

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

March 18, 1985

IE INFORMATION NOTICE NO. 85-21: MAIN STEAM ISOLATION VALVE CLOSURE LOGIC

Addressees:

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

Purpose:

This information notice is provided as a notification of a potentially significant problem pertaining to logic for closure of main steam isolation valves (MSIVs). It is expected that recipients will review the information for applicability to their facilities and consider actions, if appropriate, to preclude a similar problem from 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.

Description of Circumstances:

In early 1985 the licensee for Robinson 2 discovered and reported a logic fault with respect to MSIV closure. The MSIVs at Robinson are operated by air pressure admitted to the top or bottom area of a piston controlling the MSIV clapper (see Figure 1). The air pressure is controlled by two parallel "closing" solenoid valves on the top of the piston and two parallel "opening" solenoid valves on the bottom of the piston. For each MSIV, a closure signal from either of the redundant ESF logic trains (A or B) should be able to pressurize the top of the piston and to depressurize the bottom of the piston to provide positive and rapid closure of the MSIV.


At Robinson, which is a three loop plant, the "B" and "C" MSIVs had both opening solenoid valves controlled by the B train. In the event of a single failure of the B logic train, it is not clear what the response of the B and C MSIVs would be. While one closing solenoid valve would open to admit air pressure to the top of the piston, both the opening solenoid valves would remain in position to pressurize the bottom of the piston. The test solenoid valve connected to the space above the piston would remain in position to continue slowly venting the top of the piston through an orifice. The resulting difference in pressure above and below the piston is judged to be nearly zero. The only closing force remaining would be provided by the spring, which is designed to move the clapper only partly closed for testing purposes. Although steam flow may close the MSIV under accident conditions, this is not how the valves were designed or qualified to close and rapidly terminate the blowdown.

The licensee is correcting this situation by modifying the control circuitry to ensure that either a Train A or a Train B closure signal will cause positive closure of all three MSIVs.

Discussion:

In the event of a steamline break accident, rapid closure of the MSIVs protects against positive reactivity excursions from rapid cooling and against loss of heat sink. At most, the design basis contemplates that one MSIV might fail to close due to failure of a single active component. In this instance, two MSIVs might have failed to close due to a single failure of the B closure signal. Licensees may wish to review their MSIV control logic in the light of this discovery.

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 NRC regional office or this office.


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

Technical Contact: C. V. Hodge, IE
301-492-7275

Attachments:

1. Figure 1
2. List of Recently Issued IE Information Notices

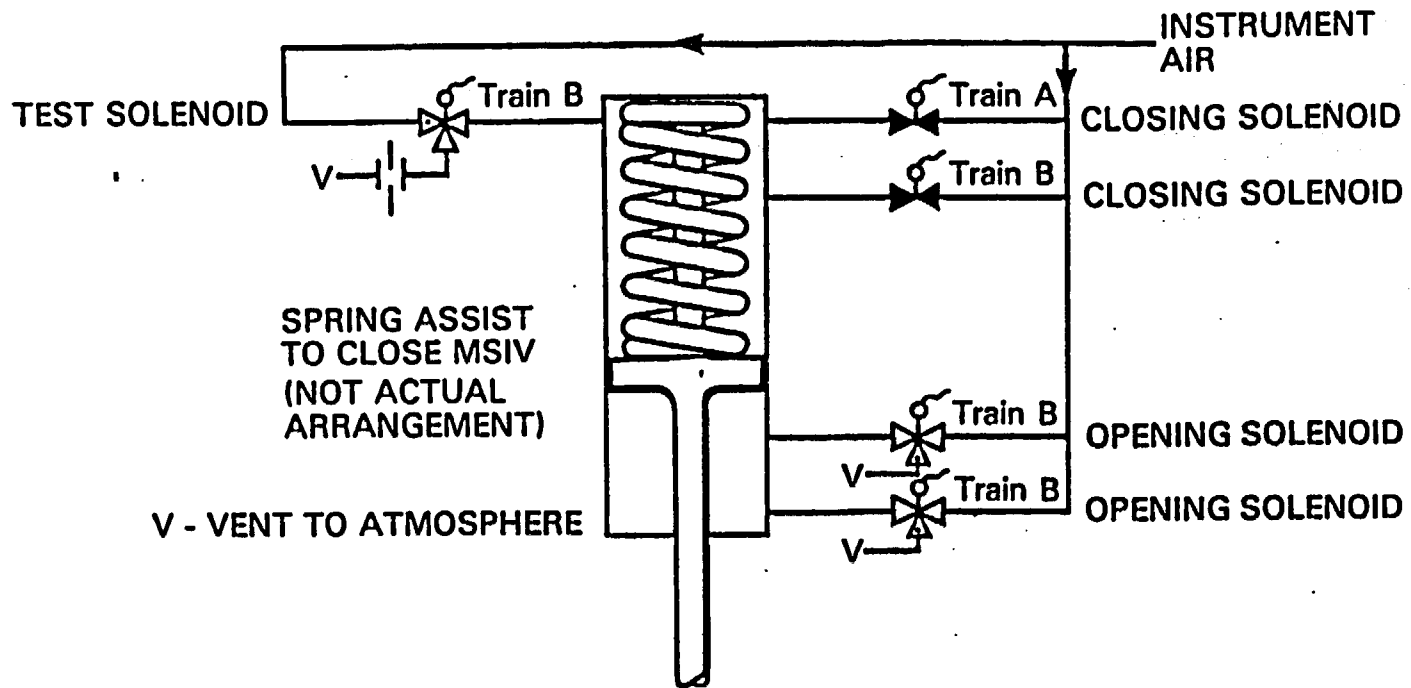


Figure 1 Schematic representation for the closure logic before modification for B or C MSIV

LIST OF RECENTLY ISSUED
 IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
85-20	Motor-Operated Valve Failures Due To Hammering Effect	3/12/85	All power reactor facilities holding an OL or CP
85-19	Alleged Falsification Of Certifications And Alteration Of Markings On Piping, Valves And Fittings	3/11/85	All power reactor facilities holding an OL or CP
85-10 Sup. 1	Posstensioned Containment Tendon Anchor Head Failure	3/8/85	All power reactor facilities holding an OL or CP
84-18	Failures Of Undervoltage Output Circuit Boards In The Westinghouse-Designed Solid State Protection System	3/7/85	All Westinghouse PWR facilities holding an OL or CP
83-70 Sup. 1	Vibration-Induced Valve Failures	3/4/85	All power reactor facilities holding an OL or CP
85-17	Possible Sticking Of ASCO Solenoid Valves	3/1/85	All power reactor facilities holding an OL or CP
85-16	Time/Current Trip Curve Discrepancy Of ITE/Siemens-Allis Molded Case Circuit Breaker	2/27/85	All power reactor facilities holding an OL or CP
85-15	Nonconforming Structural Steel For Safety-Related Use	2/22/85	All power reactor facilities holding an OL or CP
85-14	Failure Of A Heavy Control Rod (B4C) Drive Assembly To Insert On A Trip Signal	2/22/85	All power reactor facilities holding an OL or CP
85-13	Consequences Of Using Soluble Dams	2/21/85	All BWR and PWR facilities holding an OL or CP

OL = Operating License
 CP = Construction Permit