



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 11, 2015

Vice President, Operations
Entergy Nuclear Operations, Inc.
Vermont Yankee Nuclear Power Station
P.O. Box 250
Governor Hunt Road
Vernon, VT 05354

SUBJECT: VERMONT YANKEE NUCLEAR POWER STATION - ISSUANCE OF
AMENDMENT RE: CHANGES TO THE EMERGENCY PLAN AND
EMERGENCY ACTION LEVELS (TAC NO. MF4279)

Dear Sir or Madam:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment No. 264 to Renewed Facility Operating License No. DPR-28 for the Vermont Yankee Nuclear Power Station (VY), in response to your application dated June 12, 2014, as supplemented by letters dated October 21, 2014, February 5, 2015, June 18, 2015, and July 16, 2015.

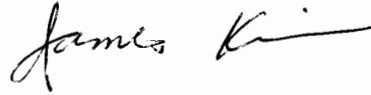
The amendment revises the VY Emergency Plan and Emergency Action Level (EAL) scheme to reflect the low likelihood of any credible accident at the plant in its permanently shutdown and defueled condition that could result in radiological releases requiring offsite protective measures. The changes were submitted to the NRC for approval in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.54(q)(4) and 10 CFR Part 50, Appendix E, Section IV.B.2.

The amendment revises the VY Emergency Plan and EAL scheme to comply with the requirements of 10 CFR 50.47, "Emergency plans," and 10 CFR Part 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," subject to the exemptions granted to the licensee by the NRC letter to the licensee dated December 10, 2015. In addition, the EAL scheme revision is based on the NRC-endorsed Nuclear Energy Institute (NEI) document, NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," dated November 2012. NEI 99-01, Revision 6, provides guidance for permanently shutdown and defueled nuclear power plants for the development of a site-specific emergency classification scheme.

The NRC staff concluded that the VY revised Emergency Plan and EAL scheme provide (1) an adequate basis for finding an acceptable state of emergency preparedness, and (2) reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency, based on the permanently shutdown and defueled condition of the VY facility.

A copy of the related safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

A handwritten signature in black ink that reads "James Kim". The signature is written in a cursive style with a long horizontal stroke at the end.

James Kim, Project Manager
Plant Licensing IV-2 and Decommissioning
Transition Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-271

Enclosures:

1. Amendment No. 264 to DPR-28
2. Safety Evaluation

cc: Listserv



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

ENTERGY NUCLEAR VERMONT YANKEE, LLC

AND ENTERGY NUCLEAR OPERATIONS, INC.

DOCKET NO. 50-271

VERMONT YANKEE NUCLEAR POWER STATION

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 264
License No. DPR-28

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment filed by Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc. (the licensee) dated June 12, 2014, as supplemented by letters dated October 21, 2014, February 5, 2015, June 18, 2015, and July 16, 2015, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, by Amendment No. 264, Renewed Facility Operating License No. DPR-28 is hereby amended to authorize the revision to the Vermont Yankee Nuclear Power Station Emergency Plan and Emergency Action Level Scheme as set forth in Entergy Nuclear Operations, Inc.'s application dated June 12, 2014, as supplemented by letters dated October 21, 2014, February 5, 2015, June 18, 2015, and July 16, 2015, and as evaluated in the NRC staff's safety evaluation dated December 11, 2015.
3. This license amendment will become effective as of April 15, 2016, and shall be implemented within 90 days of the effective date.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink that reads "William M. Dean for". The signature is written in a cursive, flowing style.

William M. Dean, Director
Office of Nuclear Reactor Regulation

Date of Issuance: December 11, 2015



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 264

TO RENEWED FACILITY OPERATING LICENSE NO. DPR-28

ENTERGY NUCLEAR VERMONT YANKEE, LLC

AND ENTERGY NUCLEAR OPERATIONS, INC.

VERMONT YANKEE NUCLEAR POWER STATION

DOCKET NO. 50-271

1.0 INTRODUCTION

The Vermont Yankee Nuclear Power Station (VY) is a decommissioning power reactor located on the west bank of the Connecticut River immediately upstream of the Vernon Hydrostation, in the town of Vernon, Vermont (5 miles south of Brattleboro, Vermont). The station is located on about 125 acres in Windham County. The licensee, Entergy Nuclear Operations, Inc. (ENO), is the holder of the VY Renewed Facility Operating License (FOL) No. DPR-28, issued pursuant to the Atomic Energy Act of 1954, as amended, and Part 50, "Domestic Licensing of Production and Utilization Facilities," of Title 10 of the *Code of Federal Regulations* (10 CFR).

By letter dated September 23, 2013 (Reference 1), ENO submitted a certification to the U.S. Nuclear Regulatory Commission (NRC) of its intention to permanently cease power operations in the fourth quarter of calendar year 2014.

By letter dated March 14, 2014 (Reference 2), ENO requested a license exemption to certain planning standards contained in Section 47 to 10 CFR Part 50, "Emergency plans," and the requirements of Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50, based on the permanently shutdown and defueled condition of the VY reactor. The requested exemptions will be implemented 15.4 months after the reactor was permanently shut down (estimated as April 15, 2016).

By letter dated June 12, 2014 (Reference 3), ENO submitted a license amendment request (LAR) to revise the VY Emergency Plan, referred to hereafter as the Permanently Defueled Emergency Plan (PDEP), and the VY Emergency Action Level (EAL) scheme, based on the staff's approval of the proposed exemptions. ENO's June 12, 2014, letter contained a copy of the proposed PDEP and EAL scheme, including a description and evaluation of the proposed

changes and a comparison of the EALs to the Nuclear Energy Institute (NEI) document NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors" (Reference 4). ENO submitted the VY PDEP and the VY EAL scheme to the NRC for approval in accordance with 10 CFR 50.54(q)(4) and 10 CFR 50, Appendix E, Section IV.B.2. The NRC staff sent a request for additional information (RAI) dated September 30, 2014 (Reference 5). By letter dated October 21, 2014 (Reference 6), ENO provided responses to the RAI and a supplement to its original request. The staff provided a supplemental RAI by letter dated October 20, 2014 (Reference 7).

VY permanently shut down on December 29, 2014, and the permanent removal of fuel from the reactor vessel was completed on January 12, 2015. By letter dated January 12, 2015 (Reference 8), ENO submitted a certification to the NRC of permanent cessation of power operations and indicated that fuel had been permanently removed from the reactor pursuant to 10 CFR 50.82(a)(1)(i) and 10 CFR 50.82(a)(1)(ii), respectively. Upon docketing of these certifications, the 10 CFR Part 50 license for VY no longer authorizes operation of the reactor or emplacement or retention of fuel into the reactor vessel, as specified in 10 CFR 50.82(a)(2). VY is authorized to possess and store irradiated nuclear fuel. Spent fuel is currently stored on site in a spent fuel pool (SFP) and an independent spent fuel storage installation (ISFSI).

By letter dated February 5, 2015 (Reference 9), ENO provided responses to the RAI and a supplement to its original request. By letter dated June 18, 2015 (Reference 10), ENO provided supplemental RAI responses to their February 5, 2015 letter and the revised PDEP with the proposed changes to reflect the supplemental RAI response.

The supplemental letters submitted by ENO dated October 21, 2014; February 5, 2015; June 18, 2015; and July 16, 2015 (Reference 11), provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration (NSHC) determination as published in the *Federal Register* on December 9, 2014 (79 FR 73109).

1.1 Discussion

ENO submitted the proposed VY PDEP to the NRC in accordance with 10 CFR 50.54(q)(4), contingent on the NRC's prior approval of certain exemptions from specific requirements of 10 CFR 50.47 and Appendix E to 10 CFR Part 50. By letter dated December 10, 2015 (Reference 12), the NRC staff granted ENO exemptions from certain emergency planning (EP) requirements in 10 CFR 50.47 and Appendix E to 10 CFR Part 50, in accordance with 10 CFR 50.12, "Specific exemptions," and based, in part, on the low risks associated with the permanently shutdown and defueled condition of the VY reactor.

In granting the requested exemptions, the NRC primarily relied on the VY site-specific analyses, which provided reasonable assurance that: (1) an offsite radiological release would not exceed the U.S. Environmental Protection Agency's (EPA's) Protective Action Guides (PAGs) at the site's exclusion area boundary (EAB or "Site Boundary") for the design-basis accidents (DBAs) applicable to the VY facility in its permanently shutdown and defueled state; and (2) in the unlikely event of a severe beyond-DBA resulting in a loss of all cooling to the spent fuel stored in the VY SFP and ISFSI, sufficient time would be available to initiate appropriate mitigating actions, and if needed, for offsite authorities to implement protective actions using a

comprehensive emergency management plan (CEMP)¹ approach to protect the health and safety of the public. The Commission's approval of the requested exemptions is documented in a Staff Requirements Memorandum (SRM) dated March 2, 2015 (Reference 13), responding to SECY-14-0125, "Request by Entergy Nuclear Operations, Inc. for Exemptions from Certain Emergency Planning Requirements," dated November 14, 2014 (Reference 14). With the NRC's approval of the requested EP exemptions, ENO states that the proposed VY PDEP will continue to meet the remaining applicable planning standards in 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR Part 50.

In addition to the proposed emergency plan changes in the PDEP, ENO is proposing to change the entire EAL scheme to reflect the permanently shutdown and defueled condition of the VY reactor. In accordance with Section IV.B.2 of Appendix E to 10 CFR Part 50, the licensee must receive NRC approval before implementing a change to the entire EAL scheme. ENO states that the changes to the EAL scheme are consistent with the methodology recommended for permanently shutdown and defueled reactors, as provided in NEI 99-01, Revision 6 (Reference 4), which has been endorsed by the NRC.

2.0 REGULATORY EVALUATION

2.1 Emergency Plan

Section 50.47 of 10 CFR Part 50 sets forth emergency plan requirements for nuclear power plant facilities. The regulations in 10 CFR 50.47(a)(1)(i) state, in part, that:

...no initial operating license for a nuclear power reactor will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

Section 50.47(b) of the Commission's regulations establishes the standards that the onsite and offsite emergency response plans must meet for NRC staff to make a positive finding that there is reasonable assurance that the licensee can and will take adequate protective measures in the event of a radiological emergency.

Appendix E, Section IV, "Content of Emergency Plans," to 10 CFR Part 50 provides the requirements for the content of the emergency plans.

The current EP regulations contained in 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50, apply to both operating power reactors, and permanently shutdown and defueled power

¹ A CEMP in this context, also referred to as an emergency operations plan (EOP), is addressed in the Federal Emergency Management Agency's (FEMA) Comprehensive Preparedness Guide (CPG) 101, "Developing and Maintaining Emergency Operations Plans." CPG 101 is the foundation for State, territorial, Tribal, and local EP in the United States. It promotes a common understanding of the fundamentals of risk-informed planning and decision-making and helps planners at all levels of government in their efforts to develop and maintain viable, all-hazards, all-threats emergency plans. An EOP is flexible enough for use in all emergencies. It describes how people and property will be protected; details of who is responsible for carrying out specific actions; identifies the personnel, equipment, facilities, supplies, and other resources available; and outlines how all actions will be coordinated. A CEMP is often referred to as a synonym for "all hazards planning."

reactors. However, the EP regulations are silent with regard to the fact that once a power reactor permanently ceases operation and permanently removes fuel from the reactor vessel, the risks of credible emergency accident scenarios at the facility are greatly reduced. Therefore, the consistent practice for permanently shutdown and defueled power reactors has been for the licensees to request exemptions, under 10 CFR 50.12, which allow changes to the facility's emergency plan, commensurate with the credible site-specific risks that are present during decommissioning. Such EP exemptions generally recognize the reduction in radiological risk as spent fuel ages and the preclusion of accidents that are strictly applicable to an operating power reactor.

The consistent practice of granting exemptions from the Commission's EP regulations for permanently shutdown and defueled power reactor licensees is a well-established part of the NRC regulatory process that allows licensees to address site-specific situations or to implement alternative approaches in response to circumstances that are not necessarily contemplated in regulations that are generally intended for operating power reactors. The exemption process, which allows the NRC to provide relief in appropriate circumstances where safety and security continue to be assured, is not unique to the decommissioning of power reactors or to the specific technical areas of EP. The Commission makes decisions on exemption requests on a site-specific, case-by-case basis, following an established process that includes the NRC staff's detailed technical assessment on individual exemption requests. According to 10 CFR 50.12, the Commission may grant exemptions from the requirements of its regulations, which are authorized by law, will not present an undue risk to the public health and safety, are consistent with the common defense and security, and present special circumstances.

Revision 1 to NUREG-0654/FEMA (Federal Emergency Management Agency)-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants" (Reference 15), provides a common reference and guidance source for power reactor licensees to develop radiological emergency response plans. NUREG-0654/FEMA-REP-1 provides guidance for the format and content of the emergency plan, which can be applied to the evaluation criteria for each of the planning standards in 10 CFR 50.47(b), as exempted for VY.

2.2 Emergency Action Level Scheme

Paragraph 50.47(b)(4) of 10 CFR, as exempted for VY, requires that a licensee's emergency response plan contain:

A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.

This requirement emphasizes a standard emergency classification and action level scheme, assuring that implementation methods are relatively consistent throughout the industry for a given reactor and containment design, while simultaneously providing an opportunity for a licensee to modify its EAL scheme as necessary to address plant-specific design considerations or preferences.

Section IV.B of Appendix E to 10 CFR Part 50, as exempted for VY, states:

1. The means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within ~~and outside~~ the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite ~~and offsite~~ monitoring. ~~By June 20, 2012, for nuclear power reactor licensees, these action levels must include hostile action that may adversely affect the nuclear power plant.~~ The initial emergency action levels shall be discussed and agreed on by the applicant or licensee and state and local governmental authorities, and approved by the NRC. Thereafter, emergency action levels shall be reviewed with the State and local governmental authorities on an annual basis.
2. A licensee desiring to change its entire emergency action level scheme shall submit an application for an amendment to its license and receive NRC approval before implementing the change. Licensees shall follow the change process in § 50.54(q) for all other emergency action level changes.

This review is based upon a revision to the VY EAL scheme provided in the licensee's June 12, 2014, letter (Reference 3), and supplemented by the licensee's responses to the NRC's RAIs (References 6, 9, 10, and 11). Attachment 3 to the licensee's letter dated February 5, 2015 (Reference 9), contains the final version of the licensee's proposed site-specific EAL scheme for VY, which was reviewed by the NRC for acceptability.

As part of this review, the NRC staff assessed the site-specific modifications made by ENO to the guidance provided by NEI 99-01, Revision 6 (Reference 4). The purpose of NEI 99-01, Revision 6, is to provide guidance to nuclear power plant operators on an acceptable method for the development of a site-specific emergency classification scheme. The methodology described in this document is consistent with related NRC requirements and guidance. In particular, this methodology has been endorsed by the NRC, by letter dated March 28, 2013 (Reference 16), as an acceptable method for developing EALs required by 10 CFR 50.47(b)(4), related sections of Appendix E to 10 CFR Part 50, and the associated planning standard evaluation criteria in NUREG-0654/FEMA-REP-1, Revision 1 (Reference 15). In addition, the methodology also provides guidance for permanently shutdown and defueled power reactors for the development of a site-specific emergency classification scheme.

3.0 TECHNICAL EVALUATION

3.1 Emergency Plan

Pursuant to ENO's certifications of permanent cessation of operations and permanent removal of fuel under 10 CFR 50.82, "Termination of license," no reactor operations can take place, and VY is prohibited from moving the fuel from the SFP to the reactor vessel. Consequently, the VY PDEP describes the licensee's response to emergencies that may arise at VY while it is in a permanently shutdown and defueled configuration. Recognizing that there are no longer any credible DBAs that would result in offsite dose consequences large enough to require offsite radiological emergency preparedness (REP) plans, the PDEP no longer specifies the requirements for formal offsite REP planning. Additionally, the onsite EP activities contained in the VY PDEP are reduced in scope. The PDEP specifically implements the planning standards of 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR Part 50, as exempted by the NRC's letter to ENO dated December 10, 2015 (Reference 12).

This section of the NRC staff's safety evaluation (SE) summarizes the NRC staff's technical evaluation of the VY PDEP based on the planning standards of 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR Part 50, as exempted for VY, and using the evaluation criteria provided in NUREG-0654/FEMA-REP-1, as applicable to 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50, as exempted for VY. The proposed changes are shown with a strikethrough of the current wording associated with the regulations, as exempted for VY.

3.1.1 Assignment of Responsibility (Organizational Control)

Paragraph 50.47(b)(1) of 10 CFR, as exempted for VY, requires in a licensee's emergency plan that:

Primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations ~~within the Emergency Planning Zones~~ have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.

The Shift Manager is at the station 24 hours a day and is the senior management position at the station during off-normal hours. The Shift Manager shall assume the position of Emergency Director once the emergency classification has been made. This position is responsible for monitoring conditions and approving all onsite activities and has the requisite authority, management ability, technical knowledge, and staff to manage the site emergency and recovery organization. The Emergency Director is responsible for the direction of the total emergency response and has the designated authority to accomplish this responsibility.

In addition to the Shift Manager, designated on-shift staff positions include a Non-Certified Operator and Radiation Protection Technician, along with security personnel. The VY Emergency Response Organization (ERO) is activated at an Alert classification. However, it can be activated in part, or in whole, at the discretion of the Emergency Director for a

Notification of Unusual Event (Unusual Event). The on-shift staff can perform all required response actions, including initiation of SFP mitigation measures, until the ERO arrives.

Offsite response organization assistance (ORO) (i.e., fire, ambulance, and local law enforcement agency (LLEA)) is requested by the Emergency Director. State/Commonwealth and local government agency offsite response will be in accordance with each agency's CEMP approach and will be commensurate with the hazard posed by the emergency. The following letters of agreement provided in the letter dated June 18, 2015 (Reference 10), are in place for those local agencies that may respond to the site, and for the hospital that may be required to treat a contaminated injured individual from the VY site:

- Vernon and Brattleboro Fire Departments (assistance to the Plant Fire Brigade),
- Rescue, Inc. Ambulance Service, and
- Brattleboro Memorial Hospital (offsite medical services).

All letters of agreement from LLEA, as required by the site Physical Security Plan, are classified as Safeguards Information and as such are maintained by the VY Security Department.

The NRC staff reviewed the VY PDEP, as described above, against the applicable evaluation criteria in NUREG-0654/FEMA-REP-1, based on 10 CFR 50.47(b)(1), as exempted for VY. The NRC staff found that the VY PDEP met the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, because the VY PDEP adequately describes the concept of operations for individuals and organizations responsible for responding to emergencies at the site, identifies the position of Emergency Director as the individual in charge of the emergency response, and identifies the minimum staff on duty at the plant during all shifts to provide emergency response. Additional personnel are available on an on-call basis to respond to plant emergencies. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(1), as exempted for VY, pertaining to assignment of responsibility (organization control), is addressed in an acceptable manner in the PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.2 Onsite Emergency Organization

Paragraph 50.47(b)(2) of 10 CFR requires that a licensee's emergency response plan contain:

On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available and the interfaces among various onsite response activities and offsite support and response activities are specified.

VY has designated personnel on-shift at all times, including a designated Shift Manager, Non-Certified Operator, and Radiation Protection Technician, who would provide the initial response to an event. The Shift Manager is the on-shift individual who declares the initial emergency classification and assumes the role of Emergency Director. The Shift Manager has the authority to immediately and unilaterally initiate any emergency actions. The PDEP also specifies the non-delegable and delegable responsibilities of the Emergency Director.

Members of the on-shift organization are trained on their responsibilities and duties in the event of an emergency and are capable of performing necessary response actions until the ERO arrives to augment on-shift staffing or the event is terminated. The on-shift staffing assignments include the roles and responsibilities for their emergency response functions. The relationship between normal and emergency response positions for the shift personnel is unchanged when an event occurs.

The VY ERO augments the on-shift station organization's ability to respond to declared emergencies. Personnel are trained and assigned to the ERO based on either their normal job qualifications or by being specifically trained to fill a position. The ERO is activated when an Alert is declared, or at the discretion of the Shift Manager for an Unusual Event, and at such time, the Shift Manager assumes the responsibilities of the Emergency Director. The Emergency Director is responsible for ensuring that an ERO callout method is initiated to augment the on-shift staff. The minimum augmented staff is a Radiation Protection Coordinator and a Technical Coordinator. The table of on-shift positions and the augmented positions that fulfill emergency staffing capabilities is depicted in Table 8.1 of the VY PDEP. This table provides a graphical representation of the functional responsibilities for designated on-shift positions and the augmented positions that fulfill emergency staffing capabilities.

The VY PDEP further provides that, in the event of an emergency at VY requiring additional personnel and other support resources, the VY ERO can be augmented with manpower and equipment support from the remainder of the Entergy Nuclear organization. Additional support to VY is available from offsite organizations, as previously discussed in Section 3.1.1 of this SE. Arrangements are in place through letters of agreement for ambulance services, treatment of contaminated and injured patients, fire support services, and law enforcement response as requested by the station.

The NRC staff reviewed the VY PDEP, as described above, against the applicable evaluation criteria in NUREG-0654/FEMA-REP-1, based on 10 CFR 50.47(b)(2). The NRC staff found that the VY PDEP met the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, because the VY PDEP identified the onsite ERO and its relationship to the normal shift complement, and that the on-shift individual responsible for emergency response is the Shift Manager, who has the authority and responsibility to initiate the functional responsibilities for emergency response; there is adequate staffing to provide initial facility accident response in key functional areas; timely augmentation of response capabilities is available; local services are identified with letters of agreement in place; and arrangements for the treatment and transportation of contaminated injured personnel are identified. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(2), pertaining to the onsite emergency organization, is addressed in an acceptable manner in the PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.3 Emergency Response Support and Resources

Paragraph 50.47(b)(3) of 10 CFR, as exempted for VY, requires that a licensee's emergency response plan contain:

Arrangements for requesting and effectively using assistance resources have been made, ~~arrangements to accommodate State and local staff at the licensee's Emergency Operations Facility have been made~~, and other organizations capable of augmenting the planned response have been identified.

The Emergency Director is authorized to request assistance as needed. Fire, ambulance, and LLEA response is at the request and direction of the Emergency Director. Letters of agreement are in place for those local agencies that will respond to the site and for the local hospital that may be required to treat a contaminated injured individual from the site, as designated in the PDEP. These letters of agreement are discussed in Section 3.1.1, above. Federal agencies, including the NRC, U.S. Department of Energy (DOE), and DOE - Radiation Emergency Assistance Center/Training Site (REAC/TS), are also listed, along with their overall responsibilities.

The NRC staff reviewed the VY PDEP, as described above, against the applicable evaluation criteria in NUREG-0654/FEMA-REP-1 based on 10 CFR 50.47(b)(3), as exempted for VY. The NRC staff found that the VY PDEP met the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, because the VY PDEP adequately describes the arrangements for requesting assistance from other organizations or individuals in an emergency, and that this assistance is supported by letters of agreement. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(3), as exempted for VY, pertaining to emergency response support and resources, is addressed in an acceptable manner in the PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.4 Emergency Classification System

Paragraph 50.47(b)(4) of 10 CFR, as exempted for VY, requires that a licensee's emergency response plan contain:

A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, ~~and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.~~

The VY PDEP identifies that the emergency classification system covers a spectrum of possible radiological and non-radiological emergencies at VY. A graded scale of response for distinct classifications of emergency conditions, actions appropriate for those classifications, and criteria for escalation to a more severe classification are provided. The revised emergency classification system categorizes accidents and/or emergency situations into one of two emergency classification levels depending on emergency conditions at the time of the incident. The emergency classification levels applicable at VY, in order of increasing severity, are an Unusual Event and Alert. Each of these emergency classes requires notification to the States of Vermont and New Hampshire, and the Commonwealth of Massachusetts, as designated in the PDEP, as well as the NRC. The classification of emergencies up to an Alert is consistent with the regulations for an ISFSI in 10 CFR 72.32(a)(3) and the exemptions granted, as described in the NRC letter dated December 10, 2015 (Reference 12).

The VY emergency classification system is based on NEI 99-01, Revision 6 (Reference 4), as applied to a permanently shutdown and defueled power reactor with fuel stored in a SFP and ISFSI, which specifies emergency classification levels of an Unusual Event and Alert. Once indications are available to plant operators that an EAL has been met, the event is assessed and classified, and the corresponding emergency classification level is promptly declared as soon as possible, but within 30 minutes, consistent with Section IV.C.2 to Appendix E of Part 50, as exempted. The 30-minute criterion will commence when plant instrumentation, plant alarms, computer displays, or incoming verbal reports corresponding to an EAL first become available to the designated Shift Manager/Emergency Director.

The initiating conditions, their corresponding emergency classification levels, and the technical bases for each classifiable EAL threshold are contained in the station's EAL Technical Basis Manual, which is based on NEI 99-01, Revision 6.

The NRC staff reviewed the VY PDEP, as described above, against the applicable evaluation criteria in NUREG-0654/FEMA-REP-1, based on 10 CFR 50.47(b)(4), as exempted for VY. The NRC found that the VY PDEP met the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, because the VY PDEP adequately identifies that the emergency classification system covers a spectrum of possible radiological and non-radiological emergencies at VY, and a graded scale of response for distinct classifications of emergency conditions, actions appropriate for those classifications, and criteria for escalation to a more severe classification is provided. The specific instruments, parameters, or equipment status are described for each emergency class in the EAL scheme. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(4), as exempted for VY, pertaining to the emergency classification system, is addressed in an acceptable manner in the PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.5 Notification Methods and Procedures

Paragraph 50.47(b)(5) of 10 CFR, as exempted for VY, requires that a licensee's emergency response plan contain:

Procedures have been established for notification, by the licensee, of State and local response organizations and for notification of emergency personnel by all organizations; the content of initial and follow-up messages to response organizations ~~and the public has been established; and means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established.~~

The VY PDEP identifies the Emergency Director position, which is assumed by the Shift Manager, as having the authority and responsibility for declaring emergencies; initiating notifications to Federal and State/Commonwealth officials; and initiating corrective and mitigative actions. Emergency implementing procedures are established for notification and mobilization of ERO personnel. Each emergency classification results in onsite personnel being notified of the initial classification or any escalation of an emergency by a plant announcement and by the ERO notification system, as directed by the Emergency Director. In the event that personnel required to staff emergency positions are not onsite, they may be contacted through manual notification by commercial telephone and/or wireless devices capable of receiving text

messages. At an Alert classification level, all ERO personnel are notified to respond to augment the on-shift staff complement. Notifications of onsite personnel will be made as soon as possible after the triggering event (emergency declaration or decision to take onsite protective actions) to ensure the actions.

The Emergency Classification Form was revised, as follows, based on SECY-14-0125 (Reference 14), and approved by the Commission on March 2, 2015 (Reference 13):

- Remove the Site Area and General Emergency classifications consistent with the proposed Permanently Defueled Emergency Action Level scheme;
- Remove reference to the Emergency Operations Facility (EOF) and protective action recommendations; and
- Reflect a notification time of within 60 minutes following declaration of an emergency.

The format and contents of the initial message between the plant and State authorities are specified in notification procedures as described in Section 11.1 of the PDEP. Information provided as part of the initial notification may include:

- Date and time of the incident;
- Emergency classification;
- Status of the facility;
- Whether a release has occurred, is occurring, or is anticipated to occur; and
- Actual or projected dose rates at the Site boundary.

By letter dated October 20, 2014 (Reference 7), the NRC staff issued an RAI to the licensee to determine if the format and content of the initial and followup messages had been discussed with the States of Vermont and New Hampshire, and the Commonwealth of Massachusetts. VY responded by letter dated June 18, 2015 (Reference 10), that it had provided the proposed Emergency Classification Form to be implemented coincident with the approved PDEP to the responsible authorities with the States of Vermont and New Hampshire, and the Commonwealth of Massachusetts, for review by e-mail dated April 16, 2015.

VY has previously established mutually agreeable methods and procedures for notification of OROs, consistent with the approved emergency classification scheme. While not required by NRC regulations, VY currently maintains formal letters of agreement for notifications and emergency response activities with the States of Vermont and New Hampshire, and the Commonwealth of Massachusetts. By letter dated June 18, 2015 (Reference 10), VY provided the NRC copies of the signed letters of agreement with the State of New Hampshire and the Commonwealth of Massachusetts, agreeing to the proposed changes in event notification. The letter further stated that on April 28, 2015, the State of Vermont notified ENO that it will not provide any comments or its concurrence with the form until the pending NRC adjudicatory proceeding concerning the PDEP LAR (NRC Docket No. 50-271-LA-2) and Vermont's March 12, 2015, "Petition for Reconsideration of Commission's Decision Approving ENO's Exemption Requests" (Reference 17), are resolved.

The InForm Notification System is used by VY as the primary means to send the Emergency Notification Form to the States of Vermont and New Hampshire, and the Commonwealth of

Massachusetts. Backup to the InForm Notification System is the Nuclear Alert System (NAS). Both the InForm Notification System and NAS are currently monitored on a 24-hour basis by the States of Vermont and New Hampshire, and the Commonwealth of Massachusetts. VY will continue to utilize the InForm Notification System and NAS as the primary and backup means of event notification under the PDEP.

When an emergency classification level is declared or upgraded, initial notifications are promptly made within 60 minutes to the designated ORO warning points, consistent with Section IV.D.3 of Appendix E to 10 CFR Part 50, as exempted. The following offsite agencies (as described in Section 11.1 of the PDEP), at a minimum, will receive initial notification and followup messages:

- State of Vermont Dispatching Point,
- State of New Hampshire Dispatching Point, and
- Commonwealth of Massachusetts Dispatching Point.

Followup reports, as described in Section 11.1 of the PDEP, are provided to OROs as additional information describing the emergency situation becomes available and on an as-needed basis until such time as the emergency condition has been terminated.

The Event Notification System (ENS) is a dedicated telephone system used to notify the NRC Operations Center. The NRC will be notified as soon as possible after State/Commonwealth notification, but within 60 minutes of event declaration or change in classification, consistent with Section (a)(3) to 10 CFR 50.72. In the event of failure of the ENS, commercial phone lines will be used to notify the NRC, consistent with Section (a)(2) to 10 CFR 50.72. Notification to the NRC is the responsibility of the Emergency Director.

Medical, LLEA, and firefighting support services may also be requested to respond onsite. The Mutual Aid Radio is a multi-channel radio that can be utilized to contact Southwest Mutual Aid; Rescue, Inc. Ambulance Service; Brattleboro Memorial Hospital; and the respective Emergency Operations Centers (EOCs) for the States of Vermont and New Hampshire, and the Commonwealth of Massachusetts, in the event that all other offsite channels of communication fail. Requests for support services are the responsibility of the Emergency Director.

The NRC staff reviewed the VY PDEP, as described above, against the applicable evaluation criteria in NUREG-0654/FEMA-REP-1, based on 10 CFR 50.47(b)(5), as exempted for VY. The NRC staff found that the VY PDEP met the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, because the VY PDEP adequately describes the process for initiating notifications to the NRC and State/Commonwealth officials, and the contents of the emergency messages to be sent. VY, in cooperation with the State of New Hampshire and the Commonwealth of Massachusetts, has established mutually agreeable methods and procedures for notification of OROs (as discussed above), consistent with the approved emergency classification level scheme and the contents of the initial notification form. Followup calls will also be made to each of the lead agencies notified initially and will utilize a followup notification form with information similar to the initial notification form. Although a letter of agreement was not obtained from the State of Vermont, methods of notification remain consistent with the existing VY Emergency Plan and with planning standard 10 CFR 50.47(b)(5), as exempted. VY has demonstrated a good faith effort to discuss and obtain alignment with the State of Vermont on event notification aspects. As such, the NRC

would expect the State of Vermont to respond to an event at VY to ensure public health and safety, consistent with 10 CFR 50.47(c)(1). Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(5), as exempted for VY, pertaining to notification methods and procedures, is addressed in an acceptable manner in the PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.6 Emergency Communications

Paragraph 50.47(b)(6) of 10 CFR, as exempted, requires that a licensee's emergency response plan contain:

Provisions exist for prompt communications among principal response organizations to emergency personnel *and to the public*.

Offsite notifications are provided from the licensee's Control Room to the designated offsite agencies' dispatching points, which are continually staffed, using the InForm Notification System (primary means of communication) or NAS (backup means of communication), as discussed in Section 3.1.5 of this SE. The communication methods provide 24-hour capability internal to the plant and for plant-to-offsite communications.

In the event that personnel required to staff ERO positions are not on-site at the time an emergency is declared, they may be contacted by commercial telephone, including land lines and/or wireless devices capable of receiving telephone calls and text messages. Telephone numbers are maintained in various telephone directories.

The Mobile Ultra High Frequency (UHF) Radio System is utilized as a primary means of communications for security personnel, and is the alternate means of communication between the Control Room and onsite response teams. Security also has the capability to contact the primary local law enforcement agency patrol vehicle(s) as defined in the VY Physical Security Plan.

The Intercom System (Gai-Tronics) is located in many areas throughout the plant, including the Control Room and Security Gates. During emergency situations, the system is used as the primary means for: (1) notifying plant personnel of the emergency; (2) coordinating the activities of onsite response teams with the Control Room; and (3) calling for any missing or unaccounted for personnel that may be in the plant. This system is in continuous daily use.

The Mutual Aid Radio is a multi-channel radio that can be utilized to contact Southwest Mutual Aid; Rescue, Inc. Ambulance Service; Brattleboro Memorial Hospital; and the respective EOCs for the States of Vermont and New Hampshire, and the Commonwealth of Massachusetts, in the event that all other offsite channels of communication fail.

The ENS is a dedicated telephone system used to notify the NRC Operations Center. In the event of failure of the ENS, commercial phone lines will be used to notify the NRC.

Communication channels with the States of Vermont and New Hampshire, and the Commonwealth of Massachusetts are currently tested monthly and will continue to be tested monthly, as described in Section 12.1.2 in the PDEP. These communication tests will include

the aspect of understanding the content of messages. The ENS is tested daily by the NRC. Testing of communications used on a frequent basis, which includes commercial telephone, mobile UHF radio system, and plant intercom system is not necessary.

The NRC staff reviewed the VY PDEP, as described above, against the applicable evaluation criteria in NUREG-0654/FEMA-REP-1, based on 10 CFR 50.47(b)(6), as exempted for VY. The NRC staff found that the VY PDEP met the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, because the VY PDEP adequately identifies that provisions exist for prompt communications among principal response organizations to emergency personnel. The communication methods provide a reliable primary and backup means of communication; a 24-hour capability internal to the plant; and for plant-to-offsite communications with Federal, State, and local agencies. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(6), as exempted for VY, pertaining to emergency communications, is addressed in an acceptable manner in the PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.7 Public Education and Information

Paragraph 50.47(b)(7) of 10 CFR, as exempted, requires that a licensee's emergency response plan contain:

~~Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors),~~ (T)he principal points of contact with the news media for dissemination of information during an emergency ~~(including the physical location or locations)~~ are established in advance, and procedures for coordinated dissemination of information to the public are established.

Section 11.2 of the VY PDEP identifies that upon the declaration of an event, the licensee's Public Information Representative is notified and handles public information associated with the event. Communication personnel will be notified of an emergency declaration via the ERO notification system and would serve as the licensee's spokesperson. However, the function could also be performed by plant or corporate management. Upon receiving notification of an emergency declaration, the spokesperson contacts the Control Room and receives a brief description of the event. The spokesperson monitors media activity and coordinates with senior management to address rumors and disseminate information to the public. The spokesperson will participate in news conferences as appropriate with Federal, States/Commonwealth, and local emergency response organizations conducted on-site or at other locations, as necessary. The spokesperson is available for media inquiries, and the positional duties include maintaining liaison with local media and coordinating with Federal, States/Commonwealth, and local response organizations to disseminate appropriate information regarding an emergency at VY. Federal, States/Commonwealth, and local response organizations maintain the capability to disseminate appropriate information regarding an emergency at VY. Also, as part of its normal corporate structure, ENO maintains a corporate public affairs office that can be called upon to provide additional resources, as necessary. VY maintains a public inquiry phone for media and public use. During an emergency, a pre-recorded message will provide up-to-date status reports regarding the situation.

The NRC staff reviewed the VY PDEP, as described above, against the applicable evaluation criteria in NUREG-0654/FEMA-REP-1, based on 10 CFR 50.47(b)(7), as exempted for VY. The NRC staff found that the VY PDEP met the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, because the VY SAFSTOR organization includes a communications position that would serve as the licensee's designated spokesperson should an emergency be declared at VY. The spokesperson is available for media inquiries, and the positional duties include maintaining liaison with local media and coordinating with Federal, States/Commonwealth, and local emergency response organizations to disseminate appropriate information regarding an emergency at VY. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(7), as exempted for VY, pertaining to public education and information, is addressed in an acceptable manner in the PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.8 Emergency Facilities and Equipment

Paragraph 50.47(b)(8) of 10 CFR requires that a licensee's emergency response plan contain:

Adequate emergency facilities and equipment to support the emergency response are provided and maintained.

The VY PDEP identifies that the Control Room is where plant systems and equipment parameters are monitored. The Control Room is the onsite center for emergency command and control. Control Room personnel will assess plant conditions; evaluate the magnitude and potential consequences of abnormal conditions; initiate preventative, mitigating, and corrective actions; and perform notifications.

The Control Room is occupied on a continuing basis, requiring no activation to initiate response actions. When activated, the ERO, which initially consists of the Technical Coordinator and Radiation Protection Coordinator, reports to the Emergency Director to assist the on-shift staff in the assessment, mitigation, and response to an emergency, and support the dispatching of emergency teams. The goal of the ERO is to augment the on-shift staff within 2 hours of an Alert classification.

The Control Room contains communications equipment, emergency radiation monitoring equipment, emergency respiratory devices, and an emergency kit containing protective clothing and other supplies. The ERO has access to up-to-date technical documentation, including drawings, system information, and procedures to enable mitigation planning and support of Control Room staff. A general assembly area for emergency mitigation and radiation protection personnel is also maintained. The Shift Manager activates the ERO if plant conditions reach predetermined EALs.

Annunciator and computer alarms are provided for a variety of parameters, including the SFP cooling system, to indicate SFP level, temperature, and pump status.

A number of radiation monitors and monitoring systems are provided on process and effluent liquid and gaseous lines that serve directly or indirectly as discharge routes for radioactive materials. These monitors, which include Control Room readout and alarm functions, exist in

order that appropriate action can be initiated to limit fuel damage and/or contain radioactive material. In addition to installed monitoring systems, VY has augmented onsite radiological assessment capability, including portable radiation and contamination monitoring instruments and sampling equipment. Fire detectors are located throughout the plant with alarms and indicators in the Control Room.

The meteorological equipment at the site consists of wind-speed and direction transmitters, signal translators, and recorders. In addition, the temperature measurement consists of recorders and resistance temperature detectors (RTDs). RTDs are used to monitor ambient temperature and calculate differential temperature. In addition, VY has the capability to access additional meteorological information through offsite support services. This information can be forwarded to VY upon request.

Section 12.4 of the VY PDEP describes that at least quarterly and subsequent to each usage, designated VY personnel are assigned to inventory and maintain the emergency kits and/or equipment. Rotation of survey instruments normally used in the plant with instruments in the emergency kits assures that emergency equipment is calibrated and fully operable. There are sufficient reserve instruments and equipment to replace those that are removed from emergency kits for calibration purposes.

The NRC staff reviewed the VY PDEP, as described above, against the applicable evaluation criteria in NUREG-0654/FEMA-REP-1 based on 10 CFR 50.47(b)(8). The NRC staff found that the VY PDEP met the applicable evaluation criteria of NUREG-0654/FEMA-REP-1 because the VY PDEP adequately identifies the Control Room as the onsite facility used to respond to emergency events, plant systems and equipment parameters necessary to initiate emergency measures, and assess conditions may be monitored in this location. Appendix B of the VY PDEP identifies the general category of equipment and supplies that make up equipment available to assist with emergency response. Section 12.4 of the VY PDEP discusses the inventorying and testing of equipment. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(8), pertaining to emergency facilities and equipment, is addressed in an acceptable manner in the PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.9 Accident Assessment

Paragraph 50.47(b)(9) of 10 CFR, as exempted, requires that a licensee's emergency response plan contain:

Adequate methods, systems, and equipment for assessing and monitoring actual or potential ~~offsite~~ consequences of a radiological emergency condition are in use.

The VY PDEP identifies that EAL thresholds have been established in accordance with NEI 99-01, Revision 6. The EAL Technical Bases Manual identifies the system parameter and effluent parameter values that can be used to determine the emergency condition.

The activation of the VY PDEP and the continued assessment of accident conditions require monitoring and assessment capabilities. VY maintains and operates onsite monitoring systems

needed to provide data that is essential for initiating emergency measures and performing accident assessment, including dose assessment and assessing the magnitude of a release. This capability includes monitoring systems for plant processes, radiological conditions, meteorological conditions, and fire hazards. The essential monitoring systems needed are incorporated in the EALs specified in Appendix A.

A number of radiation monitors and monitoring systems are provided on process and effluent liquid and gaseous lines that serve directly or indirectly as discharge routes for radioactive materials. These monitors, which include Control Room readout and alarm functions, exist in order that appropriate action can be initiated to limit fuel damage and/or contain radioactive material. The monitoring equipment provides radiological surveillance capabilities; warns personnel of a radiological release; provides warning of certain plant malfunctions which might lead to a radiological release, and prevents, or minimizes, the effects of an accidental release of radioactivity to the environment.

VY has developed a method to quickly determine the projected radiological conditions at the site boundary. During the initial stages of an emergency, the Shift Manager or designated individual is responsible to perform the initial evaluation of radiological conditions. Plant instrumentation provides personnel in the Control Room with the following parameters necessary to perform dose assessment and determine the magnitude of a potential release: gaseous and liquid effluent monitor readings, radiation levels, and SFP area radiation levels.

The NRC staff reviewed the VY PDEP, as described above, against the applicable evaluation criteria in NUREG-0654/FEMA-REP-1 based on 10 CFR 50.47(b)(9), as exempted for VY. The NRC staff found that the VY PDEP met the applicable evaluation criteria of NUREG-0654/FEMA-REP-1 because Section 6 of the VY PDEP adequately identifies the onsite capabilities and resources available to provide initial and continuing information for accident assessment throughout the course of an event, including area and process radiation monitoring systems. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(9), as exempted for VY, pertaining to accident assessment, is addressed in an acceptable manner in the PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.10 Protective Response

Paragraph 50.47(b)(10) of 10 CFR, as exempted, requires that a licensee's emergency response plan contain:

~~A range of protective actions has been developed for the plume exposure pathway EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate. Evacuation time estimates have been developed by applicants and licensees. Licensees shall update the evacuation time estimates on a periodic basis. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.~~

The VY PDEP identifies the protective actions for onsite personnel, including station personnel, contractors, and visitors (members of the public) located onsite, and will include:

- site personnel accountability,
- site egress control methods,
- contamination control and decontamination capability,
- use of onsite protective equipment and supplies,
- firefighting,
- medical treatment, and
- medical transportation.

The VY PDEP identifies that onsite staff are informed of an emergency condition through the use of the plant public address system, office telephone, and/or wireless devices capable of receiving telephone calls and text messages. Further, the goal of the personnel accountability process is to account for personnel within 60 minutes of an Alert declaration, with accountability for an Unusual Event initiated at the discretion of the Emergency Director. However, accountability may be modified or suspended if the safety of personnel may be jeopardized by a security event or other event hazardous to personnel. The Emergency Director, Technical Coordinator, and Radiation Protection Coordinator are responsible for accounting for their staff. An organizational sign-in method that enhances this reporting process is maintained. All reports are provided to the Emergency Director, who initiates search and rescue actions for any missing personnel.

Plant security provides assistance for this accountability effort and aids in the control of personnel during extended emergency operations. Plant procedures require Security personnel to maintain a list of personnel entering or leaving the site during a site evacuation. If a Code Red Security event is declared, evacuation and accountability may put personnel at risk. In these situations, evacuation and accountability may be suspended until directed by Security.

The VY PDEP also provides that all visitors and unnecessary contractors are evacuated from the plant upon an Alert declaration. All personnel are monitored for radioactive contamination prior to leaving the site. Portable radiation survey meters are available to frisk personnel for suspected contamination. Plant evacuees are advised of evacuation procedures prior to being released.

Equipment such as respiratory protection gear and protective clothing is assigned to ERO members and plant personnel in accordance with established plant radiation protection criteria.

The NRC staff reviewed the VY PDEP, as described above, against the applicable evaluation criteria in NUREG-0654/FEMA-REP-1 based on 10 CFR 50.47(b)(10), as exempted for VY. The NRC staff found that the VY PDEP met the applicable evaluation criteria of NUREG-0654/FEMA-REP-1 because Section 10.3 of the VY PDEP adequately identifies the protective actions for onsite personnel, including station personnel, contractors, and visitors (members of the public) and provides that protective equipment and supplies will be distributed, as needed, to personnel remaining or arriving onsite during an emergency. The VY PDEP also describes that evacuation routes and procedures are addressed in emergency plan overview

training, plant evacuees are advised of evacuation procedures prior to being released, and all personnel are monitored for radioactive contamination prior to leaving the site. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(10), as exempted for VY, pertaining to protective response, is addressed in an acceptable manner in the PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.11 Radiological Exposure Control

Paragraph 50.47(b)(11) of 10 CFR requires that a licensee's emergency response plan contain:

Means for controlling radiological exposures, in an emergency, are established for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides.

The VY PDEP identifies all reasonable measures shall be taken to control the radiation exposure to emergency response personnel providing rescue, first aid, decontamination, emergency transportation, medical treatment services, or corrective or assessment actions within applicable limits specified in 10 CFR Part 20. Table 10.1 of the VY PDEP denotes the guidelines on emergency dose limits for personnel providing emergency response duties consistent with Table 2-2, "Response Worker Guidelines," provided in the EPA PAG Manual. The Shift Manager/Emergency Director has the responsibility to authorize emergency dose commitments in excess of 10 CFR Part 20 limits, which is coordinated with the Radiation Protection Coordinator. Exposure to individuals providing emergency functions will be consistent with the limits specified in Table 10.1, with every attempt made to keep exposures As Low as Reasonably Achievable.

The Radiation Protection Coordinator is responsible for developing emergency radiological protection programs for ERO and other augmented personnel responding on-site. Emergency kits are provided with self-reading dosimeters. Each member reporting to the site will be provided a Dosimeter of Legal Record (DLR). The capability exists for the emergency processing of DLRs on a 24-hour per day basis. Dose records will be maintained based upon the results of the self-reading dosimeters, which is cross-referenced with the DLR data. Emergency workers are instructed to read self-reading dosimeters frequently, and DLRs may be processed with increased periodicity.

The VY PDEP further provides that during emergency conditions, VY maintains normal plant decontamination and contamination control measures as closely as possible. However, these measures may be modified by the Emergency Director, should conditions warrant. Contaminated areas are isolated as restricted areas with appropriate radiological protection and access control. Personnel leaving contaminated areas are monitored to ensure both they and their clothing are not contaminated. Supplies, instruments, and equipment that are in contaminated areas or have been brought into contaminated areas will be monitored prior to removal. Items found to be contaminated will be decontaminated using normal plant decontamination techniques and facilities or may be disposed of as radioactive waste. VY permits areas and items to be returned to normal use following conduct of appropriate surveys and verification that contamination levels have returned to acceptable levels.

VY maintains an in-plant decontamination facility. Waste generated is collected and processed by the plant liquid radwaste system. Survey instrumentation for personnel "frisking" and sensitive body burden monitoring equipment are available in various plant locations. Decontamination is performed under the direction of the Radiation Protection Coordinator.

The NRC staff reviewed the VY PDEP, as described above, against the applicable evaluation criteria in NUREG-0654/FEMA-REP-1 based on 10 CFR 50.47(b)(11). The NRC staff found that the VY PDEP met the applicable evaluation criteria of NUREG-0654/FEMA-REP-1 because the VY PDEP adequately identifies the means for controlling radiological exposures for emergency workers. Emergency worker dose limits are established for designated activities and under specific conditions. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(11), pertaining to radiological exposure control, is addressed in an acceptable manner in the PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.12 Medical and First Aid Support

Paragraph 50.47(b)(12) of 10 CFR requires that a licensee's emergency response plan contain:

Arrangements are made for medical services for contaminated injured individuals.

The VY PDEP identifies that medical supplies are provided on-site and that initial onsite medical treatment is provided by on-site personnel. The VY PDEP also identifies that arrangements, by letter of agreement, are maintained with Brattleboro Hospital, which is located in the vicinity of the station, as discussed in Sections 3.1.1 and 3.1.3 of this SE. This facility is equipped and qualified for receiving and treating radiologically contaminated or over-exposed persons with injuries requiring immediate hospital care. The VY PDEP further provides arrangements that are made by the station for prompt ambulance transport of persons with injuries involving radioactivity to the designated hospital. Such service is available on a 24-hour per day basis and is confirmed by letter of agreement with Rescue, Inc. Ambulance Service.

The NRC staff reviewed the VY PDEP, as described above, against the applicable evaluation criteria in NUREG-0654/FEMA-REP-1 based on 10 CFR 50.47(b)(12). The NRC staff found that the VY PDEP met the applicable evaluation criteria of NUREG-0654/FEMA-REP-1 because the VY PDEP adequately identifies that arrangements are maintained with primary and backup hospitals or medical facilities located in the vicinity of the station, arrangements have been made for prompt ambulance transport of persons with injuries involving radiologically contaminated to designated hospitals, and the station maintains onsite first aid supplies and equipment necessary for the treatment of contaminated or injured persons. Based on this review, the NRC staff concludes that planning standard 10 CFR 0.47(b)(12), pertaining to medical and first aid support, is addressed in an acceptable manner in the PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.13 Recovery and Reentry

Paragraph 50.47(b)(13) of 10 CFR requires that a licensee's emergency response plan contain:

General plans for recovery and reentry are developed.

The VY PDEP identifies that an extensive review of plant parameters, including SFP parameters and radiation monitoring systems, in conjunction with the pre-established EALs, is required to terminate an emergency. Termination of an emergency status is the responsibility of the Emergency Director. The Emergency Director reaches agreement with offsite authorities concerning de-escalation or termination of the event and closes out the event by verbal summary to offsite authorities.

Upon termination of an emergency and transition into the recovery phase, the Emergency Director assembles the recovery organization to address the specific emergency circumstances of the terminated event. The remainder of the recovery organization consists of the normal plant and emergency organizations described in Sections 8.1 and 8.2 of the VY PDEP, as necessary, to provide the radiological and technical expertise required to assist the Emergency Director restore the plant to normal conditions. The actions taken by this organization concerning termination of the emergency proceeds in accordance with a recovery plan developed specifically for the accident conditions.

The recovery organization's responsibilities include:

- maintaining comprehensive radiological surveillance of the plant to assure continuous control and recognition of problems;
- controlling access to the area and exposure to workers;
- decontaminating affected areas and/or equipment; conducting clean-up and restoration activities;
- isolating and repairing damaged systems; documenting all proceedings of the accident; and
- reviewing the effectiveness of the emergency organization in reducing public hazard and/or plant damage.

The organization relies on plant staff and resources to restore the plant to normal conditions. Dependent upon the emergency condition and response needs, the VY ERO can be augmented by manpower and equipment support from the remainder of the Entergy Nuclear organization. If required, expertise can also be provided from DOE through the letters of agreement.

The NRC staff reviewed the VY PDEP, as described above, against the applicable evaluation criteria in NUREG-0654/FEMA-REP-1 based on 10 CFR 50.47(b)(13). The NRC staff found that the VY PDEP met the applicable evaluation criteria of NUREG-0654/FEMA-REP-1 because the VY PDEP adequately identifies the general goals for plant recovery and that the licensee's recovery organization will be based on a normal VY organization and will function with a VY executive management position responsible for directing all site activities. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(13), pertaining to recovery

and reentry, is addressed in an acceptable manner in the PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.14 Exercises and Drills

Paragraph 50.47(b)(14) of 10 CFR requires that a licensee's emergency response plan contain:

Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are (will be) corrected.

The VY PDEP identifies that emergency exercises and drills are conducted to test and evaluate:

- the adequacy of emergency facilities, equipment, procedures and communication channels;
- actions of emergency response personnel; and
- coordination between OROs and the facility.

To evaluate the performance of participating facility personnel and the adequacy of emergency facilities, equipment, and procedures during an exercise, a designated Exercise Coordinator obtains qualified controllers, which includes resources outside of the facility to evaluate and critique the exercise. The scenario varies year to year and is approved by VY management. Within an 8-year period, the scenario content is varied to test all of the major elements of the EP program. The scenarios are designed to allow free play in exercising the decision-making process associated with such emergency response actions as exposure control, emergency classification and de-escalation, and the ERO and additional staff augmentation process.

The contents of the scenario include, but are not limited to, the following:

- basic objective(s);
- date, time period, place and participating organizations;
- simulation lists;
- time schedule of real and simulated initiating events;
- a narrative summary describing the conduct of the drill or exercise to include such items as simulated casualties, search and rescue of personnel, deployment of radiological monitoring teams, and public information affairs; and
- a list of controllers.

The following equipment and proficiency drills may be performed as part of an exercise, a drill, or as an independent drill:

- Communication tests (monthly with state/commonwealth governments; ENS tested by NRC daily);
- Augmentation Capability drills (semi-annually – off hours, unannounced communications drills);
- Fire drills (annually, in accordance with Fire Protection Plan);

- Medical Emergency drills (annually);
- Radiological Monitoring drills (annually);
- Health physics drills (semi-annually); and
- Security drills (in accordance with the VY Physical Security Plan).

To test and evaluate the response and training of the plant's fire brigade, fire drills are conducted in accordance with the VY Fire Protection Program. To demonstrate the coordination between the plant's fire brigade and the Vernon Fire Department, the fire department is annually offered the opportunity to participate in an onsite fire drill. To evaluate the training of the facility's medical response and offsite medical response (ambulance and hospital), a medical drill is conducted annually with a simulated contaminated injured individual. Plant environs and radiological monitoring drills are conducted annually. These drills include monitoring of accessible areas within the plant and include collection and analysis of airborne sample media, communications, and recordkeeping performed by members of the emergency team. Health Physics drills are conducted semi-annually, involving response to, and analysis of, simulated elevated in-plant airborne and liquid samples and direct radiation measurements in the environment.

A critique is conducted at the conclusion of the exercise with facility personnel. After the critique, the controllers submit a written evaluation to the Exercise Coordinator in which the exercise performance is evaluated against the pre-established objectives. All comments and recommendations are documented, and any weaknesses or deficiencies identified in an exercise critique are processed in accordance with the site corrective actions program.

The NRC staff reviewed the VY PDEP, as described above, against the applicable evaluation criteria in NUREG-0654/FEMA-REP-1 based on 10 CFR 50.47(b)(14). The NRC staff found that the VY PDEP met the applicable evaluation criteria of NUREG-0654/FEMA-REP-1 because the VY PDEP adequately identifies the general goals for exercises and drills, the intent of exercise scenarios, and that exercise and drill performance objectives are evaluated against measurable demonstration criteria. As soon as possible following the conclusion of each exercise or drill, a critique will be conducted. The Emergency Planning Manager is responsible for ensuring that items identified in the critique are correctly dispositioned and for ensuring resolution of each item under the site's corrective actions program. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(14), pertaining to exercises and drills, is addressed in an acceptable manner in the PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.15 Radiological Emergency Response Training

Paragraph 50.47(b)(15) of 10 CFR requires that a licensee's emergency response plan contain:

Radiological emergency response training is provided to those who may be called on to assist in an emergency.

The purpose of the emergency plan training program is to ensure the VY staff and selected support contractors, who are part of the VY ERO or augmented resources, are appropriately

trained and qualified for their position-specific emergency response duties. Emergency Plan training is divided into three major phases:

- Emergency Plan Overview Training (Prerequisite),
- Initial Training Program, and
- Continuing Training Program.

Those members of the plant staff who have been assigned to the ERO receive annual training that includes, but is not limited to, the following: familiarize individuals with Emergency Plan and implementing procedures, especially where emergency response tasks are not part of their normal duties; define an individual's responsibilities associated with his or her designated function; familiarize individuals in emergency exposure control measures and guidelines, particularly those associated with an individual's designated emergency functions; and provide sufficient technical insight to maintain emergency functions. A portion of this training may be provided by personnel participating in drills or exercises. During these drills and exercises, controllers check the performance of the personnel assigned and provide critiques which could be incorporated in future training.

Training is offered annually to offsite response organizations that may be requested to provide assistance in the event of an emergency at VY (e.g., law enforcement, firefighting, rescue, medical services, transport of injured, etc.). The training shall be structured to meet the needs of that organization with respect to the nature of its support. Topics such as event notification, site access procedures, basic radiation protection, and interface activities between the offsite organization and VY are included in the training.

VY personnel who will be qualified to provide initial onsite medical treatment will, at a minimum, complete an 8-hour program based on the American Heart Association First Aid/cardiopulmonary resuscitation (CPR)/automated external defibrillator (AED) course to meet the educational and examination requirements of its Basic First Aid and CPR/ AED courses. Recertification of the members assigned rescue/first aid treatment duties will be conducted as required by the level of certification held by the individual.

The NRC staff reviewed the VY PDEP, as described above, against the applicable evaluation criteria in NUREG-0654/FEMA-REP-1 based on 10 CFR 50.47(b)(15). The NRC staff found that the VY PDEP met the applicable evaluation criteria of NUREG-0654/FEMA-REP-1 because the VY PDEP adequately identifies the level and depth of the emergency preparedness training program to which individuals are to be trained, and the training for ERO personnel is developed from position-specific responsibilities defined in the PDEP. Training is provided or formally offered annually to OROs. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(15), pertaining to radiological emergency response training, is addressed in an acceptable manner in the PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.16 Emergency Plan Development and Review

Paragraph 50.47(b)(16) of 10 CFR requires that a licensee's emergency response plan contain:

Responsibilities for plan development and review and for distribution of emergency plans are established, and planners are properly trained.

The VY PDEP identifies that the Senior Site Executive has overall responsibility for implementation of the PDEP at VY, and the Emergency Planning Manager is responsible for EP and the interface with offsite authorities and organizations. The Emergency Planning Manager is responsible for maintaining an adequate knowledge of regulations, planning techniques, and the latest applications of emergency equipment and supplies.

The Emergency Planning Manager is responsible for maintaining an adequate knowledge of regulations, planning techniques, and the latest applications of emergency equipment and supplies. Training for this position includes, but is not limited to:

- training courses — specific or related to emergency preparedness;
- observation of, or participation in, drills and/or exercises at other decommissioned nuclear power plants;
- participation in industry review and evaluation programs; and
- participation in regional or national emergency preparedness seminars, conferences, committees, workshops, or forums.

The VY PDEP will be reviewed at least annually and the associated implementing procedures are reviewed at least biennially. All recommendations for changes to the PDEP or associated implementing procedures are reviewed in accordance with 10 CFR 50.54(q). The PDEP will then be submitted to VY's On-Site Safety Review Committee for approval.

Written agreements with outside support organizations and government agencies will be evaluated annually to determine if these agreements are still valid. If agreements are not valid, they are renewed and updated. Changes to the PDEP will be forwarded to organizations and individuals with a responsibility for implementation of the plan.

Appendix E of the PDEP contains an index of implementing procedures, by title, and a criteria cross-reference is provided in Appendix F. The PDEP further provides that the telephone number listings associated with the emergency notification process will be verified quarterly.

The NRC staff reviewed the VY PDEP, as described above, against the applicable evaluation criteria in NUREG-0654/FEMA-REP-1 based on 10 CFR 50.47(b)(16). The NRC staff found that the VY PDEP met the applicable evaluation criteria of NUREG-0654/FEMA-REP-1 because the VY PDEP adequately identifies that issuance and control of the PDEP is the responsibility of the Emergency Preparedness Manager. The PDEP will be reviewed and updated as necessary, on an annual basis, which includes required changes identified during audits, assessments, training, drills, and exercises. The PDEP and implementing procedures will be distributed on a controlled basis. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(16), pertaining to emergency plan development and review, is

addressed in an acceptable manner in the PDEP, considering the permanently shutdown and defueled status of the facility.

3.2 Emergency Action Level Scheme

The licensee currently utilizes an EAL scheme based on NEI 99-01, Revision 5, "Methodology for Development of Emergency Action Levels," dated February 2008 (Reference 18), which was approved by the NRC in a letter dated June 16, 2009 (Reference 19), as applied to an operating power reactor facility, with site-specific modifications due to design issues and/or licensee preference. The licensee is converting to an EAL scheme using the guidance in NEI 99-01, Revision 6 (Reference 4), as applied to a permanently shutdown and defueled power reactor with fuel stored in an SFP and ISFSI, and with site-specific modifications due to design issues and/or licensee preference.

As discussed in the NRC SE associated with the exemptions granted to VY (Reference 12) from certain planning standards of 10 CFR 50.47 and requirements of Appendix E to 10 CFR Part 50, there are no longer any DBAs at VY that can result in a radiological release exceeding the EPA PAGs at the EAB. Therefore, the NRC staff's assessment of the risks and consequences of a radiological release at VY, based on its permanently shutdown and defueled condition, concluded that the risks and consequences are insufficient to warrant classifications of a Site Area Emergency or General Emergency. As a result, the only emergency classification levels (ECLs) applicable to VY are an Unusual Event or an Alert.

In its June 12, 2014, letter and supplemental letters of February 5, 2015, and June 18, 2015 (References 3, 9, and 10, respectively), ENO submitted its proposed EAL scheme for VY, along with its technical basis and the EAL numbering scheme.

The proposed site-specific EAL scheme is unique to VY, as it contains site-specific designations and descriptions. However, to ensure consistency and regulatory stability, the NRC staff reviewed the proposed site-specific EAL scheme to ensure that it has the following key characteristics of an effective EAL scheme found in the endorsed guidance of NEI 99-01, Revision 6:

- Consistency (i.e., the EALs would lead to similar decisions under similar circumstances at different plants), up to and including standardization in intent, if not in actual wording;
- Human factors engineering and user friendliness;
- Potential for classification upgrade only when there is an increasing threat to public health and safety;
- Ease of upgrading and downgrading;
- Thoroughness in addressing and disposing of the issues of completeness and accuracy raised in Appendix 1 to NUREG-0654/FEMA-REP-1;
- Technical completeness for each classification level;

- Logical progression in classification for multiple events; and
- The use of objective and observable values.

The VY EAL technical basis document is an integral part of the emergency classification scheme. The material in this document supports proper emergency classification decision-making by providing informed background and development information in a readily accessible format. It can be referred to in training situations and when making an actual emergency classification, if necessary. The document is also useful for establishing configuration management controls for emergency preparedness-related equipment and explaining an emergency classification to offsite authorities.

To aid in understanding the nomenclature used in this SE, the proposed EAL scheme for VY includes two ECLs: (1) Unusual Event (U), and (2) Alert (A). Initiating conditions (ICs) for entry into each of the two ECLs are specified for conditions relating to:

- Abnormal Radiological Levels/Radiological Effluent (PD-A);
- Hazards and Other Conditions Affecting Plant Safety (PD-H);
- System Malfunction (PD-S), based on the permanently shutdown and defueled status of the facility with spent fuel stored onsite in a spent fuel pool; and
- Hazards and Other Conditions Affecting ISFSI (E-H).

For each IC, specific EAL threshold values are identified that would require the declaration of an ECL. The EAL scheme is intended to provide multiple and diverse threshold values for an Unusual Event and Alert to ensure accurate EAL classification and timely declaration.

In applying the guidance in NEI 99-01, Revision 6, developers should attempt to keep their site-specific schemes as close to the generic guidance as possible to ensure that the intent of the generic ICs and EALs within the context of site-specific characteristics, such as locale, plant design, operating features, terminology, etc., is met. VY made the following site-specific changes to incorporate the generic EAL scheme, globally, throughout the proposed EAL scheme, as follows:

- used the term “Unusual Event (UE)” instead of “Notification of Unusual Event (NOUE),” as VY determined that its use was consistent with current EAL matrix and agreed in meaning and intent with NEI 99-01, Revision 6;
- removed the emergency class level as it is identified in the IC;
- added the recognition category for each EAL;

- removed reference to “Operating Mode,” as it did not apply in a permanently defueled condition;
- removed the “Example Emergency Action Levels”;
- changed the numbering of the EALs; and
- added site-specific basis information.

The NRC staff determined that these changes are administrative in nature, and as such, acceptable, since they do not impact the overall EAL scheme. An evaluation of the acceptability of the EALs is provided in the following sections.

3.2.1 CATEGORY “PD-A”: ABNORMAL RADIATION LEVELS/RADIOLOGICAL EFFLUENT

3.2.1.1 EAL PD-AU1, “Release of gaseous or liquid radioactivity greater than 2 times the radiological effluent Offsite Dose Calculation Manual (ODCM) for 60 minutes or longer”

This EAL addresses a potential or actual decrease in the level of safety of the plant, as indicated by a low level radiological release that exceeds regulatory commitments for an extended period of time (e.g., an uncontrolled release). It includes any gaseous or liquid radiological release, monitored or unmonitored, including those for which a radioactivity discharge permit is normally prepared.

The NRC staff verified that the VY implementation of this EAL, except for the site-specific changes identified below, is identical to the guidance provided in the permanently defueled station standard EAL scheme in NEI-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme, as follows:

- Inserted “ODCM” for the site-specific effluent release controlling document.
- Changed EAL numbers 1 and 2 into separate EALs (PD-AU1.1 and PD-AU1.2).
- Substituted numbers for bulleted notes and relocated notes after each EAL.
- EAL PD-AU1.1: Replaced “2 times the alarm set point established by a current radioactivity discharge permit” with “Reading on an effluent radiation monitor greater than the values shown for 60 minutes or longer” and a table that includes VY-specific radiation monitors and action values of “2 x High Alarm” for gaseous and liquid release monitors.

For the site-specific change to reference the ODCM, the NRC staff verified that VY implemented the developer notes for identifying the site-specific effluent release controlling document identified in NEI 99-01, Revision 6, as the basis for this specific EAL. Because VY has

implemented Generic Letter 89-01, "Implementation of Programmatic Controls for Radiological Effluent Technical Specifications [RETS] in the Administrative Controls Section of the Technical Specifications and the Relocation of Procedural Details of RETS to the Offsite Dose Calculation Manual or to the Process Control Program" (Reference 20), pursuant to the guidance, the ODCM is VY's site-specific effluent release controlling document. The revision to the changed numbers under the second bullet and substituting numbers for bulleted notes and their location under the third bullet of the EAL are administrative and do not affect the applicability of the EAL. For the site-specific change to PD-AU-1.1, the NRC staff verified that the VY Permanently Defueled EAL Technical Bases document provides the specific ODCM references that the high alarm set point for the Stack Gas Monitor RM-17-156/157 is established to ensure the ODCM release limits are not exceeded and that the high alarm set point for SW [service water] Discharge Hdr [header] Discharge Monitor (RM-17-351) is also established to ensure the ODCM release limits are not exceeded.

Based on the NRC staff's review of these EALs, the NRC staff finds that the licensee-specific implementation method for these EALs includes the key characteristics of an effective EAL scheme. While there are site-specific differences to what is provided in the generic EAL development guidance, these EALs continue to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, are acceptable for implementation.

3.2.1.2 EAL PD-AA1, "Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem [millirem] TEDE [total effective dose equivalent] or 50 mrem thyroid CDE [committed dose equivalent]"

This EAL addresses a release of gaseous or liquid radioactivity that results in projected or actual offsite doses greater than or equal to 1 percent of the EPA PAGs. It includes both monitored and unmonitored releases. Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant as indicated by a radiological release that significantly exceeds regulatory limits (e.g., a significant, uncontrolled release).

The NRC staff verified that the VY implementation of this EAL, except for the site-specific changes identified below, is identical to the guidance provided in the permanently defueled station standard EAL scheme in NEI-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Changed numbers 1, 2, 3, and 4 into separate EALs (PD-AA1.1, PD-AA1.2, PD-AA1.3, and PD-AA1.4).
- Substituted numbers for bulleted notes and relocated notes after each EAL.
- EAL PD-AA1.1: Substituted "an" for "ANY"; defined "effluent radiation monitor" as the applicable "radiation monitors" and included a table referencing the gaseous and liquid monitors and their respective action value; and substituted "value" for "reading."
- EAL PD-AA1.2: Identified the site boundary as the site-specific dose receptor point.

- EAL PD-AA1.3: Identified the site boundary as the site-specific dose receptor point.
- EAL PD-AA1.4: Defined the site boundary as the site-specific dose receptor point. The revision to the changed numbers under the first bullet and substituting numbers for bulleted notes and their location under the second bullet of the EAL are administrative and do not affect the applicability of the EAL.

For the site-specific change to EAL PD-AA1.1, the licensee provides that the gaseous release portion of this EAL is not based on any particular dose value but rather on effluent radiation monitoring readings equivalent to 90 percent of the full scale reading of the monitors. Any releases associated with fuel damage caused by credible fuel handling accidents would be monitored by RM-17-156 and RM-17-157. Using the IC dose values of 10 mrem TEDE and 50 mrem thyroid CDE is not practicable and would result in count rates that exceed the capacity of the gaseous effluent monitors at small fractions of the 10 mrem TEDE or 50 mrem thyroid CDE. Using effluent radiation monitor readings equivalent to 90 percent of full scale of the monitor range more accurately implements the NEI guidance for the gaseous release portion of this EAL. The liquid release portion of this EAL is based on a counts per second value equivalent to 10 mrem TEDE. The developer notes in NEI 99-01, Revision 6, recognize that the radiological condition described in the IC may result in a radiological effluent value beyond the operating or display range of the installed effluent monitor. In those cases, the EAL values should be determined with a margin sufficient to ensure that an accurate monitor reading is available. The NRC staff finds this site-specific change acceptable, as the instrumentation values are within the range of the instrumentation to allow for accurate and timely classification of the EAL, as described in the NRC-accepted developer notes in NEI 99-01, Revision 6.

For the site-specific changes to EAL PD-AA1.2, EAL PD-AA1.3, and EAL PD-AA1.4, the developer notes in NEI 99-01, Revision 6, identify the "site-specific dose receptor point" as the distance(s) and/or locations used by the licensee to distinguish between onsite and offsite radiation doses. The selected distance and/or locations should reflect the content of the emergency plan and the procedural methodology used to determine offsite doses and protective action recommendations. For the purposes of these EALs, the VY site boundary is a 0.35 mile radius around the plant. Therefore, the site boundary is an acceptable site-specific substitute for the generic "site-specific dose receptor point."

Based on the NRC staff's review of this EAL, the NRC staff finds that the licensee-specific implementation method for this EAL includes the key characteristics of an effective EAL scheme. While there are site-specific differences to what is provided in the generic EAL development guidance, this EAL continues to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, is acceptable for implementation.

3.2.1.3 EAL PD-AU2, "UNPLANNED rise in plant radiation levels"

This EAL is based upon site-specific indications of increased plant radiation levels caused by a decrease in water level above irradiated (spent) fuel. The increased radiation levels are

indicative of a minor loss in the ability to control radiation levels within the plant. This condition is a potential degradation in the level of safety of the plant.

The NRC staff verified that the VY implementation of this EAL, except for the site-specific changes identified below, is identical to the guidance provided in the permanently defueled station standard EAL scheme in NEI-01, Revision 6.

The licensee made the following site-specific change to the generic EAL scheme, as follows:

- Changed numbers 1 and 2 into separate EALs (PD-AU2.1 and PD-AU2.2).
- EAL PD-AU2.1: Identified the SFP low level alarm monitors rather than a specific level, added visual observation as an additional indicator, and provided a site-specific list of area radiation monitors.
- EAL PD-AU2.2: Defined UNPLANNED rise as 25 mR/hour (hr) over NORMAL LEVELS (the highest reading in the past 24 hours, excluding the current peak value).

The site-specific changes to EAL PD-AU2.1 and EAL PD-AU2.2 are in accordance with the guidance provided in NEI 99-01, Revision 6, for this specific EAL. The developer notes in NEI 99-01, Revision 6, provide that the site-specific indications may include instrumentation values, such as water level, area radiation monitoring readings, and personnel reports. These site-specific indications are installed plant equipment with indications in the Control Room that provide timely indication for classifying this EAL. Therefore, the SFP low level alarm monitors are acceptable site-specific indications of increased plant radiation levels caused by a decrease in water level above irradiated (spent) fuel. The licensee provides that besides a water level decrease being primarily determined by indications from available level instrumentation, other sources of level indications may include reports from plant personnel or video camera observations (if available). A significant drop in the water level may also cause an increase in the radiation levels of adjacent areas that can be detected by monitors in those locations.

Based on the NRC staff's review of this EAL, the NRC staff finds that the licensee-specific implementation method for this EAL includes the key characteristics of an effective EAL scheme. While there are site-specific differences to what is provided in the generic EAL development guidance, this EAL continues to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, is acceptable for implementation.

3.2.1.4 EAL PD-AA2, "UNPLANNED rise in plant radiation levels that impedes plant access required to maintain spent fuel integrity"

This EAL addresses increased radiation levels that impede necessary access to areas containing equipment that must be operated manually or that require local monitoring in order to maintain systems needed to maintain spent fuel integrity. As used here, "impede" includes hindering or interfering, provided that the interference or delay is sufficient to significantly threaten necessary plant access. As such, it represents an actual or potential substantial degradation of the level of safety of the plant.

The Alert classification for this EAL is primarily intended to ensure that the ERO is activated to support the on-shift personnel in removing the impediment to normal access to maintain spent fuel integrity.

The NRC staff verified that the VY implementation of this EAL, except for the site-specific changes identified below, is identical to the guidance provided in the permanently defueled station standard EAL scheme in NEI-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Changed numbers 1 and 2 into separate EALs (PD-AA2.1 and PD-AA2.2).
- EAL PD-AA2.1: Defined the site-specific area as the Control Room.
- EAL PD-AA2.2: Deleted reference to Area Radiation Monitor readings. Also, defined the site-specific area as the SFP pump area.

There are no permanently installed SFP pump area radiation monitors that may be used to assess the EAL threshold. Equipment in this area must be operated manually to maintain spent fuel pool integrity. These thresholds must be assessed via local radiation survey.

For the site-specific changes to EAL PD-AA2.1, the developer notes in NEI 99-01, Revision 6, provide that the list should include all areas requiring continuous occupancy to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity. The list that VY provided includes only the Control Room, requiring continuous occupancy to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity.

The revisions to the wording of EAL PD-AA2.2 are administrative and do not affect the applicability of the EAL. The list that VY provided includes only the SFP pump area, as needed, to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity.

Based on its review of this EAL, the NRC staff finds that the licensee-specific implementation method for this EAL includes the key characteristics of an effective EAL scheme. While there are site-specific differences to what is provided in the generic EAL development guidance, this EAL continues to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, is acceptable for implementation.

3.2.2 CATEGORY 'PD-H' – HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

3.2.2.1 EAL PD-HU1, "Confirmed SECURITY CONDITION or threat"

This EAL is based upon any security-related event listed in the approved VY Security Plan that constitutes a threat/risk to site personnel or a potential degradation to the level of safety of the plant.

The NRC staff verified that the VY implementation of this EAL, except for the site-specific changes identified below, is identical to the guidance provided in the permanently defueled station standard EAL scheme in NEI-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Changed numbers 1, 2, and 3 into separate EALs (PD-HU1.1, PD-HU1.2, and PD-HU1.3).
- EAL PD-HU1.1: Defined the site-specific security shift supervision title, "Security Shift Supervisor."

For the site-specific change to EAL PD-HU1.1, the developer notes in NEI 99-01, Revision 6, provide that the "site specific security shift supervision" is the title of the on-shift individual responsible for supervision of the on-shift security force. For VY, the Security Shift Supervisor is the title of the on-shift individual responsible for supervision of the on-shift security force.

Based on the NRC staff's review of this EAL, the staff finds that the licensee-specific implementation method for this EAL set is in alignment with the key characteristics of an effective EAL scheme. While there are site-specific differences to what is provided in the generic EAL development guidance, this EAL continues to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, is acceptable for implementation.

3.2.2.2 EAL PD-HA1, "HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes"

This EAL addresses the occurrence of a hostile action within the Owner Controlled Area or notification of an aircraft attack threat. This event will require rapid response and assistance due to the possibility of the attack progressing to the protected area, or the need to prepare the plant and staff for a potential aircraft impact.

The NRC staff verified that the VY implementation of this EAL, except for the site-specific changes identified below, is identical to the guidance provided in the permanently defueled station standard EAL scheme in NEI-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Changed numbers 1 and 2 into separate EALs (PD-HA1.1 and PD-HA1.2).
- EAL PD-HA1.1: Defined the site-specific security shift supervision title.

For the site-specific change to EAL PD-HU1.1, the developer notes in NEI 99-01, Revision 6, provide that the "site specific security shift supervision" is the title of the on-shift individual responsible for supervision of the on-shift security force. For VY, the Security Shift Supervisor is the title of the on-shift individual responsible for supervision of the on-shift security force.

Based on the NRC staff's review of this EAL, the NRC staff finds that the licensee-specific implementation method for this EAL set is in alignment with the key characteristics of an effective EAL scheme. While there are site-specific differences to what is provided in the generic EAL development guidance, this EAL continues to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, is acceptable for implementation.

3.2.2.3 EAL PD-HU2, "Hazardous event affecting equipment necessary for spent fuel cooling"

This EAL is based upon the effect that natural and destructive hazards may have on at least one train of a safety system needed for spent fuel cooling. The damage must be of sufficient magnitude that the system(s) train cannot, or potentially cannot, perform its design function. This condition reduces the margin to a loss or potential loss of the fuel clad barrier, and therefore, represents a potential degradation of the level of safety.

The NRC staff verified that the VY implementation of this EAL, except for the site-specific changes identified below, is identical to the guidance provided in the permanently defueled station standard EAL scheme in NEI-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Removed reference to "SAFETY SYSTEM."
- Changed numbering of EAL to PD-HU2.1.
- Added river level (>250 feet (ft.) MSL [mean seal level (plant grade)]) and intake level (<210 ft. MSL) to the list of hazardous events.

The license provided that this IC addresses a hazardous event that causes damage to equipment needed for spent fuel cooling. All systems required to support SFP cooling will be considered to be within the scope of this EAL. Following permanent cessation of operations, SFP cooling will be accomplished using the standby fuel pool cooling subsystem (SFPCS). The SFPCS is a two-train system designed to prevent a single active failure from disabling both trains. The system consists of two pumps and two heat exchangers that are normally lined up as two parallel trains. Each train of the SFPCS can be placed in service remotely.

For this site-specific change to EAL PD-HU2.1, the developer notes in NEI 99-01, Revision 6, provide that the EAL developers should consider other significant site-specific hazards (e.g., a seiche). The licensee provides that both the high river level and low intake level are ICs that exist presently in the VY EAL matrix and should continue to be considered.

Based on the NRC staff's review of this EAL, the NRC staff finds that the licensee-specific implementation method for this EAL set is in alignment with the key characteristics of an effective EAL scheme. While there are site-specific differences to what is provided in the generic EAL development guidance, this EAL continues to meet the requirements of Section IV

of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, is acceptable for implementation.

3.2.2.4 EAL PD-HU3, "Other conditions exist which in the judgment of the Emergency Coordinator warrant declaration of an Unusual Event (UE)"

This EAL set is based upon providing the decision-maker with EALs to consider when the decision-maker's judgment deems an emergency classification is warranted.

The NRC staff verified that the VY implementation of this EAL, except for the site-specific changes identified below, is identical to the guidance provided in the permanently defueled station standard EAL scheme in NEI-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Changed numbering of the EAL to PD-HU3.1.

Based on the NRC staff's review of this EAL, the NRC staff finds that the licensee-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme. While there are site-specific differences to what is provided in the generic EAL development guidance, this EAL continues to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, is acceptable for implementation.

3.2.2.5 EAL PD-HA3, "Other conditions exist which in the judgment of the Emergency Coordinator warrant declaration of an Alert"

This EAL is based upon providing the decision-maker with EALs to consider when the decision-maker's judgment deems an emergency classification is warranted.

The NRC staff verified that the VY implementation of this EAL, except for the site-specific changes identified below, is identical to the guidance provided in the permanently defueled station standard EAL scheme in NEI-01, Revision 6.

The licensee made the following site-specific change to the generic EAL scheme:

- Changed numbering of the EAL to PD-HA3.1.

Based on the NRC staff's review of this EAL, the NRC staff finds that the licensee-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme. While there are site-specific differences to what is provided in the generic EAL development guidance, this EAL continues to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, is acceptable for implementation.

3.2.3 CATEGORY "PD-S": SYSTEM MALFUNCTION

3.2.3.1 EAL PD-SU1, "UNPLANNED spent fuel pool temperature rise"

This EAL is based upon a loss of the ability to maintain SFP cooling. If uncorrected, boiling could occur and result in a loss of water inventory and increased radiation levels.

The NRC staff verified that the VY implementation of this EAL, except for the site-specific changes identified below, is identical to the guidance provided in the permanently defueled station standard EAL scheme in NEI-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Changed numbering of the EAL to PD-SU1.1.
- Referenced the unplanned spent fuel temperature level (150 degrees Fahrenheit (°F)).

For the site-specific change to EAL PD-SU1.1, ENO provided that whenever irradiated fuel is stored in the SFP, the pool water temperature shall be maintained below 150 °F. The SFPCS is designed to maintain the pool water temperature below 125 °F per VY technical specifications bases. The NRC staff finds that this site-specific change to EAL PD-SU1.1 to reference the site-specific value of 150 °F is acceptable, based on this analysis and the developer notes in NEI 99-01, Revision 6, which provide that the site-specific temperature should be chosen based on the starting point for fuel damage calculations. Typically, this temperature is 125 °F to 150 °F.

Based on the NRC staff's review of this EAL, the NRC staff finds that the licensee-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme. While there are site-specific differences to what is provided in the generic EAL development guidance, this EAL continues to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, is acceptable for implementation.

3.2.4 CATEGORY "E": INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)

3.2.4.1 E-HU1.1, "Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by a radiation reading greater than two times the ISFSI Technical Specification allowable levels"

This EAL addresses an event that results in damage to the confinement boundary of a storage cask containing spent fuel. It applies to irradiated fuel that is licensed for dry storage beginning at the point that the loaded storage cask is sealed. The issues of concern are the creation of a potential or actual release path to the environment; degradation of one or more fuel assemblies due to environmental factors; and configuration changes, which could cause challenges in removing the cask or fuel from storage.

A spent fuel storage license contains technical requirements and operating conditions (fuel specifications, cask leak testing, surveillance, and other requirements) for the ISFSI and specifies what the licensee is authorized to store at the site.

The NRC staff verified that the VY implementation of this EAL, except for the site-specific changes identified below, is identical to the guidance provided in the permanently defueled station standard EAL scheme in NEI-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Changed numbering of the EAL to E-HU1.1.
- Defined the readings equating to two times the site-specific cask specific technical specification allowable radiation level.
- Removed references to “on contact” and “on the surface of the spent fuel cask.”

For the site-specific changes to EAL E-HU1.1, ENO provided the values that are two times the site-specific cask-specific technical specification allowable radiation level. The developer notes in NEI 99-01, Revision 6, provide that the allowable radiation level for a spent fuel cask is a radiation reading two times the cask’s technical specification level located in the Certificate of Compliance. ENO also provided that in the case of extreme damage to a loaded cask, the fact that the dose rate limit is exceeded may be determined based on measurement of a dose rate at some distance from the cask. Therefore, the VY site-specific changes to this EAL are acceptable.

Based on the NRC staff’s review of this EAL, the NRC staff finds that the licensee-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme. While there are site-specific differences to what is provided in the generic EAL development guidance, this EAL continues to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, is acceptable for implementation.

3.3 Conclusions

3.3.1 Emergency Plan Conclusions

Based on the NRC staff’s review of the proposed VY PDEP as described in Section 3.1 of this SE, the staff finds that the proposed PDEP meets the planning standards in 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR Part 50, as exempted, and provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at the facility. Therefore, the staff concludes that the licensee’s proposed VY PDEP, in its application dated June 12, 2014 (Reference 3), as supplemented by Attachment 2 of the licensee’s letter dated February 5, 2015 (Reference 9), Attachment 2 of the licensee’s letter dated June 18, 2015 (Reference 10), and Attachment 2 of the licensee’s letter dated July 16, 2015 (Reference 11), is acceptable.

3.3.2 Emergency Action Level Scheme Conclusions

The NRC staff has reviewed the technical basis for the proposed EAL scheme, the modifications from NEI 99-01, Revision 6, and the licensee's evaluation of the proposed changes. ENO chose, in part, to modify its EAL scheme from the generic EAL scheme development guidance provided in NEI 99-01, Revision 6, in order to adopt a format more in alignment with its currently approved EAL scheme, as well as alignment with licensee-specific writer's guides and preferences. The staff determined that these modifications are administrative in nature and do not alter the intent of any specific EAL within an EAL set, EAL category, or within the entire EAL scheme as stated in NEI 99-01, Revision 6.

From the review, the NRC staff determined that the proposed EAL scheme uses objective and observable values, is worded in a manner that addresses human engineering and user friendliness concerns, follows logical progression for escalating events, and allows for event downgrading and upgrading based upon the potential risk to the public health and safety. Risk assessments were appropriately used to set the boundaries of the emergency classification levels and ensure that all EALs that trigger emergency classification are in the same range of relative risk.

Based on the above, and the NRC staff's review as described in Section 3.2 of this SE, the staff has determined that the proposed changes meet the guidance in NEI 99-01, Revision 6; planning standard of 10 CFR 50.47(b)(4); and the requirements in Sections IV.B and IV.C to Appendix E of 10 CFR Part 50, as exempted. Therefore, the staff concludes that the proposed EAL scheme, as stated in Attachment 3 of the licensee's letter dated June 12, 2014 (Reference 3), as supplemented by Attachment 3 of the licensee's letter dated February 5, 2015 (Reference 9), is acceptable, and provides reasonable assurance that the licensee can and will take adequate protective measures in the event of a radiological emergency.

4.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

According to 10 CFR 50.91(a)(3), the Commission will not make and will not publish a final determination of NSHC unless it receives a request for a hearing on the LAR. In this case, there was a request for a hearing on the licensee's request to revise the emergency plan and EAL scheme at VY following the facility's permanent cessation of operations and permanent defueling. Therefore, the Commission has made the following final NSHC determination.

The Commission's regulations in 10 CFR 50.92(c) state that the Commission may make a final determination that a proposed amendment involves NSHC if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety. As required by 10 CFR 50.91(a), the licensee has provided its analysis of the issue of NSHC, which is presented below.

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The proposed changes to the emergency plan and EAL scheme do not impact the function of plant structures, systems, or components (SSCs). The proposed changes do not affect accident initiators or precursors, nor does it alter design assumptions. The proposed changes do not prevent the ability of the on-shift staff and emergency response organization (ERO) to perform their intended functions to mitigate the consequences of any accident or event that will be credible in the permanently defueled condition.

The probability of occurrence of previously evaluated accidents is not increased, since most previously analyzed accidents can no longer occur and the probability of the few remaining credible accidents are unaffected by the proposed amendment.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed changes reduce the scope of the emergency plan and EAL scheme commensurate with the hazards associated with a permanently shutdown and defueled facility. The proposed changes do not involve installation of new equipment or modification of existing equipment, so that no new equipment failure modes are introduced. Also, the proposed changes do not result in a change to the way that the equipment or facility is operated so that no new or different kinds of accident initiators are created.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No.

Margin of safety is associated with confidence in the ability of the fission product barriers (i.e., fuel cladding, reactor coolant system pressure boundary, and containment structure) to limit the level of radiation dose to the public. The proposed changes are associated with the emergency plan and EAL scheme and do not impact operation of the plant or its response to transients or accidents. The change does not affect the Technical Specifications. The proposed changes do not involve a change

in the method of plant operation, and no accident analyses will be affected by the proposed changes. Safety analysis acceptance criteria are not affected by the proposed changes. The revised SEP will continue to provide the necessary response staff with the proposed changes.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

The NRC staff has reviewed the licensee's NSHC analysis. The NRC received comments on the NSHC determination from the State of Vermont (see Section 5.0 of this SE). The staff considered these comments with respect to the NSHC determination, and determined that the comments were not applicable to the NSHC determination. As such, the comments were reviewed and considered as part of the State Consultation process, as described in Section 5.0. Section 5.0 provides the staff's response to each of the comments received. Based on this review and on the NRC staff's SE of the underlying LAR, the NRC staff concludes that the three standards of 10 CFR 50.92(c) are satisfied. Accordingly, the NRC staff makes a final determination that NSHC is involved.

Pursuant to 10 CFR 50.91(a)(4), since the NRC staff has determined that NSHC is involved and that the amendment should be issued, the amendment will be effective as stated in the amendment, even though an interested person meeting the provisions for intervention called for in 10 CFR 2.309 has filed a request for a hearing.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the NRC published this proposed license amendment in the *Federal Register* (FR) on December 9, 2014 (79 FR 73109) for a 30-day comment period and a 60-day request for hearing period. The following comments were submitted by the State of Vermont Department of Public Service (DPS), the State of Vermont Division of Emergency Management and Homeland Security, and the State of Vermont Department of Health (Reference 21):

- The VY PDEP proposes insufficient standards for the facility while spent fuel remains in the fuel pool. While the spent fuel remains in pool storage, the facility poses a higher risk than an ISFSI. The standards applied at VY should reflect and respond to the circumstances at the site.
- The VY PDEP submission is incomplete. Referenced letters of agreement (LOAs) and emergency plan implementing procedures were not included in the submission. The actual documents referred to in an index, emergency plan implementing procedures and support plans, were not made available for review.
- The VY PDEP fails to adequately evaluate and support offsite response resources. Without the requirement to evaluate OROs, the assessment of the licensee's ability to address significant issues is inherently incomplete. The NRC should, at a minimum, require the evaluation of OROs by FEMA to respond as outlined in the PDEP and LOAs.

- The NRC staff has failed to consider the ability of offsite resources to provide necessary assistance to VY. The health and economic viability of the areas surrounding VY depend on the assurances provided by governmental entities that impacted areas are safe as is the case in any other disaster. Those assurances can only be provided by training, exercising and equipping personnel to assess the impacts to health and the environment outside of plant boundaries.
- The LAR generally raises significant concerns, both because of the flawed assumptions used by Entergy in assessing threat scenarios, and because of Entergy's reliance on outdated NRC guidance as support for the LAR.
 - The full scope of possible threat scenarios is not contemplated (for example, hostile action) and additional information supporting the discussion of the loss of SFP cooling event is required, but the submittal does not provide a reference supporting the stated results; analysis of certain credible beyond design basis events is not properly considered; and it is stated that the remaining design basis and credible beyond design basis accidents will progress slowly. This assertion is used to justify extending the required notification time from 15 to 60 minutes and, in part to justify the elimination of Site Area Emergency and General Emergency EALs currently used in VY EP.
 - The fuel assembly heat up/zirconium fire probability event discussed in the PDEP/EAL scheme lacks adequate analysis. The possibility of a much more rapid heat up time contradicts the slow progression assumption of the PDEP/ EAL scheme and could require an EAL beyond Alert to properly address.
 - There are significant concerns about the quality of the NRC guidance in SECY-00-0145 that Entergy used in developing the PDEP / EAL scheme. SECY-00-0145 has not been reevaluated since the events of September 11, 2001. The State believes that once the SECY-00-0145 guidance has been considered, ideas such as reducing the Emergency Planning Zone (EPZ) to the VY fence line and relying on "ad hoc" offsite EP (rather than continued offsite radiological EP support) will be found to be imprudent and unwarranted.
 - The LAR is also deficient because it fails to properly analyze the risks of an accident while transferring fuel from the spent fuel pool to dry casks. This risk is heightened at VY because of the existence of high-burnup fuel at the site.
- While it is stated that Entergy will discuss the implementation of the PDEP/EAL scheme with Vermont State and local officials subsequent to NRC approval, such discussions should occur prior to NRC approval to allow for modification of Entergy's action prior to regulatory approval.

- The safety of onsite VY staff during an on-going security event or Hostile Action could result in the suspension of ERO activation. The Emergency Operation Facility (EOF) in the proposed PDEP/EAL scheme is the onsite VY Control Room. Entergy should include an alternate, offsite EOF, such as the current VY EOF, in the proposed PDEP/EAL scheme.
- The noted evacuation of onsite plant contractors during an Alert condition could impede the DPS Designee (typically the State Nuclear Engineer) from reaching the EOF (the VY Control Room) in the proposed PDEP/EAL scheme. Measures to mitigate this potential impediment should be made either in the PDEP/EAL scheme or in a related implementation procedure.
- The exemption approval recommendation of the NRC staff is inappropriately based solely upon dose of radioactive contamination and does not include the health impacts of radioactive contamination from releases that result in doses below the EPA PAGs;
- The exemption approval recommendation of the NRC staff incorrectly assumes a CEMP appropriate for response and recovery from radioactive contamination releases can exist and be maintained by offsite response organizations without licensee financial support; and
- There has been no rulemaking and public comment appropriate to the proposed exemptions to the EP requirements of 10 CFR 50.47 (b) and Appendix E to 10 CFR Part 50.

NRC Staff Response to State of Vermont Comments

Standards/Risk Associated With VY

The NRC has consistently concluded that a relaxation of formal offsite radiological EP for permanently shutdown and defueled facilities would result in an acceptably small change in risk. The NRC has based this conclusion on technical studies conducted from 1975 to 2014 that have found that the risk posed by SFPs is very low.

In granting the requested exemptions to eliminate formal offsite EP to VY, the NRC primarily relied on the VY site-specific analyses, which provided reasonable assurance that: (1) an offsite radiological release would not exceed the EPA PAGs at the site's EAB for the DBAs applicable to the VY facility in its permanently shutdown and defueled state; and (2) in the unlikely event of a severe beyond-DBA resulting in a loss of all cooling to the spent fuel stored in the VY SFP and ISFSI, sufficient time would be available to initiate appropriate mitigating actions, and if needed, for offsite authorities to implement protective actions using a CEMP approach to protect the health and safety of the public. The Commission's approval of the requested exemptions is documented in an SRM dated March 2, 2015 (Reference 13) responding to SECY-14-0125, "Request by Entergy Nuclear Operations, Inc. for Exemptions from Certain Emergency Planning Requirements," dated November 14, 2014 (Reference 14).

Referenced Letters of Agreement

In a letter dated June 18, 2015 (Reference 10), the licensee provided signed Letters of Agreement with the following organizations: State of New Hampshire; Commonwealth of Massachusetts; Brattleboro Memorial Hospital; Rescue, Inc. Ambulance Service; Vernon Fire Department; Brattleboro Fire Department; Town of Vernon; U.S. Department of Energy; DOE – REAC/TS. An unsigned Letter of Agreement with the State of Vermont is also included based on the licensee’s engagement of the State of Vermont. The documents referred to in an index, emergency plan implementing procedures and support plans are ENO’s documents and they were not provided to the NRC.

Evaluation of OROs by FEMA and Ability of Offsite Resources to Support Vermont Yankee

The fact that OROs would no longer be evaluated by FEMA does not provide a basis for the assertion that the proposed changes fail to provide reasonable assurance that adequate protective measures can and will be taken in the event of an emergency, particularly in light of the Commission’s approval of EP exemptions for defueled facilities.

The PDEP provides for biennial exercises (and a drill between biennial exercises) to test, among other things, the timing and content of its implementing methods and procedures, to test emergency equipment and communication networks, Vermont, fire, medical and law enforcement responders. The quoted language also shows that ENO will offer Vermont and the listed organizations (i.e., a hospital, the fire department, law enforcement, and an ambulance service) the “opportunity to participate to the extent their assistance would be required during an emergency declaration” but that “participation is not required.” In addition, Section 12.2 of the VY PDEP states: “Training is offered annually to offsite response organizations that may be requested to provide assistance in the event of an emergency at VY (e.g., law enforcement, fire-fighting, rescue, medical services, transport of injured, etc.)” Fire and medical drills involving applicable offsite organizations will also continue to occur per the VY PDEP Sections 12.1.4 and 12.1.5, respectively.

Additional Threat Scenarios and the Impact on the Elimination of Site Area Emergency and General Emergency Classification Levels and the Timeliness of Notification to Offsite

The State of Vermont’s claim that other beyond-design-basis accidents should be considered is speculative. The Site Area Emergency and General Emergency classification levels are eliminated, consistent with the reduced accident risk at the facility and based on analyses that showed no DBAs would exceed the EPA PAGs at the EAB, and in the unlikely event of a severe beyond-DBA resulting in a loss of all cooling to the spent fuel stored in the VY SFP and ISFSI, sufficient time would be available to initiate appropriate mitigating actions, and if needed, for offsite authorities to implement protective actions using a CEMP approach to protect the health and safety of the public. Although the State of Vermont states that the NRC has prematurely treated VY as an MRS or ISFSI, it does not offer a cogent explanation as to why storing fuel in the SFP does not render VY more akin to a wet storage ISFSI similar to the General Electric-Hitachi Morris Operations ISFSI than a reactor. The EP regulations for storage of spent nuclear fuel in 10 CFR Part 72, “Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste, and Reactor- Related Greater Than Class C Waste,” do not differentiate between wet or dry storage.

The exemption to the EPZ and the exemption to increase the notification time from 15 minutes to 60 minutes are contained SECY-14-0125. The Commission has approved these exemptions by SRM-SECY-14-0125, dated March 2, 2015.

Zirconium Fire Probability Event

Following the terrorist attacks of September 11, 2011, additional studies were conducted by the Sandia National Laboratories (SNL) to assess SFP risks and it found that the risk of a successful terrorist attack (i.e., one that results in an SFP zirconium fire) is very low. These studies found that air-cooling of spent fuel would be sufficient to prevent zirconium fires at a point much earlier following fuel offload from the reactor than considered in NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants" (Reference 22). The research found that there may be a significant amount of time between the event initiating the SFP water level drop and the uncovering of the spent fuel, as well as between the uncovering of the spent fuel and the possible onset of a zirconium fire, thereby providing a substantial opportunity for mitigation. Moreover, additional mitigation strategies were implemented subsequent to September 11, 2001, to enhance spent fuel cooling in the event of an SFP drain.

Vermont assertions that SECY-14-0125 improperly assumes that the revised emergency plan would enable offsite authorities to take protective actions because of the presence of high-burnup fuel and that NRC has not considered the effects of high burnup fuel lack the requisite support. In response to these assertions, not only did NUREG-1738 consider high burnup fuel (fuel with an average burnup of over 45 gigawatt-days per metric ton of uranium (GWd/MTU), but guidance in RG 1.183, Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Plants (July 2000), concerning Fuel Handling Accident (FHA) analyses includes release fractions for fuel with burnup up to 62,000 MWD/MTU.

With respect to design-basis accidents at VY, the licensee provided analysis in "Request for Exemptions from Portions of 10 CFR 50.47 and 10 CFR 50, Appendix E, Vermont Yankee Nuclear Power Station" (Reference 2) demonstrating that 17 days following permanent shutdown, the radiological consequences of the only remaining design-basis accident with potential for offsite radiological release (the FHA) will not exceed the limits of the EPA PAGs at the exclusion area boundary. Therefore, because VY has been permanently shutdown for approximately 11 months, there is no longer any design-basis accident that would warrant an offsite radiological emergency plan meeting the requirements of 10 CFR Part 50.

With respect to beyond design-basis accidents at VY, the licensee analyzed a drain down of the spent fuel pool water that would effectively impede any decay heat removal. The analysis in (Reference 2) demonstrates that at 15.4 months after shutdown, there would be at least 10 hours after the assemblies have been uncovered until the limiting fuel assembly (for decay heat and adiabatic heatup analysis) reaches 900 degrees Celsius, the temperature used to assess the potential onset of fission product release. The analysis conservatively assumed the heat up time starts when the spent fuel pool has been completely drained, although it is likely that site personnel will start to respond to an incident when drain down starts. The analysis also does not consider the period of time from the initiating event causing loss of SFP water inventory until cooling is lost.

ENO furnished information concerning its SFP inventory makeup strategies. Several sources of makeup to the pool are available, such as the service water (SW) system, which has redundant pumping capability and power supplies to ensure alternative fuel pool makeup function. The SW system runs continuously, thus allowing for constant monitoring. Additionally, there are electric-driven and diesel-driven fire pumps that can supply makeup water to the SFP via the SW system or the fire water system. All sources discussed above take suction from the Connecticut River. The VY also has an engine-driven emergency makeup pump capable of taking suction from the Cooling Tower No. 2 deep basin to provide an alternate source of makeup water to the SFP. In a letter dated April 24, 2014, "Technical Specifications Proposed Change No. 307, Revision to Mitigation Strategy License Condition and Technical Specification Administrative Controls for Permanently Defueled Condition – Supplement 1 (TAC No. MF2991) Vermont Yankee Power Station Docket No. 50-271 License No. DPR-28" (Reference 23), ENO withdrew its request to remove License Condition 3.N, "Mitigation Strategy License Condition," from the VY Renewed FOL. This license condition requires VY to maintain its SFP inventory makeup strategies as discussed above.

Quality of NRC Guidance Used By Entergy

The State of Vermont's issue that the PDEP EALs are based primarily on NRC guidance that predates the events of September 11, 2001, is unsupported. While SECY-00-0145 predates September 11, 2001, the State of Vermont did not consider that the NRC subsequently evaluated the accident risks to SFPs and that the Commission has approved recent EP exemptions for permanently defueled reactors based on the staff's assessment that there is a reduced risk of accidents at these facilities, which results in elimination of formal offsite radiological emergency preparedness plans and reduces the EPZ to onsite (VY fence line). In addition, the issue does not consider the NRC's conclusion that the only credible beyond-design-basis scenario is the loss of cooling due to a seismic event.

Alternate Emergency Facility to Control Room

Per Planning Criterion H.2 of NUREG-0654/FEMA-REP-1, VY has established the Control Room as the onsite center for emergency command and control.

Site Evacuation as Possible Impediment to Interface with State of Vermont

Although the State of Vermont states that evacuation of contractors could impede the State Engineer's ability to reach the operations facility during an Alert, the Staff of Vermont does not show that the delay will preclude other means to communicate with the State until the State Engineer arrives. Periodic drill and exercises, as described in the VY PDEP, will continue to be used to demonstrate adequate communication and coordination with the States/Commonwealth.

The need for continued funding to support the maintenance of a CEMP

NRC regulations contained in 10 CFR 50.47 or Appendix E to 10 CFR 50 do not provide specific requirements for a licensee to provide funding to State/Commonwealth or local response organizations, irrespective of whether it is an operating or decommissioning commercial nuclear power plant, but rather are intended to establish the requirements for REP planning and preparedness. As such, sources of funding are not specified in NRC REP regulations.

The decommissioning facility, at the time the PDEP would be implemented, would pose significantly less of a radiological risk to public health and safety than an operating power

reactor, which should result in a straightforward transition to a more streamlined CEMP. Aspects of existing offsite radiological emergency preparedness plans may remain in place, at the State's discretion, before completion of any adjustments to State and local CEMPs that are appropriate for the reduced radiological risk and can be adopted to minimize burden on the State and local governments. VY will still be required to maintain an onsite emergency plan, which would provide for the notification of, and coordination with, offsite organizations commensurate with the approved exemptions.

Rulemaking and Public Comments

The exemption process of 10 CFR 50.12 does not have an opportunity for public comment and participation similar to the 10 CFR 50.90 process. To allow for public participation in the development of decommissioning guidance, a draft Interim Staff Guidance (ISG) NSIR/DPR-ISG-02, "Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants," was published for public comment in the *Federal Register* on January 10, 2014 (79 FR 1900). The *Federal Register* notice stated that the "document would provide guidance for NRC staff to ensure clear and consistent reviews of requests for exemptions from emergency preparedness regulations and license amendments for defueled station emergency plans submitted by nuclear power plant licensees after permanent cessation of plant operations." This ISG was finalized and issued on May 11, 2015.

In Staff Requirements Memorandum (SRM)-SECY-14-0118, "Request by Duke Energy Florida, Inc., for Exemptions from Certain Emergency Planning Requirements," dated December 30, 2014 (ML14364A111), the Commission directed the NRC staff to proceed with rulemaking on decommissioning and set an objective of early 2019 for its completion.

In SECY-15-0014, "Anticipated Schedule and Estimated Resources for a Power Reactor Decommissioning Rulemaking," dated January 30, 2015 (ML15082A089 redacted), the NRC staff committed to proceed with a rulemaking on decommissioning and provided an anticipated schedule and estimate of the resources required for the completion of a decommissioning rulemaking.

In an advance notice of proposed rulemaking (ANPR) published in the *Federal Register* on November 19, 2015 (80 FR 72358), the NRC announced its intention to develop a draft regulatory basis to support a new decommissioning rule. The new rule would seek to provide an efficient decommissioning process, reduce the need for exemptions from existing regulations, and improve openness, clarity and reliability of the agency's work.

The ANPR is constructed to seek public comment on specific questions and issues with respect to possible revisions to the NRC's requirements for power reactors transitioning to decommissioning. Stakeholder input will be used to inform the amendment of regulations associated with decommissioning and the supporting regulatory basis. The scope of the questions contained in the ANPR have been tailored to address Commission direction regarding development of the power reactor decommissioning rulemaking.

Review of EAL Scheme with State and Local Government Authorities

Per Section IV.B.1 (Assessment Actions) of Appendix E to Part 50, an applicant or licensee is only required to discuss and agree upon the initial emergency action levels with State and local

governmental authorities. Thereafter, a licensee is required to review emergency action levels with the State and local governmental authorities on an annual basis.

On December 10, 2015, the NRC staff consulted with the State of Vermont official to discuss the staff responses to the comments. The State official had no additional comments.

6.0 PUBLIC COMMENTS

In accordance with the Commission's regulations, the NRC published this proposed license amendment in the *Federal Register* on December 9, 2014 (79 FR 73109) for a 30-day comment period and a 60-day request for hearing period. Twenty-seven comments were received from the public regarding the proposed amendment. Some of the issues discussed in the public comments do not specifically pertain to the proposed NSHC determination. However, the NRC staff has addressed both the issues within the scope of the proposed NSHC and those that are not within the scope. A summary of comments and the NRC staff responses, grouped by issue, are addressed below.

- With VY downsizing its staff, is there enough security and oversight to protect citizens from terrorist threats?
- If power is lost due to severe weather or if the grid goes down for any reason, will the back-up generators be sufficient to cool the spent fuel pool to ensure public safety? How long would back-up generators be effective: These questions are important to consider especially after 9/11 and the disaster at Fukushima, Japan (a plant that was the same Mach 1 Boiling Water Reactor as VY). In fact, the U.S. government advised U.S. citizens in Japan within 50 miles to evacuate. The current 10 mile zone should be extended to 50 miles at the minimum, until the spent fuel has been completely moved to dry cask storage.
- Oppose the two exemptions that VY is requesting and support the State of Vermont's efforts to require Entergy Inc. to continue EP zone coverage for the present 10 mile radius around VY until the spent fuel pool is empty and all highly radioactive spent fuel is in dry cask storage and deny Entergy's request for an exemption to increase notification time of a problem at VY from the present 15 minutes to 60 minutes. Immediate notification on an event is needed.
- Please set up a system to move fuel into dry cask storage and better as soon as physically practical.
- The temporary spent fuel pool is now holding four times as much spent fuel as it was designed to hold (close to 3,000 spent fuel rods), on top of a seven-story building covered with a thin metal roof. A highly radioactive fuel will continue to be moved through 2020 from the over-packed SFP high above the reactor into dry cask storage and we need to be protected.

- The NRC needs to take into consideration that there are close to 3,000 spent fuel rods at VY (3 million curies of highly radioactive spent fuel at VY). The bomb at Hiroshima was only 2,000 curies.

NRC Staff Response to Public Comments

Exemptions

By an SRM, dated March 2, 2015 (Reference 13), the Commission approved the NRC staff's recommendation to grant Entergy's request for exemptions from certain EP requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50 for VY to be implemented as stipulated in SECY-14-0125, dated November 14, 2014 (Reference 14).

The exemption to the EPZ and the exemption to increase the notification time from 15 minutes to 60 minutes are also contained SECY-14-0125. The Commission has approved these exemptions by SRM-SECY-14-0125 based on the staff's analysis contained in the staff's recommendation.

Emergency Planning Zone Adequacy

A petitioner filed with the Commission a petition for rulemaking (PRM-50-104) on February 15, 2012 (Reference 24). The petitioner requested that the Commission amend its regulations in Part 50 of 10 CFR to expand existing EPZs around nuclear power plants, create a new EPZ, and require the incorporation of concurrent natural disasters in the required periodic emergency plan drills. The petitioner wanted to expand the 10-mile plume exposure pathway EPZ to a 25-mile plume exposure pathway EPZ.

SECY-13-0135, "Denial of Petition for Rulemaking Requesting Amendments regarding Emergency Planning Zone Size (PRM-50-104)," dated December 13, 2013 (Reference 25), was presented to the Commission.

By SRM-SECY-13-0135, dated February 27, 2014 (Reference 26), the Commission denied PRM-50-104. The Commission Voting Record (VR) VR-SECY-13-0135, "Denial of Petition for Rulemaking Requesting Amendments Regarding Emergency Planning Zone Size (PRM-50-104)," for this paper was issued on February 27, 2014 (Reference 27). Based on SRM-SECY-13-0135, the Commission denied the 25 mile EPZ and it is highly unlikely that 50 mile EPZ will be considered.

Facility Staff

The composition of the facility staff organization is governed by VY Technical Specification 6.2.B, "Facility Staff" (ADAMS Accession No. ML052720265).

The number of staff required at decommissioning sites is generally small but is commensurate with the need to safely store spent fuel at the facility in a manner that is protective of public health and safety. The duties of the on-shift personnel at a decommissioning reactor facility are not as complicated and diverse as those for an operating power reactor. The systems and equipment needed to maintain the spent fuel in a SFP or in a dry cask storage system in a safe condition require minimal personnel and are governed under technical specifications. In the 2011 EP Final Rule, "Enhancements to Emergency Preparedness Regulations," published in

the *Federal Register* (76 FR 72560) and associated Statements of Consideration (76 FR 72589), dated November 23, 2011, the NRC required nuclear power plant licensees to provide a detailed analysis to show that on-shift personnel assigned emergency plan implementation functions were not assigned any responsibilities that would prevent them from performing their assigned emergency plan functions. As part of the 2011 EP Final Rule, the NRC concluded that the staffing analysis requirement was not necessary for non-power reactor licensees due to the small staffing levels required to operate the facility. Therefore, based on similarities of non-power reactors and decommissioning reactors with regard to staffing, and as discussed in Section 4.2.1, a detailed staffing analysis is not needed for a decommissioning reactor.

As part of the ENO request, it provided information stating that the assigned operators on shift were trained in the use of the procedures and adequate in number to carry out the actions required for restoring SFP cooling/level in accordance with their procedures. ENO estimates the SFP mitigation strategies can be implemented within 2 hours, using the on-shift staffing complement (Shift Manager/Emergency Director, Noncertified Operator, and Radiation Protection Technician), without impacting the ability to meet all of the major functional areas of Table B-1 in NUREG-0654/FEMA-REP-1. The licensee has committed to maintaining the important mitigation strategies for the loss of large areas of the plant due to explosion or fire previously required under 10 CFR 50.54(hh)(2). These strategies will continue to be required as a license condition.

Security Plan

The Security Plan for VY is governed by Renewed FOL No. DPR-28, License Condition G, "Security Plan" (ADAMS Accession No. ML052720265).

After the terrorist attacks of September 11, 2001, the NRC evaluated the EP planning basis to ensure it continued to protect the public health and safety in the current threat environment. In 2002, the NRC issued "Order Modifying Licenses for Interim Safeguards and Security Compensatory Measures," dated May 23, 2002 (ADAMS Accession No. ML021420288), requiring compensatory measures that include nuclear security and EP. The NRC staff determined that the EP planning basis continues to protect public health and safety. However, the NRC staff recognized that enhancements were desirable to ensure effective plan implementation during security-related events at nuclear power reactors. Examples of such enhancements include more timely NRC notification, improvement to onsite protective actions, and revision of emergency action levels to identify security-related emergencies more succinctly. The NRC issued NRC Bulletin (BL) 2005-02, "Emergency Preparedness and Response Actions for Security-Based Events," dated July 18, 2005 (ADAMS Accession No. ML051740058), to obtain information from licensees on progress in implementing security-event-related EP program enhancements. The 2011 EP Final Rule made generically applicable the security-based response elements of BL 2005-02. ENO has certified that it had permanently ceased operations at VY and that all fuel had been removed from the reactor vessel. The enhancements of BL 2005-02 were not applicable to holders of operating licenses for nuclear power reactors that had permanently ceased operations and had certified that fuel had been removed from the reactor vessel. Therefore, the enhancements for hostile actions as

required by the 2011 EP Final Rule are not necessary for VY in its permanently shutdown and defueled status.

In addition, Renewed FOL No. DPR-28, License Condition N, "Mitigation Strategy License Condition" (ADAMS Accession No. ML052720265), is for maintaining strategies for addressing large fires and explosions.

Auxiliary Electrical Power Systems

ENO furnished information concerning its SFP inventory makeup strategies. Several sources of makeup to the pool are available such as the service water (SW) system, which has redundant pumping capability and power supplies to ensure alternative fuel pool makeup function. The SW system runs continuously, thus allowing for constant monitoring. Additionally, there are electric-driven and diesel-driven fire pumps that can supply makeup water to the SFP via the SW system or the fire water system. All sources discussed above take suction from the Connecticut River. The VY also has an engine-driven emergency makeup pump capable of taking suction from the Cooling Tower No. 2 deep basin to provide an alternate source of makeup water to the SFP. In a letter dated April 24, 2014, "Technical Specifications Proposed Change No. 307, Revision to Mitigation Strategy License Condition and Technical Specification Administrative Controls for Permanently Defueled Condition – Supplement 1 (TAC No. MF2991) Vermont Yankee Power Station Docket No. 50-271 License No. DPR-28" (Reference 23), ENO withdrew its request to remove License Condition 3.N, "Mitigation Strategy License Condition," from the VY Renewed FOL. This license condition requires VY to maintain its SFP inventory makeup strategies as discussed above.

Spent Fuel Storage vs. Dry Cask Storage

Used (spent) radioactive nuclear fuel can be safely shielded with water, or steel and concrete. The NRC allows two types of storage methods for used nuclear fuel using these shielding methods: wet and dry storage. Wet storage (spent fuel pool) is an underwater storage and cooling facility for spent fuel elements that have been removed from the reactor. It involves placing the fuel assemblies under at least 20 feet of water. The water serves two purposes: it serves as a shield to reduce the radiation levels that people working above may be exposed to and it cools the fuel assemblies that continue to produce heat (called decay heat) for some time after removal.

In the late 1970's and early 1980's, the need for alternative storage began to grow when pools at many nuclear reactors began to fill up with stored used fuel. Utilities began looking at options for increasing spent fuel storage capacity. The first choice was to re-rack the spent fuel pools, moving the stored assemblies closer together (high-density fuel storage). The NRC allowed high-density storage of spent fuel in pools originally designed to hold much smaller inventories (low-density, open rack storage). Plants started to use a dense storage configuration with assemblies approximately 1 inch apart. In order to prevent the spent fuel from going critical, the fuel assemblies are partitioned off from each other in metal boxes whose walls contain neutron absorbing boron. These shields effectively create a thermos around each waste assembly. Eventually, spent fuel pools reached their capacity.

Dry cask storage allows spent fuel that has already been cooled in the spent fuel pool for at least 5 years to be surrounded by inert gas inside a container called a cask and stored on a concrete pad. The casks are typically steel cylinders that are either welded or bolted closed.

The steel cylinder provides a leak-tight containment of the spent fuel. Each cylinder is surrounded by additional steel and concrete to provide radiation shielding to workers and members of the public. The fuel is kept cool by air entering vents on the side of the container and circulating around the outside of the steel canister. Each canister is designed to hold approximately two to six dozen spent fuel assemblies. Water and air are removed, and the canister is filled with inert gas, sealed, and tested for leaks.

The NRC regulates spent fuel through a combination of regulatory requirements and licensing; safety oversight, including inspection, assessment of performance, and enforcement; operational experience evaluation; and regulatory support activities. The NRC's regulations are found in Chapter I of 10 CFR. Chapter I is divided into Parts 1 through 199. Part 72, "Licensing requirements for the independent storage of spent nuclear fuel and high level radioactive waste," rules spent fuel storage. The NRC periodically inspects the design, fabrication, and use of dry cask storage.

By COMSECY-13-0030, "Staff Evaluation on Recommendation for Japan Lessons-Learned Tier 3 Issue on Expedited Transfer of Spent Fuel," dated November 12, 2013 (Reference 28), the NRC staff concluded that the expedited transfer of spent fuel to dry cask storage would provide only a minor or limited safety benefit.

By SRM-COMSECY-13-0030, dated May 23, 2014 (Reference 29), the Commission approved the NRC staff's recommendation that this Tier 3 Japan lessons learned activity be closed and that no further generic assessments be pursued related to possible regulatory actions to require the expedited transfer of spent fuel to dry cask storage.

Number of Spent Fuel Assemblies

By letter dated September 15, 1977 (Reference 30), the Commission issued Amendment No. 37 to FOL DPR-28 for VY. Amendment No. 37 permitted the replacement of the storage racks in the spent fuel storage pool, increasing its capacity in phases from 600 fuel assemblies to 2,000 fuel assemblies.

By letter dated July 10, 1991 (Reference 31), the Commission issued Amendment No. 130 to FOL DPR-28 for VY. Amendment No. 130 increased the spent fuel pool storage capacity from 2,000 to 2,870 fuel assemblies.

By letter dated December 21, 1999 (Reference 32), the Commission issued Amendment No. 182 to FOL DPR-28 for VY. Amendment No. 182 increased the spent fuel pool storage capacity from 2,870 to 3,353 fuel assemblies. Based on the review described in the SE, the NRC staff found the criticality aspects of the proposed modifications to the VY spent fuel pool storage racks are acceptable and meet the requirements of General Design Criterion 62 for the prevention of criticality in fuel storage and handling.

Spent Fuel vs. Hiroshima Bomb

Atomic bombs produce a rapid fission chain reaction to release a large amount of energy at once. If the amount of uranium or other matter capable of generating nuclear fission is too small, the neutrons produced from the fission will scatter and not continue the chain reaction. To produce an instant chain reaction, it is necessary to use a near 100 percent concentration of Uranium-235 or Plutonium-239 at a fixed amount or greater. This fixed amount is called the

critical quantity. For example, the Uranium-235 bomb used on Hiroshima required at least 15 kilograms of uranium. The Uranium-235 was compartmentalized in the bomb to prevent it from exceeding its critical quantity during transport. To explode the bombs, gunpowder explosions quickly forced all the matter into one area, at which time the critical quantity was exceeded, generating a sudden chain reaction.

Spent fuel is stored in a spent fuel pool, which is an underwater storage and cooling facility for spent fuel elements that have been removed from the reactor. It involves placing the fuel assemblies under at least 20 feet of water. The water serves two purposes: it serves as a shield to reduce the radiation levels that people working above may be exposed to, and it cools the fuel assemblies that continue to produce heat for some time after removal.

The fuel used in the VY reactor had a ratio of about 3 to 5 percent Uranium-235. This fuel was incapable of detonating like a nuclear bomb when it was in the reactor, and it is also incapable of detonating like a nuclear bomb when it is in the spent fuel pool.

Section 50.68 of 10 CFR, "Criticality accident requirements," requires that spent fuel pools remain subcritical in an unborated, maximum moderation condition.

7.0 ENVIRONMENTAL CONSIDERATION

The amendment changes requirements with respect to the installation or use of facility components located within the restricted area, as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has also determined that the amendment involves NSHC. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

8.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

9.0 REFERENCES

1. Perito, M., Entergy Nuclear Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Notification of Permanent Cessation of Power Operations, Vermont Yankee Nuclear Power Station, Docket No. 50-271 License No. DPR-28," dated September 23, 2013 (ADAMS Accession No. ML13273A204).

2. Wamser, C. J., Entergy Nuclear Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Exemptions from Portions of 10 CFR 50.47 and 10 CFR 50, Appendix E, Vermont Yankee Nuclear Power Station, Docket No. 50-271 License No. DPR-28," dated March 14, 2014 (ADAMS Accession No. ML14080A141).
3. Wamser, C. J., Entergy Nuclear Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Vermont Yankee Permanently Defueled Emergency Plan and Emergency Action Level Scheme, Vermont Yankee Nuclear Power Station, Docket No. 50-271 License No. DPR-28," dated June 12, 2014 (ADAMS Accession No. ML14168A302).
4. Nuclear Energy Institute (NEI) 99-01, "Development of Emergency Action Levels for Non-Passive Reactors," Revision 6, dated November 2012 (ADAMS Accession No. ML12326A805).
5. Kim, James, U.S. Nuclear Regulatory Commission, letter to Site Vice President, Entergy Nuclear Operations, Inc., "Vermont Yankee Nuclear Power Station – Request for Additional Information Regarding Exemption from the Requirements of 10 CFR 50.47 and Appendix E (TAC No. MF3614)," dated August 19, 2014 (ADAMS Accession No. ML14192A835).
6. Wamser, C. J., Entergy Nuclear Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Vermont Yankee Permanently Defueled Emergency Plan and Emergency Action Level Scheme – Supplement 1 (TAC No. MF4279), Vermont Yankee Nuclear Power Station, Docket No. 50-271 License No. DPR-28," dated October 21, 2014 (ADAMS Accession No. ML14300A014).
7. Kim, J., U.S. Nuclear Regulatory Commission, letter to Entergy Nuclear Operations, Inc., "Vermont Yankee Nuclear Power Station – Request for Additional Information Regarding License Amendment Request for Permanently Defueled Emergency Plan Change (TAC No. MF4279)," dated October 20, 2014 (ADAMS Accession No. ML14281A233).
8. Wamser, C. J., Entergy Nuclear Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Certifications of Permanent Cessation of Operations and Permanent Removal of Fuel from the Reactor Vessel, Vermont Yankee Nuclear Power Station, Docket No. 50-271 License No. DPR-28," dated January 12, 2015 (ADAMS Accession No. ML15013A426).
9. Wamser, C. J., Entergy Nuclear Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Vermont Yankee Permanently Defueled Emergency Plan and Emergency Action Level Scheme – Supplement 2 (TAC No. MF4279), Vermont Yankee Nuclear Power Station, Docket No. 50-271 License No. DPR-28," dated February 5, 2015 (ADAMS Accession No. ML15062A122).
10. Wamser, C. J., Entergy Nuclear Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Vermont Yankee Permanently Defueled Emergency Plan and Emergency Action Level Scheme – Supplement 3 (TAC No. MF4279), Vermont Yankee Nuclear Power Station, Docket No. 50-271 License No. DPR-28 dated June 18, 2015 (ADAMS Accession No. ML15173A100).

11. Wamser, C. J., Entergy Nuclear Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Vermont Yankee Permanently Defueled Emergency Plan and Emergency Action Level Scheme – Supplement 4 (TAC No. MF4279), Vermont Yankee Nuclear Power Station, Docket No. 50-271 License No. DPR-28," dated July 16, 2015 (ADAMS Accession No. ML15201A157).
12. Kim, James, U.S. Nuclear Regulatory Commission, letter to Site Vice President, Entergy Nuclear Operations, Inc., "Vermont Yankee Nuclear Power Station – Exemption from the Certain Emergency Planning Requirements and Related Safety Evaluation (CAC No. MF3614)," dated December 10, 2015 (ADAMS Accession No. ML15180A054).
13. U.S. Nuclear Regulatory Commission, "Staff Requirements - SECY-14-0125 - Request by Entergy Nuclear Operations, Inc., for Exemptions from Certain Emergency Planning Requirements," dated March 2, 2015 (ADAMS Accession No. ML15061A516).
14. U.S. Nuclear Regulatory Commission, "Request by Entergy Nuclear Operations, Inc., for Exemptions from Certain Emergency Planning Requirements," SECY-14-0125, dated November 14, 2014 (ADAMS Accession No. ML14227A711).
15. U.S. Nuclear Regulatory Commission and Federal Emergency Management Agency, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," NUREG-0654/FEMA-REP-1, November 1980 (ADAMS Accession No. ML040420012).
16. Thaggard, M., U.S. Nuclear Regulatory Commission, letter to Ms. Susan Perkins-Grew, Nuclear Energy Institute, "U.S. Nuclear Regulatory Commission Review and Endorsement of NEI 99-01, Revision 6, dated November 2012 (TAC No. D92368)," March 28, 2013 (ADAMS Accession No. ML12346A463).
17. State of Vermont's Motion to Stay the License Amendment Proceeding Pending Commission Reconsideration, dated March 12, 2015 (ADAMS Accession No. ML15071A487).
18. Nuclear Energy Institute (NEI) 99-01, Revision 5, "Methodology for Development of Emergency Action Levels," dated February 2008 (ADAMS Accession No. ML080450149).
19. Leeds, E. J., U.S. Nuclear Regulatory Commission, letter to Entergy Nuclear Operations, Inc., "Vermont Yankee Nuclear Power Station – Safety Evaluation for Emergency Action Levels (TAC No. MD9157)," dated June 16, 2009 (ADAMS Accession No. ML091550592).
20. U.S. Nuclear Regulatory Commission, Generic Letter 89-01, "Implementation of Programmatic Controls for Radiological Effluent Technical Specifications [RETS] in the Administrative Controls Section of the Technical Specifications and the Relocation of Procedural Details of RETS to the Offsite Dose Calculation Manual or to the Process Control Program," dated January 31, 1989 (ADAMS Legacy Library No. 8901300114).

21. State of Vermont's Petition for Leave to Intervene and Hearing Request, dated February 9, 2015 (ADAMS Package Accession No. ML15040A723).
22. U.S. Nuclear Regulatory Commission, NUREG-1738, "Technical Study of Spent Fuel Accident Risk at Decommissioning Nuclear Power Plants," dated February 2001 (ADAMS Accession No. ML010430066).
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24. "Petition for Rulemaking To Improve Emergency Planning Regulations (10 C.F.R. 50.47)," submitted by Michael Mariotte on Behalf of the Nuclear Information and Resource Service and 37 co-petitioners, PRM-50-104 dated February 15, 2012 (ADAMS Accession No. ML12048B004).
25. U.S. Nuclear Regulatory Commission, "Denial of Petition for Rulemaking Requesting Amendments Regarding Emergency Planning Zone Size (PRM-50-104)," SECY-13-0135, dated December 13, 2013 (ADAMS Accession No. ML13109A506).
26. U.S. Nuclear Regulatory Commission, "Staff Requirements - SECY-13-0135 – Denial of Petition for Rulemaking Requesting Amendments regarding Emergency Planning Zone Size (PRM-50-104)," dated February 27, 2014 (ADAMS Accession No. ML14058A644).
27. U.S. Nuclear Regulatory Commission, Commission Voting Record SECY-13-0135, "Denial of Petition for Rulemaking Requesting Amendments Regarding Emergency Planning Zone Size (PRM-50-104)," dated February 27, 2014 (ADAMS Accession No. ML14063A166).
28. U.S. Nuclear Regulatory Commission, "Staff Evaluation on Recommendation for Japan Lessons-Learned Tier 3 Issue on Expedited Transfer of Spent Fuel," COMSECY-13-0030, dated November 12, 2013 (ADAMS Accession No. ML13273A601).
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30. Reid, R. W., U.S. Nuclear Regulatory Commission, letter to Mr. Robert H. Groce, Yankee Atomic Electric Company - Issuance of Amendment 37 to Facility Operating License DPR-28, Permitting Licensee to Replace the Storage Racks in the Present Spent Fuel Storage Pool, Increasing its Capacity in Phases from 600 Fuel Assemblies to 2000 Fuel Assemblies," dated September 15, 1977 (ADAMS Accession No. ML011620013).

31. Fairtile, M. B., U.S. Nuclear Regulatory Commission, letter to Mr. L.A. Tremblay, Vermont Yankee Nuclear Power Corporation, "Issuance of Amendment No. 130 to Facility Operating License No. DPR-28 – Vermont Yankee Nuclear Power Station (TAC No. 69179)," dated June 10, 1991 (ADAMS Accession No. ML011650045).
32. Croteau, R. P., U.S. Nuclear Regulatory Commission to Mr. Samuel L. Newton, Vermont Yankee Nuclear Power Corporation, "Issuance of Amendment [182] Re: Spent Fuel Pool Storage Capacity Expansion (TAC No. MA3490)," dated December 21, 1999 (ADAMS Package Accession No. ML993620134).

Principal Contributors: M. Norris, NSIR
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Date: December 11, 2015

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

/RA/

James Kim, Project Manager
Plant Licensing IV-2 and Decommissioning
Transition Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-271

Enclosures:

1. Amendment No. 264 to DPR-28
2. Safety Evaluation

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*by memo dated 8/14/15

**via email

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