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SCRS No. 6835  
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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
WASHINGTON, D.C. 20555

August 18, 1986

IE INFORMATION NOTICE NO. 86-69: SPURIOUS SYSTEM ISOLATIONS CAUSED BY THE  
PANALARM MODEL 86 THERMOCOUPLE MONITOR

Addressees:

All General Electric boiling water reactor facilities holding an operating license or a construction permit.

Purpose.

This notice is to alert recipients of a potentially significant problem involving isolations of various BWR systems caused by spurious trips of the Panalarm Model 86 thermocouple monitors, and of the actions taken by a licensee to mitigate the problem. It is expected that recipients will review this 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 notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

Licensee event reports (LERs) involving a spurious actuation of an isolation system were recently compiled and evaluated in an NRC Office for Analysis and Evaluation of Operational Data Report (AEOD/E604, March 14, 1986). Of the 31 LERs studied from various facilities between January 1984 and November 1985, only 1 event involved a valid trip of the thermocouple monitor resulting from a high differential room temperature. Additional LERs related to spurious isolation have been reported since the AEOD compilation. To date the monitor trips have affected eight different plants and have caused spurious isolations of reactor core isolation cooling (RCIC), high-pressure coolant injection (HPCI), reactor water cleanup (RWCU), and main steam isolation valves.

On January 14, 1985, General Electric issued a Service Information Letter (SIL No. 416) that provided recommended corrective actions for inadvertent isolations which occurred following loss and restoration of the ac power supply. In addition to the problem addressed by the GE SIL, three recurring problems have been identified from the LERs. The predominant source of the monitor trips were caused by the operation of the monitor's "READ/SET" switch. Trips also were attributed to electrical noise and nearby maintenance activities. The spurious actuations have not always been repeatable by testing.


Discussion:

The Panalarm Model 86 thermocouple monitor has been manufactured or distributed by Ametek Panalarm Division, Scam Instrument Corporation, and Riley Panalarm Company. It consists of three major components: (1) a point module, which contains the appropriate thermocouple for each area monitored; (2) an optional meter module, which permits reading the actual temperatures monitored; and (3) a thermocouple monitor, which amplifies the output of the thermocouple. When the temperature being monitored is in an alarm condition, the monitor can be set to close relay contacts and initiate further action such as isolations or provide annunciation. The actual monitoring function is performed continuously and is independent of the operation of any controls. The indication depends on the operation of a "READ/SET" switch which causes the outputs of each point module to be indicated by the respective meter module. As stated above, the transient caused by operation of this switch has been the most prevalent cause of the monitor trips.

The Duane Arnold Energy Center, following spurious isolation events, has installed a 1-second time delay in the steam leak detection circuitry for the RWCU and is planning to install similar time delays in the HPCI and RCIC circuits. The addition of a 1-second time delay appears to have been effective at eliminating spurious isolations while allowing an actual alarm condition to initiate isolation as designed. Duane Arnold Center verified that the addition of a 1-second time delay between the monitor and isolation actuation would not cause any valve closure times to exceed the assumptions of the design basis and safety analysis of the various systems. The increase in system reliability and reduction in challenges to the systems was considered by Duane Arnold Center to result in a greater margin of safety.

GE has stated that additional information concerning increasing reliability of the thermocouple monitor will be issued in the near future via the SIL system.

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: James Stewart, IE  
(301) 492-9061

Attachment: List of Recently Issued IE Information Notices

LIST OF RECENTLY ISSUED  
IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
86-68	Stuck Control Rod	8/15/86	All BWR facilities holding an OL or CP
86-67	Portable Moisture/Density Gauges: Recent Incidents And Common Violations Of Requirements For Use, Transportation, And Storage	8/15/86	All NRC licensees authorized to possess, use, transport, and store sealed sources
86-66	Potential For Failure Of Replacement AC Coils Supplied By The Westinghouse Electric Corporation For Use In Class 1E Motor Starters And Contractors	8/15/86	All power reactor facilities holding an OL or CP
86-65	Malfunctions Of ITT Barton Model 580 Series Switches During Requalification Testing	8/14/86	All power reactor facilities holding an OL or CP
86-64	Deficiencies In Upgrade Programs For Plant Emergency Operating Procedures	8/14/86	All power reactor facilities holding an OL or CP
86-63	Loss Of Safety Injection Capability	8/6/86	All PWR facilities holding an OL or CP
86-62	Potential Problems In Westinghouse Molded Case Circuit Breakers Equipped With A Shunt Trip	7/31/86	All power reactor facilities holding an OL or CP
86-61	Failure Of Auxiliary Feed-water Manual Isolated Valve	7/28/86	All power reactor facilities holding a CP

OL = Operating License  
CP = Construction Permit