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January 18, 2007  
Docket No. 50-271  
BVY 07-004

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

- References: (1) Letter, Samuel J. Collins to Theodore A. Sullivan, "Final Significance Determination for a White Finding and Notice of Violation (NRC Inspection Report 05000271/2006011 – Vermont Yankee Nuclear Power Station), NVY 06-181, dated December 20, 2006
- (2) Letter, A. Randolph Blough to Theodore A. Sullivan, "Vermont Yankee Nuclear Power Station NRC Inspection Report 05000271/2006011; Preliminary White Finding," NVY 06-162, dated November 7, 2006

**Subject: Vermont Yankee Nuclear Power Station**  
**Reply to a Notice of Violation; EA-06-253**

This letter is written in response to NRC Notice of Violation, EA-06-253 that documents a violation of regulatory requirements pertaining to transportation of radioactive material provided in 10 CFR 71.5 and 49 CFR 173.441(a). We concur with your assessment that Vermont Yankee (VY) did not adequately prepare and package the Advanced Crusher-Shearer (ACS) equipment prior to shipment to Susquehanna Steam Electric Station (SSES).

On August 31, 2006, VY made an Exclusive-Use shipment of radioactive material that was not sufficiently designed or prepared to assure that under conditions normally incident to transportation that the contact radiation level on the bottom of the package would not exceed 200 mrem/hr. The vehicle and package dose rate surveys conducted prior to departure from VY were within the Department of Transportation's (DOT) limits as set forth in 49 CFR 173.441(a). When the package was removed from the vehicle at SSES, the bottom, external surface of the package exhibited a contact radiation level of 820 mrem/hr over a surface area of approximately one square inch. All other surfaces were less than the regulatory limits.

We believe that the safety significance of this condition was substantially mitigated by the fact that upon arrival at SSES the radiation level measured on the bottom of the trailer with the package installed did not exceed the radiation limits described in 49 CFR 173.441(b)(2). The subject package was secured to the trailer during transport and had a gross weight of approximately 14,000 pounds. Incidental contact with the spot in

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excess of the DOT limits could not have occurred during conditions normally incident to transportation. Personnel access to the high contact reading would have required the use of industrial lifting equipment. The packages were shipped as "Exclusive Use", as appropriate to prevent the packages from being moved by the transport company during transport to accommodate additional packages. This event did not involve an exposure or hazard to the public. Our response to the cited violation is provided below.

### **Statement of Violation**

**10 CFR 71.5, "Transportation of licensed material," requires that NRC licensees comply with the Department of Transportation (DOT) regulations in 49 CFR Parts 170 through 189, relative to the transportation of licensed material.**

**49 CFR 173.441(a) requires, in part, that each package of radioactive material offered for transport must be designed and prepared for shipment so that, under conditions normally incident to transportation, the radiation level does not exceed 200 millirem per hour at any point on the external surface of the package.**

**Contrary to the above, on August 31, 2006, the licensee offered for transportation and shipment a package (containing radioactive material) that was not designed and prepared to assure that, under conditions normally incident to transportation, the radiation level on any point on the external surface of the package would not exceed 200 millirem per hour. Specifically, the contents of the package were not effectively decontaminated and an adequate radiological survey of the package was not performed to assure that, under conditions normally incident to transport, the radiation level would not exceed 200 millirem per hour at any point on the external surface of the package. As a result, when the package was received at its shipping destination at the Susquehanna Nuclear facility in Luzerne County, Pennsylvania, on September 1, 2006, an area on the bottom of external surface of the package exhibited a radiation level of 820 millirem per hour.**

**This violation is associated with a White significance determination process finding.**

### **Response**

#### **(1) Reason for violation:**

An investigation team was formed to identify the causes for the finding. The team's report was approved and issued on September 20, 2006. The two root causes identified by our investigation team were:

- (a) Procedures were inadequate in that they did not provide sufficient direction to alert workers to the potential for discrete radioactive particle (DRP) presence after decontamination activities nor did they provide contingency measures to address such residual contamination when preparing the ACS for shipment.
- (b) Overconfidence in prior practices due to a successful history within the industry for preparing and shipping the ACS in a similar manner. This overconfidence resulted in an insufficient questioning attitude that affected

the personnel ability to consider the likelihood of DRP migration that could result in dose rates in excess of regulatory limits.

(2) Corrective steps that have been taken and the results achieved:

Following the discovery of this condition, the VY Radiation Protection staff immediately responded to SSES to provide additional radiological assistance. The root cause analysis identified additional barriers and shipping procedural enhancements that were incorporated into VY's Radioactive Material shipping program. These enhancements include, but are not limited to the following;

- (a) The procurement of a more suitable radiation detection instrument for surveying within the small confines of equipment potentially exposed to an environment containing discrete radioactive particles.
- (b) Procedure enhancements that will alert technicians to the potential of discrete particles when preparing radioactive material shipments that will include; direction for sealing inaccessible areas on equipment, additional shielding, and the use of closed transport vehicles when appropriate.
- (c) Guidance for using more conservative and robust shipping methods, in the form of requiring an evaluation of equipment such as ACS to determine what design changes can be made to enhance accessibility for decontamination and survey, and to require vendors supplying such equipment to provide a robust shielding design for equipment with the potential for DRP migration.
- (d) By formally notifying the nuclear industry of this event through the Institute for Nuclear Power Operations (INPO) Industry Operating Experience (OE) program, VY was able to solicit new ideas and stimulate conversation for this subject area within industry peer groups that VY participates. This OE report summarized the causes of this event and corrective actions implemented at VY to prevent recurrence.

(3) Corrective steps that will be taken to avoid further violations:

On October 2, 2006, the Radiation Protection Manager issued a Standing Order to establish an interim requirement to review all outbound shipments to determine the potential for DRP migration during shipment. This Standing Order also established interim requirements to evaluate decontamination processes, survey methods, and packaging/shipping processes for tools and equipment that have potentially been exposed to DRP environments. Additional requirements will be imposed upon these types of shipments as follows, but not limited to;

- wrapping of tools/materials/items in plastic or similar materials to contain DRPs,
- use of a robust shipping container with surfaces that are fortified with appropriate shielding,
- barriers to seal inaccessible areas, and

- the use of a closed transport vehicle.

(4) Date when full compliance will be achieved:

SSES identified the non-compliance with 10 CFR 71.5 and 49 CFR 173.441(a) on September 1, 2006. SSES contacted VY, and stored the sealed package in a Radiologically Controlled Area within the Protected Area pending an investigation by VY. On September 5, 2006, Entergy Radiation Protection Shipping Specialists were dispatched from VY to perform a verification survey on the package and to determine the source of the high contact dose rate. VY personnel un-sealed, opened the package and performed a detailed survey revealing the source of the dose rate that caused the package to exceed the limits of 49 CFR 173.441(a). The condition was corrected, and SSES accepted the package containing the ACS, at which time the package was no longer in transport or shipment. Also noted was that there was no shifting of equipment or temporary shielding within the package. Full compliance with these regulations was achieved on September 6, 2006.

This letter contains no regulatory commitments.

If you have any questions or require additional information, please contact Mr. David Mannai at (802) 451-3304.

I declare under penalty of perjury that the foregoing information is true and correct.

Executed on January 18, 2007.

Sincerely,

A handwritten signature in black ink, appearing to read "Ted A. Sullivan", is written over a horizontal line.

Ted A. Sullivan  
Site Vice President  
Vermont Yankee Nuclear Power Station

Cc: next page

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