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SSINS No.: 6835  
IN 83-39

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

June 17, 1983

IE INFORMATION NOTICE NO. 83-39: FAILURE OF SAFETY/RELIEF VALVES TO OPEN AT  
BWR - INTERIM REPORT

Addressees:

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

Purpose:

This information notice is provided as a supplement and update to Information Notice No. 82-41. An update is provided on testing results, meetings, and events involving Target-Rock two-stage safety/relief valves (SRVs). No specific action or response is required.

Description of Circumstances:

Georgia Power Co. (GPC) has been joined by five additional licensees in the formation of an owners' group to fund the General Electric (GE) test program, mentioned in IN 82-41, to find the cause of the high setpoint drift problem with SRVs. The SRVs are specified to open within  $\pm 1\%$  of their setpoint. Valves that did not open at 103% of the setpoint were selected for additional testing to determine the cause of the failure to actuate.

At the February 10, 1983 meeting with the owners' group, GE, and Target Rock, a report was given on the results of testing accomplished at that time. Eleven valves had been screened: six from Millstone 1, one from Browns Ferry, and four from Hatch 1 (licensees are Northeast Nuclear, TVA, and GPC, respectively). Of these, seven failed to actuate at 103% of set pressure and became candidates for additional testing. Five of the seven showed signs of labyrinth seal friction. The other two valves had indications that a stuck pilot disc/seat condition existed. One of these two valves was sent to the GE laboratory at Vallecitos, CA for metallurgical examination. Preliminary reports on this valve and two additional valves, subjected to metallurgical examination at other laboratories, indicate that the grey-black film on the discs is a corrosion product of the stellite disc. The principal constituents of the film are cobalt, chromium, and oxygen. Iron and silicon were identified in amounts consistent with the base metal of the disc. No elements that could not be found in the stellite alloy were detected in the film.

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As a result of these and other tests, it was determined that leakage is unrelated to the problem of setpoint drift. (For more information on the leakage problem, see INPO SER 98-81 and LERS 50-293/81-62 and 50-333/82-037.)

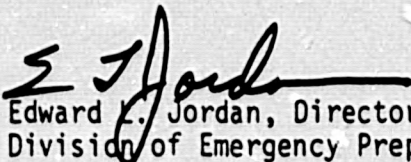
On January 17, 1983, at the J. A. FitzPatrick Nuclear Plant, the reactor scrammed from 89% power, caused by main steam isolation valve closure and recirculation pump trip. During the ensuing transient conditions the K relief valve (Target Rock two-stage; setpoint 1090 psig) did not lift. The reactor system pressure reached 1120 psig, as measured by the process computer, when the J relief valve (Target Rock two-stage; setpoint 1140 psig) lifted. Since the event resulted in a relatively rapid transient, the failure of the K SRV to open tends to contradict the hypothesis that SRV sticking occurs only during slow pressure increases.

The topworks (pilot section) of both valves were sent to Wyle Laboratories where both actuated within 103% of their setpoints. The K valve was not exercised prior to shipment to Wyle (LER 50-333/83-006). The results obtained at Wyle are not inconsistent with the event observed at the FitzPatrick plant.

Continuing tests on the disc-seat interface on non-leaking valves are being done to establish the magnitude of the disc-sticking and labyrinth seal contribution when the disc is stuck. Additional candidates for metallurgical exam are being sought and the data base on time without actuation is being expanded. The testing program is expected to conclude in the late Fall of this year.

Target Rock is investigating a modification of the valve internals which is expected to alleviate the sticking problems. The modifications will be bench tested prior to offering them to the utilities for plant operational experience. A carbon bushing to reduce the labyrinth seal friction and a redesigned pilot disc are being considered.

If you have any questions regarding 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

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Attachment:  
List of Recently Issued IE Information Notices