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SSINS No.: 6835
IN 86-75

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

August 21, 1986

IE INFORMATION NOTICE NO. 86-75: INCORRECT MAINTENANCE PROCEDURE ON TRAVERSING INCORE PROBE LINES

Addressees:

All nuclear power reactor facilities holding an operating license or a construction permit.

Purpose:

This notice is to inform licensees of a potential generic problem concerning maintenance procedures on traversing incore probe (TIP) systems having TIP process lines that penetrate the containment. The problem arises from an incorrect FSAR statement that the TIP lines did not have to satisfy 10 CFR 50, Appendix A, General Design Criterion (GDC) 56. It is expected that recipients will review the information for applicability to their facilities and consider actions, if appropriate, to preclude similar problems 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:

On August 9, 1985 maintenance was performed on a Duane Arnold Energy Center (DAEC) TIP isolation ball valve. The valve was not opening properly, thereby preventing the TIP from being inserted. The licensee reviewed the design and the FSAR which states in a note to Table 3.1-1: "Since the TIP system lines do not communicate freely with the containment atmosphere and since they do not comprise a portion of the reactor coolant pressure boundary [10 CFR 50, Appendix A, General Design Criteria] GDC 55 and 56 are not directly applicable to this specific class of lines." Following this review, the licensee decided that the isolation ball valve could be changed out with the plant on-line because of the closed system configuration. The indexer was positioned on a blanked off line to provide additional assurance against leakage if a TIP tube failed in the reactor vessel. The isolation ball valve was removed and replaced (see Figure 1).

GDC 55 addresses process lines that are part of the reactor coolant pressure boundary and penetrate containment. GDC 56 addresses lines that connect directly to the containment atmosphere. GDC 57 addresses lines of closed systems that penetrate containment and are neither part of the reactor coolant pressure boundary nor connected directly to the containment atmosphere.

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In January 1986, the replacement ball valve appeared to be sticking and would not fully open. While the licensee's Operations Review Committee was reviewing the design before performing maintenance, it was concluded that the FSAR basis for the previous action was not correct. Inside the primary containment, the indexing mechanism (a revolver-like mechanism used for selecting a guide tube leading into the reactor vessel) is mounted inside a housing equipped with a pressure relief valve which communicates with primary containment atmosphere. This pressure relief valve is unique in that it will open on a negative or positive pressure inside the housing. The indexing mechanism (indexer) has a slip fitting with the guide tubes leading to the reactor vessel. If a loss of coolant accident occurred and the primary containment became pressurized, the pressure relief valve would open to reduce the pressure differential across the indexer housing and the containment atmosphere would leak past the slip fitting into the TIP line. Under these conditions GDC 56 would apply rather than GDC 57. With the ball valve removed for repair or replacement, primary containment integrity would be compromised.

The licensee is conducting a review to determine the necessary revisions to the Technical Specifications and FSAR. The subsequent required maintenance on the system was conducted such that primary containment integrity was not compromised and post-maintenance testing included Type B and C leak testing.

Discussion:

NRC has concerns that incorrect interpretation of the design basis for TIP systems can lead to hazardous maintenance practices. The possibility exists for this type of maintenance error to occur on a generic basis. The FSARs for each of several additional BWR reactors with MARK I containments were reviewed. In those cases where the FSAR contained a section in Part 3 on meeting individual general design criteria of 10 CFR 50, wording is included that is essentially identical to that in the FSAR of the Duane Arnold Energy Center, as quoted above.

Plants which have committed to using ANSI/ANS 3.2-1976 (or 1982), "American National Standard Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants," have committed to the requirement of 5.2.7.1 therein which states: "Maintenance shall be scheduled and planned so as not to compromise the safety of the plant." The finding of the DAEC Operations Review Committee is consistent with the NRC licensing practice in defining these systems as open to the containment atmosphere, thus, opening the system to the atmosphere outside of containment during plant operation constitutes a violation of containment integrity and compromises the safety of the plant in violation of the above commitment.

In addition, if a leak from the reactor coolant system occurred or existed in any of the TIP tubes of an indexing mechanism, opening the external line from that mechanism for maintenance while the plant is in operation would result in a non-isolable LOCA. Primary coolant released into the work area would result in a hazardous steam environment and radiation exposure to maintenance personnel in the area. The consequences of a coolant-to-tube leak are potentially

significant unless the system is depressurized prior to performing repairs. An accident situation similar to what might occur is described in Information Notice 84-55 Seal Table Leaks at PWRs.

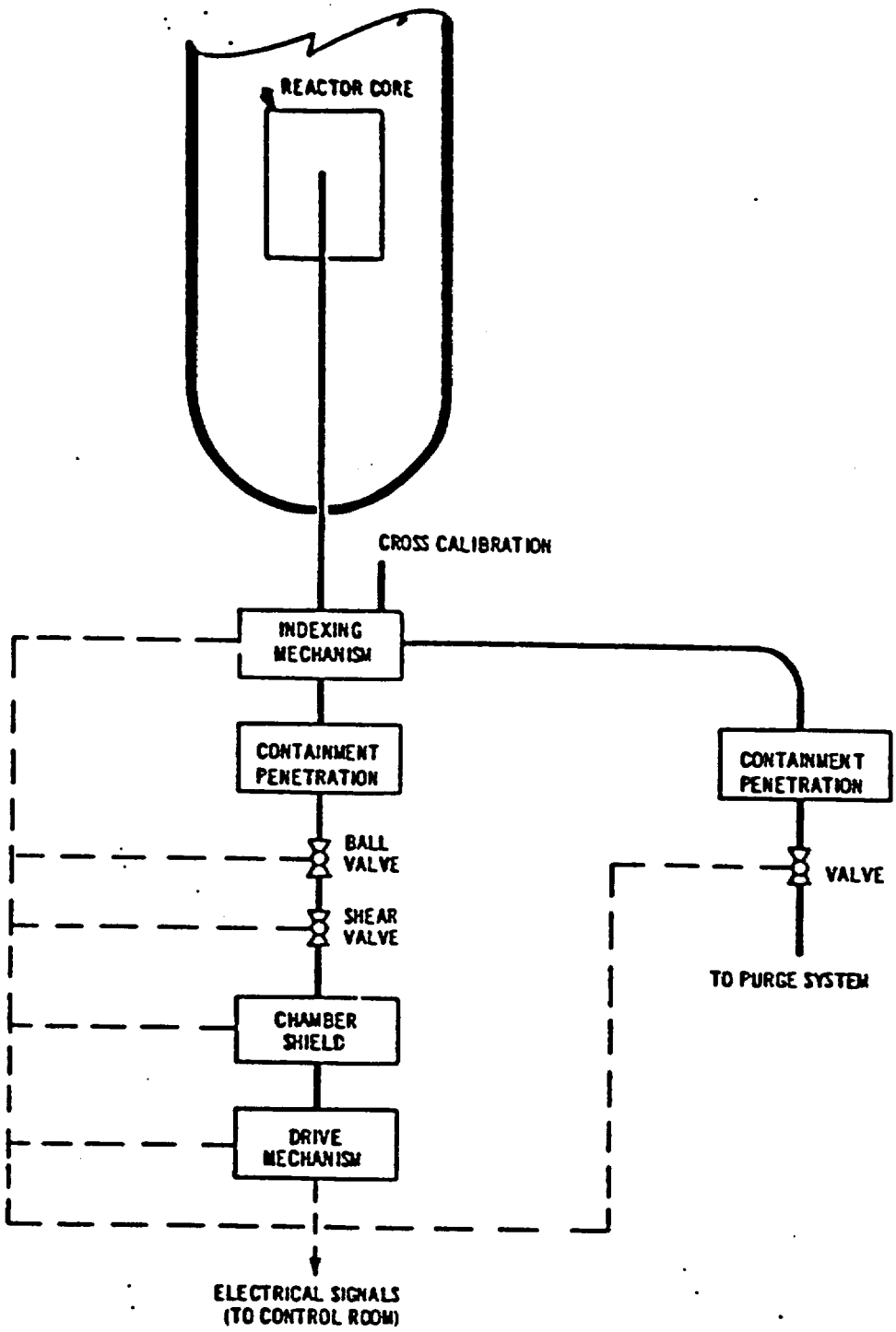
No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the Regional Administrator of the appropriate regional office or this office.

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

Technical Contact: William F. Anderson, IE
492-4819

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

Attachment 1
IN 86-75
August 21, 1986



DUANE ARNOLD ENERGY CENTER
IOWA ELECTRIC LIGHT & POWER COMPANY
FINAL SAFETY ANALYSIS REPORT

Traversing In-Core Probe
Subsystem Block Diagram

LIST OF RECENTLY ISSUED
IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
86-74	Reduction Of Reactor Coolant Inventory Because Of Misalignment Of RHR Valves	8/20/86	All BWR facilities holding an OL or CP
86-73	Recent Emergency Diesel Generator Problems	8/20/86	All power reactor facilities holding an OL or CP
86-72	Failure 17-7 PH Stainless Steel Springs In Valcor Valves Due to Hydrogen Embrittlement	8/19/86	All power reactor facilities holding an OL or CP
86-71	Recent Identified Problems With Limitorque Motor Operators	8/19/86	All power reactor facilities holding an OL or CP
86-70	Spurious System Isolation Caused By The Panalarm Model 86 Thermocouple Monitor	8/18/86	All GE BWR facilities holding an OL or CP
86-69	Scram Solenoid Pilot Valve (SSPV) Rebuild Kit Problems	8/18/86	All BWR facilities holding an OL or CP
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

OL = Operating License
CP = Construction Permit