

October 18, 1995

Mr. John R. Shank
Automatic Switch Company
Hanover Road
Florham Park, NJ 07932

SUBJECT: REQUEST FOR A TECHNICAL REVIEW OF A DRAFT INFORMATION NOTICE REGARDING FAILURES OF MAIN STEAM ISOLATION VALVES CAUSED BY STICKING SOLENOID PILOT VALVES

Mr. Shank:

The U.S. Nuclear Regulatory Commission (NRC) is planning to issue an information notice discussing a problem reported by the licensee for Lasalle County Station (Docket # 05000373 and 05000374) regarding failures of some MSIVs because of foreign material contamination in the model NP8323 solenoid pilot valves. We ask that you review the enclosed draft of that information notice to ensure the technical information is accurate. Your cooperation in this matter is appreciated. Please return any comments you may have as soon as possible. A copy of this request and your response will be placed in the Public Document Room for review by the public. Your response should be mailed to:

U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
ATTN: David Skeen, NRR/PECB
MAIL STOP: 0-11A1

Please address any questions you may have on this matter to David Skeen of my staff. Mr. Skeen may be reached by phone (301) 415-1174. If no comments are received by close of business on October 27, 1995, we will assume the technical information in the notice is correct.

[Original signed by]
Alfred E. Chaffee, Chief
Events Assessment and
Generic Communications Branch
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Enclosure: Draft Information Notice

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

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PILOT VALVES

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The U.S. Nuclear Regulatory Commission (NRC) is planning to issue an information notice discussing a problem reported by the licensee for LaSalle County Station (Docket # 05000373 and 05000374) regarding failures of some MSIVs because of foreign material contamination in the model NP8323 solenoid pilot valves. We ask that you review the enclosed draft of that information notice to ensure the technical information is accurate. Your cooperation in this matter is appreciated. Please return any comments you may have as soon as possible. A copy of this request and your response will be placed in the Public Document Room for review by the public. Your response should be mailed to:

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A handwritten signature in cursive script, appearing to read "Alfred E. Chaffee".

Alfred E. Chaffee, Chief
Events Assessment and
Generic Communications Branch
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Enclosure: Draft Information Notice

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

November xx, 1995

NRC INFORMATION NOTICE 95-XX: STICKING SOLENOID PILOT VALVES CAUSE MSIV FAILURES

Addressees

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

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to alert addressees to a potential problem involving the failure of main steam isolation valves (MSIVs) to close due to sticking solenoid pilot valves. 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 are not NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances

On February 18-19, 1995, while Commonwealth Edison Company's (ComEd) LaSalle County Station (LaSalle), Unit 2, was entering into a refueling outage, the control room was unable to close two outboard main steam isolation valves (MSIVs). The MSIVs at LaSalle use Ralph A. Hiller electrically operated pneumatic-hydraulic actuators. The actuator has a pneumatic control assembly which was designed to use an Automatic Switch Company (ASCO) Model NP8323 solenoid operated valve (SOV) for the pilot valve to control the opening and closing of the MSIVs. The ASCO NP8323 SOV is a dual coil, 3-way solenoid valve which is commonly used in both foreign and domestic MSIV applications. The testing interval for the MSIVs that failed had been extended to 118 days from the previously normal 92 days.

On June 11, 1995, LaSalle Unit 1 had a similar failure in that one of the outboard MSIVs failed its 30 day surveillance test. Two internal parts of the SOV (core and plugnut) stuck together for approximately 15 seconds.

Discussion

ComEd initiated an investigation and determined that the ASCO solenoid valves had failed to operate because two internal pieces had stuck together. The root cause of the two pieces (core and plugnut) sticking appeared to be the presence of a lubricant (Nyogel 775A) and a thread sealant (Loctite PST 550 or Neolube 100) which had formed an adhesive film between the core and plugnut (NRC Inspection Reports 50-373/95003,4,5,9 and 50-374/95003,4,5,9 [Lasalle], 99900369/95-01 [ASCO]). Neither ComEd, ASCO, General Electric, nor the NRC inspectors were able to conclusively determine how the lubricant or thread

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sealant got on the core and plugnut. The thread sealant only cures in anaerobic conditions. If the thread sealant was improperly installed on any of the connecting pipe fittings, or not allowed to cure for 24 hours before air was blown through the components, some of the uncured thread sealant could migrate through the system. Additionally, based on NRC observations of ASCO's assembly techniques and discussions with ASCO personnel, it was concluded that ASCO's NP8323 assembly and testing methods could have allowed excessive inadvertently applied lubricant (Nyogel 775A) to be transferred to the core and/or plugnut during fabrication or operational testing activities.

While the thread sealant (Loctite PST 550 or Neolube 100) is considered to be a major contributor to the sticking, all three of the in-service ASCO valves that failed also had a lubricant (Nyogel 775A) present at the core and plugnut interface.

Long term corrective measures taken by LaSalle included better control of the use of thread sealant and the replacement of ASCO NP8323 solenoid valves with valves made by a different manufacturer (Valcor). Four of the eight Unit 2 MSIV solenoid valves were replaced with the new valves. The remaining four MSIV solenoid valves had the same model ASCO valves reinstalled. Prior to installation, LaSalle returned the valves to ASCO for inspection and cleaning, and some lubricant was found on one of the returned valves. To ensure only clean valves would be used, new valves were assembled, without using internal lubricants, and returned to LaSalle.

After the June 11, 1995 event, ComEd did not have enough ASCO valves for the Unit 1 replacement and obtained four additional valves from an east coast utility. One of the valves from the other utility was found to have a material that appeared (and was subsequently analyzed) to be Nyogel 775A on the surface of the core. This utility had 45 valves left in stock. Other utilities also had a supply of the valves.

Related Generic Communications

Problems with lubricants or thread sealants contaminating solenoid valve internals are not new. The staff issued Generic Letter 91-15, "Operating Experience Feedback Report, Solenoid-Operated Valve Problems at U.S. Reactors," to distribute NUREG-1275, Volume 6, to the industry. This document provided the staff's analysis of recent U.S. light water reactor experience (primarily 1984-1989) with SOVs. Appendix D of NUREG-1275, Volume 6, listed NRC generic communications on solenoid-operated valves. Five of the information notices on the list discuss solenoids sticking because of contamination of valve internals from licensee maintenance activity or manufacturer assembly.

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This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact one of the technical contacts listed below or the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.

Dennis M. Crutchfield, Director
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Technical contacts: Edward R. Schweibinz, Region III
(708) 829-9712

David L. Skeen, NRR
(301) 415-1174