

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555

March 7, 1989

NRC INFORMATION NOTICE NO. 89-26: INSTRUMENT AIR SUPPLY TO SAFETY-RELATED EQUIPMENT

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

This information notice is being provided to alert addressees of instrument air inadequacies identified by licensees in response to Generic Letter 88-14, "Instrument Air Supply System Problems Affecting Safety-Related Equipment," dated August 8, 1988. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

During a review of the instrument air supply to safety-related equipment, as requested by Generic Letter 88-14, the Boston Edison Company, licensee for Pilgrim Nuclear Power Station, discovered two design inadequacies. These problems affect the integrity of the secondary containment and the primary containment.

On December 22, 1988, during leak rate testing of the secondary containment, the standby gas treatment system was unable to achieve the 0.25-inch water vacuum required by the technical specifications because of in-leakage of outside air past the inner door of the reactor building trucklock (RBTL). The test was being conducted with revised procedures as a result of the review requested by Generic Letter 88-14. The new procedures required the test to be conducted with the RBTL outer door open and the RBTL inner door closed, but with the inner door's inflatable seal deflated. Since the plant began operating in 1972, previous leak rate testing had been performed with the inner door seal inflated by the non-safety-related instrument air system and with the non-seismically qualified RBTL outer door closed.

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The licensee's corrective action involved installing a non-inflatable-type rubber gasket to the RBTL inner door frame, which allowed subsequent successful completion of the leak rate test.

The same problem of relying on the non-safety-related instrument air system to inflate seals on doors to maintain the integrity of the secondary containment was identified at Vermont Yankee Nuclear Power Station and Fermi Atomic Power Plant, Unit 2, on January 4, 1989, and February 8, 1989, respectively.

The second design inadequacy at the Pilgrim station was discovered on January 10, 1989. The containment isolation valves in the torus-to-reactor building vacuum breaker lines, which are redundant to the torus vacuum breakers, use instrument air pressure to maintain the valves in the closed position. Upon loss of air pressure, these valves are designed to open to allow the vacuum breakers to perform their safety function of preventing containment implosion. When the valves fail open, the isolation function of the valves is lost. At Pilgrim the design requires an adequate supply of air pressure to the vacuum breaker isolation valves for 30 days if the instrument air system fails. The licensee for Pilgrim determined by a test that the air supply provided by the safety-related accumulators would be depleted in less than 1 hour, resulting in the loss of one of the two containment isolation barriers. To correct this situation, the licensee installed additional larger qualified accumulators and a qualified air line that connects to pressurized air bottles. Portable air bottles can be connected to the air line to provide adequate air pressure if needed for the long term requirement. The licensee also instituted surveillance to ensure that acceptable accumulator air pressure will be maintained for at least 24 hours.

Similar problems involving the use of non-safety-related instrument air systems affecting the integrity of the primary containment have been discovered at Oyster Creek Nuclear Power Plant on February 8, 1989, and at Browns Ferry Nuclear Power Station, Units 1, 2, and 3, on January 31, 1989. At Oyster Creek, the licensee determined that the air accumulators to the main steam isolation valves would rapidly depressurize if the normal non-safety-related air supply was interrupted. At Browns Ferry, the instrument air system would be relied on without accumulators during a design-basis accident to provide the air pressure for the containment isolation valves in the suppression pool vacuum relief lines to maintain the valves in the closed position.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate regional office.

  
Charles E. Rossi, Director  
Division of Operational Events Assessment  
Office of Nuclear Reactor Regulation

Technical Contacts: T. Silko, AEOD  
(301) 492-9059

T. Greene, NRR  
(301) 492-1176

J. Lyash, RI  
(215) 337-5132

Attachment: List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED  
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
89-25	Unauthorized Transfer of Ownership or Control of Licensed Activities	3/7/89	All U.S. NRC source, byproduct, and special nuclear material licensees.
89-24	Nuclear Criticality Safety	3/6/89	All fuel cycle licensees and other licensees possessing more than critical mass quantities of special nuclear material.
89-23	Environmental Qualification of Litton-Veam CIR Series Electrical Connectors	3/3/89	All holders of OLs or CPs for nuclear power reactors.
89-22	Questionable Certification of Fasteners	3/3/89	All holders of OLs or CPs for nuclear power reactors.
89-21	Changes in Performance Characteristics of Molded-Case Circuit Breakers	2/27/89	All holders of OLs or CPs for nuclear power reactors.
88-73, Supplement 1	Direction-Dependent Leak Characteristics of Containment Purge Valves	2/27/89	All holders of OLs or CPs for nuclear power reactors.
89-20	Weld Failures in a Pump of Byron-Jackson Design	2/24/89	All holders of OLs or CPs for nuclear power reactors.
89-19	Health Physics Network	2/23/89	All holders of OLs or CPs for nuclear power reactors, and the following fuel facilities: Nuclear Fuel Services of Erwin, General Atomic, UNC Montville, B&W LRC Lynchburg, and B&W Lynchburg.

OL = Operating License  
CP = Construction Permit

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**\*SEE PREVIOUS CONCURRENCE**

*EAB:NRR TGreene:db 2/23/89	*EAB:NRR PBaranowsky 2/27/89	*TECH:ED  2/28/89	*RI:NRR JLyash 2/23/89	*C:EAB:NRR WDLanning 2/28/89	*PLB:DEST JCragi 3/1/89
*C:OGCB:NRR CHBerlinger 2/28/89	D.DOE:NRR CERoss 3/1/89				

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\*TECH:ED  
/ 189

C:PLB:DEST  
for J. Craig  
3/1/89

\*RI:NRR  
JLyash  
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C:EAB:NRR  
WDLanning  
2/18/89

Deficiencies have also been identified in the testing procedures that demonstrate that a negative pressure can be maintained within the secondary containment. The licensee for Pilgrim was performing this test with the non-seismically qualified outer RBTL door closed, therefore taking credit for the door's sealing capabilities. The revised procedures requires the test to be conducted with the non-seismically qualified RBTL door open.

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*With corrections as indicated*  
*T. Greene would type for Jim W. Lyash*

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TGreene:db	PBaranowsky	<i>to Columbia</i>	JLyash	<del>LShao</del>	WDLanning
2/23/89	2/27/89	2/28/89	2/23/89	1/ /89	1 /89
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