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

March 11, 2011

Mr. Michael Mulligan
P.O. Box 161
Hinsdale, NH 03451

Mr. Raymond Shadis
Consultant to New England Coalition
P.O. Box 98
Edgecomb, ME 04556

Mr. Thomas Saporito, Executive Director
RenewableElectricSystems.com
P.O. Box 8413
Jupiter, FL 33468

Dear Messrs. Mulligan, Shadis, and Saporito:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am responding to your letters dated January 12, 2010, from Mr. Michael Mulligan, February 8, 2010, from Mr. Raymond Shadis, and February 20, 2010, from Mr. Thomas Saporito about tritium leaks at the Vermont Yankee Nuclear Power Station (Vermont Yankee). Your letters are available from the NRC's Agencywide Documents Access and Management System (ADAMS) in the public Electronic Reading Room on the NRC Web site at http://www.nrc.gov/reading-rm/adams.html under ADAMS Accession Nos. ML100190688, ML100470430, and ML100621374.

The NRC staff has completed its review of the consolidated petition. The NRC staff sent a copy of the proposed Director's Decision to the petitioners and the licensee for comment on January 20, 2011. The staff did not receive any comments on the proposed Director's Decision.

In summary, the NRC's conclusion is that the activities requested in the consolidated petition have been completed, with the exception of immediate cold shutdown of Vermont Yankee. Therefore, the consolidated petition has been granted in part and denied in part.

A copy of the Director's Decision (DD-11-03) will be filed with the Secretary of the Commission for the Commission to review in accordance with 10 CFR 2.206(c). As provided for by this regulation, the decision will constitute the final action of the Commission 25 days after the date of the decision unless the Commission, on its own motion, institutes a review of the decision within that time. The documents cited in the enclosed DD are available in the Agencywide Documents Access and Management System (ADAMS) for inspection at the Commission's Public Document Room, located at One White Flint North, 11555 Rockville Pike (First Floor), Rockville, Maryland, and from the ADAMS Public Library component on the NRC Web site, http://www.nrc.gov/reading-rm.html (the Public Electronic Reading Room).

A copy of the notice of "Issuance of Director's Decision Under 10 CFR 2.206," which has been filed with the Office of the Federal Register for publication, is also enclosed.

Please feel free to contact the petition manager, James Kim, at 301-415-4125, to discuss any questions related to this petition.

Sincerely,

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

Docket No. 50-271

Enclosures:
1. Director's Decision DD-11-03
2. *Federal Register* Notice

cc: Listserv

Enclosure 1

Director's Decision Under 10 CFR 2.206
Vermont Yankee

ADAMS Accession Number
ML110540558

DD-11-03

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION

Eric J. Leeds, Director

| | | |
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| In the Matter of | ) | Docket No. 50-271 |
| | ) | |
| ENTERGY NUCLEAR VERMONT YANKEE, LLC | ) | License No. DPR-28 |
| and | ) | |
| ENTERGY NUCLEAR OPERATIONS, INC. | ) | |
| | ) | |
| Vermont Yankee Nuclear Power Station | ) | |

DIRECTOR'S DECISION UNDER 10 CFR 2.206

## I. INTRODUCTION

By letters dated January 12, 2010, from Mr. Michael Mulligan, February 8, 2010, from Mr. Raymond Shadis, and February 20, 2010, from Mr. Thomas Saporito, these individuals (collectively "Petitioners") filed separate petitions pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 2.206, requesting the Nuclear Regulatory Commission (NRC or the Commission) take actions with regard to the Vermont Yankee Nuclear Power Station (VY).

Mr. Mulligan requested in his petition that: (1) the radioactive leak into the environment of VY be immediately stopped, VY be immediately shut down, and all leaking paths be isolated; and (2) VY disclose its preliminary "root cause analysis," and the NRC release its preliminary investigative report on that analysis before plant startup.

Mr. Shadis on behalf of New England Coalition (NEC) requested in his petition that the NRC: (1) require VY to go into cold shutdown and depressurize all systems in order to slow or stop the leak; (2) act promptly to stop or mitigate the leak(s); (3) require VY to reestablish its licensing basis by physically tracing records and reporting physical details of all plant systems

that would be within scope as "Buried Pipes and Tanks," in NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," and under the requirements of 10 CFR 50.54, "Conditions of licenses"; (4) investigate and determine why Entergy has been allowed to operate VY since 2002 without a working knowledge of all plant systems and why the NRC's Reactor Oversight Process (ROP) and review process for license renewal amendment did not detect this dereliction; (5) take notice of VY's many maintenance and management failures (from 2000-2010) and the ROP's failure to detect them early and undertake a full diagnostic evaluation team inspection using NRC Inspection Procedure 95003, "Supplemental Inspection for Repetitive Degraded Cornerstones, Multiple Degraded Cornerstones, Multiple Yellow Inputs or One Red Input"; and (6) require VY to apply for an amendment to its license renewal application that would address both aging analysis and aging management of all buried piping carrying or with the potential to carry radionuclides and/or the potential to interact with any safety or safety-related system.

Mr. Saporito requested in his petition that the NRC: (1) order a cold shutdown mode of operation for VY because of leaking radioactive tritium; and (2) issue a confirmatory order modifying the NRC-issued license for VY so that the licensee must bring the nuclear reactor to a cold shutdown mode of operation until the licensee can provide definitive reasonable assurance to the NRC, under affirmation, that the reactor will be operated in full compliance with the regulations in 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," and Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, Criterion 60, "Control of Releases of Radioactive Materials to the Environment," and Criterion 64, "Monitoring Radioactivity Releases," and other NRC regulations and authority.

Mr. Shadis stated during a public teleconference with the PRB on March 3, 2010, that the tritium leak is just one example of many maintenance and management failures at VY. All three petitioners raised a concern regarding what they perceive as the NRC's failure to

examine the deficiencies at VY in an integrated manner. This concern has met the criteria for review in accordance with NRC's Management Directive (MD) 8.11 "Review Process for 10 CFR 2.206 Petitions."

In an acknowledgment letter dated June 25, 2010, the petitioners were informed of the PRB's decision to deny the request for an immediate cold shutdown of VY because the PRB did not identify any urgent safety concerns. The NRC also informed the petitioners that their petitions were consolidated per the guidance in MD 8.11. The consolidated petition was accepted for review for the following specific issues and concerns stated by the petitioners in the petitions and/or supplemented during the teleconferences:

(1) Increasing concentrations of radiocontaminants in the soil and groundwater at VY, as well as an increasing area of contamination, are manifest on a daily basis. VY risks aggravating the contamination by continuing to run the reactor at full power while attempting over a period of a month to triangulate the location of a presumed leak by drilling a series of test wells in the affected area.

(2) During the license renewal application proceeding, the licensee averred that it was unaware of the existence of some buried pipes, now uncovered, and it has yet to discover their path and purpose.

(3) Entergy has, in 8 years of ownership, failed to learn and understand VY's design, layout, and construction. This failure to comprehend and understand the layout, function, and potentially the interaction of the plant's own piping systems constitutes a loss of design basis.

(4) The NRC's ROP has apparently failed to capture, anticipate, and prevent ongoing maintenance, engineering, quality assurance, and operation issues that have manifested themselves in a series of high-profile incidents since Entergy took over VY. The agency

has repeatedly failed to detect root cause trends until they have, as in this instance, become grossly self-revealing.

(5) The NRC should ensure that Entergy has adequate decommissioning funds. The tritium leak will increase decommissioning costs because of the need for site radiological examination and soil remediation.

Copies of the petitions are available for inspection at the Commission's Public Document Room (PDR) at One White Flint North, Public File Area O1 F21, 11555 Rockville Pike (first floor), Rockville, Maryland, and from the NRC's Agencywide Documents Access and Management System (ADAMS) Public Electronic Reading Room on the NRC Web site at http://www.nrc.gov/reading-rm/adams.html under ADAMS Accession Nos. ML100190688, ML100470430, and ML100621374. Refer to NRC's Management Directive 8.11, "Review Process for 10 CFR 2.206 Petitions," (ADAMS Accession No. ML041770328), for a description of the petition review process. Persons who do not have access to ADAMS or who have problems in accessing the documents in ADAMS should contact the NRC PDR reference staff by telephone at 1-800-397-4209 or 301-415-4737, or by e-mail to pdr@nrc.gov.

## II. DISCUSSION

On January 7, 2010, Entergy reported to the NRC that water samples taken from groundwater monitoring well GZ-3 onsite at VY showed tritium levels above background. GZ-3 is about 70 feet from the Connecticut River. Tritium is another name for the radioactive nuclide hydrogen-3. Tritium occurs naturally in the environment because of cosmic ray interactions. It is also produced by nuclear reactor operations, and can be legally discharged as a radioactive effluent under NRC regulations. Tritium is chemically identical to normal hydrogen (hydrogen-1), and, like normal hydrogen, tends to combine with oxygen to form water, which is referred to as tritiated water. The detection of tritiated water in the monitoring well indicated abnormal leakage from the nuclear plant. The Environmental Protection Agency's (EPA's)

regulatory standard for tritium in drinking water is 20,000 picocuries per liter (pCi/L). Tritium was initially measured at levels up to about 17,000 pCi/L in monitoring well GZ-3, which is not used for drinking water. Samples at other monitoring wells have also shown some tritium. The highest reading from any monitoring well has been about 2.5 million pCi/L, from monitoring well GZ-10. Entergy immediately started an investigation to identify the source of the tritium, and later installed additional monitoring wells to help locate the source.

Upon notification on January 7, 2010, of the detection of tritium in the monitoring well, the NRC's staff initiated actions to review and assess the condition, by reviewing all available sampling data, hydrologic information, and analyses; conducting an onsite inspection and assessment of Entergy's plans and process for investigating the condition; and making an independent determination of public health and safety consequence based on available information. NRC inspectors provided close regulatory oversight of Entergy's investigation in order to independently assure conformance with applicable NRC regulatory requirements, assess licensee performance, and evaluate the condition with respect to NRC's radiological release limits.

On February 27, 2010, following excavation and leak testing of the Advanced Off Gas (AOG) system pipe tunnel, Entergy reported that it had identified leakage into the surrounding soil, and therefore to the groundwater, from an unsealed joint in the concrete tunnel wall. The AOG pipe tunnel is located about 15 feet underground. Also, piping inside the tunnel had previously been found to be leaking, and the drain inside the tunnel had been found to be clogged. Soil samples in the vicinity showed traces of radioactive isotopes. Entergy reported that the leakage to the environment had been stopped by isolating piping and containing the water leaking from the AOG pipe tunnel. However, on May 28, 2010, Entergy reported a second leak from AOG piping into the soil. Entergy quickly isolated this leak and has sealed off that piping to prevent further leaks in that area. The contaminated soil was removed from the

excavated area and is being stored in containers onsite for eventual disposal in accordance with NRC regulatory requirements.

As part of its oversight effort, NRC staff conducted an evaluation in accordance with NRC Manual Chapter 0309, "Reactive Inspection Decision Basis for Reactors," from January 25 to April 10, 2010, to determine if the occurrence with the AOG piping constituted a significant operational event (i.e., a radiological, safeguards, or other safety-related operational condition) that posed an actual or potential hazard to public health and safety, property, or the environment. The evaluation reviewed the condition against the specified deterministic criteria that are based on regulatory safety limits, and determined that none of the criteria were met. Notwithstanding that determination, the NRC staff continued its review, oversight, and assessment of the condition, including an independent evaluation of any potential public health and safety consequences. The staff's activities included:

1. Several onsite inspections and reviews to assess radiological and hydrological data to establish reasonable assurance that members of the public were not, nor were they expected to be, exposed to radiation in excess of the dose limits for individual members of the public specified in 10 CFR 20.1301, (i.e., 100 millirem in a year) or the As Low As Is Reasonably Achievable (ALARA) dose objectives specified in 10 CFR 50, Appendix I.
2. Engagement of hydrological scientists from NRC's Office of Nuclear Reactor Regulation, Office of Regulatory Research, and the U.S. Geological Survey to independently assess the licensee's hydrological and geological data and conclusions on groundwater flow characteristics of the area.
3. Inspection in accordance with NRC Temporary Instruction TI-2515/173, "Review of the Implementation of the Industry Ground Water Protection Voluntary Initiative," to determine the licensee's implementation of the specifications in the industry's

groundwater initiative document NEI-07-07, "Industry Ground Water Protection Initiative-Final Guidance Document," (ADAMS Accession No. ML072610036).

4. Confirmation of the basis, calculational methodology, and results obtained by the licensee to estimate a contaminated groundwater effluent release and off-site dose consequence to members of the public.
5. Analysis of selected ground water and environmental samples to aid in determining the adequacy of the licensee's analytical methods.
6. Approval for additional NRC inspection resources above the baseline inspection program to fully evaluate and provide continuing regulatory oversight of the licensee's investigation and remediation activities.
7. Documentation of the inspection scope and conclusions in publicly available NRC Inspection Reports.

As a result of these activities, the NRC established reasonable assurance, in a timely manner, that this groundwater condition would not result in any dose consequence that would jeopardize public health and safety. To date, information and data continue to support that the dose consequence attributable to the groundwater condition at VY remains well below the "As Low As Reasonably Achievable" (ALARA) dose objectives specified in 10 CFR Part 50, Appendix I; and that the NRC regulatory criteria of 10 CFR 20.1301, "Dose limits for individual members of the public," was never approached.

In addition, representatives from the State of Vermont observed NRC inspection activities and conducted independent analyses of collected groundwater samples.

As discussed in Section I, the specific concerns raised by the petitioners which are used as the basis for their requests are discussed in the following paragraphs.

A. NRC RESPONSE TO THE CONSOLIDATED PETITION

1. Concern 1 - Increasing Concentrations of Radiocontaminants in the Soil and Groundwater at VY

In order to address/remove the onsite contamination, Entergy installed an extraction well (GZ-EW1) on March 23, 2010. On April 7, 2010, Entergy placed into service a second extraction well (GZ-EW1A), with a higher flow capacity. As the plume progressed toward the Connecticut River, the extraction wells were sited accordingly, with GZ-15 being utilized for groundwater extraction at various times starting on July 28, 2010, followed by installation of extraction well EW-2 which began operation along with GZ-14 on September 13, 2010. As of December 21, 2010, Entergy has pumped approximately 307,000 gallons of groundwater out of these wells in order to reduce the amount of tritiated water in the groundwater. About 9,000 gallons of the extracted water was recycled to the facility, and about 298,000 gallons of the extracted water has been shipped off-site for processing. Data indicates that the remaining residual plume of tritiated groundwater is currently migrating from the source of the leak to the Connecticut River, which is the direction of flow for the groundwater in this location. Notwithstanding the hydrology, no detectable tritium has been found in the Connecticut River. The NRC's inspections to date confirm that no federal regulatory limits have been exceeded, and public health and safety remains unaffected.

The soil in the vicinity of the leak was contaminated with small amounts of radioactive particulates associated with nuclear plant operations, including manganese-54, cobalt-60, zinc-65, strontium-90, and cesium-137. Sampling indicated very little migration in the immediate area, which is typical for these radionuclides. Entergy has removed about 150 cubic feet of contaminated soil and packaged it for eventual disposal in accordance with NRC regulatory requirements. Although some minor amounts of contaminated soil may remain, NRC

inspections indicate that this soil poses no threat to public health and safety. Areas of remaining minor contamination are expected to be evaluated, and as appropriate, remediated during plant decommissioning. The NRC's experience with decommissioned nuclear plants such as Maine Yankee, Haddam Neck, and Yankee Rowe indicates that these areas can be successfully remediated during decommissioning. The NRC's inspections indicate that no federal regulatory limits have been exceeded, and there are no health or safety concerns for members of the public or plant workers. The initial NRC inspection covered the period of January 25 through April 14, 2010. Inspection results were initially discussed in an NRC inspection report with preliminary results, dated April 16, 2010 (ADAMS Accession No. ML101060419). The NRC issued its completed report on May 20, 2010 (ADAMS Accession No. ML101400040), and continued to inspect the licensee's actions in these areas. The follow-up NRC Inspection Report 05000271/2010010 was issued on January 7, 2011, ADAMS Accession No. ML110070085.

As part of its corrective action program, Entergy performed a root cause analysis (RCA) of the leakage event. The NRC assessed the comprehensiveness of this analysis and documented this review in NRC Inspection Report 05000271/2010009 dated October 13, 2010 (ADAMS Accession No. ML102860037). The NRC concluded that Entergy's root and apparent cause evaluations for the tritium ground water leakage events were appropriate and no violation of NRC requirements was identified.

As discussed, Entergy has identified the source of the leak and stopped it, and has reduced the onsite contamination by pumping out contaminated groundwater and removing about 150 cubic feet of contaminated soil. The NRC's inspections confirm that no federal regulatory limits have been exceeded, and the public health and safety remains unaffected. Thus, no enforcement action is warranted for this concern.

2. Concern 2 – VY Was Unaware of the Existence of Some Buried Pipes During License Renewal Application Proceeding

On February 24, 2010, Entergy informed the NRC that some employees at VY had been removed from their site positions and placed on administrative leave. Entergy took these actions as a result of Entergy's independent internal investigation into alleged contradictory or misleading information provided to the State of Vermont that was not corrected. On May 27, 2010, an NRC audit team completed an onsite audit to independently verify that information provided by Entergy material to the renewal of the VY operating license was complete and accurate. The NRC staff reviewed the VY yard piping drawings to independently identify buried and underground piping located onsite. The NRC staff performed walk-downs of yard areas and conducted interviews with the buried piping program engineer. The NRC staff also reviewed the results of system walk-downs previously performed by NRC inspectors during the performance of NRC Inspection Procedure (IP) 71002, "License Renewal Inspection," as documented in NRC Inspection Report 05000271/2007006, dated June 4, 2007 (ADAMS Accession No. ML071550330). Additionally, the NRC staff had the opportunity to observe exposed portions of buried piping that had been previously excavated by Entergy in conjunction with actions taken to investigate the cause of a leak from an underground portion of piping in the AOG system. The NRC staff compared the results of this review to a list of buried and underground piping Entergy had provided in preparation of the audit. The NRC staff did not find any discrepancies between Entergy's current accounting of buried and underground safety-related piping and the description contained in the license renewal application, and so concluded that all information provided to the NRC in the license renewal application was complete and accurate in accordance with 10 CFR 50.9. Note that non-safety underground piping is excluded from the license renewal process. The complete audit report dated September 3, 2010, may be found under ADAMS Accession No. ML102070412. Because the

NRC staff did not identify a violation of NRC requirements, no enforcement action is warranted for this concern.

3. Concern 3 - Entergy's Failure to Comprehend and Understand the Layout, Function, and Potentially the Interaction of the Plant's Own Piping Systems Constitutes a Loss of Design Basis

The design basis for VY is the information that "identifies the specific functions to be performed by a structure, system or component of a facility, and the specific values or ranges of values chosen for controlling parameters as reference bounds for design." The design basis is submitted to the NRC and is approved by the NRC by issuance of the facility operating license. Any changes to the facility as described in the final safety analysis report (FSAR) must be either submitted to the NRC for approval through a license amendment, or changed in accordance with the provisions of 10 CFR 50.59. Licensees are required under 10 CFR 50.71(e) to update the FSAR, which was originally submitted as part of the application for the license, to assure that the information included in the FSAR contains the latest information developed. These submittals contain all the changes necessary to reflect information and analyses submitted to the Commission since the last update to the FSAR. The submittal includes the effects of all changes made in the facility or procedures as described in the FSAR and all safety analyses and evaluations performed by the licensee in support of approved license amendments or in support of conclusions that the plant design change did not require a license amendment.

As discussed in previous Section A.2, an NRC audit team compared the information Entergy provided in the license renewal application to the VY Technical Specifications and the FSAR. The NRC staff determined that the information in the FSAR would meet the requirements of 10 CFR 50.71 (e) regarding maintenance of design basis information, consistent with the definition of "design bases" in 10 CFR 50.2, and reflects current plant design. Both safety and non-safety underground yard piping are depicted on drawings in the VY's

controlled drawings system. The staff concluded that the information reviewed was accurate and complete and the NRC staff did not identify any loss of the design basis. Because no violations of NRC requirements were identified, enforcement action is not warranted for this concern.

4. Concern 4 - The NRC's ROP Failure to Detect Root Cause Trends of a Series of High-Profile Incidents

While a failure of the NRC's ROP is not something for which the NRC could take enforcement action against VY, the NRC staff is responding to the petitioners' concern. Objectives of the ROP include: (1) improving the objectivity of reactor oversight so that subjective decisions and judgment are not central process features; (2) improving the scrutability of reactor oversight so that NRC actions have a clear tie to licensee performance; and (3) risk-informing reactor oversight so that NRC and licensee resources are focused on those aspects of performance having the greatest impact on safe plant operation.

The ROP evaluates plant performance using objective, risk-informed thresholds, which include the safety significance of inspection findings and performance indicators (PIs). Objective performance thresholds are intended to help determine the level of regulatory engagement appropriate to licensee performance in each cornerstone area. The thresholds were established so that sufficient margin existed between nominal performance bands to allow for licensee initiatives to correct performance problems before they warrant escalated regulatory involvement. Sufficient margin exists to allow for both NRC and licensee corrective actions to be taken in response to declining performance before plant operation becomes unsafe. Under the ROP, performance deficiencies that have no impact on safety are considered minor and are entered into a licensee's corrective action program for appropriate attention, but they do not result in any specific action by the NRC. However, the NRC reviews the licensee's corrective action program on a routine basis while performing the baseline inspection program, and the

staff performs more in-depth reviews on a periodic basis while performing the inspection procedure, "Problem Identification and Resolution."

In addition to continuous inspection and assessment of VY performance, annual and mid-cycle assessments of VY performance are conducted. Annual and mid-cycle assessments involve review of the safety significance and common factors associated with inspection findings, and review of licensee objective performance indicators. The results associated with the last several reviews indicate that VY is being operated in a manner which preserves public health and safety. The high profile events referenced by the petitioners were inspected by a combination of specialist inspectors from both the NRC regional office and NRC headquarters, and by the onsite resident inspector staff. These events were determined to either not involve systems important to plant safety, or involved performance deficiencies of very low safety significance. In June 2009, the NRC conducted a Problem Identification and Resolution inspection at VY. The results of this inspection indicated that VY was generally effective in the implementation of its corrective action program; additionally, the safety culture of station employees, including station management, indicated that personnel had a willingness to identify, evaluate, and resolve plant deficiencies. The current and past performance information, including the Mid-Cycle and Annual Assessment Letters and inspection reports issued to VY and other licensees, are publically available and presented on the NRC's public web site.

The ROP Action Matrix is used to determine the level of regulatory oversight warranted for varying levels of performance. VY is in Column 1 (Licensee Response Column) of the ROP Action Matrix because all inspection findings and PIs at this site have very low (i.e., green) safety significance. In accordance with Inspection Manual Chapter (IMC) 0305, "Operating Reactor Assessment Program," plants in Column 1 meet all cornerstone objectives and receive the NRC's baseline inspection program.

The deviation process described in IMC 0305 is used to address unique situations where the oversight defined by the ROP Action Matrix column might not be appropriate or sufficient. Even though performance at VY had not crossed any thresholds warranting additional regulatory oversight, the staff considered it appropriate to apply additional resources to monitor the licensee's efforts to address the onsite groundwater contamination and to follow up on the licensee's response to the NRC's Demand for Information dated March 1, 2010 (ADAMS Accession No. ML100570237). The staff requested and received authorization from the NRC's Executive Director for Operations (EDO) on April 5, 2010 (ADAMS Accession No. ML100960321), to deviate from the ROP Action Matrix to apply additional resources in these areas of licensee performance.

Although tritium has been found in onsite monitoring wells, the staff has not identified a hazard to public health and safety, and the staff expects any off-site radiological releases to be very small (i.e., off-site doses, if any, would be negligible with respect to those received from normal background radiation levels). Nevertheless, as noted in the Action Matrix deviation memorandum, increased NRC oversight of the characterization, mitigation, and remediation of the tritium contamination was warranted given the extraordinary level of interest and concern by stakeholders. Although there is not currently, nor is there likely to be, a public health and safety issue, the NRC is conducting additional independent inspections and assessments of the licensee's activities, and has increased external stakeholder communications and outreach, to respond to stakeholder concerns and maintain public confidence.

The NRC staff considers the ROP adequate for ensuring public health and safety and notes that the groundwater contamination at VY does not pose a public health or safety hazard. The staff further notes that it has exercised its authority to deviate from the ROP Action Matrix to be responsive to unique circumstances and stakeholder concerns. The NRC staff conducts

annual ROP self-assessments, which include evaluations of deviations from the Action matrix to see if improvements are warranted in the ROP. The results of the calendar year 2010 self-assessment will be included in the annual Commission paper and metric report, which will be issued in early April of 2011 and discussed during the Agency Action Review Meeting (AARM): a meeting of senior NRC managers to confirm the results and effectiveness of the ROP. The results of the AARM will be presented to the Commission in a public meeting in May 2011.

5. Concern 5 - VY's Decommissioning Fund is Inadequate Due to the Increase in Decommissioning Costs

NRC establishes requirements for licensees to provide reasonable assurance that funds will be available for the decommissioning process. Reasonable assurance consists of a series of steps outlined in 10 CFR 50.75, "Reporting and record keeping for decommissioning planning." VY must file an annual report to the NRC containing a certification that financial assurance for decommissioning will be or has been provided in an amount which may be more, but not less than, the amount stated in the regulations, adjusted as appropriate for changes in labor, energy, and waste burial costs. The formula for adequate decommissioning funds includes an estimated waste disposal volume based on the plant design. The actual waste disposal volume may increase due to a leak or spill at a level that requires remediation. The licensee is responsible for payment of any increased waste disposal costs, whether paid for out of the allocated funds from the decommissioning fund or other assets. The current remediation of the tritium in soil and groundwater at VY has been funded as an operating expense and no money was used from the decommissioning trust fund. VY previously submitted a site-specific decommissioning cost analysis, which was approved by the NRC by letter dated February 3, 2009 (ADAMS Accession No. ML083390193). VY must address any required changes in their

next annual report. Because no violations of NRC requirements were identified, enforcement action is not warranted for this concern.

B. ADDITIONAL NRC ACTIONS PERTAINING TO GROUNDWATER CONTAMINATION

In March of 2010, NRC's EDO established a Groundwater Task Force (GTF) to review the NRCs approach to ground water contamination conditions, given the recent incidents of leaking buried pipes at commercial nuclear power plants. The charter of the Task Force was to reevaluate the recommendations made in the Liquid Radioactive Release Lessons Learned Task Force Final Report dated September 1, 2006 (ADAMS Accession No. ML062650312); review the actions taken in Commission Paper SECY-09-0174 "Staff Progress in Evaluation of Buried Piping at Nuclear Reactor Facilities" (ADAMS Accession No. ML093160004); and review the actions taken in response to recent releases of tritium into groundwater by nuclear facilities.

The GTF completed its work in June 2010 and provided its report to the EDO. The report characterized a variety of issues ranging from policy issues to communications improvement opportunities. The complete report may be found under ADAMS Accession No. ML101740509. The GTF determined that the NRC is accomplishing its stated mission of protecting public health, safety, and protection of the environment through its response to groundwater leaks/spills. Within the current regulatory structure, the NRC is correctly applying requirements and properly characterizing the relevant issues. However, the GTF reported that there are further observations, conclusions, and recommendations that the NRC should consider in its oversight of groundwater contamination incidents.

The EDO appointed a group of NRC senior executives to review the report and consider its findings. The group reviewed the GTF final report, including the conclusions, recommendations, and their bases. They identified conclusions and recommendations that do not involve policy issues, and tasked the NRC staff to address them. They have also identified policy issues, and a policy paper has been sent to the Commission discussing those issues.

A public workshop was held on October 4, 2010, with external stakeholders to discuss the findings of the GTF Report and to receive input on the potential policy issues. In addition, a request for public comment was published in the *Federal Register* (75 FR 57987). These efforts help to ensure the NRC is considering the right issues on which to focus its attention as it moves forward. The transcript from this meeting is available on the NRC's web site at:

http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/buried-pipes-tritium.html

## III. CONCLUSION

As summarized above, the NRC staff did not identify any violations and the public health and safety remains reasonably assured. Thus, no enforcement action against VY is warranted. The NRC staff concludes that the petitioners' concerns have been addressed and resolved such that no further action is needed in response to the petitions.

As provided in 10 CFR 2.206(c), a copy of this Director's Decision will be filed with the Secretary of the Commission for the Commission to review. As provided for by this regulation, the Decision will constitute the final action of the Commission 25 days after the date of the Decision unless the Commission, on its own motion, institutes a review of the Decision within that time.

Dated at Rockville, Maryland, this 11th day of March 2011.

FOR THE NUCLEAR REGULATORY COMMISSION

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

Enclosure 2

*Federal Register* Notice
Vermont Yankee

ADAMS Accession Number
ML110540569

[7590-01-P]

U.S. NUCLEAR REGULATORY COMMISSION

ENTERGY NUCLEAR OPERATIONS, INC.

ENTERGY NUCLEAR VERMONT YANKEE, LLC

VERMONT YANKEE NUCLEAR POWER STATION

DOCKET NO. 50-271

LICENSE NO. DPR-28

RECEIPT OF REQUEST FOR ACTION UNDER 10 CFR 2.206

Notice is hereby given that petitions dated January 12, 2010, from Mr. Michael Mulligan, February 8, 2010, from Mr. Raymond Shadis, and February 20, 2010, from Mr. Thomas Saporito, have requested that, under Title 10 of the *Code of Federal Regulations* (10 CFR) 2.206, "Requests for Action under this Subpart," the U.S. Nuclear Regulatory Commission (NRC) take action with regard to the Vermont Yankee Nuclear Power Station (VY).

Mr. Mulligan requested in his petition that (1) the radioactive leak into the environment of VY be immediately stopped, VY be immediately shut down, and all leaking paths be isolated, and (2) VY disclose its preliminary root cause analysis and the NRC release its preliminary investigative report on this analysis before plant startup.

Mr. Shadis requested in his petition that the NRC (1) require VY to go into cold shutdown and depressurize all systems in order to slow or stop the leak, (2) act promptly to stop or mitigate the leak(s) and not wait until all issues raised by New England Coalition are resolved, (3) require VY to reestablish its licensing basis by physically tracing records and reporting physical details of all plant systems that would be within scope as "buried pipes and tanks" in NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," and under the requirements of 10 CFR 50.54, "Conditions of Licenses," (4) investigate and determine why Entergy has been

allowed to operate VY since 2002 without a working knowledge of all plant systems, and why the NRC's Reactor Oversight Process (ROP) and review process for license renewal amendment did not detect this dereliction, (5) take notice of Entergy Nuclear Vermont Yankee's many maintenance and management failures (from 2000 to 2010) and the ROP's failure to detect them early and undertake a full diagnostic evaluation team inspection or NRC Inspection Procedure 95003, "Supplemental Inspection for Repetitive Degraded Cornerstones, Multiple Degraded Cornerstones, Multiple Yellow Inputs or One Red Input," and (6) require Entergy VY to apply for an amendment to its license renewal that would address both aging analysis and aging management of all buried piping carrying or with the potential to carry radionuclides and/or the potential to interact with any safety or safety-related system.

Mr. Saporito requested in his petition that the NRC (1) order a cold-shutdown mode of operation for VY because of leaking radioactive tritium and (2) issue a confirmatory order modifying the NRC-issued license for VY so that the licensee must bring the nuclear reactor to a cold-shutdown mode of operation until the licensee can provide definitive reasonable assurance to the NRC, under affirmation, that the reactor will be operated in full compliance with the regulations in 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," and General Design Criteria 60, "Control of Releases of Radioactive Materials to the Environment," and 64, "Monitoring Radioactivity Releases," of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, and with other NRC regulations and authority.

The requests are being treated under 10 CFR 2.206 of the Commission's regulations. The requests have been referred to the Director of the Office of Nuclear Reactor Regulation (NRR). As provided by 10 CFR 2.206, the NRC will take appropriate action on this consolidated petition within a reasonable time.

Each petitioner stated that the tritium leak is just one example of many maintenance and management failures at VY. All three raised a concern about what they perceive as the NRC's

failure to examine the deficiencies at VY in an integrated manner. Although the individual petition was written to request enforcement action specifically because of the tritium leak, during each of the transcribed phone calls, each petitioner urged the NRC to take a broader view and assess operational and performance failures at VY collectively instead of individually. This concern has met the criteria for review in accordance with Management Directive 8.11, "Review Process for 10 CFR 2.206 Petitions."

Subsequently, the Petition Review Board recommended that the NRC accept the consolidated petition for review for the following specific issues and concerns identified in the petitions and supplemented during the teleconferences:

1. Increasing concentrations of radiocontaminants in the soil and groundwater at VY, as well as an increasing area of contamination, are manifest on a daily basis. VY risks aggravating the contamination by continuing to run the reactor at full power while attempting over a period of a month to triangulate the location of a presumed leak by drilling a series of test wells in the affected area.
2. During the license renewal application proceeding, the licensee averred that it was unaware of the existence of some buried pipes, now uncovered, and it has yet to discover their path and purpose.
3. Entergy has, in 8 years of ownership, failed to learn and understand VY's design, layout, and construction. This failure to comprehend and understand the layout, function, and potentially the interaction of the plant's own piping systems constitutes a loss of design basis.
4. The NRC's ROP has apparently failed to capture, anticipate, and prevent ongoing maintenance, engineering, quality assurance, and operation issues that have manifested themselves in a series of high-profile incidents since Entergy took over VY. The agency

has repeatedly failed to detect root cause trends until they have, as in this instance, become grossly self-revealing.

5. The NRC should ensure that Entergy has adequate decommissioning funds. The tritium leak will increase decommissioning costs because of the need for site radiological examination and soil remediation.

The NRC sent a copy of the proposed Director's Decision to the petitioners and the licensee for comment on January 20, 2011. The staff did not receive any comments on the proposed Director's Decision.

The NRR staff determined that the activities requested by the petitioners have been completed, with the exception of immediate cold shutdown of Vermont Yankee. Therefore, the Director of NRR concludes that the petition has been granted in part and denied in part. The reasons for this decision are explained in the Director's Decision (DD-11-03) pursuant to 10 CFR 2.206.

Copies of the petitions (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML100190688, ML100470430, and ML100621374) and the Director's Decision (ADAMS Accession No. ML110540558) are available for inspection at the Commission's Public Document Room (PDR) at One White Flint North, Public File Area O1 F21, 11555 Rockville Pike (first floor), Rockville, Maryland, and from the NRC's ADAMS Public Electronic Reading Room on the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. NRC Management Directive 8.11, "Review Process for 10 CFR 2.206 Petitions" (ADAMS Accession No. ML041770328), describes the petition review process. Persons who do not have access to ADAMS or who have problems in accessing the documents in ADAMS should contact the NRC PDR reference staff by telephone at 1-800-397-4209 or 301-415-4737, or by e-mail to pdr@nrc.gov.

A copy of the Director's Decision will be filed with the Secretary of the Commission for the Commission's review in accordance with 10 CFR 2.206 of the Commission's regulations. As provided for by this regulation, the Director's Decision will constitute the final action of the Commission 25 days after the date of the decision, unless the Commission, on its own motion, institutes a review of the Director's Decision in that time.

Dated at Rockville, Maryland this 11th day of March, 2011.

FOR THE NUCLEAR REGULATORY COMMISSION

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

Please feel free to contact the petition manager, James Kim, at 301-415-4125, to discuss any questions related to this petition.

Sincerely,

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Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

Docket No. 50-271

Enclosures:
1. Director's Decision DD-11-03
2. *Federal Register* Notice

cc: Listserv

DISTRIBUTION: G20100027/EDATS: OEDO-2010-0022
G20100074/EDATS: OEDO-2010-0087
G20100098/EDATS: OEDO-2010-0145

See next page
ADAMS Accession Nos:
Package: ML110540519
Incomings: ML100190688, ML100470430, and ML100621374
2.206 Final DD: ML110540558
2.206 FRN of Issuance: ML110540569
Letter to Petitioners Re: Final Director's Decision and FRN: ML110540551

*Via email

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| DATE | 2/28/11 | 2/28/11 | 2/28/11 | 3/2/11 | 3/3/11 | 3/3/11 | 3/4/11 | 3/4/11 | 3/11/11 |

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