STATE OF VERMONT
PUBLIC SERVICE BOARD

Petition of Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc., For a Certificate of Public Good Pursuant to 30 V.S.A. § 248 and 10 V.S.A. § 6522 to Construct a Second Independent Spent Fuel Storage Installation ("ISFSI") at the Vermont Yankee Nuclear Power Station	)))))))	PSB Docket No.

PREFILED TESTIMONY AND EXHIBITS OF GEORGE THOMAS

Mr. Thomas, the Senior Project Manager for Entergy VY responsible for this Project, provides an overview of the proposed Project, explains the need for it, describes the alternatives to the Project that Entergy VY considered, and explains how the Project relates to Entergy VY's spent fuel management plan.

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Q1. Please state your name, occupation and business address.

A1. My name is George Thomas. I am employed by Entergy Nuclear Operations, Inc., as a Senior Project Manager. My business address is P.O. Box 250, 320 Governor Hunt Road, Vernon, Vermont 05354. A copy of my resume is provided with my testimony as Exhibit EN-GT-1.

Q2. Please describe your educational background and professional experience.

A2. I have held numerous operational, management, engineering and consulting positions in the nuclear energy industry. From 1973 to 1977, I was the Assistant Plant Superintendent at Vermont Yankee Nuclear Power Station (to which I refer to as the "VY Station") and held a Senior Operator License for Vermont Yankee. Between 1977 and 1989, I was responsible for the startup, operation and operational support of Seabrook Station and served as Vice President, Nuclear Production, for the Public Service Company of New Hampshire for seven years. After working for Duquesne Light Company, New York

Power Authority and in private consulting, I became an employee of Entergy Nuclear Operations in 2000. I have been a Senior Project Manager for Entergy Nuclear Operations since 2002. I hold a Bachelor of Science in Mechanical Engineering from the University of Massachusetts, a Master of Science in Mechanical Engineering from Northeastern University, and a Masters in Business Administration from Robert Morris College.

Q3. Have you previously testified before the Vermont Public Service Board on behalf of Entergy VY?

A3. Yes. I provided testimony in the following dockets:

- Docket 7862 (Amended Petition for Amendment of Certificate of Public Good);
- Docket 7964 (Install a Diesel-Driven Station Blackout Electric Generator);
- Docket 6923 (Modifications To Transmission Facilities in Conjunction With the VY Station's Proposed Power Uprate);
- Docket 7015 (Installation of Three Banks of Capacitors and Associated Equipment at the VY Station); and
- Docket 6812A (Resolution of Ratepayer Protection Plan Dispute re: June/July 2004 VY Station Outage).

Q4. What is your role with respect to Entergy VY's proposed construction of the Project?

A4. I am the Project Manager responsible for managing the engineering and construction schedule and cost aspects of Entergy VY's proposed second dry fuel, or Independent

Spent Fuel Storage Installation (or "ISFSI"), storage pad, to which I will refer to as the "Second ISFSI" or the "Project."

Q5. What is the purpose of your testimony?

A5. My testimony will first explain the need for the Project and how it relates to Entergy VY's spent fuel management plan. I will then provide an overview of the Project, including a description of the technology that will be used for dry cask storage, the location of the Second ISFSI storage pad, the proposed modifications to the VY Station equipment and facilities that will be installed to support the Second ISFSI storage pad, and the construction process. Finally, I will describe the alternatives to the Project that Entergy VY considered.

Project Overview

Q6. What is the purpose of the Second ISFSI storage pad?

A6. The VY Station has an existing ISFSI pad that was approved by the Board in Docket 7082 on April 26, 2006, and installed at the VY Station in 2007. Entergy VY is seeking authorization to construct a Second ISFSI storage pad at the VY Station. The Second ISFSI storage pad is necessary for Entergy VY to store, together with the existing ISFSI storage pad, all the spent nuclear fuel at the VY Station site in dry-cask storage containers following permanent shutdown of the VY Station in the fourth quarter of 2014. In addition, the pad will allow storage of up to three casks of greater than Class C waste. Greater than Class C waste consists of non-fuel, low-level radioactive waste that the

Nuclear Regulatory Commission (or "NRC") considers not generally acceptable for near-surface disposal.

Entergy VY cannot fully decommission the VY Station until all spent fuel has been removed from the spent fuel pool. Consistent with normal practice, Entergy VY intends to keep spent fuel in the spent fuel pool for approximately five years after ceasing operation, allowing the spent fuel to cool before it is transferred to dry-cask storage. As currently planned, Entergy VY expects to transfer spent fuel from the spent fuel pool to dry-cask storage during two loading campaigns, one in 2019 and a second in 2020.

Q7. Is the Second ISFSI storage pad part of Entergy VY's Spent Fuel Management Plan?

A7. Yes. Following the Board's order in Docket 7082, Entergy VY prepared and filed with the Board a Spent Fuel Management Plan pursuant to the requirements of 10 V.S.A. § 6522(b)(3). The plan was most recently revised on June 26, 2014. A copy of the current Spent Fuel Management Plan is sponsored with my testimony as Exhibit EN-GT-2. The current Spent Fuel Management Plan is to off-load the core from the reactor vessel to the spent fuel pool shortly after the reactor has been shut down. After the core offload is complete, the spent fuel assemblies will be stored in the spent fuel pool racks until loaded into dry casks. In the absence of Department of Energy (or "DOE") performance of spent fuel acceptance, the current plan is for two dry-cask-loading campaigns – one in 2019 and one in 2020 – which will move all the fuel from the spent fuel pool to dry cask storage. Construction of the Second ISFSI storage pad must be completed before the loading campaigns in order to move all the fuel at the VY Station into dry storage. Once

the final loading campaign has been completed, Entergy VY expects to reduce the protected area to the area surrounding the ISFSI storage pads to reduce the security costs that will be funded from the decommissioning trust.

Q8. Please describe the Project, including the location of the Second ISFSI storage pad, the major components of its installation and related modifications at the VY Station.

A8. The Project primarily involves the construction of a second, highly-engineered concrete storage pad located approximately 30 feet immediately to the west of the existing ISFSI storage pad. As currently planned, the Second ISFSI storage pad will be approximately 93 feet by 76 feet.

To allow fuel storage casks to be moved onto the pads, the current plan calls for the existing ISFSI storage pad west ramp to be removed, a new 93 foot long apron to be installed on the south side of the second pad, and a 30 foot long connector to be installed between the pads' aprons. A new west ramp will also be installed. The site plan for the Project, prepared by SVE Associates, includes a depiction of the proposed Second ISFSI storage pad, apron and connector. John Goodell of SVE Associates sponsors a copy of the site plan with his testimony as Exhibit EN-JG-2. The engineering calculations associated with the seismic response of the Second ISFSI storage pad are being finalized at the time of this testimony submittal. The possibility exists that the location of the pad may have to be adjusted somewhat based on the calculations. If the location of the pad is adjusted, Entergy VY will provide an amended site plan and explain the revisions.

The proposed location for the Second ISFSI storage pad is currently occupied by the North Warehouse and a 175 kW diesel generator. Installation of the Second ISFSI storage pad requires removal of those facilities. The contents of the North Warehouse will be relocated, and the structure and its foundation and footings will be removed. The 175 kW diesel generator and its underground fuel storage tank will also be removed. A new 200 kW diesel generator with an approximately 1,250 gallon above-ground fuel storage tank will be installed. The diesel generator will be mounted in a metal enclosure/foundation base measuring approximately 12 feet wide by 35 feet long by 12 feet high and will have a ventilation hood with an approximately five foot overhang installed along the south side of the enclosure. The new 200 kW diesel generator is proposed for a location in the northwest corner of the Protected Area, as shown in the locational site plan sponsored by John Goodell as Exhibit EN-JG-3.

All of the construction activities associated with the Project will be located inside of the VY Station's Protected Area, except for the temporary storage of construction material prior to use as well as long-term storage of any excess excavated soil, which will be located in the Owner Controlled Area.

I will discuss each of the Project components in more detail later in my testimony.

Q9. Does Entergy VY plan to use the dry-cask system currently in use at the VY Station in connection with the Second ISFSI storage pad?

A9. Yes. Entergy VY plans to continue using the same Holtec HI-STORM 100 system that was previously approved by the Board for dry-cask storage of spent fuel on site. As

discussed in Docket 7082, the basic design of the Holtec HI-STORM 100 dry-cask storage equipment includes the following:

i. Multi-purpose canisters (or "MPC") into which the spent fuel assemblies are loaded; after the fuel assemblies have been loaded, the MPC is filled with helium, sealed and tested to confirm that the MPC is leak tight in accordance with ASME pressure vessel standards;

ii. The transfer container or "HI-TRAC" that is used during transfer of the MPC within the Reactor Building;

iii. HI-STORM 100S storage overpacks (large steel cylindrical structures) that contain high-density concrete for shielding and ventilation openings for cooling of the MPC; a loaded MPC is transferred from the HI-TRAC into the HI-STORM inside the Reactor Building; and

iv. The ISFSI storage pad on which the HI-STORM overpacks are stored.

Entergy VY will be able to use the existing infrastructure in place at the VY Station when transferring spent fuel to the Second ISFSI storage pad. For instance, in connection with installation of the first ISFSI storage pad, Entergy VY modified the Reactor Building to support a specially-designed, roller-wheeled, low-profile-transfer-vehicle to transfer the MPC-loaded HI-STORM overpack from the Reactor Building to the Containment Access Building. The Containment Access Building was also replaced with a larger structure that allows movement of another piece of equipment called a vertical cask transporter (or "VCT"), which is used to lift the HI-STORM overpack and

transport it from the Containment Access Building to the ISFSI storage pad. Entergy VY plans to continue utilizing these systems and equipment.

Q10. How many casks may be stored on the Second ISFSI storage pad?

A10. The Second ISFSI storage pad is sized for 25 cask spaces. Entergy VY has calculated that 58 casks will be required to hold all the spent nuclear fuel on the VY Station site following permanent shutdown of the facility in the fourth quarter of 2014. The existing pad has 40 cask spaces so there will be 65 total cask spaces with the addition of the Second ISFSI storage pad. A total of 4 spaces, accessible from the apron, must be kept open to allow for movement of casks on the ISFSI storage pad and access to each cask. Therefore, the total capacity will be 61 casks, sufficient to hold 58 casks of spent nuclear fuel and up to three casks containing greater than Class C waste. Entergy VY has not yet determined where it will place each cask or where the four open spaces will be located.

Q11. Please describe the existing condition of the site where the Second ISFSI storage pad will be located.

A11. The Second ISFSI storage pad will be located within the Protected Area, approximately 30 feet west of the existing ISFSI storage pad. The location has been previously disturbed and is currently developed. The site currently contains the North Warehouse, including a supporting foundation slab and frost wall, a building housing a 175 kW diesel generator, a fuel oil storage tank, and other underground utilities and stormwater piping.

Q12. Is the Project located in close proximity to the New England Central Railroad, the Vernon hydroelectric station, or the Vernon Substation?

A12. No. The Project is located within the Protected Area and is not in close proximity to the New England Central Railroad line, the Vernon hydroelectric station or the Vernon Substation. The Project is roughly 2,340 feet away from the New England Central Railroad line (at its closest point) and 2,900 feet from the Vernon hydroelectric station. The Project is approximately 1,077 feet from the Vernon Substation at its closest point.

Q13. Given the location of the Second ISFSI storage pad and the amount of spent fuel that will be stored there, will Entergy VY comply with the Vermont Department of Health's Radiological Health Rule after all spent fuel is moved to dry storage?

A13. Yes. Once all spent fuel has been loaded on the pads, Entergy VY expects the site boundary dose to be less than 11.6 millirem per year. This will comply with Vermont's Radiological Health Rule.

Q14. What site modifications will be required to support the Second ISFSI storage pad?

A14. Installation of the Second ISFSI storage pad will require the following modifications:

- Relocate underground utilities and storm-water piping in the location of the proposed Second ISFSI storage pad;

- Remove the North Warehouse (including foundation slab and frost wall) and the 175 kW diesel generator and its underground fuel oil storage tank;

- Remove the existing ISFSI pad west ramp, install a new apron, including a 30 foot long connector to the existing pad apron, and install a new west ramp;

- Install a highly-engineered 93’ x 76’ ISFSI storage pad; and

- Install a new 200 kW diesel generator and above-ground fuel oil storage tank with a capacity of approximately 1,250 gallons.

Q15. Please describe the process for removing the underground utilities and storm water piping in the location of the proposed Second ISFSI storage pad.

A15. This process involves rerouting or disconnecting the electrical circuits that are powered by the electrical panels within the North Warehouse or connected to the existing 175 kW diesel generator and altering a section of storm water pipe that presently runs under the location of the proposed Second ISFSI storage pad.

Each of the existing electrical circuits will be evaluated as to whether the loads will be rerouted (e.g., security power supply) or disconnected (e.g., North Warehouse lighting). Each cable will be pulled back to the nearest unaffected electrical manhole or handhole and coiled and tagged. Future unused cables will be designated as “spare” cables. In addition, the electrical circuits under the road on the south side of the proposed location of the Second ISFSI storage pad will be rerouted.

With respect to the stormwater pipelines, a drain manhole and approximately 150 feet of stormwater pipe that presently run under the location of the proposed foundation pad will be removed. Two new drain manholes and approximately 115 feet of stormwater pipe will be installed to allow proper drainage of the area between the two

ISFSI storage pads and the area to the south of the proposed Second ISFSI storage pad. The VY Station's Individual Stormwater Permit will be modified to reflect the new storm water piping configuration, as explained in more detail by Mr. Goodell.

Q16. Please describe the process for preparing the North Warehouse for removal.

A16. Shortly after the VY Station has been shut down, the tools, material and equipment in the North Warehouse will be surveyed for radioactive contamination. Any tools, materials or equipment that are free of radioactive contamination will be released for reuse or disposal. Any tools, materials or equipment that are determined to be radiologically contaminated will be relocated to the Turbine Building. Once the tools, materials and equipment are removed from the warehouse, a radiation survey, a lead paint survey and an asbestos survey will be conducted of the building and the waste-oil burner located in the building. Areas requiring remediation will be identified and marked accordingly.

Entergy VY will follow the Vermont Department of Heath asbestos regulations as necessary during this process. During any remediation of asbestos, Entergy VY uses certified personnel to identify and handle asbestos and to complete remediation activities in strict conformance with Vermont Department of Health regulations.

Q17. Please describe the process for removal of the 175 kW diesel generator and associated underground storage tank.

A17. First, the diesel engine, fuel oil supply lines and transfer tank will be drained and removed. The diesel generator fluids will also be drained. Any remaining accessories

(e.g., batteries, panels, etc.) will be disconnected and removed from the enclosure. The enclosure building roof and walls will be disassembled. Then the diesel generator will be unbolted and removed from its foundation pad. Once this is complete, the foundation will be removed. The fuel oil storage tank will be pumped down and removed in accordance with the Vermont Underground Storage Tank Rules and the Vermont Underground Closure and Site Assessment Regulations. Prior to removing the existing fuel oil storage tank, all residual materials will be cleaned from the tank, and the tank will be rendered non-explosive by purging it with air and monitoring the concentration of explosive gases. Any soil or debris contaminated with petroleum products will be handled in accordance with the requirements of the Vermont Hazardous Waste Management Rules.

Q18. Will the 175 kW diesel generator be replaced with a new generator?

A18. Yes. Entergy VY will install a 200 kW diesel generator, with an above-ground fuel oil storage tank and an uninterruptible power supply with an associated battery bank to provide a backup source of power in case the off-site power source is unavailable. The equipment will be mounted in a metal enclosure located within the Protected Area. The size of the enclosure and foundation base is approximately 12 feet wide by 35 feet long by 12 feet high, and the enclosure will have a ventilation hood with an approximately 5 foot overhang installed along the south side of the enclosure. The enclosure will contain the 200 kW diesel generator in one compartment, and the uninterruptible power supply with associated battery bank and electrical panels in a second compartment. The above-

ground, fuel oil storage tank will have a capacity of approximately 1,250 gallons. The fuel tank will be surrounded by an approximately 1,400 gallon rupture basin which contains a leak detection switch to detect a fuel oil leak from the storage tank. The fuel oil storage tank and the rupture basin will be mounted within the foundation base which is located between the enclosure and the foundation pad.

The 200 kW diesel generator will be designed to supply backup power to the security equipment (cameras, detection systems, lights, computers, etc.) that monitors and controls the VY Station, as well as some other on-site loads. An existing 12.4 kV AC off-site power source that presently feeds the VY Station will be the primary power supply to these electrical loads.

In conjunction with the installation of the 200 kW diesel generator, approximately 150 feet of underground electrical duct bank will be installed in the Protected Area. This duct bank will contain the cables that connect the AC off-site power source and the diesel generator loads to the electrical panels within the enclosure.

This modification is being installed at this time to allow removal of the 175 kW diesel generator. Entergy VY is replacing the 175 kW diesel generator with a higher rated 200 kW diesel generator because the new generator will handle loads that will be required for the ISFSI complex that currently receive back-up power from two Station Emergency Diesel Generators on site. As currently planned, Entergy VY expects to take these two Emergency Diesel Generators out of service when no longer required to meet regulatory requirements. The new 200 kW diesel generator will replace them as the site backup power source for the required loads.

Q19. How often will the new 200 kW security diesel generator be operated?

A19. Once the 200 kW security diesel generator is placed into service, it will be operated approximately monthly to demonstrate its ability to start and provide power to its associated electrical loads. Otherwise, the 200 kW security diesel generator will only be operated as a backup source of power if off-site power is unavailable. Entergy VY estimates that the 200 kW security diesel generator will be operated less than 20 hours per year.

Q20. Does the Project, including the installation of the new 200 kW diesel generator, require any upgrades to transmission facilities?

A20. No. The Project will not require any changes to the transmission facilities connecting to the VY Station. The new 200 kW diesel generator will be used solely for on-site electricity consumption. Existing distribution service is sufficient to meet the loads related to the Project and no transmission upgrades are required.

Q21. Does the Project, including the generator, involve a waste to energy facility or produce electricity using woody biomass?

A21. No, it does not.

Q22. Please describe the Second ISFSI storage pad.

A22. The Second ISFSI storage pad may appear like a simple concrete slab, but it is actually a highly-engineered structure. The design of the proposed Second ISFSI storage pad will be similar to the presently installed pad and will fully comply with the requirements specified in the Holtec Final Safety Analysis Report, or "FSAR," in order to support the loaded overpacks weighing approximately 395,000 lbs. each. Prior to placing loaded dry fuel casks on the pad, Entergy VY must also prepare a site-specific evaluation or "72.212 report" under 10 C.F.R. Part 72 of the NRC regulations as part of the general-license process. Site-specific considerations addressed in the report, including seismic issues, fire and explosion hazards, flooding, snow and ice, and projectile objects, ensure the design, construction and operation of the ISFSI meet established safety requirements that are regulated by the NRC.

As I previously discussed, the pad will measure approximately 93 feet by 76 feet. The pad's dimensions are large enough for 25 cask spaces in a five by five arrangement.

Q23. How will the new ISFSI storage pad be connected with the existing ISFSI storage pad?

A23. The existing ISFSI pad storage pad currently has an elevated concrete apron at the same height as the pad with an access ramp on either end to allow the VCT to access the pad. The existing, west-facing ramp will be removed, and a new concrete apron and west facing ramp structure will be installed for the Second ISFSI storage pad to allow the VCT to access that pad. The design and dimensions of the apron and ramp for the Second ISFSI storage pad will be essentially similar to the west-facing apron and ramp presently installed for the existing pad. In addition, an approximately 30 foot long by 24 foot wide

concrete connecting structure (connector) will be installed between the existing apron and the proposed apron to allow the VCT to transit between the pads. The connector will be 24 feet wide, which is six feet narrower than the 30 foot wide aprons. The connector is set back six feet from the existing ISFSI storage pad to ensure that undermining of the existing pad or its compacted backfill does not occur during construction of the new connector.

Q24. Please describe the pad's construction process.

A24. All soil within the footprint of the pad will be excavated from the existing grade of 252 feet above mean sea level to five feet below grade. A leveling slab will be poured and the excavated area will be backfilled with an engineered backfill soil that is compacted to a finished grade of one foot below grade. The concrete pad will be a three foot thick monolithic structure containing steel rebar and concrete constructed during a continuous concrete pour. The finished elevation of the pad will be 254 feet above mean sea level which is the same elevation as the existing pad.

Q25. How will Entergy VY handle excavated soil?

A25. Soil will be monitored for radioactive contamination prior to being removed from the Protected Area. If the soil is determined to be radioactively contaminated, on-site storage and disposal will be done in conformance with the NRC's approved requirements for on-site disposal of slightly contaminated soil at the VY Station. Like other soil and silts that the NRC authorizes Entergy VY to store on site, the soils from excavation and

construction of the Project will be placed with the existing stored materials and covered with water-proof plastic tarps. The amount of radioactively contaminated soil that is spread on-site and shipped off-site for disposal has not been determined at this time, because the material must be characterized before a determination can be made about its permanent disposal location. Excavated soil that is determined not to be radioactively contaminated will be transported to the Overflow Parking Lot for storage and subject to erosion control measures. The soil will be evaluated for future use during site restoration activities.

Q26. Please describe the construction sequence for the Project.

A26. Following receipt of the CPG, excavation will begin concurrently on the 200 kW diesel generator enclosure foundation pad and the underground electrical duct bank. Once the foundation pad is complete, the foundation base and enclosure (including diesel generator, uninterruptible power supply/batteries and electrical panels) will be installed on the foundation pad, and the existing 12.4 kV off-site power source will be connected into the new diesel generator enclosure. At this point, the new diesel generator and uninterruptible power supply/battery system will be tested prior to the application of any plant loads. When the new diesel generator installation and testing are complete, each of the designated electrical loads will be disconnected from its present power panel, its cable rerouted to the enclosure, wired into the generator electrical panels and energized. When all the loads have been transferred and testing is complete, the 200 kW diesel generator will be placed into service.

In parallel with installation of the 200 kW diesel generator, disassembly of the North Warehouse will commence. Once the 200 kW diesel generator is placed into service, the 175 kW diesel generator will be disassembled. In both disassembly activities, equipment and material will be monitored for radioactive contamination prior to removal from the Protected Area and disposed of accordingly. Once the building structures have been removed, the building foundations and their footings will also be removed. If necessary, remediation of any soil affected by the 175 kW diesel generator fuel oil storage tank will be performed at this time.

Following completion of removal of the North Warehouse and the 175 kW diesel generator, the existing west access ramp will be removed, and the area that will contain the new ISFSI pad, apron, connector and west access ramp will be excavated to a depth of five feet below grade. In some areas, excavation to deeper depths will be required to remove and install storm-drain piping and associated storm-drain manholes. Once the storm-drain-piping modifications are complete, a leveling slab will be poured and the excavated area will be backfilled with compacted fill to a level of one foot below grade.

Next, concrete forms will be installed for the connector, the new apron and west access ramp. The rebar will be placed and dimensions verified. Once the concrete has been placed and set, the concrete forms will be removed. Preparations will then be made for pouring the Second ISFSI foundation pad. Again the concrete forms and rebar will be installed. When all the rebar has been placed, quality control checks will be performed to confirm the configuration and dimensions of the rebar placement. Once all the prerequisites have been satisfied, a continuous pour of the concrete pad will be

performed. Once the concrete has set for an adequate period of time, the forms will be removed.

Q27. How will construction vehicles, including cement trucks, access the site?

A27. Just as with the construction of the existing pad, construction vehicles will access the site by traveling along Route 142 and Governor Hunt Road.

Q28. Approximately how many truck trips will be required during construction?

A28. On the day that the concrete for the ISFSI storage pad is placed, approximately 85 concrete trucks will enter the VY Station. During the approximately two-week period that the apron, connector and ramp are poured, approximately 45 concrete trucks will enter the Station. During the remainder of construction, approximately 290 truckloads of material will be transported to or from the VY site, for a total of approximately 420 trucks.

Q29. What is the construction schedule?

A29. Construction is currently planned to start in mid-July 2015 and be completed prior to July 31, 2017.

Q30. What alternatives did Entergy VY consider for the Second ISFSI storage pad?

A30. Some form of spent fuel storage and management at the VY Station is necessary because the Department of Energy is not accepting spent fuel for off-site storage. Under Section

302(a)(5)(B) of the Nuclear Waste Policy Act, 42 U.S.C. § 10222(a)(5)(B), the DOE was required to commence disposing of commercially generated spent fuel no later than January 31, 1998, in return for the payment of fees by utilities and others that generated or held title to the spent fuel. DOE is under contract to pick up spent fuel but is currently in breach of this obligation.

In Docket 7082, the Board authorized the storage of 36 casks of spent fuel on the existing ISFSI storage pad until the fuel is removed by the DOE. When the Board approved the existing ISFSI, Entergy VY indicated that an additional storage pad would be needed after the VY Station ceased operation. While there will be an ISFSI with 36 casks on site whether or not the Second ISFSI storage pad is built, Entergy VY has nonetheless considered several alternatives to the current proposal for the Second ISFSI storage pad.

Spent fuel pool storage: Keeping the spent fuel in the spent fuel pool is not a substitute for constructing a Second ISFSI storage pad because the VY Station cannot be fully decommissioned until all spent fuel has been removed from the spent fuel pool and it is not known at this time when the DOE will accept spent fuel for permanent off-site storage in quantities sufficient for the removal of all spent fuel from the spent fuel pool. Further, keeping the VY Station's spent fuel pool operating would require Entergy VY to incur significant personnel and other operating expenses that Entergy VY would be seeking to fund from the plant's nuclear decommissioning trust prior to the completion of decommissioning. This draw from the fund would slow growth of the trust balance and would delay the time when major decommissioning activities could begin.

Underground dry cask storage: Entergy VY considered the Holtec HI-STORM 100U, an underground storage design by Holtec that was licensed by the NRC in December of 2009. Entergy VY's review of the HI-STORM 100U system determined that it would be significantly more difficult and substantially more expensive to install as compared to the above ground HI-STORM 100, particularly if the system were used for the spent fuel already moved into casks on the existing ISFSI. Given the space constraints of the Protected Area, it would be extremely difficult and expensive to excavate to the depths required to build the underground facility within the existing Protected Area. Entergy VY would be seeking to pay for these additional costs (as compared to the cost of the Project) from the nuclear decommissioning trust, slowing the growth of the trust balance and delaying the time when major decommissioning activities could begin.

Additionally, Entergy VY is currently aware of only one facility that plans to use an underground system. That facility has different site conditions than the VY Station, which will simplify its installation. In addition, Entergy VY is concerned about the risks associated with being one of the first facilities to use this unproven system because of the inherent schedule and cost uncertainties associated with installing the HI-STORM 100U system.

Storage on an ISFSI pad located elsewhere on the site: Entergy VY also considered locating the Second ISFSI storage pad in other areas on the site. Entergy VY determined that locating the Second ISFSI storage pad outside of the Protected Area would be a worse alternative than locating it in the currently planned location because it

would: (1) require new security facilities at additional cost to protect the Second ISFSI and to comply with the NRC's 10 C.F.R. § 73.55 security requirements; (2) require additional facility upgrades to enable the casks to be transported to the new ISFSI pad location; and, (3) make transfers of casks between the two ISFSI pads more difficult and costly. Entergy VY also considered locating the Second ISFSI storage pad to the west of the existing ISFSI storage pad, but north of the 175 kW diesel generator. If the Second ISFSI storage pad were built in that location, however, the additional cost of relocating some areas of the security fence would have to be incurred. Ultimately, the present proposal was selected because it avoids facility impacts and increased costs from relocating the security fence, enables the use of the same transport facilities that are used for the existing pad, and provides for an efficient connection and path for transferring casks between the storage pads.

Q31. Are there any available off-site storage options available through private contractors?

A31. No. There are no off-site storage options available at this time or that are likely to be licensed and constructed within a timeframe that would allow Entergy VY to move all of its spent fuel out of the spent fuel pool by 2020 as it now plans.

Q32. Does this conclude your testimony?

A32. Yes.