

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS  
WASHINGTON, D.C. 20555

October 6, 2003

NRC INFORMATION NOTICE 2003-16: ICING CONDITIONS BETWEEN BOTTOM OF  
DRY STORAGE SYSTEM AND STORAGE PAD

Addressees:

All 10 CFR Part 72 licensees and certificate holders.

Purpose:

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to apprise addressees of an icing condition at an independent spent fuel storage installation (ISFSI) that placed the dry spent fuel storage systems into an unanalyzed condition. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to address the potential issue. However, suggestions contained in this information notice are not new NRC requirements; therefore, no specific action nor written response is required.

Description of Circumstances:

In February 2003, Maine Yankee Atomic Power Company (MYAPC) discovered that the surface area between the storage system vertical concrete casks (VCCs) and the concrete ISFSI storage pad had a significant covering of ice (approximately 80 - 95 percent of the surface). The design basis for the NAC-UMS dry spent fuel storage system used by MYAPC at the Maine Yankee ISFSI did not specifically address ice formation between the bottom of the VCC and the pad during storage operations. The icing condition created a different operating parameter than those presented in the NAC-UMS Final Safety Analysis Report (FSAR).

Discussion:

On January 7, 2003, while MYAPC was moving an empty VCC on the heavy-haul trailer from a storage area up an incline to the fuel handling building, the VCC unexpectedly slid approximately 0.6 meters (2 feet) toward the rear of the trailer. The licensee immediately stopped work and investigated the cause for the VCC sliding. During the transfer operation, the VCC was resting on an inactivated air pad and positioned approximately in the center of the heavy-haul trailer. The root cause was determined to be the presence of ice between the air pad and the bottom of the VCC. To determine the extent of this condition, MYAPC lifted six additional VCCs and examined the bearing surfaces of the VCCs and the ISFSI pad. The licensee examined a variety of VCC parameters to see if any patterns developed. The MYAPC review took into account the VCC's manufacturers, VCCs with north and south sun exposure, loaded and empty VCCs, and one empty VCC with a sheet of linoleum placed between the VCC and concrete pad.

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The licensee found that approximately 80 - 95 percent of the VCC-bearing surfaces were consistently covered with a layer of ice ranging from 1.5- to 6.4-mm (0.06- to 0.25-inches) thick. All the VCCs had a clean central surface area ranging from 0.5 to 1.4 m<sup>2</sup> (5 to 15 ft<sup>2</sup>) and all the VCCs had a considerable buildup of ice around the outer diameter.

The NAC-UMS Certificate of Compliance states that the design basis site-specific parameters and analysis that require verification by MYAPC include physical testing to demonstrate that the coefficient of friction between the VCC and the ISFSI pad surface is at least 0.5. However, the significant icing condition of the bearing surfaces of the VCCs indicated that the coefficient of friction may not be 0.5.

Conclusion:

The icing condition identified at Maine Yankee could potentially occur at other ISFSI sites using free-standing ventilated concrete cask designs (e.g., VSC-24, NAC-UMS, NAC-MPC, HI-STORM, and FuelSolutions) located in the northern regions of the country. This information notice is to inform licensees of this potential icing condition. NRC expects licensees to assess their particular ISFSIs for a similar condition and to take appropriate actions, if necessary.

This information notice requires no specific action nor written response. If you have any questions about the information in this notice, please contact the technical contact listed below or the appropriate regional office.

/RA/

E. William Brach, Director  
Spent Fuel Project Office  
Office of Nuclear Material Safety  
and Safeguards

Technical Contact: Stephen O'Connor, NMSS  
(301) 415-8561  
E-mail: [sco@nrc.gov](mailto:sco@nrc.gov)

Attachments:

1. List of Recently Issued NRC Information Notices
2. List of Recently Issued NMSS Information Notices

The licensee found that approximately 80 - 95 percent of the VCC-bearing surfaces were consistently covered with a layer of ice ranging from 1.5- to 6.4-mm (0.06- to 0.25-inches) thick. All the VCCs had a clean central surface area ranging from 0.5 to 1.4 m<sup>2</sup> (5 to 15 ft<sup>2</sup>) and all the VCCs had a considerable buildup of ice around the outer diameter.

The NAC-UMS Certificate of Compliance states that the design basis site-specific parameters and analysis that require verification by MYAPC include physical testing to demonstrate that the coefficient of friction between the VCC and the ISFSI pad surface is at least 0.5. However, the significant icing condition of the bearing surfaces of the VCCs indicated that the coefficient of friction was likely to be much less than 0.5.

Conclusion:

The icing condition identified at Maine Yankee could potentially occur at other ISFSI sites using free-standing ventilated concrete cask designs (e.g., VSC-24, NAC-UMS, NAC-MPC, HI-STORM, and FuelSolutions) located in the northern regions of the country. This information notice is to inform licensees of this potential icing condition. NRC expects licensees to assess their particular ISFSIs for a similar condition and to take appropriate actions, if necessary.

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<b>DATE:</b>	08/11/03		07/03/03		07/09/03		08/12/03		09/08/03		09/08/03	
OFC:	SFPO											
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<b>DATE:</b>	10/06/03											

\* - see previous concurrence

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