yankee to the state and the region. Wiggett pf. at 6; exh. Entergy-BW-2.

## **Discussion**

To meet the requirements of 30 V.S.A. §248(b)(4), the Board must find that the construction of a dry cask storage facility "will result in an economic benefit to the state and its residents." Entergy VY and the Department point to several positive economic aspects of the continued operation of Vermont Yankee that they argue will only be realized if dry cask storage is employed (because without dry cask storage, it is likely that Vermont Yankee would have to shut down in 2007 or 2008). These include the favorably priced power contract, employment, and tax revenue. Additionally, Entergy VY cites to additional benefits of approximately \$15.6 million in the form of payments to the state, that will occur only if the Board authorizes construction of a dry fuel storage facility.<sup>47</sup> Entergy VY also estimates that the proceeds from the revenue sharing provisions of the Docket 6812 MOU could total approximately \$5.2 million; but as the Department, NEC, CAN, and WRC point out, these payments are not guaranteed. NEC contends that Entergy VY has not shown that the economic benefits of dry cask storage will exceed the burden of hosting Vermont Yankee for 100 years or beyond.<sup>48</sup>

As we have noted previously, Section 248(b)(4) requires that an economic benefit exists, although it does not specifically state how much that benefit should be.<sup>49</sup> Therefore, we have generally concluded that this requirement is satisfied if we find that a comparison of costs and benefits yields a net economic benefit to the state, although in deciding whether a project promotes the public good, we consider the magnitude of the benefit in light of other impacts.

We reach the conclusion that the dry fuel storage facility will provide a net economic benefit to the state for two main reasons. First, positive economic benefits are likely to inure to the state from the operation of Vermont Yankee during the period from approximately November, 2008, to March, 2012 (the period during which Vermont Yankee might not operate without dry fuel storage). These benefits result from lower-cost energy available to Vermont

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47. The June 21, 2005, MOU requires that in order for payments to be made to the state, in addition to a CPG authorized construction of the dry fuel storage facility, Entergy VY must receive all approvals necessary to uprate Vermont Yankee. As we conclude in Finding 80, Entergy VY has obtained all the approvals necessary for the uprate.

48. NEC Brief at 22.

49. See, for example, Docket 6812, Order of 3/15/2004, at 25.

utilities through the PPA, state and local tax payments, and employment-related cash flows.<sup>50</sup> Moreover, the costs of construction and maintenance of the dry fuel storage facility will be borne entirely by Entergy VY. Therefore, the economic cost/benefit analysis is straightforward, and results in an economic benefit to the state and its residents.<sup>51</sup>

The second basis for our conclusion of net positive economic benefit is the direct payments to be made to the state by Entergy VY under the MOU in this Docket. If we authorize dry fuel storage, Entergy VY must pay \$15.6 million to the state whether Vermont Yankee operates or not.<sup>52</sup> In addition, Entergy VY must make additional payments to the state, estimated at \$5.2 million, under the Docket 6812 MOU (contingent upon the price and availability of uprate power). Neither NEC nor any other party refuted that tax, market-price benefits, and direct payments to the state are likely to occur during the final years of Vermont Yankee's operating license.

We are not convinced by NEC's concerns that Entergy has not shown sufficient economic benefits to outweigh the cost of hosting Vermont Yankee. We recognize that, as NEC suggests, the spent nuclear fuel may remain on-site for a long period of time. However, NEC has not shown that this long-term storage creates costs that will outweigh the benefits whether Vermont Yankee is operating or not. Similarly, the costs of hosting Vermont Yankee through decommissioning have not been shown to be increased by our approval of a dry fuel storage facility. These costs will be borne by Entergy VY, and paid out of operating revenues until plant shutdown. After closure, Entergy VY expects to obtain access to decommissioning funds to cover its costs. Elsewhere in this Order, we have also required Entergy VY to submit additional financial guarantees to cover the period after closure. Collectively, these financial elements should adequately shield Vermonters from costs associated with dry cask storage.

As we point out throughout this Order, our approval of the dry fuel storage facility in no

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50. In addition to direct payroll and expenses, the community benefits economically from the "multiplier effect." That is, much of the money paid to Vermont Yankee employees is spent, and re-spent, in the local community.

51. In a Section 248(b)(4) analysis, we have often included "unpriced environmental costs" in determining net economic benefits. In the case of dry fuel storage, no party has proposed that we consider the economics of such costs.

52. Exh. Entergy-2 at ¶11.

way affects our future consideration of license extension or renewal. In addition, we have taken steps in this Order to try to reduce the long-term storage of spent nuclear fuel by Entergy VY by accepting Entergy VY's commitment to remove spent fuel at the Vermont Yankee site as soon as is practicable. Thus, we do not accept NEC's assertion.

### **G. Environmental Impacts [30 V.S.A. § 248(b)(5)]**

#### **Findings**

89. This Project will not have an adverse effect on aesthetics, historic sites, air and water purity, the natural environment and the public health and safety; this finding is supported by Findings 90–165, below, which are based on the criteria specified in 10 V.S.A. §§ 1424a(d) & 6086(a)(1) through (8), (8)(A), and (9)(K).

#### **Public Health and Safety [30 V.S.A. § 248(b)(5)]**

90. The Project will not have an undue adverse effect on the public health and safety. Goodell pf. at 14; exhs. Entergy JG-4 and JG-5.

#### **Water and Air Pollution [[10 V.S.A. § 6086(a)(1), (A)-(C), (E)-(G), (a)(2), (a)(3)]]**

91. The Project will not cause undue air or water pollution and will comply with applicable regulations adopted by the Vermont Department of Environmental Conservation. Goodell pf. at 2–3; findings 92–140, below.

#### **Air Pollution [30 V.S.A. § 248(b)(5) and 10 V.S.A. § 6086(a)(1)]**

92. The Project will not have an undue adverse effect on air purity, and will not result in undue air pollution. This finding is supported by Findings 93–99, below.

93. Technologies, such as nuclear, hydro, wind, and solar avoid the emission of pollutants such as oxides of nitrogen and sulfur, green-house gases, particulates, and mercury during the generation of electricity. Of these technologies, hydro and nuclear have the demonstrated capability to provide economic baseload sources. Moniz pf. at 5–6.

94. Global warming and its consequent climate change is a significant global environmental

risk. Its effects are likely to include: substantial sea-level rise, increased frequency and severity of extreme weather events, modification of disease vectors, ecosystem transformation with habitat implications, population dislocations, and economic risks to agriculture and coastal property. Moniz pf. at 7, 14.

95. To avoid an unacceptable level of climate change, emissions of green-house gases must be reduced. Moniz pf. at 8, 14.

96. Mercury degradation of eastern U.S. waters currently poses a public health risk, as noted in the Environmental Protection Agency's Clean Air Interstate Rule. Acid rain deposition is damaging eastern forests. Moniz pf. at 5.

97. Vermont Yankee is an important reason that Vermont's portfolio has very low emissions of greenhouse gases and other pollutants. If Vermont Yankee were to close, Vermont's electricity consumers would likely rely much more heavily on fossil-fuel generation that, even if not predominantly located in Vermont, would increase air emissions throughout the region. Tranen pf. at 19.

98. Based on the New England Power Pool's ("NEPOOL") operations in 2003, ISO-NE estimated that replacing an increment of 500 megawatts (slightly less than the Vermont Yankee's pre-uprate capacity but at a 100 percent load factor) would increase emissions of SO<sub>2</sub>, NO<sub>x</sub>, and CO<sub>2</sub>. Tranen pf. at 20.

99. Dust will be controlled during construction by quickly seeding and mulching disturbed areas adjacent to the Project and through the use of water-spray trucks as necessary. Goodell pf. at 2.

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#### **Outstanding Resource Waters [10 V.S.A. § 1424a(d)]**

100. The project is located on the Connecticut River which has not been designated an outstanding resource water by the Vermont Water Resources Board. The Project therefore will have no adverse effect on any outstanding resource waters. Vissering pf. at 9, 40–41.

#### **Headwaters [10 V.S.A. § 6086(a)(1)(A)]**

101. The Project is not located in a headwaters area characterized by steep slopes and shallow

soils, is located in a drainage area greater than 20 square miles (the Connecticut River), is not over 1,500 feet in elevation, is not in the watershed of a public-water supply designated by Vermont Department of Environmental Conservation's Water Supply Division, and is not located in a significant, aquifer-recharge area. Goodell pf. at 3–4.

**Waste Disposal [10 V.S.A. § 6086(a)(1)(B)]**

102. The Project will not cause undue water pollution as, with the exception of the closed-cycle water that will be used to decontaminate the multi-purpose containers within the Reactor Building, water will not be used at Vermont Yankee as a result of the Project, and no discharge of any waste or other materials into waters of the state will result other than normal stormwater discharges from the impervious surface installed as part of the Project. Goodell pf. at 3.

103. The Project will meet applicable regulations regarding disposal of waste adopted by the Vermont Department of Environmental Conservation and will not involve the injection of waste materials or harmful or toxic substances into ground water or wells. *Id.* at 4.

104. Excavated soil from construction of the Project will be stockpiled in an area north of the site or at a grassy area south of the Plant Support Building, consistent with the Project's Erosion Control Plan. *Id.* at 4–5; Hoffman pf. at 6–7; exh. Entergy-1 (Sheets 2 & 3 of 3).

105. Waste from the Project, including replaced utility wire and conduits, used pavement, and metal light poles, will be recycled, stored on-site or disposed of in accordance with Entergy VY protocols and applicable solid-waste requirements of the State. Goodell pf. at 5–6.

**Water Conservation [10 V.S.A. § 6086(a)(1)(C), (2), (3)]**

106. Act 250 sub-criteria 1(C) (water conservation), 2 (water availability) and 3 (burden on existing water supply) are not applicable to the Project because, with the exception of the closed-cycle water that will be used to decontaminate the MPCs within the Reactor Building, the Project will not use water and will not have water-supply or wastewater connections. *Id.* at 6, 10, 11.

**Floodways, Erosion and Liquefaction [10 V.S.A. § 6086(a)(1)(D), (4)]**

**Findings**

107. The risk of environmental damage due to erosion is minimal because of the small scale of the Project, the relatively flat nature of the Project site and the absence of significant drainage ways and streams around it. Goodell pf. at 11.

108. The Project is expected to affect less than 1.5 acres, which is below the five-acre trigger that would require a Stormwater Discharge Construction Permit under Construction General Permit 3-9001. *Id.* at 5, 11; tr. 2/8/06 at 81–82, 94–95 (DeWolfe).

109. The Project's Erosion Control Plan is contained in Exhibit Entergy-1. Goodell pf. at 11; exh. Entergy-1 (Sheets 2 & 3 of 3)

110. Any changes in stormwater runoff caused by the Project will be addressed in accordance with the conditions of the Stormwater Discharge Operating Permit. Goodell pf. at 11.

111. As designed, the Project will not cause unreasonable soil erosion or reduction in the capacity of the land to hold water so that a dangerous or unhealthy condition may result. *Id.* at 12; exh. Entergy-1 (Sheets 2 & 3 of 3).

112. The Project has a low risk for construction-related erosion. DeWolfe pf. at 2; tr. 2/8/06 at 82–83, 89–90 (DeWolfe).

113. The Project area presently consists of sections of pavement, stone and grass. Its construction will result in approximately 14,000 square feet of new, impervious surface the stormwater runoff from which will be treated through the use of grass swales, settling ponds or other measures approved by ANR under the Stormwater Discharge Operating Permit and the general requirements of General Permit 3-9015. *Id.* at 7; *see* tr. 1/30/06 at 126–30 (Goodell); Mason pf. at 2; tr. 2/8/06 at 110–11 (Mason).

114. Existing impervious areas that are to be re-developed will either be treated or their effect mitigated by removal of impervious area from the paved, discontinued parking lot as shown on the site plans in Exhibit Entergy-1, in accordance with the requirements of General Permit 3-9015. Goodell pf. at 7–8; *see* tr. 1/30/06 at 126–28 (Goodell).

115. The ISFSI pad is a highly-engineered structure that must support the loaded overpacks (each weighing approximately 200 tons) and must ensure that no fuel damage will occur in the

event of a "non-mechanistic tip over." Hoffman pf. at 9.

116. Given the size and weight of the storage overpacks, to ensure that no fuel damage occurs requires specific soil properties, soil depths, concrete properties and pad thickness. *Id.*

117. Entergy VY took soil-property measurements at the pad location and performed soil-structure-interaction analyses to determine the seismic (*i.e.*, earthquake-related) accelerations imposed on the overpacks that will be stored on the pad. These figures were then evaluated against the criterion specified in Holtec's "Final Safety Assessment Report" or "FSAR." *Id.* at 10.

118. In addition, an analysis was performed to ensure that no soil liquefaction (which is when seismically-induced motions cause the soil to act like a liquid) can occur; the completed liquefaction analysis shows that this is not a concern for Vermont Yankee's ISFSI. *Id.*

119. In response to ANR criticism of Entergy VY's initial analyses, a follow up analysis shows that there is no potential for liquefaction during a design-basis earthquake. Soydemir reb. pf. at 2, 3, 5; DeWoolkar sur. pf. at 8; tr. 2/7/06 at 70–73 (DeWoolkar).

120. It is unlikely that disastrous, complete or overall liquefaction would be triggered under the ISFSI. DeWoolkar sur. pf. at 8.

121. The Project site is outside of the 100-year and 500-year floodplains (comprised of the floodway and the floodway fringe). Goodell pf. at 6–7; exh. Entergy-JG-2; tr. 1/30/06 at 115, 131–32 (Goodell).

122. The ISFSI pad would be constructed with a finished elevation two feet above site-grade and will thus ensure that even at the hypothetical, Design Basis flood level of 252.5 feet plus 1.5 feet of wave run-up (a level significantly in excess of the FEMA 500-year flood), the water level would be below the cooling air inlets to the overpack. Hoffman pf. at 10.

123. The Vernon Dam has been shown to be stable for floods up to the probable maximum flood, which is much larger than the 500-year flood; therefore, it is reasonable to expect that the dam will be stable (and not breach) during a 500-year flood. Gregory reb. pf. at 3; Gregory sur. pf. at 9; *see* tr. 2/8/06 at 33 (Cahoon).

124. The flood of 1936 can be considered equivalent to the 500-year flood. Surveys from that flood did not indicate any associated erosion or narrowing of the Vernon Neck. Gregory sur.

pf. at 1–2; tr. 2/8/06 at 60–61 (Cahoon).

125. No major erosion appears to have taken place on the Vernon Neck since surveys began in 1924. Gregory sur. pf. at 4; tr. 2/7/06 at 10 (Gregory); tr. 2/7/06 at 151 (Cahoon).

126. The Vernon Neck has an elevation about six to eight feet higher than the probable maximum flood elevation and therefore would not be overtopped. Gregory sur. pf. at 2.

127. Water velocities that can be resisted by riprap<sup>53</sup> are on the order of ten to fifteen feet per second, as reported in the geotechnical literature and in Army Corps of Engineers and U.S. Bureau of Reclamation reports and manuals. Being armored with riprap, Vernon Neck is not expected to be susceptible to scouring during a PMF because the river would be very wide, and the likely water velocity would be less than two to three feet per second. *Id.* at 2, 4.

128. Downstream of the dam, the river would be even wider, and the water velocities would be lower than the 10 to 15 feet per second the riprap can withstand. *Id.*

129. A failure of the Vernon Neck is unlikely due to soil saturation since a 500-year flood or a probable maximum flood are relatively short events, and it is very unlikely that the soil would have time to saturate fully. *Id.* at 3.

130. The Federal Energy Regulation Commission requires regular inspections and investigations of the entire Vernon Dam facility, including the Vernon Neck, which allows the owner to make sure the riprap on the Neck remains in good condition so that it can protect the slopes when needed. *Id.*

131. An avulsion or breach of the Vernon Neck is an unlikely event because the ground surface is higher than the expected highest flood elevation; the seepage gradients are low; the velocities of the water in the river are low due to the river's large width at this location, and the upstream and downstream slopes are protected by riprap and are regularly inspected and maintained. *Id.* at 5.

132. In the event of a breach of the Vernon Neck, it is unlikely that an erosion channel could form close enough to the site to threaten the stability of the riverbank. *Id.* at 6.

133. During a probable maximum flood, the tailwater on the downstream side of Vernon

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53. Riprap is coarse, angular rock or other material used to stabilize shore banks. It is intended to reduce water erosion by dissipating the energy of flowing water or waves.

Neck would be four feet lower than the water on the upstream side; thus, the water level in the reservoir above Vernon Neck would drop at a relatively slow pace and water velocities would not be expected to increase significantly. *Id.*; exh. ANR-XGG2, App. G.2. (CASE VI).

134. Entergy VY has agreed to perform a study to model the flows and erosion conditions in the river under probable maximum flood conditions assuming the Vernon Neck fails. Gregory sur. pf. at 9.

135. A series of unlikely events would have to occur in a specific sequence for the dry fuel storage facility to be threatened by erosion: a probable maximum flood (by definition, a worst-case flooding scenario) would have to occur; the Vernon Neck would have to be breached; an erosion channel would have to form in the river and would have to move across the river in a position perpendicular to the prevailing river flow; and the newly-formed erosion channel would have to then affect the Vermont shoreline below the nuclear plant in such a manner through scouring that the shoreline would be undermined. *Id.* at 10.

### **Positions of the Parties**

Entergy maintains that the ISFSI is safely located outside of the flood plain. It does not agree with other parties that the site is at risk for flood-related damage.

NEC argues that the Board should require Entergy to locate the proposed spent fuel facility as far away from the Connecticut River as possible to reduce the risk to the facility from dangerous flooding. NEC contends that there is potential for drastic channel alteration of the Connecticut River if the Vernon Neck were breached during an extreme flood such as the probable maximum flood. NEC also contends that not enough evidence was presented to the Board to demonstrate that such a scenario is improbable, and that the Board must therefore deny Entergy VY's application for a CPG.

Recognizing that ANR and Entergy have agreed to further study this issue and submit results of a study at a later date, NEC further maintains that -- since this study is not part of the evidence properly before this Board -- it should not be considered. Also, since this negotiated agreement to do further modeling and calculation must be disregarded, NEC claims that what the Board is left with is ANR's witness Cahoon's concern that, if a probable maximum flood were to

occur, the stability of the bank on which the proposed spent fuel facility is to be located would be endangered. It is for these reasons that NEC proposes that the spent fuel facility be located further away from the Connecticut River.

NEC also argues that the Board should disregard Entergy's argument that the spent fuel facility cannot be moved for security reasons. According to NEC, the facility could be located anywhere on the Vermont Yankee site and the security perimeter could be expanded to accommodate it.

CAN argues that ANR's testimony on potential flood damage was unrefuted: "ENVY has not produced evidence sufficient to support a finding of fact that the proposed dry cask storage site would survive a five hundred year flood (or even a probable maximum flood) . . ."54 CAN agrees with NEC's position that the ultimate conclusions which might come from further study of this are not part of the evidentiary record. According to CAN, the question before us on this matter is how we weigh witness Cahoon's expert opinion in comparison to the countervailing testimony provided. CAN argues that if we accept witness Cahoon's opinion we must conduct further hearings on this subject and consider the appropriate nature, scope, terms and personnel conducting a study of the suitability of the site.<sup>55</sup>

ANR has asked that further study of this matter be conducted, and has agreed that it would be appropriate for Entergy VY to conduct further study.<sup>56</sup> ANR states that "[g]iven that potential risk associated with channel adjustment or erosion [that] arises in the context of a probable maximum flood, and that [Entergy VY] is willing to conduct a comprehensive modeling analysis, this issue can be easily addressed in the context of a CPG flood study condition."<sup>57</sup>

### **Discussion**

The evidence shows that the ISFSI is located at a site that is above the flood plain. The pad is situated so that the air vents at the bottom of the multi-purpose canisters will be above

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54. CAN Reply Brief at 4.

55. *Id.* at 5.

56. ANR Reply Brief at 2.

57. *Id.*

even the probable maximum flood levels. In addition, the project is not expected to lead to unacceptable erosion at the site.

NEC and CAN have cited one scenario in which a flood could present a risk to the project. ANR presented testimony suggesting that an improbable combination of unlikely incidents could result in the destabilization of the river bank below the site of the proposed project. ANR's witness posited the following: a possible avulsion or breach at Vernon Neck during an event referred to as a "probable maximum flood." The probable maximum flood, which is used as the design basis for Vermont Yankee, would have "unimaginable" volumes of water.<sup>58</sup> The volume would be in the range of two and one-half times the flood of record (*i.e.*, the flood on the Connecticut River in 1936). The probable maximum flood, combined with an avulsion of Vernon Neck, could then result in a relocation of the Connecticut River's channel to a position near Vermont Yankee. The results of the relocated channel could cause scouring that, in turn, might destabilize the bank below the site where the dry fuel storage pad is located.

The evidence, however, supports the conclusion that the probability of a flood event undermining the dry fuel storage pad is too remote to be credible.<sup>59</sup> The flood of 1936, which was equivalent to the 500-year flood, did not indicate any associated erosion or narrowing of the Vernon Neck.<sup>60</sup> ANR's witness further indicated that, in spite of the Flood of 1936, there has been no visible change in the width of Vernon Neck since 1924.<sup>61</sup> Moreover, even if a breach did occur, for risk to the project to occur, the flood would then have to cause significant channel scouring that in turn erodes the bank of the river more than 200 feet.

We are not convinced of the likelihood of the combined scenario of a probable maximum flood, a breach of the Vernon Neck, channel relocation, and bank scouring which would undermine area around the proposed project. Given the evidence, we conclude that the construction of the spent fuel facility at the proposed location will result in no adverse effect on

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58. Tr. 2/8/06 at 33 (Cahoon).

59. Hoffman pf. at 29; Hoffman reb. pf. at 4; Gregory reb. pf. at 10; *see* tr. 1/31/06 at 10 (Hoffman); tr. 2/8/06 at 33, 35-36 (Cahoon).

60. Gregory sur. pf. at 1-2, 4; tr. 2/7/06 at 10 (Gregory); tr. 2/7/06 at 151; 2/8/06 at 60-61 (Cahoon).

61. Tr. 2/8/06 at 60-61; 2/7/06 at 151 (Cahoon). Flood events in the range of the projected 100 year and 500 year floods estimated by FEMA are unlikely to create channel adjustments and erosion hazards which would threaten the proposed dry fuel storage project. ANR Reply Brief citing to tr. 2/8/06 at 37 (Cahoon).

the natural environment or the public health and safety, after due consideration is given to the floodways, floodway fringes, and erosion criteria of 10 V.S.A. § 6086(a)(1)(D) and (a)(4).

Although Entergy VY took the position that such a combination of flooding events is not credible, it has agreed to undertake additional study of the matter, and will accept a condition to its CPG requiring it to perform and file the study with the Board.<sup>62</sup> We will include such a condition in this Order. While we expect that it will be valuable to learn more about this issue, Entergy VY's decision to conduct this study does not color the conclusion we reached above as to the likelihood of the actual occurrence of the sequence of events described above. That finding stands on its own and is supported by the evidence in the record.

Given our conclusion, we do not need to reach the issue raised by NEC concerning Entergy VY's inability to move the site of its proposed facility due to security reasons.

As to CAN's argument regarding how we weigh witness Cahoon's testimony and whether we need to conduct further hearings regarding the features of a future study of these issues, we conclude that no such further hearings are necessary. The conclusion set out above reflects the manner in which we weighed the evidence. Our decision does not rely upon the outcome of the study proposed by ANR and Entergy VY. As a result, it does not and will not form a part of the evidence.

#### **Streams [10 V.S.A. § 6086(a)(1)(E)]**

136. The Project will not affect the small, unnamed stream to the north because stormwater discharged from the Project area will be collected by the existing storm-drain system and discharged directly to the Connecticut River under a Stormwater Discharge Operating Permit anticipated to be issued under General Permit 3-9015 (Stormwater Discharges for New Development And Redevelopment To Waters That Are Not Principally Impaired By Collected Stormwater Runoff). *Id.* at 3, 7.

#### **Shorelines [10 V.S.A. § 6086(a)(1)(F)]**

137. The Project is not located on a shoreline. At its closest point, the existing transfer path

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62. Gregory sur. pf. at 8–10.

is located more than 100 feet from the mean high-water mark of the Connecticut River, with the overpack-storage pad located at a horizontal distance more than 210 feet from the mean high-water mark of the river. Goodell pf. at 8–9; *see* Vissering pf. at 8.

138. The Project will not change the natural condition of the waters or the lands adjacent to the Connecticut River as such lands have been previously and extensively developed. Goodell pf. at 9.

139. Existing access to the Connecticut River, which is already prohibited from Vermont Yankee for security and safety reasons, will not be affected by the Project. *Id.*

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**Wetlands [10 V.S.A. § 6086(a)(1)(G)]**

140. There will be no undue adverse impacts to wetlands as a result of the Project. Quackenbush pf. at 2; Goodell pf. at 10; *see* exh. Entergy-JG-3 (National Wetlands Inventory Mapping).

**Discussion**

CAN has argued that the Board should not give weight to ANR regarding the suitability of the site since these witnesses have not visited the site. This argument has little merit because even if we do not consider the testimony from ANR witnesses, the undisputed evidence in the record still shows that there will be no undue adverse impacts on wetlands. Moreover, we do not agree with CAN's challenge to ANR's witnesses. ANR, in recent years, reviewed three projects in the vicinity of the proposed project site with regard to impacts on wetlands: the construction of a low-level nuclear waste storage area in the early 1990s; the construction of a building in 2000; and a parking lot project in 2005.<sup>63</sup> ANR also keeps files of recent photographs of the Vermont Yankee site, some taken last year during the parking lot project review. Furthermore, ANR witnesses review the Vermont Significant Wetlands Inventory Maps and Orthophotos as well as other site maps in their review of this Project. This information provides a substantial basis of knowledge that would allow ANR to assess whether the Project would affect wetlands. Thus, we conclude that ANR's witnesses possess significant expertise upon which to base their

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63. *See* tr. 2/7/06 at 91 (Quackenbush).

testimony.

**Transportation Criterion [10 V.S.A. § 6086(a)(5)]**

141. Although there will be a temporary increase in construction vehicles during construction, traffic from the Project will not cause unusual congestion or unsafe transportation conditions, and the Project will not unduly interfere with traffic to and from the Station. Goodell pf. at 12.

142. Approximately 830 truck trips will be generated by the Project during the six-to-nine-month period encompassing the construction phase of the Project through the loading of the first six overpacks, and thereafter approximately 25 concrete trucks will be necessary to bring the concrete for each future loading campaign (assuming a campaign of six overpacks) to Vermont Yankee plus 12 trucks to transport additional MPCs and overpacks to the site (one truck per each MPC and overpack). *Id.* at 13.

**Education and Municipal Services [10 V.S.A. § 6086(a)(6), (7)]**

143. The Project will not change the number of employees at Entergy VY or the number of children in the area; therefore, it will have no impact on educational services. Goodell pf. at 14.

144. The Vernon Police Department could provide adequate law-enforcement-protection services for the proposed Project without interfering with the Police Department's regular scheduling and other duties. Goodell pf. at 14; exh. Entergy JG-4.

145. The Vernon Volunteer Fire Company could provide adequate fire-protection services to the proposed Project without unduly burdening the Fire Company. Goodell pf. at 14; exh. Entergy JG-5.

146. The Vernon Selectboard found that the Project will not overburden municipal and governmental services in the Town of Vernon. Goodell pf. at 15; Vissering pf. at 32; exh. Entergy-JEV-9.

147. The Vernon Planning Commission found that the Project will not overburden municipal and governmental services in the Town of Vernon. Goodell pf. at 15; Vissering pf. at 31; exh. Entergy-JEV-8.

148. The Project will not require municipal sewer or water-supply services, new public roads or additional road maintenance. Goodell pf. at 15.

**Aesthetics [30 V.S.A. § 248(b)(5) & 10 V.S.A. § 6086(a)(8)]**

149. The Project will not have an undue adverse impact on the aesthetics or scenic or natural beauty of the area; this finding is supported by Findings 150–161, below.

150. The Project will be within the Protected Area and located on a site presently covered with pavement, stone and grass. Vissering pf. at 8.

151. The Project will be an integral part of the Vermont Yankee complex; it will appear to be a minor and barely noticeable element of a much larger, existing industrial complex. *Id.* at 13, 17, 22; *see* tr. 1/30/06 at 161, 163 (Vissering).

152. The colors and materials used in the proposed Project will be consistent with and suitable for the surrounding industrial area. Vissering pf. at 5–6, 14, 18; tr. 1/30/06 at 141–43 (Vissering).

153. Two lights in the proposed area of the ISFSI will be relocated or removed as part of the Project, and no additional lights will be added. Vissering pf. at 12, 18.

154. Existing trees or surrounding buildings will provide significant screening of the Project from Vernon. *Id.* at 18.

155. From the Connecticut River and the New Hampshire shoreline, the Project will appear as a relatively small, low structure consisting of similar materials and colors as its surroundings; existing vegetation along the shoreline will soften views of the Project from the north. *Id.*; *see* tr. 1/30/06 at 188–89 (Vissering).

156. While the policies set forth in the Windham Regional Plan, Vernon Town Plan and Master Plan for the Town of Hinsdale may not contain clear written community standards that provide specific guidance to project developers under the Quechee test for the preservation of aesthetics or scenic natural beauty of the area, the proposed Project does not violate the broader principles of these plans, and it would not violate those policies if the Board were to construe the policies as clear community written standards. *See* Vissering pf. at 22–29; tr. 1/30/06 at 176–82 (Vissering).

157. The proposed Project will not offend the sensibilities of the average person because it will be located in an existing industrial site and will be visible only from the Connecticut River and New Hampshire shoreline. Vissering pf. at 30; tr. 1/30/06 at 139–40, 163 (Vissering).

158. When visible, the Project will appear to be of a similar size, orientation and color as several surrounding buildings in the immediate area of the Project; the shoreline in proximity to the proposed Project is already developed with a large intake structure. Vissering pf. at 30.

159. Entergy VY has agreed to mitigate the potential aesthetic impact by building a 20-foot high, dark green fence that will completely screen the ISFSI from the Connecticut River and New Hampshire shoreline. *Id.* at 5, 12, 30; tr. 1/30/06 at 172 (Vissering); exh. Entergy-JEV-2 (simulation of the Project with wall).

160. The proposed fence will appear similar in scale and color to the existing warehouse behind the planned Overpack Storage Facility. Vissering pf. at 5–6, 12, 17, 18, 30; tr. 1/30/06 at 142–45, 172 (Vissering); exh. Entergy-JEV-2.

161. For aesthetic purposes, the placement of a rounded form such as a berm in an area where buildings are oriented at right angles to each other would look artificial, out of place, and awkward. Tr. 1/30/06 at 168–169 (Vissering).

### **Discussion**

NEC has argued that the placement of containers of "searing hot radioactive waste" will have an adverse impact on aesthetics. This impact will not only be a "mental impact" on residents of the area, the casks of spent fuel will also be visible from the New Hampshire side of the Connecticut River, even with the presence of the proposed fence.<sup>64</sup> Furthermore, according to NEC, not only will it offend the sensibilities of many of the region's citizens, Entergy VY's failure to build a berm is a failure to perform a reasonable mitigation measure to lessen the adverse impact that the project creates.

We are not convinced by NEC's arguments. There is substantial evidence to indicate that the spent fuel storage facility will not create an undue adverse effect on aesthetics. Not only will the proposed Project be compatible with its industrial surroundings, the colors and the materials

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64. NEC Brief at 22-23.

with which it is comprised will be consistent with and suitable for the surrounding area. The Project does not violate principles articulated in the Windham County Regional Plan, the Vernon Town Plan or the Master Plan for the Town of Hinsdale. Because it is located in an industrial site and will be visible only from the Connecticut River and the New Hampshire shore, the Project should not offend the sensibilities of the average person.

In addition, Entergy VY has agreed to mitigate potential aesthetic impacts by constructing a 20-foot-tall fence. It is proposed to be dark green and should appear similar in scale and color to other existing buildings at Vermont Yankee. The fence should screen nearly the entire view of the spent fuel casks from the Connecticut River and New Hampshire shore.

We are not convinced, however, that the visual barrier is necessary. Vermont Yankee is an industrial site, and from an aesthetic perspective, the addition of a limited number of concrete and metal containers results in little change to the overall aesthetics of the site. We have accepted the proposal to include a fence, not because we consider it a necessary mitigation step here, but because it came as part of the memorandum of understanding accompanying this proposal.

For these reasons, we conclude that the Project will cause no undue adverse aesthetic impacts.<sup>65</sup>

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**Historic Sites [30 V.S.A. § 248(b)(5) & 10 V.S.A. § 6086(a)(8)]**

162. The Project will not have an adverse impact on historic sites because the ISFSI will be located in the midst of industrial buildings of relatively recent age; none of these buildings are classified as having statewide or historic significance. Vissering pf. at 9.

163. The ISFSI will not be visible from the nearby Governor Hunt House, an historic site, and will be screened from the historic Vernon Grange Building. *Id.*

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65. WRC also asked us to find that the Windham Regional Plan contains policies that are clear, written community standards and that the proposed ISFSI conforms to them. WRC asserts that the "proposed facility is an additional industrial use of an existing industrial site, and the visual screening is proposed beyond anything the WRC had considered necessary." WRC Brief at 2. Since WRC itself finds that the Project meets its standards, we do not need to reach the issue of whether these standards represent the type of community standards that we would rely upon in evaluating aesthetic impacts.

**Rare & Irreplaceable Natural Areas and Necessary Wildlife Habitat [10 V.S.A. § 6086(a)(8), (8)(A)]**

164. The Project is within a previously developed zone within the Protected Area and will be located on a site presently covered with pavement, stone and grass. Marshall pf. at 3; Goodell pf. at 16; Vissering pf. at 8.

165. There are no known occurrences of necessary wildlife habitat, rare, threatened or endangered species or significant natural communities located in the Project area; therefore, there will be no impacts associated with the construction and operation of the Project to rare, threatened and endangered species and significant natural communities. Marshall pf. at 3–4; Goodell pf. at 15; Vissering pf. at 8; exh. Entergy-JG-6 (Letter from Everett Marshall); tr. 2/7/06 at 140 (Marshall).

**H. Consistency with Resource Selection/Integrated Resource Plans [30 V.S.A. § 248(b)(6)]**  
**Findings**

166. Entergy is a wholesale utility that does not distribute or transmit electricity to the public. Therefore, it is not obligated to prepare and submit for approval an integrated resource plan. Hoffman pf. at 31; *see also*, Order of 6/27/01 in Docket No. 6480, *Petition of Vermont Yankee Nuclear Power Corporation for a Certificate of Public Good to Construct a Bulk-Gas Storage Facility in Vernon, Vermont*, at 6.

**Discussion**

As the Board has found previously, Entergy is not required to submit an integrated resource plan pursuant to 30 V.S.A. § 218c.<sup>66</sup> Therefore, this criteria is not applicable.

**I. Consistency with Electric Plan [30 V.S.A. § 248(b)(7)]**

**Findings**

167. Approval of the dry fuel storage facility will enable Vermont Yankee to operate between 2008 and 2012, which should provide significant value to Vermont's electricity consumers and

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66. *See* Docket 6812, Order of 3/15/04 at 103.

will therefore conform to the state's electric energy plan. Tranen pf. at 4.

168. The power from Vermont Yankee, purchased under the PPA, will provide significant economic benefits to Vermont ratepayers. Lamont pf. at 4.

169. The price that Vermont electricity consumers pay for power is likely to be lower if Entergy VY's application is approved than would otherwise be the case. *Id.* at 5.

170. The Project conforms to the Department's Twenty Year electric plan because it provides economic benefits to Vermont ratepayers. Lamont pf. at 4.

171. Wholesale power prices have increased since the publication of the 2005 Vermont Electric Plan's forecast as a result of rising gas prices and the effects of two hurricanes. Lamont pf. at 2.

172. Vermont utilities should look to mitigate the risk associated with reliance on a unit contingent contract with Vermont Yankee for such a significant portion of the annual energy needs of the state. 20 Year Plan at 10–24.

### **Discussion**

30 V.S.A. §248(b)(7) requires that a project under consideration for a CPG (as is the dry fuel storage facility) be consistent with the principles of the Department's 20 Year Electric Plan ("20 Year Plan"), or that good cause exists to permit the proposed facility. The 20 Year Plan sets out Vermont's long-range goals for electric energy planning. The 20 Year Plan also provides guidance to Vermont utilities in Integrated Resource Planning, which encompasses the principles of least-cost planning.

The 20 Year Plan addresses dry fuel storage issues in general, and how those general issues affect Vermont Yankee. However, the 20 Year Plan does not advocate any specific action regarding dry fuel storage at Vermont Yankee. We find the Project to be consistent with the principles of the 20 Year Plan. It will provide economic benefits to Vermont in the form of the favorably priced PPA. In addition, we recognize that the Department has found that dry fuel

storage is consistent with the 20 Year Plan.<sup>67</sup>

Finally, the 20 Year Plan recommends finding alternatives to the unit-contingent Power Purchase Agreement between VYNPC and Entergy VY. The Project will have no effect on this criterion as the Project does not affect the PPA (although the Project is necessary to secure the benefits of the PPA).

#### **J. Outstanding Resource Waters [30 V.S.A. § 248(b)(8)]**

##### **Findings**

173. The Project is located on the Connecticut River, which has not been designated as an Outstanding Resource Water. In addition, there are no pending petitions to consider designating the Connecticut River as an Outstanding Resource Water. Vissering pf. at 9, 40–41; exh. Entergy-JEV-10.

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#### **K. Waste to Energy Facilities [30 V.S.A. § 248(b)(9)]**

174. The Project is not a municipal solid-waste-to-energy facility, and, therefore, this criterion is not applicable.

#### **L. Transmission [30 V.S.A. § 248(b)(10)]**

175. The Project can be served economically by existing or planned transmission facilities without undue adverse effect on Vermont utilities or customers. The Project will not change the transmission facilities required for Vermont Yankee. Hoffman pf. at 31.

#### **M. Adequate financial assurance [10 V.S.A. § 6522(b)(1)]**

##### **Findings**

176. In Docket 6545, Entergy provided multiple layers of financial assurance in order to demonstrate its suitability to own and operate Vermont Yankee, including its access to revenues

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67. "The Department has determined under 30 V.S.A. § 202(f) that the petition by Entergy VY pursuant to 30 V.S.A. § 248 for a CPG to construct a dry fuel storage facility at the VY Station is consistent with the Vermont Electric Plan 2005." Letter from Riley Allen, Department of Public Service, to John H. Marshall, Esq. (Sept. 23, 2005).

from the PPA, insurance, credit agreements from Entergy Corporation affiliates, and an Entergy Corporation guaranty. Thayer reb. pf. at 2–11; Docket 6545, Order of 6/13/2002.

177. In Docket 6545, the Board found that, due to, among other things, the financial assurances it provided, Entergy VY demonstrated that it would be able to operate safely and to maintain solvency during the extended period necessary to plan and execute a shutdown of Vermont Yankee, and to prepare for full access of decommissioning trust funds. Docket 6545, Order of 6/13/2002, at Finding 140.

178. Since the Docket 6545 investigation, the federal oversight of corporations like Entergy has changed in such a manner that they are able to provide, at their discretion, any number of guarantees similar to the guaranty that was litigated by the parties and examined by the Board in Docket No. 6545. Tr. 2/6/06 at 43–44 (Thayer); Thayer reb. pf. at 7–9.

179. In Docket 6545, the Board found that, serving as a "backstop" to the credit agreements between Entergy VY and the two Entergy affiliates, the \$60 million guaranty provided in that Docket ensured with substantial certainty that in the case of an unplanned outage and premature shutdown, Entergy VY would have access to an amount of funding that would correspond to approximately six months of Vermont Yankee's operating costs, and that this amount would be adequate to get Entergy VY to the point where it could access the decommissioning fund. Docket 6545, Order of 6/13/2002 at Findings 160, 161, 164.

180. In Docket 6545, the Board found that Entergy had access to credit agreements of up to \$70 million between itself and two Entergy affiliates: Entergy Global Investments, Inc. ("EGI") and Entergy International Holdings, Ltd., LLC ("EIHL"), holding companies and financing vehicles for Entergy affiliates that will provide lines of credit to Entergy VY to fund working capital and to provide further financial assurances. *Id.* at Finding 148; *see also* tr. 2/6/06 at 39–40 (Thayer).

181. In Docket 6545, the Board found that the primary purpose of the EIHL/Entergy VY credit agreement was to pay costs during a period between an unplanned, premature shutdown of the plant and the eventual access by Entergy VY of funds from the decommissioning trust. Docket 6545, Order of 6/13/2002 at Finding 154.

182. In Docket 6545, the Board found the credit agreement between EIHL and Entergy VY

was designed to remain in place until Entergy VY had access to at least twenty percent of the decommissioning trust fund. *Id.* at Finding 157.

183. In Docket 6545, the Board found that, in addition to the lines of credit, Entergy VY had been granted a further guaranty of \$60 million by Entergy Corporation. In the case of either line of credit being drawn upon, Entergy Corporation agreed to make up any deficiency up to a total of \$60 million. *Id.* at Finding 160.

184. In Docket 6545, the Board found that the Securities and Exchange Commission ("SEC") had issued an order placing a \$2 billion cap on the amount of Entergy Corporation parent guaranties that can be outstanding at any time. *Id.* at Finding 162.

185. The Board, in Docket 6545, found that, as of December 31, 2001, Entergy Corporation had outstanding guaranties for its affiliates in the range of \$488 million. *Id.* at Finding 163.

186. In 2005, Congress passed the Energy Policy Act of 2005, which, among other things, repealed the Public Utility Holding Company Act of 1935 ("PUHCA"). With the repeal of PUHCA, there are no longer any limits on holding company financial support for exempt wholesale generators or SEC review of such activity, oversight designed to protect against adverse impact on the financial integrity of the registered holding company system. *See generally* tr. 2/6/06 42–44 (Thayer); Public Law 109-58, 119 Stat. 594.

187. The regulatory mechanisms adopted by the Board in Docket No. 6545 were established to provide an on-going ability for the Department and Board to review and consider the financial-assurance issue as uncertain future events unfold. Thayer reb. pf. at 3–4, 7–11.

188. At the time of shutdown and the NRC's review of the decommissioning-trust funds, Entergy VY agreed in Docket 6545 to provide additional funds or other acceptable financial assurances as needed to ensure that funding would be sufficient to accomplish decommissioning, including site restoration and spent fuel management committed in this Docket. *Id.* at 8–9.

189. Entergy VY is able to obtain the benefit of financial assurance agreements or liquidity agreements if it chooses to pursue such agreements; Entergy VY regularly enters into such financial assurance agreements. Tr. 01/31/06 at 170 (Thayer).

190. Entergy VY has a demonstrated ability to secure additional sources of liquidity when required or as it deems necessary. *Id.* at 171 (Thayer).

### **The Decommissioning Fund**

191. In connection with its purchase of Vermont Yankee and the granting of a CPG to own and operate the station, Entergy VY agreed that it would include in decommissioning costs those costs associated with site restoration and spent-fuel management. Docket No. 6545, Order of 6/13/02 at 32, 82–83.

192. In Docket No. 6545, the Board determined that if the decommissioning-trust funds that Entergy maintains were insufficient to complete immediate decommissioning upon plant closure, Vermont Yankee could be placed in SAFSTOR to allow the funds to increase in value until sufficient funds exist and that such an approach would not expose the state to any unnecessary risk, because SAFSTOR is a safe alternative to immediate decommissioning. *Id.* at 32–33, 65.

193. The most recent decommissioning-cost study for Vermont Yankee was conducted by TLG Services, Inc. ("TLG"), in 2001. Cloutier reb. pf. at 5.

194. Using the 2001 decommissioning-cost study as a starting point, TLG looked at two cost-estimate scenarios for decommissioning Vermont Yankee and managing spent fuel until transfer of the fuel to DOE. *Id.* at 3–5.

195. The first scenario, the so-called "Delayed DECON" scenario, assumed that Vermont Yankee ceases operation in 2012 and is placed into safe-storage until a 2042 final pick-up date for the spent fuel consistent with Entergy VY's estimate. *Id.* at 4.

196. Under the Delayed DECON scenario, the total cost to decommission Vermont Yankee, restore the site and manage spent fuel until DOE removal is approximately \$708 million. *Id.* at 5–6.

197. The second scenario, the so-called "SAFSTOR" scenario, assumed a 2082 final pick-up date for the spent fuel consistent with the Department's estimate. Cloutier reb. pf. at 4.

198. Under the SAFSTOR scenario, the total cost to decommission Vermont Yankee, restore the site and manage spent fuel until DOE removal is approximately \$862 million. *Id.* at 6–7; exhs. Entergy-TLG-3 & Entergy-TLG-5.

199. Comparing these cost estimates to the most-recently-reported amounts in the decommissioning trust fund, rates of return of 5.9 percent and 5.6 percent, respectively, would be required to accomplish the Delayed DECON (2042) scenario and the SAFSTOR (2082) scenario.

Cloutier reb. pf. at 7–8; exhs. Entergy-TLG-2, Entergy-TLG-3 and Entergy-TLG-5; Thayer reb. pf. at 9.

200. Entergy VY is required to update its site-specific decommissioning study and submit the results to the Board and Department once every five years, with the first such update due on the fifth anniversary of Entergy's purchase of Vermont Yankee or July 31, 2007. Thayer sur. pf. at 8, 10.

201. During these proceedings, Entergy VY committed to completing the next site specific decommissioning study by December 31, 2006. Thayer reb. pf. at 10.

### **Assurance of Recovery of Damages in DOE Suit**

202. The DOE was contractually responsible to begin removing spent fuel from the Vermont Yankee site starting in 1999. DOE has failed to perform its duties under the Standard Contract, and the United States Court of Appeals for the Federal Circuit, among other courts, has determined that DOE has breached the Standard Contract and is liable for the costs of storing spent fuel past the time when DOE should have picked it up. Thayer reb. pf. at 4–5; *Maine Yankee Atomic Power Co. v. United States*, 225 F.3d 1336 (Fed. Cir. 2000).

203. Under the Standard Contract, DOE was required to commence disposing of commercially-generated spent nuclear fuel no later than January 31, 1998, in return for the payment of fees by utilities and others that have generated or held title to spent nuclear fuel. Thayer reb. pf. at 2; 42 U.S.C. § 10222 (a)(5)(B); 10 C.F.R. § 961.11, Art. II.

204. Entergy VY and its predecessor, VYNPC, have complied with the terms of the Standard Contract and as of the third quarter of 2005 have paid DOE approximately \$78 million in spent-fuel-disposal fees. Thayer reb. pf. at 5; exh. Entergy-JKT-3.

205. Entergy VY has in the past, and is currently, incurring costs for spent fuel management that are not being paid by the federal government. Sherman sur. pf. at 3–4.

206. Entergy VY is suing DOE for damages related to the breach of contract at Vermont Yankee. Sherman pf. at 13.

207. Initial decisions in a similar case from the Court of Federal Claims have included unfavorable aspects, such as authorizing damages less those than requested by utilities and

damages only in arrears and not prospectively. Sherman sur. pf. at 3–4.

208. Until a settlement or other agreement with DOE is in place for DOE to assume spent fuel management costs at Vermont Yankee for a time period reasonably expected to be necessary, the payment of these costs cannot be considered "assured" in the context of the financial assurance requirement. Sherman pf. at 14.

209. Entergy VY acknowledges the possibility that settlement of a litigation does not necessarily result in the full recovery of the costs stemming from a breach of contract. Tr. 01/31/06 at 132–133 (Thayer).

210. Section 6522(b)(1) requires a finding that adequate financial assurance exists "for the management of spent fuel at Vermont Yankee for a time period reasonably expected to be necessary, including through decommissioning, and for as long as it is located in the state." 10 V.S.A. § 6522(b)(1).

#### **Sufficiency of Funding Post Shut-Down**

211. The "time period reasonably expected to be necessary" for financial assurance of spent fuel management at Vermont Yankee is uncertain. Sherman pf. at 15.

212. There is no certainty as to the date on which DOE will begin to remove spent nuclear fuel from Vermont Yankee or the date on which removal will be complete. *See* Thayer reb. pf. at 6; Sherman pf. at 14–15; Resnikoff pf. at 11–12; Thompson sur. pf. at 39.

213. Entergy VY estimates, based in part on information provided by the DOE, that DOE will commence acceptance of spent nuclear fuel from Vermont Yankee in 2017. Thayer reb. pf. at 6; exh. Entergy-JKT-4.

214. Assuming a 2012 shutdown date for Vermont Yankee, and using DOE's 2004 Acceptance Priority Ranking as a guide, Entergy VY estimates that DOE will complete removal of Vermont Yankee spent fuel by 2042. Thayer reb. pf. at 6–7; exhs. Entergy-JKT-5 & Entergy-JKT-6.

215. While political and technical impediments exist for the opening of a national repository for permanent spent fuel storage, the likely short-term path is for the federal government to take ownership and begin movement of spent fuel to federally-controlled-and-consolidated, interim

storage sites within the next ten years. Tr. 2/1/06 at 97, 99–100 (Moniz); *see also* Moniz pf. at 12–13.

216. The "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. Moniz pf. at 13.

217. The use of seventy years of interim storage appears to be a reasonable measure of the "time period reasonably expected to be necessary." Sherman pf. at 15–16.

218. Entergy has demonstrated that the Vermont Yankee decommissioning fund would have sufficient money to manage spent fuel for the time period reasonably expected to be necessary. Cloutier reb. at 3 and 7; Sherman sur. pf. at 3.

## **Discussion**

In this section, we conclude that Entergy VY has not demonstrated that there exists adequate financial assurance for the management of spent fuel at Vermont Yankee. While we recognize that Entergy VY has in place multiple assurances that will contribute to the adequate management of the spent nuclear fuel that Entergy proposes to store at Vermont Yankee, we cannot find these, in total, to be adequate.

Entergy VY contends that federal law preempts state regulation of the financial capacity of a commercial nuclear operator to manage spent fuel storage.<sup>68</sup> We do not find its arguments compelling. Our action here, pursuant to 10 V.S.A. § 6522, is within the scope of the regulation which Congress has preserved to the states in the area of nuclear-powered generation.

In the following discussion, we first consider the preemption arguments submitted by Entergy and the Department, and then the adequacy of the proposed financial assurances.

### **1. Preemption**

Entergy argues that, notwithstanding the provisions of state law being applied in this case, *i.e.*, 30 V.S.A. § 248 or 10 V.S.A. § 6522, the NRC has "exclusive authority over

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68. Entergy VY Initial Brief at p. 42.

[commercial nuclear] plant construction and operation."<sup>69</sup> Entergy points out that the U.S. Supreme Court in *PG&E*, found that the NRC "was given exclusive jurisdiction to license the transfer, delivery, receipt, acquisition, possession and use of nuclear materials" and "[u]pon these subjects no role was left for the states."<sup>70</sup> Entergy more specifically argues that the NRC "directly regulates [Entergy VY's] financial ability to manage [spent fuel] located at Vermont Yankee."<sup>71</sup> Citing to *Maine Yankee Atomic Power Co. V. Bonse*y, Entergy VY states, "[i]ndeed, the only judicial decision to consider the question has concluded that federal law preempts state regulation of the financial capacity of a commercial nuclear operator to manage" spent fuel . . . . "<sup>72</sup>

The Department disagrees with Entergy VY, contending first that *Maine Yankee* dealt with a facility that had shut down, and not one – such as Vermont Yankee – which is still operational, and "is actively seeking to remain in operation for some time to come."<sup>73</sup> According to the Department, the legal analysis is different, and it is speculative to assert "that a legal analysis applied to a nuclear plant in decommissioning would necessarily apply with equal force to a nuclear plant that is actively seeking relicensing."<sup>74</sup> The "inactive/active facility" distinction is especially relevant, according to the Department, where Entergy VY attempts to support its preemption argument by invoking the Code of Federal Regulation on the issue of federal requirements for Entergy VY to demonstrate its financial qualifications as a licensee."<sup>75</sup> This regulation, the Department argues, contemplates a demonstration that Entergy VY must undertake either two years after permanent cessation of its operations or five years before expiration of its operating license – i.e, a plant that either has entered the decommissioning phase of its existence, as had the nuclear facility in the *Maine Yankee* case, or a plant that is within five years of license expiration. Neither deadline or showing, according to the Department, pertains to this proceeding.

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69. *PG&E*. See also fn. 16–21 and accompanying text.

70. 461 U.S. at 207 (emphasis added).

71. Entergy VY Initial Brief at 42.

72. 107 F. Supp. 2d. 47, 55 (D. Me. 2000) citations omitted (hereinafter *Maine Yankee*).

73. Department Reply Brief at 7.

74. *Id.*

75. *Id.* at 8, citing to Entergy VY Initial Brief at 42 (citing 10 C.F.R. §54(bb)).

The Department adds that its request of Entergy VY to provide additional financial assurance, is in no way an effort to somehow block Entergy's spent fuel storage plans.<sup>76</sup> "If anything," says the Department, "the proposed state action of seeking additional financial assurance complements the NRC's financial qualification process and "merely requires Entergy VY to do in fact what it in theory either has or shortly will represent to the NRC that it is capable of doing."<sup>77</sup>

Finally, according to the Department, Entergy has "made no showing in evidence or argument that the additional financial assurance condition urged by the Department has created "an irreconcilable conflict with the objectives of federal law, " or that "either the Legislature's promulgation of 10 V.S.A. § 6522(b)(1) or the Department's advocacy for additional financial assurances represents an attempt to "indirectly regulate in the field of spent nuclear fuel storage." The Department maintains that "no such showing is possible on this record."<sup>78</sup>

*PG&E* stands for the proposition that the Atomic Energy Act<sup>79</sup> preempts state jurisdiction as to the "radiological safety aspects involved in the construction or operation of a nuclear plant . . . ." However, as we noted above, the Court also held that "States retain their traditional responsibility in the field of regulating electrical utilities for determining questions of need, reliability, cost and other related state concerns."<sup>80</sup>

The *PG&E* Court explained, however, that even when a statute, such as the Atomic Energy Act, does not expressly preempt state authority, a scheme of federal regulation may be so pervasive as to make reasonable the inference that Congress left no room for states to supplement it.<sup>81</sup> Upon review of the Atomic Energy Act and its legislative history, the *PG&E* Court

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76. *Id.*

77. *Id.* citing to 10 C.F.R. § 54(bb).

78. *Id.* at 10.

79. Atomic Energy Act of 1954, §§ 1–320, 274(k), as amended, 42 U.S.C.A. §§ 2011–2286i, 2021(k).

80. *PG&E* at 205. Although *PG&E* considered the preemptive effect of Section 274 of the Atomic Energy Act, the Supreme Court interpreted Section 274(k) as a reflection of the general distinction between federal and state authority to regulate activities covered by the Atomic Energy Act, as amended.

81. *Id.* at 204. Congress can preempt state authority through either express terms of legislation or by enactment of a scheme of federal regulation that is "so pervasive as to make reasonable the inference that Congress left no room for the States to supplement it," or where an Act of Congress "touch[es] a field in which the federal interest is so dominant that the federal system will be assumed to preclude enforcement of state laws on the same subject." *Id.*

(continued...)

concluded that the federal government occupied the entire field of nuclear-safety concerns, although it does not displace states' traditional authority over "the need for additional generating capacity, the type of generating facilities to be licensed, land use, rate-making, and the like."<sup>82</sup>

The Court also indicated that state regulation is preempted where it actually conflicts with federal law, *i.e.*, in a case where compliance with both federal and state regulations is an impossibility, or when state regulations serve as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress.<sup>83</sup>

We are not convinced by Entergy's argument here that we are preempted from considering financial assurances as required by 30 V.S.A. § 6522(b)(1). That section requires us to conclude that:

Adequate financial assurance exists for the management of spent fuel at Vermont Yankee for a time period reasonably expected to be necessary, including through decommissioning, and for as long as it is located in the state.

This is not a matter for which the Atomic Energy Act has left no room for the states. Instead, this requirement falls squarely within the traditional economic and land use regulation reserved to the states. Like the economic considerations that led California to impose the moratorium on nuclear plants considered in *PG&E*, this requirement is designed to ensure that economic costs were not passed on to the state of Vermont. We also find it hard to understand the validity of a preemption argument where, as here, there has been such a failure by DOE to fulfill its statutory responsibilities to take ownership of and remove the spent nuclear fuel in a timely manner, with

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81. (...continued)  
citing *Rice v. Santa Fe Elevator Corp.*, 331 U.S. 218, 230 (1947).

82. *Id.* at 212–13. *PG&E* involved a California statute that imposed a moratorium on the construction of nuclear plants until a state administrative board "finds that there has been developed and the United States through its authorized agency has approved and there exists a demonstrated technology or means for the disposal of high level nuclear waste." *Id.* at 198. Upon a challenge by utility companies that, among other things, the state of California was preempted by the federal statutory scheme, the Court held first that the federal government has occupied the entire field of nuclear safety concerns, but also that the California statute was based on economic considerations, and thus fell within the broad responsibilities traditionally held by the states in the field of public utility regulation. *Id.* at 206.

83. *PG&E, supra*, at 204. Nonetheless, the Court found that there was no inherent conflict between an NRC decision that a plant's operation was safe and California's decision that its operation might not be economically wise, even though the state's decision was contrary to the Atomic Energy Act's goal of promoting nuclear energy. *Id.* at 218–19.

the result that the state of Vermont may need to absorb some risk.

Moreover, unlike the *Maine Yankee* decision cited by Entergy, we are not seeking assurances that may conflict with federal requirements. We are not concerned with a demonstration under 10 C.F.R. §54(bb) that Entergy VY presumably will have to undertake either two years after permanent cessation of its operations or five years before expiration of its operating license. Vermont Yankee has neither entered the decommissioning phase of its existence, (as was the case with Maine Yankee) nor is it within five years of license expiration. The Atomic Energy Act has been interpreted so as to preempt states from becoming involved in the field of nuclear safety, certainly. However, it cannot automatically be interpreted to preempt states from regulating land use or from measures states may undertake to ensure what a state considers acceptable land use.<sup>84</sup> The Vermont Yankee site has never been licensed for the storage of spent fuel. This is an entirely new use of the land in Vernon, Vermont, a use which the Vermont Legislature wants to be sure is, in the broadest sense, in the public good. The financial assurances do not relate solely to safety, but also to whether the project might have land use or financial implications for the state.

Nor would requiring Entergy VY to provide adequate assurances conflict with federal law by somehow blocking Entergy VY's plans or preparations for the storage of spent fuel. There has been no showing by Entergy VY that requiring it to provide financial assurances in this context creates an irreconcilable conflict with the objectives of federal law, or that "either the Legislature's promulgation of 10 V.S.A. § 6522(b)(1) or the Department's advocacy for additional financial assurances represents an attempt to 'indirectly regulate in the field of spent nuclear fuel storage.'"<sup>85</sup> As the Maine Yankee Court recognized: the "'mere exercise of [some form of] jurisdiction by the [defendants] does not create an irreconcilable conflict with the objectives of federal law.' . . . Perhaps the state's conduct of its administrative proceedings will reveal a transparent effort to exercise regulatory authority reserved to the federal government.

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84. See *Kerr-McGee v. City of West Chicago*, Nuclear Reg. Rep. P 20,515, 59 USLW 2243, 32 ERC 1095, 20 Env'tl. L. Rep. 21,369 (1990) (hereinafter *Kerr-McGee*).

85. Department Reply Brief at 8.

Perhaps not."<sup>86</sup> Similarly, in *Kerr-McGee v. City of West Chicago*, the U.S. Court of Appeals for the Seventh Circuit held, among other things, that the Atomic Energy Act did not preempt West Chicago's application of its erosion and sedimentation regulations to Kerr-McGee's on-site nuclear waste disposal project.<sup>87</sup> Even though erosion and sedimentation are mentioned in the federal regulations, the city's regulations did not directly interfere with the regulation of radiological hazards.<sup>88</sup>

We conclude that our consideration of financial assurances, as authorized by §6522(b)(1) falls well within the scope of regulation which Congress has been deemed to have preserved for "dual regulation" in the area of nuclear-powered electricity generation. A requirement to demonstrate adequate assurances need have no impact on decisions by Entergy VY regarding radiological safety.

## **2. Adequate Financial Assurances**

### **a. Positions of the Parties**

Entergy argues that adequate financial assurance exists for the management of Vermont Yankee's spent fuel for as long as the fuel is located in Vermont, and thus that the requirements of 10 V.S.A. § 6522(b)(1) are met. These multiple assurances, according to Entergy VY, above and beyond its corporate assets, will ensure that spent nuclear fuel will be adequately managed at Vermont Yankee. Entergy VY provides five reasons in support of its position.

First, according to Entergy VY, the U.S. DOE has responsibility for the ultimate disposal of the spent fuel created at Vermont Yankee. Second, Entergy VY states that Vermont Yankee's decommissioning-trust funds are sufficiently funded to accomplish decommissioning, site restoration and spent-fuel management based on reasonable assumptions regarding the implementation of SAFSTOR at Vermont Yankee and the investment growth of the funds. Third, Entergy argues that Vermont Yankee's decommissioning trust funds are sufficient to pay for management of spent nuclear fuel. Fourth, Entergy VY maintains that the mechanisms

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86. *Id.* at 56 (quoting *Kerr-McGee*).

87. *See Kerr-McGee*.

88. *Id.*

approved by the Board in Docket No. 6545 for reviewing Entergy VY's financial assurances provide an on-going opportunity for the Board to review spent-fuel-management-cost information "as the uncertain issues involving [spent nuclear fuel] disposal are resolved." Fifth, Entergy VY states that the NRC regulates the financial qualifications of companies that operate commercial nuclear power plants operators for as long as those companies are licensed and possess spent nuclear fuel. Finally, Entergy argues "there is no basis in the record or under present circumstances for the Board to require additional financial assurances at this time," and that Entergy VY thus meets the financial assurance requirement of 10 V.S.A. § 6522(b)(1).

The Department disagrees and argues that there exists a potential "gap" in the financial assurances provided by Entergy VY, and that a parental guaranty or other financial instrument would be appropriate here.<sup>89</sup> The Department further contends that there is no evidence in the record to support Entergy VY's assertion that such a requirement would create an unacceptable cost. The Department notes that Entergy VY witness Thayer indicated that such a requirement could have an immediate or a direct cost on the business, but that nowhere in the record is there any evidence that such a requirement would result in an "unacceptable cost" to the company. According to the Department, "the record evidence demonstrates that this Company regularly 'accepts' the cost of guarantees and letters of credit."<sup>90</sup>

Second, the Department refutes Entergy VY's contention that requiring additional assurances is an "unnecessary precaution"<sup>91</sup> The Department states that, while it is understandable that the company would want to minimize its costs of doing business:

the evidentiary record reflects the existence of the uncertainties and amply demonstrates both the necessity and advisability of this Board planning carefully for the possibility of unanticipated events coming to pass.<sup>92</sup>

Third, the Department contests Entergy's argument that there is no reasonable scenario under which "the liability or responsibility for the management of the VY station's spent fuel

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89. DPS Reply Brief at 6 citing to Sherman reb. pf. at 9.

90. *Id.* at 3 citing to exhs. DPS-Cross-3, DPS-Cross-4 and DPS-Cross-5.

91. *Id.* citing to Entergy Initial Brief at 28.

92. *Id.* at 4.

would fall on the state of Vermont or its citizens."<sup>93</sup> According to the Department:

Entergy VY's emphasis on fixing legal liability and responsibility is misplaced: until the federal government lives up to its liabilities and responsibilities, Vermont and its citizens are faced with the physical reality of living with the spent nuclear fuel on Entergy VY's premises.<sup>94</sup>

The Department contends that, regardless of who bears ultimate legal title, liability or responsibility, "the Board [should] do all it can in keeping with its legislative charge under 30 V.S.A. § 6522(b)(1) to ensure Entergy VY retains the financial resources to appropriately manage its spent fuel while it remains in Vermont . . . ."<sup>95</sup>

Not only does the Department disagree with Entergy VY as to the sufficiency of the level of existing assurances, the Department also disagrees as to the amount of time for which such assurances are necessary. It is Entergy VY's position that "the only question before the Board now arguably may be whether financial assurance exists for [spent nuclear fuel] management between the present date and the date that the DOE litigation is resolved."<sup>96</sup> The Department contends that there is a more significant gap, i.e., "a period of time within which the company was at risk for incurring expenses that needed to be funded."<sup>97</sup> The Department contends that there is no evidence as to when the DOE litigation will be resolved, or as to the ultimate level of financial redress that will be offered or settled upon by Entergy VY. "[M]eanwhile," according to the Department, "until a settlement occurs with the federal government and money changes hands, Entergy VY decidedly remains at risk for incurring expenses to manage its spent fuel that will need to be funded."<sup>98</sup> According to the Department, there is a solution for this:

a parental guaranty or other financial instrument could be of limited duration, standing in force only until such time as the federal government assumed payment for management of Vermont Yankee spent fuel.<sup>99</sup>

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93. *Id.* at 4-5 citing to Entergy VY Initial Brief at p. 28. *See also* Entergy VY's proposed finding #215.

94. *Id.* at 5.

95. *Id.*

96. *Id.* citing to Entergy Initial Brief at p. 30.

97. *Id.* citing to tr. 01/31/06 at 174-175 (Thayer).

98. *Id.* at 6.

99. *Id.*

b. The Need for Financial Assurances

In reviewing whether Entergy VY has provided adequate financial assurances under 30 V.S.A. § 6522(b)(1), the Board must be able to find that:

Adequate financial assurance exists for the management of spent fuel at Vermont Yankee for a time period reasonably expected to be necessary, including through decommissioning, and for as long as it is located in the state.

Section 6522(b)(1) provides little in the way of guidance as to what constitutes "adequate" in this context. According to the Department, an adequacy determination here would depend on the "reasonable exercise of the Board's discretion." The statute also appears to leave to the Board's determination exactly what an "assurance" might be. Apart from indicating that the Board must determine what constitutes an assurance and whether it is adequate, the plain language of section 6522(b)(1) indicates that the "duration" of the financial assurance extends from the time at which spent fuel needs to be managed, i.e., the time that a spent fuel facility is proposed for construction, to "as long as [spent fuel] is located in the state."

The evidence in this Docket suggests that Entergy VY's financial assurances can be placed into two categories: first, revenues associated with the decommissioning fund and second, revenues available through the various other assurances including those that the Board reviewed in Docket 6545 or through the sale of power. We consider the adequacy of each category below.

Entergy VY maintains two trust funds to pay for the decommissioning of Vermont Yankee after the plant's closure. Entergy VY has agreed that it would include in decommissioning all costs associated with site restoration and spent-fuel management. In Docket No. 6545, the Board determined that, if the decommissioning-trust funds were insufficient to complete immediate decommissioning upon plant closure, Vermont Yankee could be placed in SAFSTOR to allow the funds to increase in value until sufficient funds exist and that such an approach would not expose the state to any unnecessary risk, because SAFSTOR is a safe alternative to immediate decommissioning.

The most recent decommissioning-cost study for Vermont Yankee was conducted by TLG Services, Inc. ("TLG"), in 2001. Using the 2001 decommissioning-cost study as a starting

point, TLG looked at two cost-estimate scenarios for decommissioning Vermont Yankee and managing spent fuel until transfer of the spent fuel to DOE. TLG concluded, under both scenarios – DECON and SAFSTOR – that the decommissioning trust funds could be prudently managed to accomplish all the tasks associated with decommissioning of Vermont Yankee.

Under Section 6 of the Docket 6545 MOU, Entergy VY is required to update its site-specific decommissioning study and submit the results to the Board and Department once every five years, with the first such update due on the fifth anniversary of Entergy's purchase of Vermont Yankee or July 31, 2007. During these proceedings, Entergy VY committed to completing the next site specific decommissioning study by December 31, 2006. The Board has also established a process to review the financial status of the decommissioning trust fund.

We consider it reasonable to expect that the decommissioning fund, managed prudently, should be sufficient to accomplish decommissioning at Vermont Yankee, including meeting all costs associated with site restoration and spent-fuel management. We recognize that Entergy VY will be submitting a new decommissioning fund study in December of this year, and that Entergy VY can expect to revisit this issue then if necessary. However, we conclude that, on the basis of record evidence, from the period after the plant's closure at which time Vermont Yankee can access the full decommissioning funds, adequate financial assurance exists for the management of spent fuel at Vermont Yankee. As we explain below, with regard to the second category of revenues – those associated with the period before full access to the decommissioning funds which are supported by the various assurances, including those that the Board reviewed in Docket 6545 – we do not reach the same conclusion.

Entergy VY takes the position that there is no need to seek additional assurances, and that doing so would be an unnecessary precaution. However, the Department has established convincingly that there are shortcomings and uncertainties associated with Entergy VY's future financial adequacy.<sup>100</sup>

For instance, the outcome of Entergy VY's litigation with DOE can be relied upon with

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100. *E.g.*, when Entergy VY was asked in discovery in this Docket about how it would manage this financial assurance plan outlined in its testimony, Entergy responded that it was not prepared to set forth a detailed, comprehensive plan for administration of the financial assurance requested. Sherman sur. pf. at 7.

little certainty to supply adequate funding. Despite a Federal Court's finding that DOE breached its contract to remove spent fuel from Vermont Yankee, Entergy VY cannot be certain of the level of redress it will receive from DOE. The implications of the litigation over DOE's breach of contract appear to be far from settled.<sup>101</sup> Initial decisions in a similar case from the Court of Federal Claims have included unfavorable aspects, such as authorizing damages less than requested by utilities and damages only in arrears and not prospectively.<sup>102</sup> Thus, not only is it unclear how much Entergy VY will receive, there is also no indication as to when any damages will be awarded to Entergy VY.

Entergy VY has also indicated that, while the proceeds it expects to recover from the DOE litigation would be treated as one of its assets, this does not necessarily mean those funds would remain with Entergy VY indefinitely. For instance, Entergy VY could loan money to other Entergy entities.<sup>103</sup> Moreover, in the interim, Entergy VY can be expected to continue to incur costs for spent fuel management. Until a settlement or other agreement with DOE is in place that specifies an adequate amount and that reserves the funds for use in spent fuel management, the payment of these costs cannot be considered "assured" in the context of the financial assurance requirement we are seeking to establish here.

In addition to unsettled questions such as the overall time period necessary for Entergy VY to manage spent fuel at Vermont Yankee, or the details of the settlement and associated payment of damages from DOE, there have been changes in federal law that cause us to question whether the Entergy Corporation guaranty provided to Entergy VY and approved by the Board in Docket 6545, is sufficient to meet the requirements of Section 6522(b)(1).

Entergy VY takes the position that, in addition to the decommissioning trusts, the financial assurances reviewed by the Board in Docket 6545 constitute adequate financial assurance for the management of spent fuel at Vermont Yankee. Entergy VY has also argued

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101. See also Entergy Brief at 30, citing to *Indiana Michigan Power Co. v. United States*, 60 Fed. Cl. 639, 641 n.1 (2004) (noting that "[m]ore than sixty Spent Nuclear Fuel cases are pending in this court."), *aff'd* 422 F.3d 1369 (Fed. Cir. 2005); Thayer reb. pf. at 4

102. Sherman sur. pf. at 3–4.

103. Letter dated February 22, 2006, from Downs Rachlin & Martin PLLC to Susan M. Hudson re: Additional Responses to Record Requests During Technical Hearings, at 2.

that there "is no basis in the record for the Board to revisit its Docket No. 6545 Order in this Docket."<sup>104</sup> We see no reason to reopen this Docket. However, the issue before us is not whether to change that Order, but rather whether the financial assurances that we found adequate based upon the record in that case are adequate to meet the requirements of § 6522(b)(1), particularly in light of changing federal law. This is not a relitigation of the adequacy of assurances provided in Docket 6545. As we explain more fully below, we are trying to ensure the public good in a new context where circumstances we once found acceptable have changed.

In Docket 6545, the case in which the Board reviewed Entergy's purchase of Vermont Yankee and its request for a Certificate of Public Good, we relied on "multiple layers of assurance" as to its financial suitability to own and operate Vermont Yankee.<sup>105</sup> We found that Entergy VY would be able to

provide adequate guarantees that it will be able to operate safely and to maintain solvency during the extended period necessary to plan and execute a shutdown of Vermont Yankee, and to prepare for full access of decommissioning trust funds.<sup>106</sup>

We reached this conclusion because Entergy VY would have revenues available from the PPA, credit agreements from Entergy Corporation affiliates, and an Entergy Corporation guaranty<sup>107</sup>

In Docket 6545, the Board found that credit agreements of up to \$70 million would be established between Entergy VY and two Entergy affiliates: Entergy Global Investments, Inc. ("EGI") and Entergy International Holdings, Ltd., LLC ("EIHL"), holding companies and Entergy financing vehicles that would provide lines of credit to Entergy VY to fund working capital and to provide further financial assurances.<sup>108</sup> The primary purpose of the EIHL/Entergy VY credit agreement was to pay costs during a period between an unplanned, premature shutdown of the plant and the eventual access by Entergy VY of funds from the decommissioning trust.<sup>109</sup> The agreement was also designed to remain in place until Entergy VY had access to at least twenty

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104. Entergy VY Brief at 40.

105. Thayer reb. pf. at 2–11.

106. Docket 6545, Order of 6/13/2002, at Finding 140.

107. *Id.*

108. *Id.* at Finding 148.

109. *Id.* at Finding 154.

percent of the decommissioning trust fund.<sup>110</sup>

To buttress these two lines of credit, Entergy Corporation granted Entergy VY a further guaranty of \$60 million. In the case where either line of credit is drawn upon, Entergy Corporation agreed to make up any deficiency up to a total of \$60 million.<sup>111</sup> The Board found that the amount of \$60 million corresponded to approximately six months of Vermont Yankee's operating costs, and that this amount would be adequate to get Entergy VY to the point where it could access the decommissioning fund.<sup>112</sup> We also found that Entergy Corporation's guaranty would remain in place until Entergy VY had access to at least twenty percent of the decommissioning trust fund.<sup>113</sup>

Recognizing that Entergy was, in essence, self-insuring, the Board sought a better understanding as to the extent to which Entergy provided guarantees and the degree to which that practice was regulated. As to the soundness of this corporate guarantee, Entergy testified that the SEC had issued an order placing a \$2 billion cap on the amount of Entergy Corporation parent guaranties that could be outstanding at any time.<sup>114</sup> Further testimony established that, as of December 31, 2001, Entergy Corporation had outstanding guaranties for its affiliates in the range of \$488 million.<sup>115</sup>

Subsequent to our Docket 6545 investigation, in 2005, Congress passed the Energy Policy Act of 2005, which, among other things, repealed the Public Utility Holding Company Act of 1935 ("PUHCA"). With the repeal of PUHCA, there are no longer any limits on holding company financial support for exempt wholesale generators, or SEC review of such activity – oversight originally designed to protect against adverse impact on the financial integrity of the registered holding company system.

Entergy's \$60 million guaranty that we reviewed in Docket 6545 ensured with substantial

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110. *Id.* at Finding 157.

111. *Id.* at Finding 160.

112. *Id.* at Findings 139, 161.

113. *Id.* at Finding 164.

114. *Id.* at Finding 162.

115. *Id.* at Finding 163. In addition, Entergy VY agreed to notify the Board on a semi-annual basis of the amount of currently outstanding Entergy Corporation guaranties. *Id.* at Finding 165.

certainty that, in the case of an unplanned outage and premature shutdown, Entergy VY would have access to an amount of funding that would correspond to approximately six months of Vermont Yankee's operating costs. Serving as a "backstop" to the credit agreements between Entergy VY and the two Entergy affiliates, EGI and EIHL, this \$60 million, bounded by PUHCA limits on corporate guarantees and SEC oversight, provided what the Board concluded would be a demonstration of financial adequacy for Entergy VY to own and operate Vermont Yankee.

Today, while Entergy's \$60 million guaranty remains in place, the regulatory oversight and the SEC's finite guaranty limits no longer exist. Entergy's \$60 million guaranty is now part of a potentially unlimited pool of guarantees that Entergy may be providing its affiliates. Given these new circumstances, we conclude that Entergy VY cannot rely upon this \$60 million guaranty and, thus, has not demonstrated that adequate financial assurance exists for the management of spent fuel at Vermont Yankee for a time period reasonably expected to be necessary — in particular, the time period between shutdown and full access to the decommissioning fund.

Moreover, we should note that, not only have the oversight and limits associated with these practices been removed, but over the last year we have witnessed that natural disasters can create financial stress for utilities and other corporations. Such strains can undermine even the best intentioned financial plans and commitments. Coupled with the SEC's relaxation of limits on corporate guarantees, we cannot fully rely upon what we had once presumed was an assurance. Given these uncertainties, we cannot agree with Entergy VY's position that requiring further attention to these matters is an unnecessary precaution.

We conclude that, in order to make a finding under § 6522 that adequate financial assurances exist here, further assurance should be submitted by the Petitioners. We do not specifically prescribe the form of such assurances at this time. However, if they were in the form of a non-Entergy-affiliated, third-party instrument — such as a letter of credit or bond in the amount of the current Entergy Corporation guaranty — they would be sufficient to meet the statutory requirement. In the alternative, we would also find acceptable a methodology which would provide the same level of certainty as to the adequacy of the parental guarantees that PUHCA's limitation on the maximum amount of total parental guarantees had previously

provided.

**N. Commitments to remove all spent fuel [10 V.S.A. § 6522(b)(2)]**

**Findings**

219. Entergy VY is responsible for and committed to paying the cost of storing spent fuel at Vermont Yankee until such time as the DOE takes title to and responsibility for the fuel. Thayer pf. at 8.

220. Entergy VY has committed to use its commercial best efforts to ensure that high-level spent nuclear fuel stored at Vermont Yankee is removed from the site in a reasonable manner and as quickly as possible to an interim or permanent location outside of Vermont. Exh. Entergy-2 at 2 (§ 8); tr. 2/6/06 at 30–31, 75–76 (Thayer).

221. DOE is contractually responsible to begin removing spent fuel from the Vermont Yankee site starting in 1999, and has been found by federal court to be in breach of contract.<sup>116</sup> Sherman pf. at 14, 17.

222. Entergy VY estimates, based on information provided by DOE, that DOE will commence acceptance of spent nuclear fuel from Vermont Yankee in 2017. Thayer reb. pf. at 6; exh. Entergy-JKT-4; tr. 2/6/06 at 30–31 (Thayer); tr. 1/31/06 at 55 (Hoffman).

223. Under current schedules, Vermont Yankee is one of the earlier plants from which DOE will receive spent nuclear fuel. Tr. 2/6/06 at 30 (Thayer).

224. It is unlikely that spent nuclear fuel will be removed from nuclear plants according to the current schedule from DOE. It is reasonable to expect that spent fuel may remain on the Vermont Yankee site for fifty to seventy years. Sherman pf. at 15; tr. 2/10/06 at 118 (Sherman).

225. Entergy VY will continue to fulfill its agreement in the Docket 6545 MOU to remove the spent fuel from Vermont, subject to federal standards and off-site storage. Thayer pf. at 8.

226. It is possible that Entergy VY could exchange its position in the queue for removal of spent nuclear fuel, although there is not a trading market or procedure now and it is unknown whether DOE would permit such exchanges. Tr. 2/6/06 at 30–31 (Thayer).

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116. See also Findings 202, 219–210, 219, above.

**Discussion**

Section 6522(b)(2) of Title 10 requires that, prior to granting a CPG for a new or altered spent nuclear fuel facility, we must find that:

The applicant has made commitments to remove all spent fuel from Vermont to a federally certified long-term storage facility in a timely manner, consistent with applicable federal standards.

Both Entergy VY and the Department maintain that Entergy VY has met this standard. These parties cite Entergy VY's commitments under the MOU in this proceeding as well as its contractual commitments with the federal government. The Department also notes that this standard is met in part due to the statutory limitations set out in 10 V.S.A. § 6522 (c)(2) and (c)(4), which prohibit Entergy VY from storing fuel derived from operation after March 21, 2012, or from other locations.

NEC has argued that Entergy VY may have the ability to negotiate changes in the order in which DOE spent nuclear fuel is removed from nuclear sites. Accordingly, NEC asks that we adopt a condition that would require Entergy VY to obtain a CPG under Section 248 from the Board prior to exchanging its position in the DOE queue for spent fuel removal. WRC also asks us to adopt a condition prohibiting Entergy VY from exchanging its position on the DOE schedule unless Entergy VY can show that the change would be beneficial to Vermont.<sup>117</sup> Entergy VY opposes these conditions, arguing that Entergy VY's commitments adequately address the concerns raised by these parties. In addition, Entergy VY asserts that the Board is preempted from adopting such a condition.

We find that the commitments that Entergy VY has made both here and previously in Docket 6545 are adequate to ensure that it would meet the statutory requirements. Specifically, in the MOU between Entergy VY and the Department filed in this proceeding, Entergy VY commits to:

use its commercial best efforts to ensure that the high-level SNF [spent nuclear fuel] stored at the Station is removed from the site in a reasonable manner and as quickly as possible to an interim or permanent

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117. WRC Brief at 1.

location outside of Vermont.<sup>118</sup>

Entergy VY also has made contractual commitments with the federal government to remove the fuel. The DOE has developed a schedule for removal of the spent fuel, with fuel from older plants being taken first. Based upon this schedule, Entergy VY now anticipates that fuel from Vermont Yankee will be removed by the DOE beginning 2018.<sup>119</sup> For planning purposes, we greatly discount the likelihood that the DOE will adhere to this schedule — DOE has consistently failed to meet its obligations to take title to and remove spent nuclear fuel from Vermont Yankee and other nuclear power plants. Nonetheless, Entergy VY, by contracting with the DOE for such removal, has taken reasonable steps to meet its obligations to remove the fuel.

As noted by NEC and WRC, it is possible that Entergy VY could exchange its position on the DOE's schedule for removal of spent fuel to a federal repository, although at the present time, the DOE has not authorized any specific owner of a nuclear power plant to make such an exchange. The NRC also has not adopted a procedure under which such exchanges could occur.<sup>120</sup> In some cases, such an exchange could be beneficial for the state. For example, Entergy VY could delay the removal of some fuel in exchange for more rapid removal of all of the remaining spent fuel.<sup>121</sup> In other instances, the exchange could prolong the period at which spent nuclear fuel remains at Vermont Yankee, even though it may be commercially reasonable for Entergy VY to make such an exchange. Entergy VY is part of a larger corporation that owns many nuclear plants; it may prove to be in the best financial interest of the corporation as a whole to conduct exchanges, even though the result may lead to longer storage of spent fuel in the state of Vermont.

We share the concern raised by NEC and WRC that Entergy VY's financial interest may create an incentive to exchange its position on the DOE's schedule in a way that may not be beneficial to Vermont. We do not, however, find a need to adopt the condition urged by NEC and WRC. As noted, Entergy VY has already committed to use its commercial best efforts to remove the spent nuclear fuel "in a reasonable manner." More importantly, as Entergy VY

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118. Exh. Entergy-2 at 2.

119. Tr. 2/6/06 at 30–31 (Thayer).

120. *Id.* at 30–31 (Thayer).

121. *Id.* at 30–32 (Thayer).

stressed in its Briefs, Entergy VY previously committed in the Docket 6545 MOU to remove the spent nuclear fuel "as quickly as possible."<sup>122</sup> A delay in the removal of spent nuclear fuel arising from an exchange of positions is unlikely to meet this latter standard — one which Entergy VY voluntarily agreed to. Thus, if Entergy VY wanted to exchange positions in the DOE queue so that the fuel was not removed as quickly as possible, it already would need to request that the Board allow this deviation from its previous commitment.

Finally, we are not persuaded that 10 V.S.A. § 6522(c)(2) and (4), cited by the Department, help to meet the statutory standard for timely removal of spent fuel. These sections limit the accumulation of spent nuclear fuel at Vermont Yankee to the spent fuel derived during the current operating license, which expires March 21, 2012. They are silent, however, on the removal of spent nuclear fuel.

#### **O. Spent fuel management plan [10 V.S.A. § 6522(b)(3)]**

##### **Findings**

227. Entergy provided a draft spent fuel management plan as part of its petition in this proceeding. Exh. Entergy-3.

228. The Spent Fuel Management Plan describes the Project and the operating procedures for the dry fuel storage facility. Exh. Entergy-3 at 2–3.

229. The Plan describes the procedures for transfer of the high-level spent nuclear fuel and closure. Entergy VY plans to remove the spent nuclear fuel to a federal repository. To facilitate this transfer, Entergy VY plans to construct a cask transfer facility at some later date. Entergy VY states that it will follow federally-mandated decommissioning procedures. Exh. Entergy-3 at 3–4.

230. When Vermont Yankee shuts down in 2012 or at some later date, Entergy VY will need to construct a separate dry fuel storage pad that may need to hold from 60 to 80 casks depending on the DOE schedule for spent nuclear fuel removal. Hoffman pf. at 24–25; tr. 1/31/06 at 89 (Hoffman); tr. 2/10/06 at 101 (Sherman).

231. The Spent Fuel Management Plan should be amended at the time of shutdown to take

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122. Entergy VY Brief at 43–44; Entergy VY Reply Brief at 16–17.

into account the separate dry fuel storage facility and other changed circumstances, including updated information regarding the DOE's removal schedule for spent fuel from Vermont Yankee. 10 V.S.A. § 6522(a), (b)(3).

### **Discussion**

Section 6522(b)(3) of Title 10 requires that, prior to granting a CPG for a new or altered spent nuclear fuel facility, we must find that:

The applicant has developed and will implement a spent fuel management plan that will facilitate the eventual removal of those wastes in an efficient manner.

Entergy VY has prepared a draft Plan that describes its spent fuel management and removal plans. In large part, Entergy VY's Plan will rely upon the Project to meet its responsibilities. The Plan also describes the procedure for removal of the spent fuel to a federal repository.<sup>123</sup> Finally, the Plan briefly states that Entergy VY will decommission the facility in compliance with federal requirements.

NEC and CAN raise several concerns with Entergy VY's Plan. First, CAN faults the Plan for using too short a time horizon; according to CAN, it is unlikely that the federal government will remove the spent fuel from Vermont Yankee according to the present DOE schedule. Second, both CAN and NEC argue that Entergy VY did not adequately consider alternatives to the Project. In particular, CAN contends that Entergy VY should have taken steps to avoid terrorist attacks that could breach the dry casks. These include the installation of a berm around the ISFSI pad, use of underground or hardened storage, or relocation of the pad to a different location on the site.<sup>124</sup> Third, CAN maintains that the Plan does not consider a reduction in the density of fuel rods in the spent fuel pool, through the use of additional dry casks.<sup>125</sup> Finally, CAN contends that the Plan should require that Entergy keep on-site all of the necessary

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123. Exh. Entergy-3 at 3–4.

124. We have addressed NEC's and CAN's concerns about the alternatives to the Project in Part VI.B., above, finding that Entergy VY's proposal is reasonable. We do not need to revisit them here.

125. WRC asks us to adopt a similar condition. WRC Brief at 1–2.

equipment for handling the dry casks.<sup>126</sup>

Entergy VY maintains that its Plan is reasonable and meets the statutory standard. Entergy VY asserts that the Board is, in large part, preempted from considering the recommendations put forth by CAN and NEC. According to Entergy VY, since these issues relate to spent nuclear fuel, they fall within the exclusive jurisdiction of the NRC. In addition, Entergy VY argues that its proposals are reasonable. Finally, Entergy VY has agreed to amend the Spent Fuel Management Plan to address the contingency that the spent nuclear fuel may remain on-site until 2082, recognizing that such a contingency is more appropriately addressed in the context of construction of the decommissioning dry fuel storage pad.<sup>127</sup>

The Department agrees with Entergy VY that the Plan is reasonable. As the Department's witness explained, Entergy VY now has limited options for spent fuel storage and removal available.<sup>128</sup>

We agree with CAN that Entergy VY's Spent Fuel Management Plan does not now incorporate an adequate planning horizon. The Plan is predicated on the assumption that the federal DOE will remove the spent fuel to a federal repository according to the present schedule, *i.e.*, beginning in 2018. Entergy VY itself acknowledged that it had not yet developed a plan for long-term storage of the spent nuclear fuel if Entergy VY is forced to keep it on-site for an extended period.<sup>129</sup> However, as the history of efforts to create a federal spent fuel repository has demonstrated, the assumption that a federal repository will be completed and that DOE will adhere to its current commitments is surrounded by significant uncertainty and cannot be relied upon in planning for the future.<sup>130</sup> In fact, Entergy VY is presently in litigation with the DOE seeking damages arising from DOE's past failures to meet fuel removal commitments.<sup>131</sup>

To address this concern, we will require that Entergy VY amend its Plan to address the

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126. CAN Brief at 13. WRC also supports adoption of a similar requirement, asking that we require that Entergy VY maintain all equipment necessary to load, handle and transport multi-purpose containers and casks and in operable condition at all times. WRC Brief at 1.

127. *See* tr. 2/10/06 at 101 (Sherman); tr. 2/6/06 at 9-11 (Thayer).

128. Tr. 2/10/06 at 115 (Sherman).

129. *See* tr. 1/31/06 at 69-71 (Hoffman).

130. *See* generally Thompson reb. pf. at 17-34.

131. *See* Findings 202, 219-210, 219, above. *See also* fn. 67, 101-67, 102, above and accompanying text.

possibility that the spent nuclear fuel will remain at the Vermont Yankee site through 2082. Entergy VY has agreed to this condition. Entergy VY should also amend the Plan to address its management of all the spent fuel, not only the rods that have been moved to dry casks.<sup>132</sup>

CAN also asks that we require Entergy VY to reduce the density of the spent fuel pool by moving more of the fuel rods into dry casks for storage on the ISFSI. WRC voiced a similar concern, asking that we require Entergy VY to optimize the transfer of spent nuclear fuel from the spent fuel pool to dry storage. The evidence here demonstrates that dry cask storage is a better storage option than is storage in the spent fuel pool.<sup>133</sup> Similarly, storage in a less-dense spent fuel pool configuration is also preferable.<sup>134</sup>

However, for two reasons, we decline to adopt the condition that CAN requests. First, we understand that the NRC is now evaluating the possibility of reducing the concentration of fuel rods in spent fuel pools at nuclear reactors.<sup>135</sup> Any action that we take may, as a result, conflict with the results of the NRC's evaluation. Considering the NRC's expertise with these materials, it is more reasonable to wait until its review process is complete. Second, the evidence shows that the proposed ISFSI may not have sufficient capacity to store both the incremental spent fuel generated through normal operation and the additional dry casks needed to store fuel off-loaded from the spent fuel pool in order to reduce density.<sup>136</sup>

If Entergy VY seeks to extend its operating license, this issue should be revisited. No party contested the fact that a reduction of the number of rods stored in the spent fuel pool was desirable. We would expect that the NRC would have completed additional analyses by that time, as well. Therefore, we will require that, if Entergy VY requests an extension of its CPG beyond March 21, 2012, the amended Spent Fuel Management Plan must address the possibility of reducing the number of fuel rods stored in the spent fuel pool. This analysis should also consider the possibility of constructing an additional ISFSI to accommodate the larger number of

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132. The statute refers to a plan to manage spent fuel. It does not differentiate between fuel stored in the spent fuel pool and that stored in dry casks.

133. Tr. 2/10/06 at 94–95 (Sherman)

134. Thompson pf. at 37; tr. 2/10/06 at 96 (Sherman)

135. Tr. 2/10/06 at 83–87, 94–96, 98–99 (Sherman).

136. Tr. 1/31/06 at 73–74 (Hoffman); tr. 2/6/06 at 34 (Thayer).

dry casks that would result.

We also do not adopt CAN's request that we require Entergy VY to amend the Spent Fuel Management Plan to specify that Entergy VY maintain a canister transporter on-site or WRC's broader request to maintain all equipment related to the dry casks. The evidence shows that Entergy VY will maintain the equipment necessary to move the MPCs on-site.<sup>137</sup> For example, Entergy VY will purchase a vertical-cask transporter specifically for use with the system deployed at Vermont Yankee.<sup>138</sup> The VCT will remain on-site and be available exclusively for use at Vermont Yankee.<sup>139</sup> In addition, Entergy VY has stated that one of the purposes of the second concrete pad is to store the MPC upender — the device used to lift and rotate MPCs.<sup>140</sup> Entergy VY has also committed to maintain on-site all equipment required by the NRC.<sup>141</sup> We find Entergy VY's current plans to retain certain equipment at the Vermont Yankee site and the further commitment to comply with federal requirements sufficient.

Finally, we note that Entergy VY's Spent Fuel Management Plan is not fully consistent with its prior commitments. Specifically, the Plan states that decommissioning will occur in compliance with federal requirements. In the Docket 6545 MOU, Entergy VY made additional commitments concerning decommissioning, including returning the site to greenfield conditions. The Plan should reflect these commitments.

#### **P. Compliance with memoranda of understanding [10 V.S.A. § 6522(b)(4)]**

##### **Findings**

232. Entergy VY is presently subject to the following additional MOUs with the State:

- Memorandum of Understanding among Entergy VY, VYNPC, CVPS, GMP, and the Department, dated March 4, 2002 ("Docket 6545 MOU") (This MOU is part of PSB Docket No. 6545 regarding the sale of Vermont Yankee to Entergy.)
- Memorandum of Understanding among Entergy VY, Entergy Nuclear Operations, Inc., and the Department, dated November 5, 2003 ("Docket 6812 MOU") (This

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137. Hoffman reb. pf. at 3.

138. Hoffman pf. at 7; tr. 1/31/06 at 47–48 (Hoffman).

139. Tr. 1/31/06 at 48 (Hoffman).

140. Hoffman pf. at 11.

141. Entergy VY Reply Brief at 8, 23.

MOU is part of PSB Docket No. 6812 regarding power uprate.)

- Memorandum of Understanding on Cooperation, Notification and Access Between Entergy VY and the Department for the Vermont Yankee Nuclear Power Station, dated July 30, 2002.

Sherman pf. at 12.

233. Most of the terms of the MOUs are prospective in nature and have conditions that are not yet applicable. Thayer pf. at 8–9.

234. 10 V.S.A. §6523 requires that the \$15,625,000 (in quarterly payments of \$625,000) under the MOU in this Docket, together with the payments made pursuant to the Docket 6812 MOU, shall be paid into the Vermont Clean Energy Development Fund, a fund to provide long-term benefits to Vermont's electricity consumers through the promotion of "cost-effective and environmentally sustainable electric power resources." Tranen pf. at 12–13, exh. Entergy-2 at ¶11.

235. Entergy VY will make quarterly payments of \$625,000 from Entergy VY to the Vermont Clean Energy Development Fund until March 21, 2012. The payments will be made whether Vermont Yankee operates or not. Exh. Entergy-2 at ¶11.

236. In addition to Entergy VY's commitment to make an initial contribution of \$200,000, Entergy VY will make payments when Vermont Yankee's output from uprate capacity is sold at prices that exceed a "strike price" defined in the Docket 6812 MOU.<sup>142</sup> Tranen pf. at 11.

237. Entergy VY is in substantial compliance with the memoranda of understanding entered between itself and the state, as required by 10 V.S.A. § 6522 (b)(4). *Id.*; Sherman pf. at 7–12, 17.

### **Discussion**

10 V.S.A. §6522(b)(4) provides that the Board shall find "[t]he applicant is in substantial compliance with any memoranda of understanding entered between the state and the applicant." Four MOUs, entered into by Entergy VY and the Department, are applicable to the requirements of Section 6522(b)(4): the Docket 6545 MOU; the Docket 6812 MOU; the MOU that was entered into on June 21, 2005, and filed in this Docket; and an MOU on Cooperation,

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142. The \$200,000 payment from Entergy VY to the state was made on April 5, 2006.

Notification and Access, also entered into in Docket 6545.

The Docket 6545 MOU provides that Entergy VY will allow VYNPC the right of first negotiation for the purchase of additional power from Vermont Yankee at the end of the Power Purchase Agreement or through the uprate of the facility. However, as a condition of the Ratepayer Protection Plan in Docket 6812, GMP and CVPS waived their rights to negotiate for 20 MW of uprate power.<sup>143</sup> To date, GMP and CVPS have elected not to purchase any additional uprate power.

The Docket 6545 MOU also contains provision regarding the sharing of excess funds should decommissioning be delayed. As that provision is entirely prospective, it is not immediately relevant to the requirements of 10 V.S.A. §6522(b)(4).

Also prospective in nature are provisions in the Docket 6545 MOU regarding sharing of excess revenue for ten years commencing on March 13, 2012. "Excess Revenue," according to the Docket 6545 MOU, is determined by comparison to a strike price, which is escalated by calculating a number of factors. We find that because compliance with 10 V.S.A. §6522(c) is expressly limited to the operation of Vermont Yankee until its licence expiration on March 21, 2012, the sharing provisions of the Docket 6545 MOU do not apply to our consideration here.

Similarly, several provisions of the Docket 6545 MOU address decommissioning reports and studies, which have been submitted by Entergy VY,<sup>144</sup> or will occur at such time as required by the NRC. Also, the use of excess funds on delayed decommissioning provisions, amendment to the Qualifying Decommissioning Trust Fund, and transfer of decommissioning funds of the Docket 6545 MOU were modified in Appendix D of the Docket 6545 final Order.

The Docket 6545 MOU also provides that Board approval will be required for any license renewal of Entergy VY's license to operate Vermont Yankee, and that the Board is not preempted by federal law in its jurisdiction over license renewal.<sup>145</sup> This provision is also prospective.

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143. See Docket 6812, Order of 3/15/04, at 49.

144. For example, in this case Entergy VY has agreed to accelerate its next decommissioning study. Thayer reb. pf. at 10.

145. The Docket 6545 MOU states: ("Each of VYNPS, CVPS, GMP, ENVY, and ENO expressly and irrevocably agrees: (a) that the Board has jurisdiction under current law to grant or deny approval of operation of the VYNPS beyond March 21, 2012; and (b) to waive any claim each may have that federal law preempts the

(continued...)

Finally, the Docket 6545 MOU codifies certain financial assurances, PPA provisions, and obligations that Entergy VY must use its commercial best efforts to ensure that the spent nuclear fuel is removed from the Vermont Yankee station "in a reasonable manner and as quickly as possible rather than stored at VYNPS"<sup>146</sup> – all requirements addressed elsewhere in this Order.

The Docket 6812 MOU codified a "Ratepayer Protection Proposal," requires that Entergy VY perform certain transmission upgrades, and allows for the installation of 125 horsepower fans in the cooling towers.<sup>147</sup> Additionally, the Docket 6812 MOU set out a payment schedule, by which Entergy VY would make payments to the state based on twenty percent of fifty percent of the weighted average price received by Entergy VY in excess of a scheduled strike price.<sup>148</sup> Entergy estimates this amount to be approximately \$5.2 million,<sup>149</sup> but this is an uncertain benefit. At this time, Entergy VY is in compliance with that provision.

The MOU dated June 21, 2005, obligates Entergy VY to take the specific actions:

- erect a wall on the north and east sides of the dry fuel storage pad;
- set the pad back at least 100 feet from the Connecticut River's 500-year floodplain;
- space casks to achieve maximum access;
- not construct inappropriate access roads;
- monitor cask temperature;
- not use corrosive or flammable chemicals for de-icing;
- not store waste generated outside Vermont on site;
- use its commercial best practices to remove spent fuel as quickly as possible;
- configure the spent fuel pool to surround high-decay-heat assemblies with low-decay-heat assemblies;
- pay \$15.6 million (in quarterly payments of \$625,000) to the Vermont Clean Energy

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145. (...continued)  
jurisdiction of the Board to take actions and impose the conditions agreed upon in this paragraph.." Exh. Entergy-2 at ¶12.

146. Docket 6545 MOU at para. 11.

147. The Board did not accept the settlement as it related to the cooling fans.

148. The Docket 6812 MOU established certain funds that would receive the proceeds under the MOU. The Board found that the use of these funds, instead, should be determined by the Legislature, which it did in 10 V.S.A. §6523.

149. Exh. BW-3.

Development Fund;

- not seek federal preemption (except where Entergy VY would not comply with NRC obligations); and
- accede to Vermont law to resolve any disputes of the MOU.<sup>150</sup>

The June 21, 2005, MOU obligates the Department to support Board approval of the MOU, but does not limit the Department's ability to investigate issues or advocate positions in the broader Board consideration of the dry fuel storage facility.

At the time of the evidentiary hearings, the remaining obligations under the June 21, 2005, MOU were prospective. Therefore, we conclude that to the extent Entergy VY can be compliant with the June 21, 2005, MOU, it is.

Finally, Entergy VY and the Department agreed in the Docket 6545 MOU that they would execute a Memorandum of Understanding on Cooperation, Notification and Access. Absent any evidence to the contrary, we accept the Department's assertion that Entergy VY is in compliance with that MOU and have no evidence to suggest otherwise.<sup>151</sup>

**Q. Conditions Required by 10 V.S.A. § 6522(c)**

Section 6522(c) of Title 10 sets out several conditions that must apply to any CPG issued by the Board for a spent nuclear fuel facility, such as that proposed by Entergy VY and considered herein. These include (1) limiting the storage to fuel generated by Vermont Yankee, (2) limiting the total amount of fuel stored to the amount derived from operation through the end of the current operating license, (3) specifying that the requirements that we adopt apply to future owners, and (4) stating that prior to operating past the end of the current operating license (March 21, 2012), the owners of a generation facility must obtain an additional CPG.

Our Order incorporates each of these conditions.

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150. Exh. Entergy-2.

151. Sherman pf. at 12.

## VII. CONCERNS OF THE PUBLIC

### Discussion

As we noted in Section IV, above, many members of the public submitted written comments, e-mails, phone calls, and attended or spoke at the public hearing. We have considered these comments, and here we address the five major topics raised.

- ***The economic benefits will not outweigh the risks or costs associated with storage of the fuel for a long time.***

In Section VI. F. above, we weighed the economic benefits and costs associated with the proposed dry fuel storage facility. In that analysis, we conclude that the economic benefits exceed the costs, primarily because of the tangible economic benefits of low-cost energy sold to Vermont utilities during the period from 2007 or 2008 to the end of Vermont Yankee's license in 2012, the payments Entergy VY will make directly to the state to the Clean Energy Development Fund, and tax payments. Equally important, however, is that we rely on the statutory requirement of 10 V.S.A. §6522(c), which ensures that the CPG for a dry fuel storage facility is limited to the amount of fuel derived from the operation of the facility up to, but not beyond, March 21, 2012, the end of the current operating license. Therefore, the long-term economic costs are not increased from those that would be incurred without dry fuel storage.

The evidence in this case does not demonstrate that dry fuel storage will result in greater economic risks to Vermonters. As we discussed in Section VI. F., the costs of dry cask storage are borne by Entergy VY, alone.

- ***Dry fuel storage is too dangerous in terms of vulnerability to natural or manmade disasters or the ravages of time.***

The evidence suggests that dry casks present a reliable means of fuel storage which have been used successfully for 20 years. Entergy VY has also agreed to put up a visual barrier, in order to lessen the vulnerability of the casks.

As we discussed in Sections VI. N., the uncontested evidence shows that dry casks represent a superior alternative to storage of spent fuel in the pool. The only currently available alternatives to dry fuel storage at this time present a greater vulnerability.

The risks posed by dry fuel storage are remote, and lessened further by the mitigating actions that will be taken by Entergy VY.

- ***Dry fuel storage should be tied to license expiration, immediate shutdown of the facility, or quick removal of the fuel.***

Future dry fuel storage will certainly be tied to any consideration of a possible license extension. 10 V.S.A. §6522(c) specifically draws this connection. The question of the immediate shutdown of Vermont Yankee is not under consideration here. No party has advocated for such closure in this proceeding or presented evidence that closure of Vermont Yankee would be in the best interests of the State of Vermont. Instead, this Docket involves the review of fuel storage options only. Regarding the quick removal of the spent fuel in the pool, we do not now require it, although we agree with the Department's recommendation that Entergy VY should move as much spent fuel as is practicable from the pool into casks, as quickly as possible. As we explained above, the NRC is now examining the possibility of reducing the amount of fuel in the spent fuel pool. We fully expect to revisit this issue if Entergy VY seeks an extension of its operating license. Finally, we note that the MOUs in this Docket and in Docket 6545 obligate Entergy VY to use its commercial best practices to remove spent fuel as quickly as possible from the Vermont Yankee site.

- ***Dry fuel storage technology has not been adequately proven, and the proposed dry fuel storage casks are inadequate for long-term storage.***

Dry fuel storage is currently in use at approximately half of the nuclear facilities nationwide, and has been used for 20 years. In addition, there are over 100 casks of the type that Entergy VY plans to use now functioning at eight nuclear plant sites in the United States.<sup>152</sup> The evidence shows that the technology is proven, and the type of cask chosen by Entergy VY is among the best currently available.

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152. Sherman pf. at 5.

- ***The Board should add conditions to any approval including the hardening of the site or construction of a berm.***

We discussed these concerns in Section VI. B. In summary, we do not find that fortifying the ISFSI is necessary, or that it would provide any additional security to the Vermont Yankee site as a whole. Regarding the suggested construction of a berm or other additional environmental protections, we conclude that a berm could not be feasibly sited to protect the proposed ISFSI. In addition, a berm would provide little or no environmental or security benefits.

### **VIII. CONCLUSION**

We find that the construction of a dry fuel storage facility at Vermont Yankee will promote the general good of the state. For the reasons we have set out above, we conclude that the project will have no undue adverse effects upon the environment and will cause no discernable increase in safety risks for the public. Moreover, the Project provides a significant economic benefit to the state of Vermont by allowing Vermont Yankee to continue to operate, and thereby enable participating Vermont utilities and their customers to receive favorably-priced power through March 21, 2012.

Our approval is not unconditional; Entergy VY must comply with a number of conditions specifically required by state law. Entergy VY also must provide additional financial assurances that the spent fuel can be managed during the period following closure of the facility but prior to full access to the decommissioning funds. Subject to these conditions (and others set out in this Order), we find that the Project meets the applicable statutory requirements.

To the extent the findings in this Order are inconsistent with any findings proposed by the parties, the parties' proposed findings are denied.

### **IX. ORDER**

IT IS HEREBY ORDERED, ADJUDGED AND DECREED by the Public Service Board of the State of Vermont that:

1. The construction of a dry fuel storage facility at the Vermont Yankee Nuclear Power Station ("Vermont Yankee") by Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear

Operations, Inc. (collectively "Entergy VY"), as proposed in Entergy VY's petition and supporting testimony and exhibits, will, subject to the conditions set out in this Order, promote the general good of the State of Vermont, in accordance with 30 V.S.A. § 248 and 10 V.S.A. § 6522, and a Certificate of Public Good to that effect shall be issued.

2. Entergy VY shall comply with the terms and conditions of the Memorandum of Understanding between Entergy VY and the Department of Public Service dated June 21, 2005.

3. Entergy VY shall submit additional financial assurances, consistent with this Order, to address the management of spent nuclear fuel at Vermont Yankee during the period after the facility is no longer operating until Entergy VY obtains full access to decommissioning funds.

4. The cumulative total amount of spent nuclear fuel stored at Vermont Yankee is limited to the amount derived from the operation of the facility up to, but not beyond, the end of the current operating license, March 21, 2012. This capacity may include on-site storage capacity to accommodate full core offload or any order or requirement of the Nuclear Regulatory Commission with respect to the fuel derived from these operations.

5. Entergy VY is authorized to store only spent nuclear fuel that is derived from the operation of Vermont Yankee. Entergy VY may not store spent nuclear fuel derived from any other source.

6. The Certificate of Public Good issued here applies to the Vermont Yankee Station, regardless of who owns the facility, and the conditions of the Certificate of Public Good and the requirements of this Order will apply to any future owner.

7. Compliance with the provisions of the Certificate of Public Good and this Order shall not confer any expectation or entitlement to continued operation of Vermont Yankee following the expiration of its current operating license on March 21, 2012. Before Entergy VY, its successors or assigns, may operate the facility beyond that date, the owners must first obtain a Certificate of Public Good from the Board under Title 30.

8. Entergy VY shall perform and file with the Board a study addressing the stability of the bank adjacent to the proposed storage pad based upon the assumption that the Connecticut River experiences the probable maximum flood, and an avulsion occurs at Vernon Neck.

9. Entergy VY shall undertake a new study of decommissioning costs for Vermont Yankee,

and by the end of 2006, it shall file the study with the Board as well as evidence demonstrating Entergy VY's financial ability to store spent-nuclear fuel at Vermont Yankee through decommissioning based on the assumption that decommissioning will not be completed until 2082.

10. Entergy VY shall revise its Spent Fuel Management Plan to address Entergy VY's plans for storage of the spent nuclear fuel on-site if the federal Department of Energy does not remove the fuel under its current schedule. The revised Plan should, at a minimum, consider storage through 2082. In addition, the Plan should be revised to reflect the commitments Entergy VY previously made concerning site decommissioning. Entergy VY shall submit the revised Plan within 60 days of this Order.

Dated at Montpelier, Vermont, this 26<sup>th</sup> day of April, 2006.

_____ )	
_____ )	PUBLIC SERVICE
_____ )	
s/David C. Coen _____ )	BOARD
_____ )	
_____ )	OF VERMONT
s/John D. Burke _____ )	

OFFICE OF THE CLERK

FILED: April 26, 2006

ATTEST: s/Judith C. Whitney  
Deputy Clerk of the Board

*NOTICE TO READERS: This decision is subject to revision of technical errors. Readers are requested to notify the Clerk of the Board (by e-mail, telephone, or in writing) of any apparent errors, in order that any necessary corrections may be made. (E-mail address: Clerk@psb.state.vt.us)*

*Appeal of this decision to the Supreme Court of Vermont must be filed with the Clerk of the Board within thirty days. Appeal will not stay the effect of this Order, absent further Order by this Board or appropriate action by the Supreme Court of Vermont. Motions for reconsideration or stay, if any, must be filed with the Clerk of the Board within ten days of the date of this decision and order.*