

November 7, 2006

EA-06-253

Mr. Theodore A. Sullivan
Site Vice President
Entergy Nuclear Operations, Inc.
Vermont Yankee Nuclear Power Station
320 Governor Hunt Road
Vernon, VT 05354

SUBJECT: VERMONT YANKEE NUCLEAR POWER STATION
NRC INSPECTION REPORT 05000271/2006011
PRELIMINARY WHITE FINDING

Dear Mr. Sullivan:

On October 6, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Vermont Yankee Nuclear Power Station. The enclosed report documents the inspection findings which were discussed on October 6, 2006, with members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report discusses one finding that appears to have a low to moderate safety significance. As described in Section 2PS2 of this report, the finding involves an August 31, 2006 radioactive material shipment from your facility, via an exclusive-use open transport vehicle, that did not conform to the applicable Department of Transportation (DOT) regulatory requirements when it arrived at the shipping destination. Specifically, upon receipt, the external radiation exposure rate on the surface of the affected package was determined to exceed DOT's regulatory specification. The apparent cause was ineffective decontamination of the package contents, and an insufficient radiological survey to assure that, under conditions normally incident to transport, the package would conform with DOT's radiation level limits specified in 49 CFR 173.441(a).

Preliminarily, we consider that this is a self-revealing finding having a low to moderate safety significance because the external package dose rate was greater than two, but less than five times the radiation level limitation specified in the DOT regulatory requirement. Though the surface of the package was inaccessible to the public during transport, that aspect was fortuitous and not the result of design or package preparation by the licensee. Additionally, the condition had the potential to adversely affect personnel who would normally receive the package or respond to an incident involving the package with the reasonable expectation that the package conformed with DOT radiation limitations. Accordingly, the finding is considered an apparent violation of NRC requirements specified by 10 CFR 71.5 and 49 CFR 173.441(a), and is being considered for escalated enforcement action in accordance with the NRC

Enforcement Policy. The current policy is included on the NRC's website at <http://www.nrc.gov> - select **What We Do, Enforcement**, then **Enforcement Policy**.

We believe that we have sufficient information to make a final significance determination for this matter. However, before the NRC makes a final decision on this matter, we are providing you an opportunity to (1) present to the NRC your perspectives on the facts and assumptions, used by the NRC to arrive at the finding and its significance at a Regulatory Conference, or (2) submit your position on the finding to the NRC in writing. If you request a Regulatory Conference, it should be held within 30 days of the receipt of this letter and we encourage you to submit supporting documentation at least one week prior to the conference in an effort to make the conference more efficient and effective. If a Regulatory Conference is held, it will be open for public observation and a press release will be issued to announce it. If you decide to provide a written response in lieu of the Regulatory Conference, the submission should be sent to the NRC within 30 days of the receipt of this letter.

Please contact John R. White at 610-337-5114 within 10 business days of the date of this letter to notify the NRC of your intentions. If we have not heard from you within 10 days, we will continue with our significance determination and enforcement decision; and you will be advised by separate correspondence of the results of our deliberations on this matter.

Since the NRC has not made a final determination in this matter, no Notice of Violation is being issued for this inspection finding at this time. While this matter continues under NRC review, the number and characterization of apparent violations described in the enclosed inspection report may change.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA by M.Gamberoni acting for/

A. Randolph Blough, Director
Division of Reactor Safety

Docket No. 50-271
License No. DPR-28

Enclosure: Inspection Report No. 05000271/2006011
w/Attachment: Supplemental Information

cc w/encl:

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G. J. Taylor, Chief Executive Officer, Entergy Operations
J. T. Herron, Senior Vice President and Chief Operating Officer
C. Schwarz, Vice-President, Operations Support
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J. M. DeVincentis, Manager, Licensing, Vermont Yankee Nuclear Power Station
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DATE	10/27/06	11/02/06	11/02/06	11/02/06	11/03/06

*See Previous Concurrence Page

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.: 50-271

Licensee No.: DPR-28

Report No.: 05000271/2006011

Licensee: Entergy Nuclear Operations, Inc.

Facility: Vermont Yankee Nuclear Power Station

Location: 320 Governor Hunt Road
Vernon, Vermont 05354-9766

Dates: September 6, 2006 through October 6, 2006

Inspectors: James D. Noggle, Senior Health Physicist, DRS

Approved by: John R. White, Chief
Plant Support Branch 2
Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000271/2006011; 09/06/06 - 10/06/06; Vermont Yankee Nuclear Power Station;
Radioactive Material Processing and Transportation.

This report covered a one month period of inspection by a regional senior health physics inspector. One potential White finding was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Public Radiation Safety

- Preliminary White: The inspector identified a self-revealing finding, involving a failure to properly prepare and ship a package containing radioactive material in a manner that assured, under conditions normally incident to transport, conformance with Department of Transportation (DOT) radiation level limitations specified by 49 CFR 173.441(a), i.e., 200 millirem per hour (mrem/h) on any external surface of the package. Accordingly, the finding was also considered an apparent violation of the requirements of 10 CFR 71.5 and 49 CFR 173.441(a). The finding involved an August 31, 2006 radioactive material shipment, via an exclusive-use open transport vehicle, that was determined to have 820 mrem/h on the external surface of a package upon receipt at the shipping destination. The licensee entered this performance deficiency in its corrective action program; completed a root cause evaluation; and initiated corrective measures, including various process improvements to prevent recurrence.

This finding is more than minor since it affected the Public Radiation Safety cornerstone, and involved an occurrence in the licensee's radioactive material transportation program that was contrary to DOT regulations. Preliminarily, the significance of this finding is considered as having low to moderate safety significance, since the radiation level was greater than two times the limit (400 mrem/h), but less than five times the limit (1000 mrem/h) specified by the DOT regulatory requirement. Though the surface of the package was inaccessible to the public during transport, that aspect was fortuitous and not the result of design or package preparation by the licensee; and the condition had the potential to adversely affect personnel who would normally receive the package or respond to an incident involving the package, with a reasonable expectation that the package conformed with DOT radiation limitations. This finding is documented within the licensee's corrective action system as CR-VTY-2006-02723. (Section 2PS2)

REPORT DETAILS

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety

2PS2 Radioactive Materials Processing and Shipping (7112202)

a. Inspection Scope

This inspection was focused at reviewing the circumstances surrounding an August 31, 2006, radioactive material shipment from Entergy's Vermont Yankee nuclear power plant (Windham County, Vermont) to Pennsylvania Power and Light's Susquehanna nuclear power plant (Luzerne County, Pennsylvania). The radioactive material shipment (three packages via an exclusive-use vehicle) was received at Susquehanna on September 1, 2006. Upon receipt, one of the packages, which contained contaminated equipment (i.e, an Advance Crusher/Shearer), was found to have radiation levels on the external surface (underside) in excess of the Department of Transportation's radiation limit for external surface of packages shipped by exclusive use vehicles, as specified in 49 CFR 173.441(a). Specifically, 49 CFR 173.441(a) limits the radiation level on package surfaces to 200 millirem per hour (200 mrem/h). When received at Susquehanna, the radiation level on the surface of one of the packages was measured as 820 mrem/h.

On September 6-7, 2006, the inspector witnessed the as-received condition of the Vermont Yankee shipment on the refueling floor at Susquehanna. The inspector observed the conduct of radiological surveys of the package conducted by Vermont Yankee and Susquehanna radiation protection personnel, and the radiological controls implemented to open and examine the package contents (i.e., Advanced Crusher/Shearer equipment). The inspector observed the efforts by the Susquehanna and Vermont Yankee personnel to identify the source of the excessive radiation levels on the package. In addition, the inspector reviewed shipping documentation, including all receipt surveys conducted by Susquehanna personnel.

On October 2-6, 2006, the inspector examined the radioactive material shipping process at the Vermont Yankee nuclear power plant, including review of Vermont Yankee's corrective action documentation and associated root cause analysis. The inspector also observed the conduct of Vermont Yankee's corrective action review board meeting that was convened to review and approve the root cause analysis. In addition, the inspector reviewed the conduct of activities associated with a radioactive material shipment in order to ascertain the effectiveness of the licensee's corrective actions that were instituted in response to this occurrence.

The above inspection activities were conducted to verify that the licensee's radioactive material processing and transportation programs complied with the requirements of 10 CFR 20, 61, and 71; and Department of Transportation (DOT) regulations 49 CFR 170-189.

b. Findings

Introduction

The inspector identified a self-revealing finding involving Entergy's (Vermont Yankee) failure to properly prepare and ship a package containing radioactive material in a manner that assured, under conditions normally incident to transport, conformance with Department of Transportation (DOT) radiation level limitations specified by 49 CFR 173.441(a), i.e., 200 millirem per hour (mrem/h) on any external surface of the package. When shipped from Vermont Yankee on August 31, 2006, the licensee's radiological surveys indicated that the package conformed with the DOT regulatory requirements. However, when the shipment arrived at Susquehanna on September 1, 2006, the maximum radiation dose rate on the external surface of the package was measured as 820 mrem/h.

Description

On August 31, 2006, a Low Specific Activity (LSA) shipment of a control rod drive processing device, i.e., Advanced Crusher/Shearer, was packaged and shipped from Entergy's Vermont Yankee nuclear power plant (Windham County, Vermont) to Pennsylvania Power and Light's Susquehanna nuclear power plant (Luzerne County, Pennsylvania). Vermont Yankee's final shipment surveys indicated the maximum dose rate on any package surface to be 60 mrem/h. However, upon receipt at Susquehanna, the package containing the Advanced Crusher/Shearer unit was surveyed and found to have a radiation level on the underside (bottom) external surface of 820 mrem/h at contact.

On September 6-7, 2006, under controlled conditions at Susquehanna, qualified personnel opened the package containing the Advanced Crusher/Shearer unit to determine the source of the high radiation level. The equipment was found to be properly braced and secured, as required. Upon close examination, several small highly radioactive pieces of debris were identified, including a small metal sliver (<1"). Additionally, several discrete radioactive particles were detected, though not visible. Surveys indicated that the metal sliver exhibited a radiation level of about 800 mrem/h; and the discrete radioactive particles exhibited radiation levels that ranged from 400 - 1400 mrem/h. The debris was found in a location in the package that coincided with the external surface that indicated the 820 mrem/h radiation level. After removal of this radioactive material, the external surface (bottom) of the package was re-surveyed by the Susquehanna radiation protection technicians. A dose rate of about 60 mrem/h was measured at the location, which confirmed that the loose debris was the likely cause of the 820 mrem/h dose rate.

Enclosure

The detection of the highly radioactive debris indicated that Entergy's efforts to decontaminate the Advanced Crusher/Shearer unit prior to shipment were not completely successful; and that radiological surveys, conducted to assure conformance with the DOT regulatory requirements, were not sufficient for detecting highly radioactive small particles that potentially could be redistributed within the package under conditions normally incident to transport.

The inspector determined that in the configuration used to transport the package, the bottom external surface of the package was not accessible to any member of the public. However, it was noted that though redistribution of the material likely occurred as a result of conditions normally incident to transport, it was fortuitous and not the result of design or package preparation that the material was deposited in such manner that effectively limited the potential for any public exposure. Further, it was determined that the condition had the potential to adversely affect personnel who would normally receive the package or respond to an incident involving the package with the reasonable expectation that the package conformed with DOT radiation limitations.

Analysis

This matter was considered a performance deficiency, in that the failure to adequately decontaminate and survey the Advanced Crusher/Shearer equipment prior to shipment was within Entergy's ability to foresee, correct, and should have been prevented, particularly, since the phenomena of redistribution of highly radioactive particles during transport of contaminated equipment is not uncommon. However, the matter had no actual safety consequence, or impact on the NRC's ability to perform its regulatory function; and there were no willful aspects associated with this finding.

This finding was considered more than minor since it is associated with the Public Radiation Safety cornerstone attributes of the program and process relative to DOT package radiation limits; and affected the cornerstone objective to ensure adequate protection of the public from exposure to radioactive materials released into the public domain. Application of Manual Chapter 0609, Appendix D, the Public Radiation Safety Significance Determination Process is appropriate since the finding involved an occurrence in the licensee's radioactive material transportation program that was contrary to DOT regulations, i.e., 49 CFR 173.441(a). This finding was documented within the licensee's corrective action system as CR-VTY-2006-02723.

Preliminarily, the significance of this finding is considered as having low to moderate safety significance (White), since the radiation level determined on the external package surface was greater than two times the limit (400 mrem/h), but less than five times the limit (1000 mrem/h) specified by the DOT regulatory requirement. This determination is also reinforced by the determination that, though the potential for public exposure was limited during transportation, the condition had the potential to adversely affect personnel who would normally receive the package or respond to an incident involving the package with the reasonable expectation that the package conformed with DOT radiation limitations.

Enforcement

Title 10 CFR 71.5, "Transportation of licensed material," requires licensees to comply with the DOT regulations in 49 CFR parts 170 through 189 relative to the transportation of licensed material. Title 49 CFR 173.441(a) requires that each package of radioactive material offered for transportation must be designed and prepared for shipment, so that under conditions normally incident to transportation, the radiation level does not exceed 2 mSv/h (200 mrem/h) at any point on the external surface of the package, and the transport index does not exceed 10. Contrary to this requirement, on August 31, 2006, Entergy (Vermont Yankee) shipped a package containing radioactive material that was not sufficiently designed or prepared to assure that, under conditions normally incident to transportation, the radiation level on the external surface of the package would not exceed 200 mrem/h. When received at the shipping destination on September 1, 2006, the external surface of the package exhibited a radiation level of 820 mrem/h,

Following identification of this apparent violation, Entergy documented the condition and completed a root cause review (CR-VTY-2006-02723); and instituted corrective measures, including the suspension of radioactive material shipments that were susceptible to discrete radioactive particle contamination until corrective actions could be implemented. Subsequently, Entergy initiated various corrective actions including measures to effect more extensive decontamination and survey of equipment prior to shipment, application of plastic wrapping to contain and fix any remaining loose radioactive material; application of shielding to susceptible portions of shipping packages, and use of exclusive-use, closed transport vehicles. Pending determination of a final safety significance, this finding is identified as an apparent violation, (AV) 05000271/2006011-01, Radioactive Material Shipment Package Dose Rate Exceeded.

4OA6 Exit Meeting Summary

On October 6, 2006, the inspector presented the inspection results to Messrs. Bill Maguire and John Dreyfuss and members of the VY staff. The inspector asked whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

Enclosure

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Entergy Personnel

Duane Holmquist, Radwaste Radiation Protection technician
Mark VanDale, Radwaste Radiation Protection Supervisor
Kevin Pushee, Radiation Protection Manager

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000271/2006011-01	AV	Radioactive Material Shipment Package Dose Rate Exceeded (Section 2PS2)
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LIST OF DOCUMENTS REVIEWED

Condition Report CR-VTY-2006-02723 and associated Root Cause Analysis Report
EN-RW-102, Radioactive Shipping Procedure
FP-OP-012, Operation of the Advanced Crusher Shearer Procedure

LIST OF ACRONYMS

DOT	Department of Transportation
LSA	Low specific activity
SDP	Significance determination process