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10 CFR 50.82(a)(7)

April 6, 2017

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Subject: Notification of Revised Post-Shutdown Decommissioning Activities  
Report (Revised PSDAR)  
Vermont Yankee Nuclear Power Station  
Docket Nos. 50-271 & 72-59  
License No. DPR-28

References: (1) Letter, Entergy Nuclear Operations, Inc., to USNRC, "Application for Order  
Consenting to Direct and Indirect Transfers of Control of Licenses and Approving  
Conforming License Amendment and Notification of Amendment to  
Decommissioning Trust Agreement." February 9, 2017 (ADAMS Accession No.  
ML17045A140).

(2) Letter, Entergy Nuclear Operations, Inc., to USNRC transmitting "Post Shutdown  
Decommissioning Activities Report." December 19, 2014 (ADAMS Accession No.  
ML14357A110).

In Reference 1, Entergy Nuclear Operations, Inc. ("ENO"), on behalf of itself and Entergy Nuclear Vermont Yankee, LLC ("ENVY") (to be known as "NorthStar Vermont Yankee, LLC" or "NorthStar VY"), and NorthStar Nuclear Decommissioning Company, LLC ("NorthStar NDC"), requested that the U.S. Nuclear Regulatory Commission ("NRC") consent to direct and indirect transfers of control of ENO's and ENVY's Renewed Facility Operating License No. DPR-28 for the Vermont Yankee Nuclear Power Station, as well as the general license for the VY Independent Spent Fuel Storage Installation (the "Licenses"). NorthStar Groups Services, Inc. is submitting this Revised Post Shutdown Decommissioning Activities Report providing the plan for activities to be conducted by NorthStar VY and NorthStar NDC, if the Application for license transfers is approved.


In Reference 2, ENO submitted a Post Shutdown Decommissioning Activities Report in accordance with 10 CFR 50.82, "Termination of license," paragraph (a)(4)(i) ("2014 PSDAR"). This letter is provided to notify the NRC of a significant schedule change to the 2014 PSDAR in accordance with 10 CFR 50.82,

“Termination of license,” paragraph (a)(7), by which we intend to accelerate the decommissioning schedule if the Application for license transfers is approved. The Revised PSDAR is provided as an attachment to this letter. The attached Revised PSDAR demonstrates that our elected actions are consistent with NRC requirements for decommissioning activities.

If you have any questions about this letter, please contact me at 212.951.3660 or [sstate@NorthStar.com](mailto:sstate@NorthStar.com).

Respectfully,

**NorthStar Group Services, Inc.**



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# Vermont Yankee Nuclear Power Station

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## Revised Post Shutdown Decommissioning Activities Report

**Prepared by NorthStar Group Services, Inc.**

**4/6/2017**

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Attachment 1

Table 1 Decommissioning Comparison Schedule and Plant Status Summary

Table 2 Decommissioning Cost Summary

Table 3 Decommissioning Annual Spend Plan

Attachment 2: Settlement Agreement between NorthStar VY (formerly ENVY) and State of Vermont

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Acronyms

AIF	Atomic Industrial Forum
ALARA	As Low As Reasonably Achievable
ANR	Vermont Agency of Natural Resources
BMP	Best Management Practices
BWR	Boiling Water Reactor
CFR	Code of Federal Regulations
D&D	Dismantling and Decontamination
DCE	Decommissioning Cost Estimate
DG	Diesel Generator
DOE	Department of Energy
DSAR	Defueled Safety Analysis Report
DSEIS	Draft Supplemental Environmental Impact Statement (NUREG-1437)
ENO	Entergy Nuclear Operations, Inc.
ENVY	Entergy Vermont Yankee, LLC (renamed NorthStar VY)
EPA	Environmental Protection Agency
FFP	Firm Fixed Price Fixed Unit Price
FSAR	Final Safety Analysis Report
FUP	Fixed Unit Price
GEIS	Generic Environmental Impact Statement (NUREG-0586)
GTCC	Greater than Class C
GW	Groundwater
ISFSI	Independent Spent Fuel Storage Installation
LLRW	Low-Level Radioactive Waste
LTP	License Termination Plan
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MWt	Megawatt-thermal
NDT	Nuclear Decommissioning Trust
NEI	Nuclear Energy Institute
NESP	National Environmental Studies Project
NS	NorthStar Group Services, Inc.
NorthStar VY	NorthStar Vermont Yankee (formerly ENVY)
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
PSD	Vermont Public Service Department
PSDAR	Post-Shutdown Decommissioning Activities Report
RPV	Reactor Pressure Vessel
RPVI	Reactor Pressure Vessel Internals
REMP	Required Emergency Management Personnel
SAS	Site Assessment Study
SEIS	Generic Environmental Impact Statement for License Renewal of Nuclear Plants (NUREG-1437), Supplement 30 “Regarding Vermont Yankee Nuclear Power Station”
SFP	Spent Fuel Pool

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SNF	Spent Nuclear Fuel
SSCs	Structures, Systems and Components
T&D	Transport and Disposition
UPS	Uninterruptable Power Supply
VDH	Vermont Department of Health
VTDEC	Vermont Department of Environmental Conservation
VYNPS	Vermont Yankee Nuclear Power Station
WAC	Waste Acceptance Criteria
WCS	Waste Control Specialists

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## **1.0 INTRODUCTION AND SUMMARY**

### **1.1 Introduction**

This Revised Post-Shutdown Decommissioning Activities Report (Revised PSDAR) for the Vermont Yankee Nuclear Power Station (VYNPS) is submitted to notify the NRC of changes in the actions and schedules previously described in the PSDAR for VYNPS submitted on December 19, 2014 (available at ADAMS Accession No. ML14357A110) (Reference 1) (2014 PSDAR) and accepted by the NRC by letter dated January 29, 2016 (ADAMS Accession No. ML15343A210) (Reference 2). The 2014 PSDAR was submitted in accordance with the requirements of Title 10 of the Code of Federal Regulations (CFR) 50.82, "Termination of license," paragraph (a)(4)(i), and this Revised PSDAR updates the information previously provided as required by 10 CFR 50.82(a)(7).

This Revised PSDAR is intended to apply based upon and contingent upon Entergy Nuclear Vermont Yankee, LLC (ENVY) being acquired by NorthStar Decommissioning Holdings, LLC (NorthStar), pursuant to the terms of the November 7, 2016, Membership Interest Purchase and Sale Agreement executed by ENVY and NorthStar. On December 16, 2016, ENVY and NorthStar submitted a joint petition to the Vermont Public Service Board seeking approval of the proposed acquisition. On February 9, 2017, Entergy Nuclear Operations, Inc. (ENO) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) requesting approval of the transfer of control of ENVY to NorthStar and of the transfer of the authority to possess, maintain and decommission VYNPS from ENO to NorthStar Nuclear Decommissioning Company, LLC (NorthStar NDC). Upon completion of the proposed transfer, ENVY's name will be changed to NorthStar Vermont Yankee, LLC (NorthStar VY). In the event that NorthStar does not acquire ENVY, this Revised PSDAR will be ineffective, and the 2014 PSDAR will remain in effect.

This Revised PSDAR, which will apply upon NorthStar VY and NorthStar NDC becoming the licensees for VYNPS, contains the following:

1. A description of the planned decommissioning activities along with a schedule for their accomplishment.
2. A discussion that provides the reasons for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by appropriate previously issued environmental impact statements.
3. A site-specific decommissioning cost estimate (DCE), including the projected irradiated fuel management costs, license termination costs, and site restoration costs.
4. A settlement agreement between ENO, ENVY ("NorthStar VY" after its acquisition by NorthStar), and agencies of the State of Vermont.

The Revised PSDAR has been developed consistent with Regulatory Guide 1.185, "Standard Format and Content for Post-Shutdown Decommissioning Activities Report," (Reference 3). This report is based on currently available information and the plans discussed herein may be modified as additional information becomes available or conditions change. As required by 10 CFR 50.82(a)(7), NorthStar VY will notify the Nuclear Regulatory Commission (NRC) in writing, with copies sent to the affected State(s), before performing any decommissioning

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activity inconsistent with, or making any significant schedule change from, those actions and schedules described in the Revised PSDAR, including changes that significantly increase the decommissioning cost.

## **1.2 Background**

The VYNPS site is located in the town of Vernon, Vermont, in Windham County on the west shore of the Connecticut River immediately upstream of the Vernon Hydroelectric Station. VYNPS employed a General Electric boiling water reactor nuclear steam supply system licensed to generate 1,912 megawatts - thermal (Mwth). The principal structures at VYNPS include a reactor building, primary containment, control building, radwaste building, intake and discharge structures, turbine building, cooling towers and main stack.

A brief history of the major milestones related to VYNPS construction and operational history is as follows:

- |  |                   |
|--|-------------------|
| • Construction Permit Issued:            | December 11, 1967 |
| • Operating License Issued:              | March 21, 1972    |
| • Commercial Operation:                  | November 30, 1972 |
| • Initial Operating License Expiration:  | March 21, 2012    |
| • Renewed Operating License Expiration:  | March 21, 2032    |
| • Permanent Cessation of Operations:     | December 29, 2014 |
| • Switch Yard Lease (99 yr.) Expiration: | May 17, 2108      |

By letter dated January 12, 2015 (Reference 4), ENO certified to the NRC that it had permanently ceased power operations of VYNPS and permanently removed the fuel from the reactor vessel, in accordance with 10 CFR 50.82(a)(1)(i) and 10 CFR 50.4(b)(8). Pursuant to 10 CFR 50.82(a)(2), the 10 CFR Part 50 license for VYNPS no longer authorizes operation of the reactor or emplacement or retention of fuel in the reactor vessel.

Pursuant to 10 CFR 50.51(b), “Continuation of license,” the license for a facility that has permanently ceased operations continues in effect beyond the expiration date to authorize ownership and possession of the utilization facility until the Commission notifies the licensee in writing that the license has been terminated.

During the period that the license remains in effect, 10 CFR 50.51(b) requires that NorthStar VY:

1. Take actions necessary to decommission and decontaminate the facility and continue to maintain the facility (including storage, control, and maintenance of the spent fuel) in a safe condition.
2. Conduct activities in accordance with all other restrictions applicable to the facility in accordance with NRC regulations and the 10 CFR 50 facility license.

10 CFR 50.82(a)(9) states that power reactor licensees must submit an application for termination of the license at least two years prior to the license termination date and that the



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application must be accompanied or preceded by a license termination plan to be submitted for NRC approval.

On December 23, 2013, ENVY and ENO entered into a Settlement Agreement (the “Settlement Agreement”) with the Vermont Public Service Department (PSD), the Vermont Agency of Natural Resources (ANR), and the Vermont Department of Health (VDH), with the Vermont Office of the Attorney General and Entergy Corporation agreeing to certain provisions of that agreement. In the Settlement Agreement, ENVY committed to reflect ENVY’s commitments in that agreement in the 2014 PSDAR and to include the Settlement Agreement with the 2014 PSDAR. The Settlement Agreement is provided as Attachment 2 of this Revised PSDAR. NorthStar VY will remain a party bound by this Settlement Agreement after its acquisition by NorthStar.

### **1.3 Summary of Decommissioning Alternatives**

The NRC has evaluated the environmental impacts of three general methods for decommissioning power reactor facilities in NUREG-0586, “Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities: Supplement 1, Regarding the Decommissioning of Nuclear Power Reactors,” (GEIS) (Reference 5). The three general methods evaluated are summarized as follows:

- **DECON:** The equipment, structures and portions of the facility and site that contain radioactive contaminants are promptly removed or decontaminated to a level that permits termination of the license shortly after cessation of operations.
- **SAFSTOR:** After the plant is shut down and defueled, the facility is placed in a safe, stable condition and maintained in that state (safe storage). The facility is decontaminated and dismantled at the end of the storage period to levels that permit license termination. During SAFSTOR, a facility is left intact or may be partially dismantled, but the fuel is removed from the reactor vessel and radioactive liquids are drained from systems and components and then processed. Radioactive decay occurs during the SAFSTOR period, thereby reducing the quantity of contamination and radioactivity that must be disposed of during decontamination and dismantlement.
- **ENTOMB:** Radioactive structures, systems and components (SSCs) are encased in a structurally long-lived substance, such as concrete. The entombed structure is appropriately maintained, and continued surveillance is carried out until the radioactivity decays to a level that permits termination of the license.

The decommissioning approach selected by ENVY for VYNPS as stated in the 2014 PSDAR is the SAFSTOR method. In the Revised PSDAR, NorthStar VY has selected the DECON method, with decontamination and dismantlement activities commencing promptly after completion of the transfer of spent fuel to dry cask storage (the Fuel Transfer Period). The primary objectives of the VYNPS decommissioning project remain removing the facility from service, reducing residual radioactivity to levels permitting unrestricted release, restoring the site, performing this work safely, and completing the work in a cost-effective manner.

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After the Fuel Transfer Period, the facility will enter the Decommissioning Period and be dismantled and decontaminated to levels that permit license termination. NorthStar VY intends to complete radiological decommissioning, restoration, and release for unrestricted use of all portions of the site other than the Independent Spent Fuel Storage Installation (“partial site release”) potentially as soon as 2026, but no later than the end of 2030. While license termination will not occur until spent fuel has been removed from the site and the ISFSI is decommissioned, a license termination plan will be developed and submitted for NRC approval to the extent necessary to support the partial site release.

NorthStar VY has determined that the stabilization, disassembly and decontamination activities that are being conducted currently will allow the Decommissioning Period to proceed immediately following the Fuel Transfer Period. These activities will minimize worker exposure and provide for a safer disassembly process. NorthStar VY will utilize mechanical means and disassembly during decommissioning, which will restrict worker exposure to industrial and radiological hazards. NorthStar VY has successfully utilized the described method at multiple University Reactors, DOE Sites and Fuel Cycle Facilities.

NorthStar VY plans to release the large majority of the VYNPS site property for redevelopment decades sooner than planned under the 2014 PSDAR, thereby reducing the overall risk to the workers, public, and environment associated with the long-term storage of aged, excess nuclear facilities.

The revised decommissioning approach by NorthStar VY for VYNPS is described in the following sections.

- Section 2.0 describes the planned decommissioning activities and the general timing of their implementation.
- Section 3.0 describes the overall decommissioning schedule, including the SNF management activities.
- Section 4.0 provides an analysis of expected decommissioning costs, including the costs associated with SNF management and site restoration.
- Section 5.0 describes the basis for concluding that the environmental impacts associated with decommissioning VYNPS are bounded by the NRC generic environmental impact statement related to decommissioning.
- Section 6.0 is a list of references.

## **2.0 DESCRIPTION OF PLANNED DECOMMISSIONING ACTIVITIES**

NorthStar VY plans to use the DECON method following the Fuel Transfer Period. DECON is broadly defined in Section 1.3 of this report. Use of the DECON method will require the management of SNF because of the DOE's failure to perform its spent fuel removal obligations under its contract with ENVY. To explain the basis for projecting the cost of managing SNF, a discussion of SNF management activities for the site is included herein. NorthStar VY has accelerated the timeline for the decontamination and dismantlement phase of the project and intends to begin DECON promptly after the SNF is transferred to the ISFSI and the licenses are transferred to NorthStar NDC and control of ENVY is transferred to NorthStar.

The initial decommissioning activities being performed under the 2014 PSDAR following plant shutdown have involved preparing the plant for a period of dormancy. This entailed de-fueling the reactor and transferring the fuel into the spent fuel pool, draining fluids and de-energizing systems, and reconfiguring the electrical distribution, ventilation, heating, and fire protection systems. Systems temporarily needed for continued operation of the spent fuel pool (SFP) have been reconfigured for operational efficiency. An additional ISFSI pad is being added, in close proximity to the existing ISFSI pad, to expand the ISFSI and allow for dry storage of all spent fuel assemblies and Greater-than-Class-C (GTCC) waste generated during plant operation.

Under this Revised PSDAR, these activities will continue during the Fuel Transfer Period and will enable NorthStar VY to commence decontamination and dismantlement activities soon after the closing of the proposed transaction.

During the Fuel Transfer Period, VYNPS will be staffed with personnel that will monitor, maintain and provide security for the ISFSI and plant facilities.

Spent fuel will remain in the SFP until it meets the criteria for transfer, and the spent fuel can be transferred in an efficient manner to the ISFSI. After all fuel has been transferred to the ISFSI, the SFP and supporting systems will be drained and de-energized, and decontamination and dismantlement activities will commence. The spent fuel will be stored in on-site dry storage at the ISFSI until transfer to the DOE, which is assumed to be completed by 2052, or an approved interim storage facility.

After the final spent fuel transfer to the ISFSI, the plant will proceed with the Decommissioning Period and start dismantling and decontamination (D&D) activities associated with the main plant buildings. D&D activities will be scheduled to commence no later than 2021 but potentially as early as 2019.

For the purposes of NorthStar VY's DECON decommissioning cost estimate ("DECON DCE"), it is assumed that remaining structures are to be demolished to the depths proposed for adoption by the State of Vermont (four feet below ground surface) and the excavations backfilled.

Decommissioning activities will be performed in accordance with written, reviewed and approved site procedures, as amended for NorthStar VY to begin decommissioning. There are

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no identified or anticipated decommissioning activities that are unique to the VYNPS site and outside the bounds considered in the GEIS.

Radiological and environmental programs will be maintained throughout the decommissioning process to ensure occupational, public health and safety, and environmental compliance with all applicable laws and regulations. Radiological programs will be conducted in accordance with the facility's revised Technical Specifications, Operating License, Defueled Safety Analysis Report (DSAR), Radiological Environmental Monitoring Program, and the Offsite Dose Calculation Manual, as amended for NorthStar VY to begin decommissioning. Non-radiological Environmental Programs will be conducted in accordance with applicable requirements and permits.

Tables 2-1 and 2-2 provide summaries of the comparison schedule / plant status and costs for decommissioning VYNPS under this Revised PSDAR relative to the 2014 PSDAR. The major decommissioning activities and the general sequence of activities are discussed in more detail in the sections that follow.

### **2.1 Discussion of Decommissioning Activities**

The following narrative describes the basic activities associated with decommissioning VYNPS. The DECON DCE is divided into phases or periods based upon major milestones within the project or significant changes in the annual projected expenditures. The following sub-sections correspond to the major decommissioning periods within the estimate. Further details regarding the DECON DCE are provided in Tables 1, 2 and 3 in Attachment 1.

#### **2.1.1 Fuel Transfer Period**

During the Fuel Transfer Period, the main facility will be left intact, with structures maintained in a stable condition. Systems that are not required to support the spent fuel, HVAC, Emergency Plan or site security are drained, de-energized, secured and scheduled for disposition. Minimal cleaning/removal of loose contamination and/or fixation and sealing of remaining contamination is performed. Access to contaminated areas is maintained secure to provide controlled access for inspection and maintenance. Excess facilities and systems may be released for D&D as available.

The process of placing the plant in dormancy pending D&D will includes, but is not limited to, the following activities:

- Creation of an organizational structure to support the decommissioning plan and evolving emergency planning and site security requirements.
- Revision of technical specifications, plans and operating procedures appropriate to the operating conditions and requirements.
- Characterization of the facility and major components as may be necessary to plan and prepare for the Decommissioning Period.

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- Isolation of the SFP and reconfiguring fuel pool support systems so that draining and de-energizing may commence in other areas of the plant.
- Design and construction of an ISFSI pad expansion.
- Deactivation (de-energizing and /or draining) of systems that are no longer required during D&D.
- Processing and disposal of water and water filter and treatment media not required to support D&D.
- Disposition of incidental waste and excess facilities that may be present prior to the start of the Decommissioning Period, such as excess tools and equipment, waste produced while deactivating systems, and excess facilities.
- Reconfiguration of power, lighting, heating, ventilation, fire protection, communication and any other services needed to support decommissioning and ISFSI isolation.
- Stabilization by fixing or removing loose incidental surface contamination to facilitate future building decommissioning. Decontamination, stabilization (lock-down), or removal of high-dose equipment or areas may be performed.
- Performance of interim radiation surveys of the plant, mapping contamination, posting caution signs and establishing access requirements, where appropriate.
- Maintenance of appropriate barriers for contaminated and radiation areas.
- Reconfiguration of security boundaries and surveillance systems, as required for ISFSI isolation and stand-alone operation.

The following is a general discussion of the planned reconfiguration expected after plant shutdown.

Electrical Systems, Mechanical Systems, Ventilation and Heating Systems, and Fire Protection Systems, Maintenance of Systems Critical to Decommissioning

There are no changes to the information previously provided regarding these systems.

### **2.1.2 Fuel Transfer Activities**

Spent fuel will remain in the spent fuel pool until it meets the criteria for transfer and the spent fuel can be transferred in an efficient manner to the ISFSI. The ISFSI expansion (second pad) is currently under construction and is scheduled for completion in 2017. ENVY plans to commence loading spent fuel into dry fuel storage casks and transferring the casks to the existing ISFSI pad on or about April 10, 2017. Assuming the receipt of required NRC approvals, spent fuel transfer is expected to be complete in late 2018. After the fuel transfer is completed, the pool and systems can be drained and de-energized for decommissioning.

Fuel Transfer activities will include a 24-hour security force, preventive and corrective maintenance on security systems, area lighting, general building maintenance, freeze protection heating, ventilation of buildings for periodic habitability, routine radiological inspections of

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contaminated structures, maintenance of structural integrity, and a site environmental and radiation monitoring program. A fire protection program will be maintained.

Security during the Fuel Transfer Period will be conducted primarily to safeguard the spent fuel on site and prevent unauthorized entry. A security barrier, sensors, alarms, and other surveillance equipment will be maintained as required to provide security.

An environmental surveillance program will be carried out during the Fuel Transfer Period to monitor for radioactive material in the environment. Appropriate procedures will be established and initiated for potential releases that exceed prescribed limits. The environmental surveillance program will consist of a version of the program in effect during normal plant operations that will be modified to reflect the plant's conditions and risks at the time.

ISFSI Operations & Fuel Management activities will include transferring the spent fuel from the ISFSI to the DOE. NorthStar VY intends to continue ENVY's current spent fuel management plan for the VYNPS spent fuel that is based, in general and for planning purposes, upon the following projections: 1) a 2025 start date for the DOE initiating transfer of commercial spent fuel to a federal facility, 2) a corresponding 2026 date for beginning to remove spent fuel from VYNPS, and 3) a 2052 completion date for removal of all VYNPS spent fuel. Transfer could occur earlier if the DOE is successful in implementing its current strategy for the management and acceptance of spent fuel.<sup>1</sup> The ISFSI pad and facilities will be decommissioned after DOE has removed all spent fuel from the site. This allows for a target partial site release date of no later than 2030 and license termination and site closure by ~2052, with only the 345kv substation (former switchyard) remaining until the lease expires in May 2108.

Under this Revised PSDAR, as compared to the 2014 PSDAR, the NorthStar VY approach provides a 23-year acceleration of the site closure date from 2075 to ~2052.

### **2.1.3 Preparations for Decommissioning**

Following the Fuel Transfer Period, the following types of activities will proceed upon license transfer to NorthStar NDC and transfer of control over ENVY: engineering and planning; site waste characterization; and the assembly of a decommissioning management organization. This would likely include the development of work plans, specifications procedures, and long lead procurements of specialty equipment.

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<sup>1</sup> DOE's repository program assumes that spent fuel is accepted for disposal from the nation's commercial nuclear plants in the order ("queue") in which it was removed from service ("oldest fuel first"). The contracts that U.S. generators have with the DOE, however, provide mechanisms for altering the oldest fuel first allocation scheme, including emergency deliveries, exchanges of allocations amongst generators, and the option of providing priority acceptance from permanently shut down nuclear reactors. Such mechanisms could result in an earlier completion date for removal of all VYNPS spent fuel. This Revised PSDAR conservatively assumes that DOE will accept spent fuel in an oldest fuel first order.



#### **2.1.4 Decommissioning (Dismantling and Decontamination)**

There are no changes to the information previously provided in this section.

#### **2.1.5 Site Restoration**

Subject to the establishment of site restoration standards by the Vermont Public Service Board, NorthStar VY currently assumes the removal of all above-ground structures on site, other than the Plant Support Building, the 345kv substation, and other uncontaminated structures that can be part of site redevelopment without affecting the site's release for unrestricted use. NorthStar VY also currently assumes that underground structures—including, without limitation, building foundations, buried piping, and contained piping—to a depth of 4 feet below ground surface and to a greater depth wherever required to meet the site release standards. Asbestos-containing material would be removed regardless of depth. Pipes and other spaces with void space that are below 4 feet and allowed to be left in place would be filled with concrete or other material as necessary to ensure stability of the ground above.

These same activities relate to license termination. NorthStar VY plans to perform some Site Restoration activities during the Decommissioning Period in parallel with license termination activities in order to take advantage of the excavated soils generated as bedding and filler within the bulk debris containers, which are gondola-type railroad cars. NorthStar VY will track and account for Site Restoration activities and license transfer activities separately even though they are proceeding concurrently.

Concrete rubble produced by the demolition activities, may be transported to an offsite area for appropriate disposal as construction debris or reused as fill materials, if applicable radiological and non-radiological standards for radiological decommissioning and site restoration are met and if permitted under Site Restoration Standards established by the Vermont Public Service Board.

The site will be restored as appropriate for its intended use, consistent with the Site Restoration Standards established by the Vermont Public Service Board.

### **2.2 General Decommissioning Considerations**

#### **2.2.1 Major Decommissioning Activities**

As defined in 10 CFR 50.2, "definitions," a "major decommissioning activity" is "any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment, or results in dismantling components for shipment containing greater than class C waste in accordance with § 61.55." The following discussion provides a summary of the major decommissioning activities currently planned for VYNPS. These activities are envisioned to occur in Decommissioning Period. The schedule may be modified as conditions dictate.

Prior to starting a major decommissioning activity, the affected components will be surveyed and decontaminated, as required, in order to minimize worker exposure, and a plan will be developed for the activity in accordance with the VYNPS Work Control Procedure, as amended for

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NorthStar VY Decommissioning. Shipping containers and other equipment necessary to conduct major decommissioning activities will be procured.

The initial major decommissioning activity inside the reactor building will be the removal, packaging, and disposal of systems and components associated with the reactor. Other major decommissioning activities that would be conducted include the removal and disposal of the turbine, condenser, recirculation pumps, main steam piping, feed water piping, pumps and heaters, liners (from the spent fuel pool, drywell and reactor cavity), the torus, spent fuel storage racks and neutron activated / contaminated concrete materials. The disposition of the drywell structure would be undertaken as part of the reactor building demolition. Major equipment may be stabilized (locked-down) and removed mechanically during building demolition, to minimize worker exposure that would be incurred if performed manually. Bulk material will be removed utilizing large equipment and remote handling techniques.

### **2.2.2 Other Decommissioning Activities**

In addition to the reactor and large components discussed above, other plant components may be removed from the Reactor, Turbine and associated buildings, radiologically surveyed, and dispositioned appropriately. The primary approach to decommissioning is to minimize the use of manual removal methods and minimize worker exposure by utilizing large equipment that allows for the remote handling of contaminated equipment and materials. This method has been used by NorthStar very successfully at DOE closure sites for several years.

### **2.2.3 Decontamination and Dismantlement Activities**

The overall objective of D&D is to ensure that radioactively contaminated or activated materials will be removed from the site to allow the site to be released for unrestricted use. This may be accomplished by decontamination in place, off-site processing of the materials, or direct disposal of the materials as radioactive waste. A combination of these methods may be utilized. The methods chosen will be those deemed most appropriate for the particular circumstances.

Low-level radioactive waste (LLRW) will be managed in accordance with approved procedures and commercial disposal facility requirements. This includes characterizing contaminated materials in accordance with waste acceptance criteria(s) (WAC), packaging, transporting and disposal at a licensed LLRW disposal facility.

### **2.2.4 Radioactive Waste Management**

A major component of the decommissioning work scope for VYNPS is the packaging, transportation and disposing of contaminated / activated equipment, piping, concrete, and soil. A waste management plan will be developed to incorporate the most cost effective disposal strategy, consistent with regulatory requirements and disposal / processing options for each waste type at the time of the D&D activities. Being located in Vermont, the VYNPS is subject to the regulations of the Texas Low Level Radioactive Waste Compact Commission. As such, NorthStar VY has access to dispose VYNPS waste at the Waste Control Specialists (WCS)



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LLRW disposal site in Andrews County, Texas. NorthStar VY may apply for export permits to use other licensed LLRW facilities, if necessary or desirable.

LLRW from VYNPS will be transported by licensed transporters. The waste management plan will be based on the evaluation of available methods and strategies for processing, packaging, and transporting radioactive waste in conjunction with the available disposal facility options and associated WAC. NorthStar VY has negotiated an exclusive agreement with WCS to disposition virtually all wastes from the VYNPS decommissioning. Transportation will be largely by railroad in bulk, gondola type rail cars. This approach is estimated to provide a cost savings to the decommissioning cost as well as provide for a safer means of transportation for the LLRW.

#### **2.2.5 Removal of Mixed Wastes**

There are no changes to the information previously provided in this section.

#### **2.2.6 Site Characterization**

There are no changes to the information previously provided in this section.

#### **2.2.7 Groundwater Protection and Radiological Decommissioning Records Program**

There are no changes to the information previously provided in this section.

#### **2.2.8 Changes to Management and Staffing**

There are no changes to the information previously provided in this section.

### **3.0 SCHEDULE OF PLANNED DECOMMISSIONING ACTIVITIES**

NorthStar VY intends to use the DECON method, with decontamination and dismantlement activities during the Decommissioning Period commencing promptly after the Fuel Transfer Period. NorthStar VY has made a reasonable determination that the funds in the nuclear decommissioning trust (NDT) for VYNPS are adequate to complete decommissioning and remaining SNF management activities that the federal government has not yet agreed or been ordered to reimburse. NorthStar VY is submitting this Revised PSDAR to provide notification required by 10 CFR 50.82(a)(7) of the changes in activities and schedule to allow decontamination and dismantlement activities to proceed. Work activities associated with the planning and preparation period began before the plant was permanently shut down and will continue into 2017. The schedule for the duration (start and end dates) of spent fuel management and major decommissioning activities is provided in Table 1 in Attachment 1.

The schedule accounts for spent fuel being stored in the ISFSI until the assumed date of transfer to the DOE.

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**4.0 ESTIMATE OF EXPECTED DECOMMISSIONING AND SPENT FUEL  
MANAGEMENT COSTS**

TLG Services had prepared a site-specific DCE for VYNPS, which also provides projected costs of managing spent fuel, as well as non-radiological decommissioning and site restoration costs, accounted for separately. The site-specific DCE was provided with the 2014 PSDAR and fulfilled the requirements of 10 CFR 50.82(a)(4)(i) and 10 CFR 50.82(a)(8)(iii).

NorthStar has prepared its own revised site-specific DECON DCE. A summary level itemization of the site-specific DCE, including the projected cost of managing spent fuel is provided in Table 2 in Attachment 1. Table 3 in Attachment 1 provides a summary of annual spending. Table 1 in Attachment 1 also provides a high level summary of the cost estimate as compared with the cost estimate under the 2014 PSDAR approach.

The methodology used by NorthStar VY to develop its site-specific DECON DCE for spent fuel management involved the comparison of actual costs from three (3) existing decommissioned reactors within the region and adjusting the site specific cost factors. The DECON DCE for VYNPS follows the basic approach originally advanced by the Atomic Industrial Forum (AIF) in its program to develop a standardized model for decommissioning cost estimates. The results of this program were published as AIF/NESP-036, "A Guideline for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," (Reference 6). The AIF document presents a unit cost factor method for estimating direct activity costs, simplifying the estimating process.

The method used to prepare the decommissioning portion of the DCE includes the utilization of typical unit cost factors used by NorthStar for similar work in the region as well as experience with: the decommissioning of test reactors at University of Buffalo, University of Arizona, University of Illinois, and University of Washington; and support of the Vallecitos BWR and DOE Closure Sites including Rocky Flats, Savannah River Site, Hanford (308 TRIGA & 309 PRTR reactors), Oak Ridge TN, Portsmouth Ohio, Paducah KY, and Brookhaven NY. NorthStar VY has developed the revised DCE to include the normal contingencies associated with the decommissioning work in order to reduce the uncertainty associated with work scheduled to be performed in the near future.

In order to provide a more efficient decommissioning effort, NorthStar VY has developed a team of industry leaders and initiated a series of Firm Fixed Price (FFP) and Fixed Unit Price (FUP) subcontracts to minimize the overall cost and schedule risk of the project. By accelerating the VYNPS decommissioning and obtaining these FFP and FUP subcontracts, NorthStar VY has minimized the overall project risks.

Under NRC regulations (10 CFR § 50.82(a)(8)), a licensee must provide reasonable assurance that funds will be available (or "financial assurance") for decommissioning (i.e., license termination) costs. The regulations also describe the acceptable methods a licensee can use to demonstrate financial assurance. Funding for decommissioning VYNPS currently is provided by an external trust. NorthStar VY will continue this practice. NorthStar VY will continue to use the current trustee, the Bank of New York Mellon, a national banking association having trust

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powers. The trust had a balance of \$572 million as of the end of February 2017, excluding the value of the Site Restoration Trust. Further details regarding the financial assurance to be provided by NorthStar VY and financial qualifications of NorthStar VY are provided in the license transfer application submitted by ENO on February 9, 2017 (Reference 5).

10 CFR 50.82(a)(6)(iii) states that, "Licensees shall not perform any decommissioning activities," as defined in 10 CFR 50.2 that, "Result in there no longer being reasonable assurance that adequate funds will be available for decommissioning." NorthStar VY does not intend to perform any decommissioning activities that result in there no longer being reasonable assurance that adequate funds will be available for decommissioning.

## **5.0 ENVIRONMENTAL IMPACTS**

There are no changes to the information previously provided in this section.

### **5.1 Conclusions**

Based on the information previously provided in this Section, NorthStar VY concludes that the environmental impacts associated with planned VYNPS site-specific decommissioning activities are less than and bounded by the impacts addressed by previously issued environmental impact statements. Specifically, the environmental impacts are bounded by the GEIS (Reference 5) and SEIS (Reference 9).

1. The postulated impacts associated with the decommissioning method chosen, DECON, have already been considered in the SEIS and GEIS.
2. There are no unique aspects of VYNPS or of the decommissioning techniques to be utilized that would invalidate the conclusions reached in the SEIS and GEIS.
3. The methods assumed to be employed to dismantle and decontaminate VYNPS are standard construction-based techniques fully considered in the SEIS and GEIS.

Therefore, it can be concluded that the environmental impacts associated with the site-specific decommissioning activities for VYNPS will be bounded by appropriate previously issued environmental impact statements.

10 CFR 50.82(a)(6)(ii) states that licensees shall not perform any decommissioning activities, as defined in 10 CFR 50.2 that result in significant environmental impacts not previously reviewed. No such impacts have been currently identified. NorthStar VY will conduct ongoing reviews during the decommissioning process to assure identification of any such impacts.

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**6.0 REFERENCES**

1. Letter, Entergy Nuclear Operations, Inc., to USNRC transmitting Post Shutdown Decommissioning Activities Report. December 19, 2014 (ADAMS Accession No. ML14357A110).
2. Letter, USNRC to Entergy Nuclear Operations, Inc., acceptance of Shutdown Decommissioning Activities Report. January 29, 2016 (ADAMS Accession No. ML15343A210).
3. Regulatory Guide 1.185, Standard Format and Content for Post-Shutdown Decommissioning Activities Report, Revision 1. June 2013.
4. Letter, Entergy Nuclear Operations, Inc., to USNRC, Certifications of Permanent Cessation of Power Operations and Permanent Removal of Fuel from the Reactor Vessel, BVM 15-001. January 12, 2015 (ADAMS Accession No. ML15013A426).
5. Letter, Entergy Nuclear Operations, Inc., to USNRC, "Application for Order Consenting to Direct and Indirect Transfers of Control of Licenses and Approving Conforming License Amendment and Notification of Amendment to Decommissioning Trust Agreement." February 9, 2017 (ADAMS Accession No. ML17045A140).
6. NUREG-0586, Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities: Supplement 1, Regarding the Decommissioning of Nuclear Power Reactors, Final Report. November 2002.
7. AIF/NESP-036, A Guideline for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates. May 1986.
8. Regulatory Guide 1.159, Assuring the Availability of Funds for Decommissioning Nuclear Reactors, Revision 2. October 2011.
9. NUREG-1496, Generic Environmental Impact Statement in Support of Rulemaking on Radiological Criteria for License Termination of NRC-Licensed Nuclear Facilities. July 1997.
10. NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 30, Regarding Vermont Yankee Nuclear Power Station. August 2007.
11. Entergy Nuclear Vermont Yankee, LLC NPDES Permit No. VT0000264. October 2014.
12. Entergy Nuclear Vermont Yankee, LLC Indirect Discharge Permit ID-9-0036. January 2011.

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13. Entergy Nuclear Vermont Yankee, LLC Solid Waste Management Facility Certification F0405. August 2014.
14. Entergy Nuclear Vermont Yankee Public Water System Temporary Permit to Operate No. 8332. July 2008.
15. Entergy Nuclear Vermont Yankee Public Water System Temporary Permit to Operate No. 20738. August 2008.
16. Vermont Yankee Air Contaminant Source Registration Certificate WM2335. 2014.
17. PAG Manual, Protective Action Guides and Planning Guidance for Radiological Incidents, Draft for Interim Use and Public Comment. March 2013.
18. Vermont Yankee Nuclear Power Station, License Renewal Application. Appendix E, Applicant's Environmental Report. January 2006.
19. NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants. June 2013.
20. NUREG-2157, Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel, Final Report. September 2014.

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**Attachment 1**

**Table 1  
Decommissioning Comparison Schedule and Plant Status Summary\***  
(Thousands of 2016 dollars)

NorthStar Vermont Yankee Decommissioning DCE Comparison Chart												
Decommissioning Period / Activity	NorthStar VY Prompt DECON <i>(Cost estimate includes contingency)</i>						Entergy SAFSTOR - PSDAR <i>(Cost estimate includes contingency)</i>					
	Start	End	Duration, years	License Termination	Spent Fuel Mgt.	Site Restoration	Start	End	Duration, years	License Termination	Spent Fuel Mgt.	Site Restoration
<b>Fuel Transfer Period</b>	<b>2016</b>	<b>2018</b>	<b>3</b>				<b>2068</b>	<b>2069</b>	<b>1.5</b>			
VY Spend Plan 2016 – 2020				86,534	148,274					79,560		1,034
NS Pre-CLOSING Activities				30,620								
NS Pre-Turnover Activities												
<b>Decommissioning</b>	<b>2019</b>	<b>2026</b>	<b>7</b>				<b>2069</b>	<b>2073</b>	<b>4.5</b>			
Facility Management				83,494	40,828					70,108		4,934
Building D&D (Includes Lump Sums)				223,175		13,457				130,842		4,118
Large Component Removal				94,993						99,291		25
Soil Contamination & Remediation						11,815						
Project Management				93,335						60,668		11,833
License Termination (NS in D&D)										18,958		
Site Restoration (NS in D&D)							2073	2075	1.5	823		35,201
<b>ISFSI Operations &amp; Fuel Mgt.</b>	<b>2027</b>	<b>2052</b>	<b>26</b>				<b>2014</b>	<b>2067</b>	<b>53</b>	<b>356,972</b>	<b>368,347</b>	
Facility Management					246,974							
ISFSI D&D				3,454								
<b>Sub-Total Decommissioning Costs</b>				<b>615,605</b>	<b>436,076</b>	<b>25,272</b>				<b>817,222</b>	<b>368,347</b>	<b>57,145</b>
<b>Other Direct Costs (JJ)</b>												
<b>Total Costs</b>						<b>\$ 1,076,952</b>						<b>\$ 1,242,714</b>

\* Includes pre-closing costs such as spent fuel management that are funded separately by ENVY and not from the NDT.



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**Table 2  
Decommissioning Cost Summary  
(Thousands of 2016 dollars)**

Total NorthStar VY Costs - 2016 thru 2052			
	2016-2018	2019-2052	
	Pre-Closing	Post-Closing	Total
<b>2019-2026 Activities:</b>			
Facility Management	\$0	\$129,600	\$129,600
Decontamination and Decommissioning	\$3,600	\$236,631	\$240,231
Large Component Removal	\$17,250	\$94,993	\$112,243
Soil Contamination & Remediation	\$0	\$11,815	\$11,815
Project Management	\$9,770	\$93,335	\$103,105
<b>Subtotal (2019-2016)</b>	<b>\$30,620</b>	<b>\$566,375</b>	<b>\$596,995</b>
<b>2027-2052 Fuel Management Activities:</b>			
Facility Management		\$241,695	\$241,695
ISFSI Decommissioning		\$3,454	\$3,454
<b>Subtotal (2027-2052)</b>	<b>\$0</b>	<b>\$245,149</b>	<b>\$245,149</b>
<b>Total Decommissioning Costs</b>	<b>\$30,620</b>	<b>\$811,524</b>	<b>\$842,144</b>

TOTAL NORTHSTAR VY COSTS - POST-CLOSING (2019-2052)			
License Termination (10 CFR 50.75)	Spent Fuel Management (10 CFR 50.54(bb))	Site Restoration (Non 10 CFR 50.75 Costs)	Total
\$83,494	\$46,107		\$129,600
\$223,174		\$13,457	\$236,631
\$94,993			\$94,993
		\$11,815	\$11,815
\$93,335			\$93,335
<b>\$494,996</b>	<b>\$46,107</b>	<b>\$25,272</b>	<b>\$566,375</b>
\$3,454	\$241,695		\$241,695
<b>\$3,454</b>	<b>\$241,695</b>	<b>\$0</b>	<b>\$245,149</b>
<b>\$498,450</b>	<b>\$287,802</b>	<b>\$25,272</b>	<b>\$811,524</b>

a. Columns may not add due to rounding.

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**Table 3  
Decommissioning Annual Spend Plan  
(Thousands of 2016 dollars)**

ANNUAL COST PROFILE (2019-2052)											
Total NorthStar VY Costs											
	2019	2020	2021	2022	2023	2024	2025	2026	(25 years) 2027-2051	2052	TOTAL
<b>License Termination Costs</b>											
Facility Management	\$12,541	\$11,041	\$11,041	\$11,041	\$11,041	\$11,041	\$11,041	\$4,703			\$83,494
Decontamination and Decommissioning	\$3,713	\$7,736	\$28,513	\$49,596	\$59,488	\$50,163	\$23,964				\$223,175
Large Component Removal	\$40,902	\$37,303	\$13,645	\$1,255	\$944	\$944					\$94,993
Project Management	\$9,515	\$9,531	\$16,545	\$16,545	\$16,045	\$14,105	\$6,363	\$4,686			\$93,335
ISFSI Decommissioning										\$3,454	\$3,454
<b>Total License Termination Costs (10 CFR 50.75)</b>	<b>\$66,672</b>	<b>\$65,612</b>	<b>\$69,745</b>	<b>\$78,438</b>	<b>\$87,519</b>	<b>\$76,253</b>	<b>\$41,369</b>	<b>\$9,390</b>	<b>\$0</b>	<b>\$3,454</b>	<b>\$498,450</b>
<b>Spent Fuel Management</b> (10 CFR 50.54(bb))	\$9,241	\$6,141	\$4,241	\$4,241	\$4,241	\$4,241	\$8,657	\$5,104	\$231,888	\$9,807	<b>\$287,802</b>
<b>Site Restoration</b> (10 CFR 50.54(bb))	\$453	\$1,430	\$5,848	\$4,669	\$1,705	\$2,536	\$8,630				<b>\$25,272</b>
<b>Total Decommissioning Costs</b>	<b>\$76,366</b>	<b>\$73,183</b>	<b>\$79,834</b>	<b>\$87,348</b>	<b>\$93,465</b>	<b>\$83,030</b>	<b>\$58,655</b>	<b>\$14,494</b>	<b>\$231,888</b>	<b>\$13,261</b>	<b>\$811,524</b>

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**Attachment 2:**

Settlement Agreement between ENO, ENVY (“NorthStar VY”),  
and State of Vermont Agencies

## SETTLEMENT AGREEMENT

This Settlement Agreement ("Agreement") is entered into by and between Entergy Nuclear Vermont Yankee, LLC ("EVY"), Entergy Nuclear Operations, Inc. ("ENO," and together with EVY, "Entergy VY"), the Vermont Public Service Department ("PSD"), the Vermont Agency of Natural Resources ("ANR"), and the Vermont Department of Health ("VDH") (collectively, "the Parties").

A. The Vermont Yankee Nuclear Power Station ("VY Station") is a nuclear power plant located in Vernon, Vermont, that is owned by EVY and operated by ENO.

B. Entergy VY operated the VY Station until March 21, 2012, pursuant to a license from the Nuclear Regulatory Commission ("NRC") and a Certificate of Public Good ("CPG") from the Vermont Public Service Board ("Board"). Before the expiration of those approvals, the NRC renewed the license of Entergy VY for a further 20-year term, and EVY and ENO petitioned the Board for a new CPG for a further 20-year term. The Parties disagree whether EVY had authority from the State of Vermont to operate the VY Station after March 21, 2012. The Parties also disagree about much of the evidence presented to the Board in connection with Entergy VY's petition for a further 20-year term, including, among other things, the degree, extent, and duration of economic dislocation that residents of Vermont would experience as a result of the shutdown of the VY Station.

C. Until August 27, 2013, Entergy VY was seeking from the Board a CPG that would permit Entergy VY to operate the VY Station through 2032. On August 27, 2013, Entergy VY announced that it will cease operating the VY Station at the end of the current operating cycle. On August 27, 2013, Entergy VY filed a Second Amended Petition with the Board, seeking a CPG from the Board to continue operations to generate electricity only through December 31, 2014. On September 23, 2013, ENO formally notified the NRC that the VY Station would permanently cease power operations effective at the end of the current operating cycle, which is expected to be no later than December 31, 2014.

D. Entergy VY and the State of Vermont ("State") are engaged in and/or contemplating other actual and potential litigation relating to the VY Station, including: (1) potential petitions for review by the United States Supreme Court of the August 14, 2013, decision of the United States Court of Appeals for the Second Circuit in *Entergy v. Shumlin* (2d Cir. Docket Nos. 12-707 and 12-791); (2) Entergy VY's motion for attorneys' fees in *Entergy v. Shumlin* (D. Vt. Docket No. 1:11-cv-99); (3) Public Service Board Docket No. 7600; (4) potential petitions for review of the December 10, 2013, decision of the United States Court of Appeals for the Second Circuit in Entergy VY's challenge to Vermont's generation tax enacted in 2012 (2d Cir. Docket No. 12-4659); and (5) Entergy VY's appeal to the Supreme Court of Vermont from the Board's decisions in Public Service Board Docket No. 7440 (Sup. Ct. Vt. Docket No. 2013-043). In accordance with this Agreement, Entergy VY and the State of Vermont (through its appropriate agencies and departments) are entering into other agreements and/or filing pleadings that will resolve the claims between the Parties in items (1) - (5) above, with each Party to bear its own costs, including attorneys' fees, with the exception of any fees or costs that are covered by statutory bill-back or other state billing authority.

E. It is in the best interests of Entergy VY and the State that post-operation matters concerning the VY Station be addressed as constructively and transparently as possible, and be guided by the following principles: (1) the VY Station should be permitted to operate through the end of the current operating cycle to allow a reasonable transition and adjustment period for plant employees and other affected stakeholders; (2) to facilitate the decommissioning and overall closure of the VY Station, spent nuclear fuel ("SNF") should be moved from the spent fuel pool to dry cask storage in a timely manner; (3) to facilitate the prompt economic redevelopment of the VY Station site, the decommissioning process should occur without unreasonable delay, as soon as there are sufficient funds in the Nuclear Decommissioning Trust ("NDT") for the VY Station; (4) it is in the best interests of the State for the VY Station site to be available for prompt economic redevelopment through the expeditious progress and completion of decommissioning and, as provided for in prior agreements, site restoration; and (5) a specific fund should be established related to Entergy VY's site restoration obligations in connection with the VY Station as agreed to herein.

In consideration of all of the foregoing, the obligations hereafter set forth and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties agree as follows.

1. On or before December 31, 2014, Entergy VY shall cease all nuclear power generating operations at the VY Station, except for the operation of emergency back-up generators as needed, including periodic testing of same. Notwithstanding the foregoing, in the event the current operating cycle is affected by unexpected operational events that are beyond Entergy VY's reasonable control (whether external to the plant or otherwise), Entergy VY may seek permission to operate the VY Station for a limited period of time after December 31, 2014. Entergy VY will not operate the VY Station beyond December 31, 2014, unless: (1) PSD supports Entergy VY's request to extend operation, and (2) Entergy VY seeks and obtains approval from both the NRC and the Board by December 31, 2014, for such limited continued operation. It shall not be sufficient that Entergy VY commenced the steps needed to obtain NRC and Board approval before December 31, 2014; Entergy shall not operate in 2015 unless, during 2014, it receives every approval necessary for those limited operations. Entergy VY assumes the risk that either the NRC or the Board or both may not approve Entergy VY's request in 2014. In the event that Entergy VY obtains the Board and NRC approvals to operate beyond December 31, 2014, under no circumstance, including pursuant to 3 V.S.A. § 814(b), shall Entergy VY refuel or in any way supplement or extend the normal life of the fuel at the VY Station for the current operating cycle, or conduct nuclear power generating operations at the VY Station after February 28, 2015.
2. Entergy VY and PSD shall jointly recommend to and shall support before the Board the issuance of CPG(s) effective as of March 21, 2012, for: (1) operation of the VY Station through December 31, 2014, and (2) storage of SNF derived from such operation, as requested by the second amended petition filed by Entergy VY in Board Docket No. 7862 on August 27, 2013. Entergy VY and PSD will submit a Memorandum of Understanding ("MOU") to the Board, in the form attached as Exhibit A, in connection with those filings.

In the event that by March 31, 2014, the Board has not granted Entergy VY a CPG that: (i) approves operation of the VY Station until December 31, 2014, and the storage of SNF derived from such operation; and (ii) approves the Parties' jointly filed MOU substantially in its entirety and contains conditions that do not materially alter, add to, or reject what is

provided for by the MOU, each Party agrees that this Agreement may terminate, if such Party so determines in its sole discretion and provides written notice within ten (10) days of Board issuance of its order, whereupon each Party shall be placed in the position that it occupied before entering into this Agreement, except that the obligations of paragraph 3(a) through (c) and the actions taken thereunder are final and shall not be affected by any termination.

3. Contemporaneous with this Agreement and subject to the provision for costs and fees in paragraph 24 of this Agreement, Entergy VY and the State or the PSD shall take the following steps or refrain from taking the steps noted (as appropriate) with respect to the litigation described below, which they are engaged in and/or contemplating:
  - a. Entergy VY and the State shall not file petitions for writs of *certiorari* for review by the United States Supreme Court of the August 14, 2013, decision of the United States Court of Appeals for the Second Circuit in *Entergy v. Shumlin* (2d Cir. Docket Nos. 12-707 and 12-791);
  - b. Entergy VY shall move to dismiss, with prejudice, its claim for attorneys' fees in *Entergy v. Shumlin* (D. Vt. Docket No. 1:11-cv-99);
  - c. Entergy VY shall not file petitions for rehearing or writ of *certiorari* for review by the United States Supreme Court of the December 10, 2013, decision of the United States Court of Appeals for the Second Circuit (2d Cir. Docket No. 12-4659) in connection with the generation tax, and shall not challenge the generating tax at issue in that case in any other proceeding or tribunal; and
  - d. Within thirty (30) days of this Agreement or receipt, as appropriate, Entergy VY shall pay all outstanding and all properly submitted future bill-back invoices issued by the State.

Upon the Board's issuance of a CPG as described in paragraph 2:

- e. Entergy VY shall withdraw its appeal to the Supreme Court of Vermont from the Board's decisions in Public Service Board Docket No. 7440 (Sup. Ct. Vt. Docket No. 2013-043); and
  - f. Entergy VY and PSD shall jointly recommend that the Board close Docket 7600.
4. Entergy VY shall conduct all activities in Vermont, including at the VY Station site, in accordance with federal and state laws, including VDH's Radiological Health Rule.
5. Entergy VY shall operate the VY Station in accordance with its existing National Pollutant Discharge Elimination System ("NPDES") permit. Entergy VY and ANR agree to continue to pursue issues related to Entergy VY's thermal discharge through ANR's NPDES permitting process, in accordance with state and federal law.
6. By December 31, 2014, Entergy VY shall complete and shall provide to PSD, ANR, and VDH a site assessment study of the costs and tasks of radiological decommissioning, SNF management, and site restoration of the VY Station. One scenario evaluated in that site assessment study shall be proceeding to prompt decontamination and dismantling (DECON),

rather than putting the VY Station into a storage and monitoring phase prior to decontamination and dismantling (SAFSTOR), as those terms are defined by the NRC. The site assessment study shall include, without limitation, an analysis of steps required to move all SNF to dry fuel storage and to close the spent fuel pool. The site assessment study also shall include, without limitation, a full assessment of non-radiological conditions at the VY Station site. In connection with the site assessment study, Entergy VY shall conduct a good faith search for, and provide to, ANR and VDH copies of all commercial general liability insurance policies in its possession, along with all pollution legal liability policies and all other insurance policies in its possession that may provide coverage for investigation and cleanup of releases of pollutants at or from the VY Station site from the date construction of the VY Station began, to the present. Once the site assessment study is completed, and before any submission to the NRC of the site assessment study, any site-specific estimate, or any Post-Shutdown Decommissioning Activities Report ("PSDAR"), Entergy VY shall review the results of the study with PSD, ANR, and VDH, and shall consider any comments provided by those parties for inclusion in the PSDAR that Entergy VY, as the NRC licensee, is responsible for submitting to the NRC, without limitation of the State's rights to otherwise comment or participate in the NRC process. Entergy VY shall file its PSDAR for the VY Station with the NRC no sooner than sixty (60) days after completing the site assessment study described in this paragraph. Any PSDAR Entergy VY submits for the VY Station will include this Agreement and reflect Entergy VY's commitments to the State in that report.

7. Entergy VY shall make appropriate filings with the NRC to obtain authority to begin radiological decommissioning within one hundred twenty (120) days after it has made a reasonable determination that the funds in the NDT are adequate to complete decommissioning and remaining SNF management activities that the federal government has not yet agreed (or been ordered) to reimburse. Once Entergy VY receives either NRC approval of, or non-opposition to, its filings, Entergy VY shall promptly commence, pursue, and complete as soon as reasonably possible radiological decontamination and dismantling activities. Entergy VY shall provide to the PSD such additional explanatory or supporting information as the PSD reasonably may request relating to its evaluation of the adequacy of the NDT.
8. As used in this Agreement, the period of "site restoration" applies only to the period of time after radiological decommissioning has been completed to the satisfaction of the NRC. EVY expressly acknowledges the State's jurisdiction over site restoration. Following completion of the site assessment study specified in paragraph 6, EVY, PSD, ANR, and VDH shall work in good faith to determine in a timely and cost-effective manner overall site restoration standards necessary to support use of the property without limitation (excepting any independent spent fuel storage installation ("ISFSI") and any perimeter related to it), including that EVY shall not employ rubbleization at the VY Station site (*i.e.*, demolition of an above-grade decontaminated concrete structure into rubble that is buried on site) and addressing removal of structures and radiological exposure levels. Nothing in this Agreement is intended to limit the authority of state agencies to require standards for site restoration commensurate with the standards most protective to the environment as employed at similar sites nationwide or required by law.
9. EVY shall commence site restoration in accordance with the overall site restoration standards established pursuant to paragraph 8 promptly after completing radiological decommissioning. The standards and timing for site restoration may be adjusted by agreement of EVY, PSD, ANR, and/or VDH if the property or any sub-unit of the property is to be used solely for



industrial, commercial, or other similar uses that do not require immediate or full completion of “site restoration” to accommodate such use of the property.

10. Upon the Board’s issuance of a CPG as described in paragraph 2, EVY shall establish a separate trust fund specifically and solely dedicated to funding site restoration at the VY Station (“Site Restoration Fund”), as described in paragraphs 8 and 9. EVY shall designate the State of Vermont as a material beneficiary to the Site Restoration Fund until site restoration is completed in accordance with the overall site restoration standards established pursuant to paragraph 8, and shall provide to the State within sixty (60) days of the Board’s issuance of a CPG draft trust terms and provisions. Within thirty (30) days of receipt of the draft trust terms and provisions, the State shall provide comments to EVY regarding the same, which EVY shall accept and incorporate so long as commercially reasonable. Provided that the Board issues the CPG as described in paragraph 2, EVY will make initial deposits, in the form of cash or other equivalent financial instrument (including a secured note ) in a form acceptable to the PSD (which approval shall not be unreasonably withheld) and the Board, into the Site Restoration Fund as follows:

- a) \$10 million within thirty (30) days of the Board’s issuance of a CPG as described in paragraph 2;
- b) \$5 million by December 31, 2015;
- c) \$5 million by December 31, 2016;
- d) \$5 million by December 31, 2017.

Those initial deposits into the Site Restoration Fund shall not be drawn from the NDT or affect any financial assurance or guarantee in existence with respect to the VY Station as of the date of this Agreement. EVY shall also provide financial assurance, in the form of a parent guarantee from Entergy Corporation in the amount of \$20 million for the Site Restoration Fund, provided, however, that such \$20 million guarantee shall be established only after the existing parent guarantee from Entergy Corporation, dated January 26, 2010, and related to paragraph 13 of the Memorandum of Understanding in Docket No. 6545 is terminated. The \$20 million parent guarantee can be eliminated if the balance in the Site Restoration Fund exceeds \$60 million (either as a result of additional deposits or fund performance).

11. Except as otherwise provided in this Agreement, the Parties reserve all rights regarding further proceedings related to the VY Station, including without limitation its decommissioning and the proper use of the NDT and to seek or contest expenditures from that fund with the NRC and in any other appropriate forum. No Party’s exercise of such rights shall affect the terms of this Agreement or release or reduce the obligations of the Parties hereunder. Notwithstanding the foregoing:

- (a) In the event that funds from the NDT are expended for SNF management activities, Entergy VY shall diligently pursue all available reimbursement of such expenses, including from the federal government, and Entergy VY shall deposit all such proceeds into either: (i) the NDT, or (ii) a separate trust (if allowed under existing federal and state law, and other agreements), provided that the funds in any such trust are: (1) dedicated to meeting the liabilities of EVY, including



decommissioning, SNF management, and site restoration activities at the VY Station; (2) considered original transferred trust funds (not as new contributions from Entergy VY) subject to calculation and distribution of any Excess Funds under paragraph 3 of the Memorandum of Understanding in Docket No. 6545, as amended by the Board's Orders in that docket; and (3) considered part of the NDT for purposes of determining whether "the funds in the NDT are adequate" as required by paragraph 7 of this Agreement, and included in EVY's submission to the NRC and considered part of sufficient funds under 10 C.F.R. Part 50 for purposes of commencing decommissioning. Any such separate trust shall be in a form that is commercially consistent with trusts of that type, provided that Entergy VY shall provide the trust document(s) to the PSD at least sixty (60) days before the trust is formed and shall provide notice to the PSD at least sixty (60) days before any material change is made to the trust document(s) so that the State will have the opportunity to pursue any legal remedies available to it to redress any concerns it may have with the trust formation or amendment document(s) if such concerns cannot be resolved through mutual agreement of the parties.

- (b) Entergy VY shall not seek reimbursement from the NDT or Department of Energy ("DOE") of any amount relating to: (i) the five (5) annual economic development payments of \$2 million each (for a total of \$10 million) identified in paragraph 17 below; or (ii) the released escrow funds (approximately \$5.2 million) identified in paragraph 14 below.
- (c) Entergy VY shall not seek reimbursement from the NDT or DOE for deposits to the Site Restoration Fund. Consistent with prior agreements and orders regarding proper use of the NDT and distributions of any excess funds in the NDT, including paragraph 3 of the Memorandum of Understanding in Docket No. 6545 as amended by the Board's orders in that docket, after site restoration activities have been completed in accordance with the overall site restoration standards established pursuant to paragraph 8, any remaining funds in the Site Restoration Fund shall be released to EVY or its designee.

- 12. Entergy VY shall apply to the NRC for every approval needed to release portions of the VY Station site for other use after Entergy VY determines in good faith that such portions reasonably could be made available for such use, and shall diligently pursue such applications to completion, provided, however, that Entergy VY shall not be required to submit such applications for parcels smaller than ten acres nor more frequently than once every five years. Entergy VY shall not wait until completion of radiological decommissioning to apply to the NRC to make appropriate portions of the site available for reuse.
- 13. EVY or its affiliate owns the property on which the VY Station is located ("VY Property"). EVY for itself or on behalf of its affiliate shall grant the State (through its designated agency or department) a right of first refusal to purchase the VY Property, and if the owner of the VY Property offers less than all of the VY Property for sale at any one time, the right of first refusal shall apply to each portion from time to time, as they are so offered. The price payable by the State shall be fair market value as determined by an independent appraisal performed by a mutually agreed upon MAI appraiser at the time the right of first refusal is exercised. If the parties are unable to agree on an appraiser within 60 days, each party shall select an

independent appraiser, who in turn will select a third independent appraiser to conduct the valuation. The State's right of first refusal as to each offered portion of the VY Property must be exercised by July 1 of the year following EVY's notice to the State that the VY Property or a portion thereof is available for sale. The State and the owner of the VY Property shall enter into any separate documents or instruments necessary to effectuate this right of first refusal and the intent of this provision.

14. EVY has made quarterly payments related to the Clean Energy Development Fund ("CEDF") into an escrow account since March 21, 2012. In consideration of all provisions of this Agreement, EVY shall make no future payments into that escrow account and make no further payments into the CEDF, with the exception that all amounts held in the escrow account (approximately \$5.2 million at the time of execution of this Agreement) shall be paid to the CEDF within thirty (30) days of the Board's issuance of a CPG as described in paragraph 2, with at least fifty percent (50%) of those amounts to be used in accordance with CEDF criteria for clean energy development activities in or for the benefit of Windham County, Vermont. EVY shall not seek or accept funds from the NDT relating to those escrowed funds.
15. During the period of continued operation of the VY Station for nuclear power generating activities pursuant to paragraph 1 above, EVY shall timely pay all taxes and other monies owed to the State, the Town of Vernon, and any other political subdivision of the State, including the generation tax. Entergy VY specifically reserves its rights to challenge the imposition of, or the amount of, any tax, fee, or other payment not already in effect as of the date of this Agreement which is sought to be imposed on it by the State or any political subdivision thereof, including the right to seek an injunction or other relief in connection with such challenge.
16. In consideration of all provisions of this Agreement, including dismissal of litigation described above, for calendar year 2015 EVY shall make a one-time payment of \$5 million on or before April 25, 2015, to the State of Vermont Department of Taxes. Such payment shall not satisfy any obligation(s) EVY may have now or in the future for: amounts owed to any city or town, including, without limitation, the Town of Vernon or the Town of Brattleboro; EVY's obligation to make in January 2015 the fourth quarterly payment of the generation tax owed for calendar year 2014 operations and, in the event that it generates electricity subsequent to 2014, EVY's obligation to pay the generation tax with respect to such subsequent quarters; or EVY's obligations to pay state income, withholding, and sales and use taxes. If a Vermont law is enacted subsequent to execution of this Agreement that imposes on EVY a state property tax or obligation to make payments in lieu of state property tax related to the VY Station effective in calendar year 2015, the \$5 million payment required under this paragraph for calendar year 2015 shall be an offset against any such amount owed in calendar year 2015.
17. For each of the next five years -- 2014, 2015, 2016, 2017, and 2018 -- EVY shall make a payment to the State of Vermont on or before April 1 of each year in the amount of \$2 million to promote economic development in Windham County, Vermont. EVY shall not seek or accept reimbursement from the NDT for any of these payments. Payments pursuant to this paragraph shall be sent to the attention of the Secretary of Commerce and Community Development, Agency of Commerce and Community Development Central Office, 1 National Life Drive #6, Montpelier, Vermont 05620.
18. The introductory paragraphs contained in this Agreement express the intentions of the Parties

with respect to the VY Station. The binding obligations of the Parties pursuant to this Agreement are set forth in paragraphs 1 through 33. Except as expressly stated in this Agreement, the Parties retain all authority and reserve all rights to take any actions authorized by law. Other than the obligations specifically and expressly undertaken in this Agreement, the Parties reserve and retain all rights, including without limitation Entergy VY's reservation of the right to challenge any requirement or obligation imposed by state law on the ground that such law is preempted by applicable federal law or is otherwise invalid, and the State's reservation of its rights to participate in NRC proceedings and to dispute Entergy VY's use(s) of the NDT.

19. Nothing in this Agreement shall be interpreted as prohibiting or restricting Entergy VY from complying with any requirements or orders of the NRC, or any obligation under its NRC license. To the extent that Entergy VY would be required to obtain approval from the NRC in order to fulfill any obligation under this Agreement, Entergy VY shall pursue such NRC approvals diligently and in good faith, and shall advance each related request by a date reasonably expected to be necessary to meet its obligations under this Agreement.
20. Nothing in this Agreement shall affect, restrict, or limit the jurisdiction or regulatory authority of any state or federal agencies over Entergy VY or the VY Station site.
21. The Parties have made compromises on specific issues to reach this Agreement. This Agreement, and all orders approving and implementing provisions of this Agreement shall not be construed by any Party or tribunal as having precedential impact on any future proceedings involving the Parties, except in a proceeding to enforce the terms of this Agreement.
22. Except as expressly stated in this Agreement, all other agreements, Board orders and MOUs (collectively "Requirements") remain in full force and effect. Entergy VY shall operate and conduct all other activities at the VY Station, including the operation of emergency generators, in full compliance with all such Requirements, as required by state and federal law.
23. The Parties shall negotiate in good faith the terms of necessary instruments to be filed with the appropriate tribunals to embody the terms necessary to accomplish the goals of this Agreement.
24. Each Party bears its own costs and fees in connection with the litigation and other proceedings resolved by this Agreement, including any future litigation related to this Agreement or to the continued operation, shutdown, decommissioning, or site restoration of the VY Station, with the exception of any fees or costs covered by statutory bill-back authority incurred by any state agency.
25. Any notice given pursuant to this Agreement shall be in writing and delivered by: hand (with mailed confirmation copy); receipted overnight delivery service; email (if acknowledged by a reply email from the recipient identified in this Agreement); or mail, first class postage prepaid, with receipted delivery, to the other Party at the address set forth below:

If to PSD:

Commissioner  
Vermont Public Service Department  
112 State Street – Drawer 20  
Montpelier, VT 05620

*With a copy to:*

Director for Public Advocacy  
Vermont Public Service Department  
112 State St.  
Montpelier, VT 05620-2601

*and a copy to:*

Vermont Office of the Attorney General  
109 State Street  
Montpelier, VT 05609-1001

If to ANR:

Secretary  
Vermont Agency of Natural Resources  
1 National Life Drive, Davis 2  
Montpelier, Vermont 05620-3901

*With a copy to:*

General Counsel  
Vermont Agency of Natural Resources  
1 National Life Drive, Davis 2  
Montpelier, Vermont 05620-3901

*and a copy to:*

Vermont Office of the Attorney General  
109 State Street  
Montpelier, VT 05609-1001

If to VDH:

Commissioner  
Vermont Department of Health  
108 Cherry Street  
Burlington, VT 05402

*With a copy to:*

Senior Policy and Legal Advisor  
Vermont Department of Health  
108 Cherry Street  
Burlington, VT 05402

*and a copy to:*

Vermont Office of the Attorney General  
109 State Street  
Montpelier, VT 05609-1001

If to Office of the Attorney General:

Vermont Office of the Attorney General  
109 State Street  
Montpelier, VT 05609-1001

If to Entergy VY:

Entergy Nuclear Vermont Yankee, LLC  
Site Vice President  
P.O. Box 250  
320 Governor Hunt Rd  
Vernon, VT 05354

*With a copy to:*


Entergy Nuclear Vermont Yankee, LLC  
General Counsel  
639 Loyola Avenue  
New Orleans, LA 70113

26. This Agreement shall be governed by and construed in accordance with the laws of the State of Vermont and the courts of the State of Vermont shall be an available venue for enforcement of any disputes arising under this Agreement. The Parties reserve all rights regarding other possible venues. The Parties' obligations under this Agreement are to be applied and enforced consistent with the plain meaning of the language used herein.
27. Entergy VY, PSD, ANR, and VDH each enter into this Agreement freely and after opportunity for and actual consultation with all desired counsel, legal and otherwise, of its choice.
28. Entergy VY, PSD, ANR, and VDH shall reasonably and in good faith cooperate in connection with this Agreement, including by providing executed versions of documents reasonably requested in connection with carrying out the objectives of this Agreement.

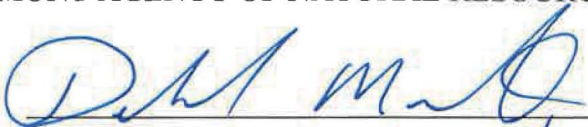
29. Entergy VY, PSD, ANR, and VDH each represent that it possesses the power and authority to execute, deliver and perform its obligations under this Agreement, which obligations are valid, binding, and enforceable under this Agreement.
30. This Agreement shall be binding on, and inure to the benefit of, the respective successors and assigns of Entergy VY, PSD, ANR, and VDH and, in any event, shall continue to be binding upon the Parties. Any Party may name a successor or assign its rights under this Agreement by providing notice to and receiving consent from the other parties pursuant to paragraph 25 of this Agreement, such consent not to be unreasonably withheld.
31. This Agreement and any referenced Exhibits hereto constitute the entire agreement between the Parties. This Agreement shall not be changed, modified or altered in any manner except by an instrument in writing executed by the Parties.
32. If any part of this Agreement is determined not to be valid, such provision shall be null and void and the remainder of the Agreement shall continue in full force and effect.
33. This Agreement is effective as of December 23, 2013.

**IN WITNESS WHEREOF**, the parties below enter into this Agreement as a sealed instrument. Each person signing this Agreement represents and warrants that he or she has been duly authorized to enter into this Agreement by the party on whose behalf it is indicated that the person is signing.

VERMONT PUBLIC SERVICE DEPARTMENT

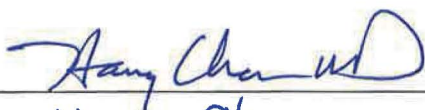
By:   
Name: CHRISTOPHER TRECIAN  
Title: COMMISSIONER, PSD  
Date: December 23, 2013

VERMONT AGENCY OF NATURAL RESOURCES

By:   
Name: Sec. Deb Markow  
Title: Sec. ANR  
Date: Dec 23, 2013

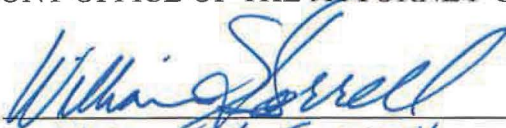


VERMONT DEPARTMENT OF HEALTH

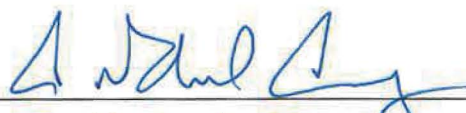
By:   
Name: Harry Chen  
Title: Commissioner of Health  
Date: 12/23/13

As to the terms of §§ 3(a)-(c) and 16 only and otherwise as to form:

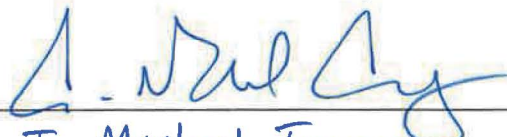
VERMONT OFFICE OF THE ATTORNEY GENERAL

By:   
Name: William H. Sorrell  
Title: Attorney General  
Date: 12/23/13


ENTERGY NUCLEAR VERMONT YANKEE, LLC

By:   
Name: T. Michael Twomey  
Title: VP- External Affairs  
Date: December 23, 2013

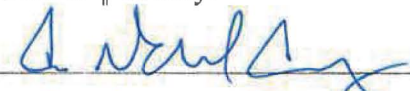
ENTERGY NUCLEAR OPERATIONS, INC.

By:   
Name: T. Michael Twomey  
Title: VP- External Affairs  
Date: December 23, 2013

As to the terms of ¶ 10 only:  
ENTERGY CORPORATION

By:   
Name: BILL MOHR  
Title: PRESIDENT EWC  
Date: 12/20/13

As to the terms of ¶ 13 only:

By:   
Name: T. Michael Twomey  
Title: VP- External Affairs ENVY  
Date: December 23, 2013