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IN 86-42

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

June 9, 1986

IE INFORMATION NOTICE NO. 86-42: IMPROPER MAINTENANCE OF RADIATION MONITORING SYSTEMS

Addressees:

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

Purpose and Summary:

This notice is issued to alert licensees to the potential for defeating the safety function associated with radiation monitoring systems by not properly adhering to established surveillance and maintenance procedures. A recent event at a BWR, when an electrical jumper was inadvertently left in place after a planned surveillance, led to failure to maintain secondary containment integrity during irradiated fuel movement.

It is expected that recipients will review the information for applicability to their maintenance and surveillance program and consider actions, if appropriate, to preclude similar problems at their facility. However, suggestions contained in this notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Previous Related Correspondence

IE Information Notice No. 83-23, "Inoperable Containment Atmosphere Sensing Systems," April 25, 1983.

INPO Significant Event Report, 35-83, "Compromise of Secondary Containment Integrity," June 9, 1983.

IE Information Notice No. 83-52, "Radioactive Waste Gas System Events," August 9, 1983.

IE Information Notice No. 84-37, "Use of Lifted Leads and Jumpers During Maintenance or Surveillance Testing," May 10, 1984.

Description of Circumstances:

On November 18, 1985 the Cooper Nuclear Station was in a shutdown condition (reactor coolant temperature less than 212°F and vented) with acceptance testing for a plant design change in progress. When this testing failed to provide for the required Group VI isolation (various containment isolation and

Copies to: Withers, Yundt, Lentsch, Orser, Steele, E. Burton, E. Jordan, A. Holm, LIS, C. A. Olmstead, S. Hoag, S. Sautter, TNP:GOV REL F:NRC CHRONO, TNP:GOV REL F:NRC IE Information Notice 86-42
PGE OAR Action - M. H. Malmros (Due 8/12/86)
NSRD Action - M. H. Malmros

engineered safety feature (ESF) initiations), the licensee investigated and discovered that electrical jumpers were installed in the reactor building (RB) ventilation radiation monitors (VRM) auxiliary trip units. These jumpers prohibited a Group VI isolation by a high radiation signal from the RB VRM. The jumpers were immediately removed and the NRC was promptly notified as required by 10 CFR 50.72.

The licensee's subsequent investigation revealed that the electrical jumpers had been installed on November 13, 1985 by an instrument and control technician during a routine surveillance procedure to functionally test the VRM. These jumpers are used to prevent trip and equipment operations during the required functional/calibration testing. The technician had signed off the procedural step requiring jumper removal (before actually removing the electrical jumper) and then started checking control room annunciator and trip signal status. The technician then became involved in other unrelated craft work and forgot to go back and remove the jumpers.

On November 18, 1986, before discovery of the jumpers, 18 irradiated fuel bundles were loaded into a spent fuel shipping cask. Failure to properly implement the surveillance procedure for operability checks of radiation monitors rendered inoperable the automatic initiation of the standby gas treatment system (SBGTS) and automatic isolation of the reactor building upon receipt of a high radiation signal. This degraded condition lasted approximately 5 days. However, control room annunciators and instrumentation that would provide warning to operators of any high radiation problems remained operational during the 5 days. Manual-start of the SBGTS and reactor building isolation capabilities from the control room remained available during the event.

Discussion:

This event clearly demonstrates that the level of attention given to the procedural controls for the maintenance of radioactive monitoring systems providing ESF actuation can be significantly improved. While there were no actual radiological consequences of this event, the NRC took escalated enforcement actions (issued civil penalty) to emphasize the importance of correctly performing surveillance procedures on systems designed to mitigate or prevent accidents. Attachment No. 1 contains 6 summaries of related events taken from the Licensee Event Report files. Further examples of how improper maintenance practices have degraded radiation monitoring systems are provided in the listed Previous Related Correspondence section.

The Cooper Station initiated the following corrective actions to prevent recurrence:

1. All temporary modifications (e.g., electrical jumpering, fuse removal) performed by the involved technician since October 5, 1985 were independently verified.

2. Site management stressed the importance of procedural adherence--sign off the procedural step after completing the required action.

3. All surveillance procedures requiring temporary modifications to system or plant components were reviewed for deficiencies, and these procedures will be modified to provide for independent verification to ensure that temporary modifications are removed and the system/component is fully restored to operational status.

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

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Attachments:
1. Event Summaries
2. List of Recently Issued IE Information Notices

EVENT SUMMARIES

Unplanned Gaseous Release (Connecticut Yankee, PWR)
LER 85-025
Event Date: 9/19/85
Cause: Personnel Maintenance Error
Abstract: With the plant operating at 100 percent power, a main stack high radiation alarm was received during routine scheduled maintenance on a pressure actuated valve in the gaseous waste stream. The unplanned release occurred through an isolation valve inadvertently left open, allowing the on-line waste gas decay tank a release path. The maintenance tag-out procedure correctly required the isolation valve to be isolated, but the operator shut the wrong valve. The total noble gas release was approximately 20 curies (about 14 percent of technical specification limit). Licensee corrective action included clearly relabeling associated valves and discussion of the event with operation staff.

Containment Radiation Monitor Isolated (Byron 1, PWR)
LER 85-026
Event Date: 2/28/85
Cause: Improper Valve Position
Abstract: With the reactor at zero percent power, a containment radiation monitor used for required reactor coolant leakage detection was inadvertently left isolated for 72 hours from containment after maintenance on an associated valve. Abnormal in-leakage at the monitor caused normal-range readings on RM-11 console in the main control room (leakage was later repaired). Licensee corrective action included implementing administrative controls to ensure system integrity/proper restoration after completion of maintenance activities.

Liquid Radwaste Effluent Monitor Isolated (Cooper, BWR)
LER 84-008
Event Date: 6/09/84
Cause: Monitor Discharge Valve Shut
Abstract: A liquid discharge occurred without required continuous radiation monitoring because the liquid effluent radiation monitor was isolated. No discharge limits were exceeded. Two days before the event, a technician apparently shut the radiation monitor outlet valve during maintenance without permission or knowledge of operations personnel. As corrective actions, the licensee revised controlling procedures and informed all plant operators of the event.

Off-Gas Stack Monitor Inoperable (Cooper, BWR)
LER 84-006
Event Date: 4/18/84
Cause: Personnel Error
Abstract: With the reactor at 70 percent power, the off-gas stack effluent sampler was found inoperable. The sampler was drawing air from the surrounding off-gas filter building ambient atmosphere instead of sampling the plant stack effluent. The event resulted from a chemistry technician failing to follow the approved procedure for changing the inline particulate filter/iodine cartridge (routine operation). In addition to making appropriate supervisors and all chemistry technicians aware of the event, the licensee revised and clarified the governing procedure to prevent recurrence.

Liquid Radwaste Auto-Isolation Valve Inoperative (Hatch 1, BWR)
LER 82-093
Event Date: 11/07/82
Cause: Jumper Installed
Abstract: During a liquid radwaste discharge, the licensee discovered that the radiation monitor auto control (provides isolation signal upon high radiation) to the discharge isolation valve was inoperable. However, the monitor's alarm function remained operable. An electrical jumper used during corrective maintenance had not been removed after the work was completed.

Containment Atmosphere Radiation Monitors Isolated (FitzPatrick 1, BWR)
LER 81-061 (Rev 1)
Event Date: 8/21/81
Cause: Containment Isolation Valve Isolated
Abstract: The NRC resident inspector discovered that during normal 85 percent power operations the containment isolation valves for the containment atmosphere gaseous and particulate monitoring system had been shut for approximately 22 hours. With this loss of monitoring capability, the technical specifications require a reactor hot shutdown within 12 hours. The event occurred because a surveillance procedure did not direct the operator to re-open the isolation valves following the surveillance activities. As a corrective action, the licensee corrected the subject procedure and reviewed all other surveillance procedures for similar deficiencies.

Attachment 2
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LIST OF RECENTLY ISSUED IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
86-41	Evaluation Of Questionable Exposure Readings Of Licensee Personnel Dosimeters	6/9/86	All byproduct material licensees
86-32 Sup. 1	Request For Collection Of Licensee Radioactivity Measurements Attributed To The Chernobyl Nuclear Plant Accident	6/6/86	All power reactor facilities holding an OL or CP
86-40	Degraded Ability To Isolate The Reactor Coolant System From Low-Pressure Coolant Systems in BWRS	6/5/86	All power reactor facilities holding an OL or CP
86-39	Failures Of RHR Pump Motors And Pump Internals	5/20/86	All power reactor facilities holding an OL or CP
86-38	Deficient Operator Actions Following Dual Function Valve Failures	5/20/86	All power reactor facilities holding an OL or CP
86-37	Degradation Of Station Batteries	5/16/86	All power reactor facilities holding an OL or CP
86-36	Change In NRC Practice Regarding Issuance Of Confirming Letters To Principal Contractors	5/16/86	All power reactor facilities holding an OL or CP
86-35	Fire In Compressible Material At Dresden Unit 3	5/15/86	All power reactor facilities holding an OL or CP
86-34	Improper Assembly, Material Selection, And Test Of Valves And Their Actuators	5/13/86	All power reactor facilities holding an OL or CP

OL = Operating License
CP = Construction Permit