SSINS No.: 6835
IN 85-84

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

October 30, 1985

IE INFORMATION NOTICE NO. 85-84: INADEQUATE INSERVICE TESTING OF MAIN STEAM ISOLATION VALVES

Addressees:

All nuclear power reactor facilities holding an operating license (OL) or a construction permit (CP).

Purpose:

This notice is being provided to alert recipients of a potentially significant problem concerning the possible failure of main steam isolation valves (MSIVs) to close under low steam flow conditions and the testing of these valves with non-safety-related motive power in place. It is expected that recipients will review the information for applicability to their facilities and consider actions, if appropriate, to preclude a similar problem occurring at their facilities. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Past Related Correspondence

Information Notice 85-21, "Main Steam Isolation Valve Closure Logic", March 18, 1985.

Description of Circumstances:

During inspections at Robinson Unit 2 in November 1984 and at Turkey Point Units 3 and 4 in February 1985, NRC inspectors noted that MSIV surveillance testing procedures did not call for securing the instrument air supply to the MSIV control system during a test. Recognizing this as contrary to the objective of operational verification of the MSIVs, the NRC cited these plants for violating 10 CFR 50.55a(g).

After reviewing the matter to determine the corrective action, Florida Power & Light Co., the licensee for Turkey Point Units 3 and 4, reported to the NRC on July 23, 1985, that a deficiency existed concerning the ability of MSIVs to close under low steam flow conditions. The safety-related air supply, stored in accumulators, was not adequate to close the valves in the event of loss of the non-safety-related instrument air system. This had not been discovered during routine testing because that testing had been performed improperly using the non-safety-related instrument air to achieve closure.

Operating air for the MSIVs is stored in accumulators mounted on the valve assembly; the non-safety-related plant instrument air system provides additional supply. During normal operation the MSIVs at Turkey Point are held open against steam flow by air pressure acting on the bottom of the actuator operating piston. When a closing signal is received, air is directed to the top of the piston while air is vented from the bottom of the piston. Closure of each MSIV is assisted by a spring that moves the piston part way, by steam flow in the steam line, and by gravity. Assuming a loss of the instrument air system, the air stored in the safety-related accumulators may not be adequate to close the MSIV without sufficient assistance from steam flow.

The Turkey Point MSIVs are required to close within 5 seconds to mitigate the consequences of a large main steam line break accident. In the event of such an accident, the high steam flow rate would assist in closing the MSIVs. However, MSIV closure also is required for other events in which large steam flow may not exist. Under these conditions and a loss of instrument air pressure, the accumulator air volume may not be sufficient to close the MSIVs.

In the regulations, 10 CFR 50.55a(g) requires that inservice testing to verify operational readiness of pumps and valves whose function is required for safety be accomplished in accordance with Section XI of the ASME Boiler and Pressure Vessel (BPV) Code. The ASME BPV Code, Section XI, 1980 edition through winter 1980 addenda, Paragraph IWV-3415, requires that fail-safe valves be tested by observing the operation of the valves upon loss of actuator power. Since the MSIVs have been identified as fail-safe valves they should have been tested with the instrument air supply, as well as electric power, removed. Proper testing would have revealed the inadequate accumulators much earlier.

Discussion:

The practice of performing inservice testing of components, which are relied on to mitigate the consequences of accidents, with sources of power not considered in the safety analyses is not in keeping with the objective of periodic testing. This objective is to test equipment to verify operational readiness under conditions that reasonably duplicate the design basis. When such testing was performed at Turkey Point, it was shown that with low or no steam flow, MSIV closure could only be assured with instrument air powering the actuator.

Continued operation at Turkey Point has been justified by the availability of two instrument air systems as backups and by procedures that require plant shutdown if the instrument air supply is lost. In addition, design modifications are being implemented on an expedited basis that will ensure MSIV closure in 5 seconds without steam flow assistance or non-safety-related instrument air power. These modifications also will resolve the testing deficiency noted above.

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

Edward L. Jordan, Director
Division of Emergency Preparedness
and Engineering Response
Office of Inspection and Enforcement

Technical Contact: Vern Hodge, IE
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Attachment: List of Recently Issued IE Information Notices

Attachment 1
IN 85-84
October 30, 1985

LIST OF RECENTLY ISSUED IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
85-83	Potential Failures Of General Electric PK-2 Test Blocks	10/30/85	All power reactor facilities holding an OL or CP
85-82	Diesel Generator Differential Protection Relay Not Seismically Qualified	10/18/85	All power reactor facilities holding an OL or CP
85-81	Problems Resulting In Erroneously High Reading With Panasonic 800 Series Thermoluminescent Dosimeters	10/17/85	All power reactor facilities holding an OL or CP and certain material and fuel cycle licensees
85-80	Timely Declaration Of An Emergency Class Implementation Of An Emergency Plan, And Emergency Notifications	10/15/85	All power reactor facilities holding an OL or CP
85-17 Sup. 1	Possible Sticking Of ASCO Solenoid Valves	10/1/85	All power reactor facilities holding an OL or CP
85-79	Inadequate Communications Between Maintenance, Operations, And Security Personnel	9/30/85	All power reactor facilities holding an OL or CP; research and nonpower reactor facilities; fuel fabrication and processing facilities
85-78	Event Notification	9/23/85	All power reactor facilities holding an OL or CP
85-77	Possible Loss Of Emergency Notification System Due To Loss Of AC Power	9/20/85	All power reactor facilities holding an OL or CP

OL = Operating License
CP = Construction Permit