

ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.: 50-397
License No.: NPF-21
Report No.: 50-397/98-23
Licensee: Washington Public Power Supply System
Facility: Washington Nuclear Project-2
Location: Richland, Washington
Dates: November 22 through December 26, 1998
Inspectors: J. E. Spets, Resident Inspector
Reviewed by: J. Melfi, Project Engineer
G. Pick, Senior Project Engineer
Approved By: Linda J. Smith, Acting Chief
Project Branch E
Division of Reactor Projects
ATTACHMENT: Supplemental Information

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EXECUTIVE SUMMARY

Washington Nuclear Project-2 NRC Inspection Report 50-397/98-23

This information covers a 5-week period of resident inspection.

Operations

- Operators demonstrated a proper safety focus when responding to smoke issuing from a constant voltage supply transformer in the reactor building, in that appropriate attention and resources were given to address and control the event without losing sight of other operational responsibilities (Section O1.1).

Engineering

- The configuration of the low pressure core spray (LPCS) out-of-service annunciator did not conform to Final Safety Analysis Report (FSAR) Figure 7.3-9, in that out-of-service signals from Battery B1-1, Diesel Generator 1, and Service Water A were not supplied to the annunciator. This design deficiency was not identified during ongoing efforts to review the accuracy of the FSAR. The failure to ensure that the design basis, as specified in the license application, was correctly translated into drawings was identified as a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control." However, because the licensee implemented appropriate corrective actions, no response was required (Section E1.1).

Plant Support

- The licensee did not effectively ensure that the fire seal for Containment Penetration X099 was in accordance with licensee drawings and not degraded, as evidenced by the loosely packed penetration seal that issued a warm gas. Based on gas analysis, the licensee confirmed that the gas was not from containment. In addition, the initial slow response to the inspectors' concern of a warm gas issuing from a penetration was not commensurate with the potential safety significance of the finding (Section F2.1).
- The inspectors found a security officer reading a magazine, unauthorized material, while on duty in the secondary alarm station (SAS). This was a violation of License Condition 2.E for failure to meet the Commission-approved physical security plan; however, since the licensee implemented appropriate corrective actions, no response was required (Section S4.1).
- The immediate corrective actions associated with water leaking from an established contamination zone were adequate. However, the corrective actions resulting from previous incidents were weak, as evidenced by water leaking from the contamination zone (Section R1.1).

- Overall, work conditions associated with maintenance on the reactor building stack monitor flow cabinet were orderly; however, contrary to management expectation, personnel had left an out-of-date procedure section and an uncontrolled instrument user's guide posted at the cabinet (Section R2.1).



Report Details

Summary of Plant Status

At the beginning of the inspection period, the plant operated at 100 percent power. On November 29, 1998, operators reduced power to 65 percent for economic dispatch and returned to 100 percent the following day. Reactor power was adjusted several times for rod line maintenance. At the end of the inspection period, the plant was operating at 100 percent power.

I. OPERATIONS

O1 Conduct of Operations

O1.1 Response to Failed Transformer

a. Inspection Scope (71707)

The inspectors assessed operator response to a failed transformer that was emitting smoke on the 487-foot elevation of the radwaste building. The assessment included the adequacy of event classification, procedure adherence, and followup actions.

b. Observations and Findings

On December 22, 1998, the chemistry department notified operations that smoke was issuing from Transformer TR-4DIV-A120 located adjacent to the radio chemistry lab. Operators dispatched the plant fire brigade, contacted the Hanford Fire Department, and de-energized Supply Breaker PP-7EB#8, which isolated power to the faulty transformer and resulted in the cessation of smoke.

The operating crew reviewed emergency classification and reporting criteria and determined that the event did not constitute an emergency and was not reportable. The inspectors independently verified the conclusions and found them appropriate. Operators implemented Procedure 4.12.4.1, "Fire," Revision 20, in response to the identified smoke. The inspectors did a partial review of Procedure 4.12.4.1 and found that the operating crew took the actions that were identified. In addition, the inspectors noted that operators gave appropriate attention and resources to address and control the event without losing sight of other operational responsibilities. The inspectors observed that a reflash watch was appropriately stationed at the failed transformer after the event.

The inspectors determined that an ionization smoke detector located in close proximity to the failed transformer did not go into alarm. The licensee stated that the detector probably did not go into alarm because there was insufficient smoke. However, the licensee initiated a work order to verify that the detector was functional. Subsequent testing demonstrated that the detector operated properly.



c. Conclusion

Operators demonstrated a proper safety focus when responding to smoke issuing from a constant voltage supply transformer in the reactor building, in that appropriate attention and resources were given to address and control the event without losing sight of other operational responsibilities.

II. ENGINEERING

E1 Conduct of Engineering

E1.1 Plant Design

a. Inspection Scope (37551)

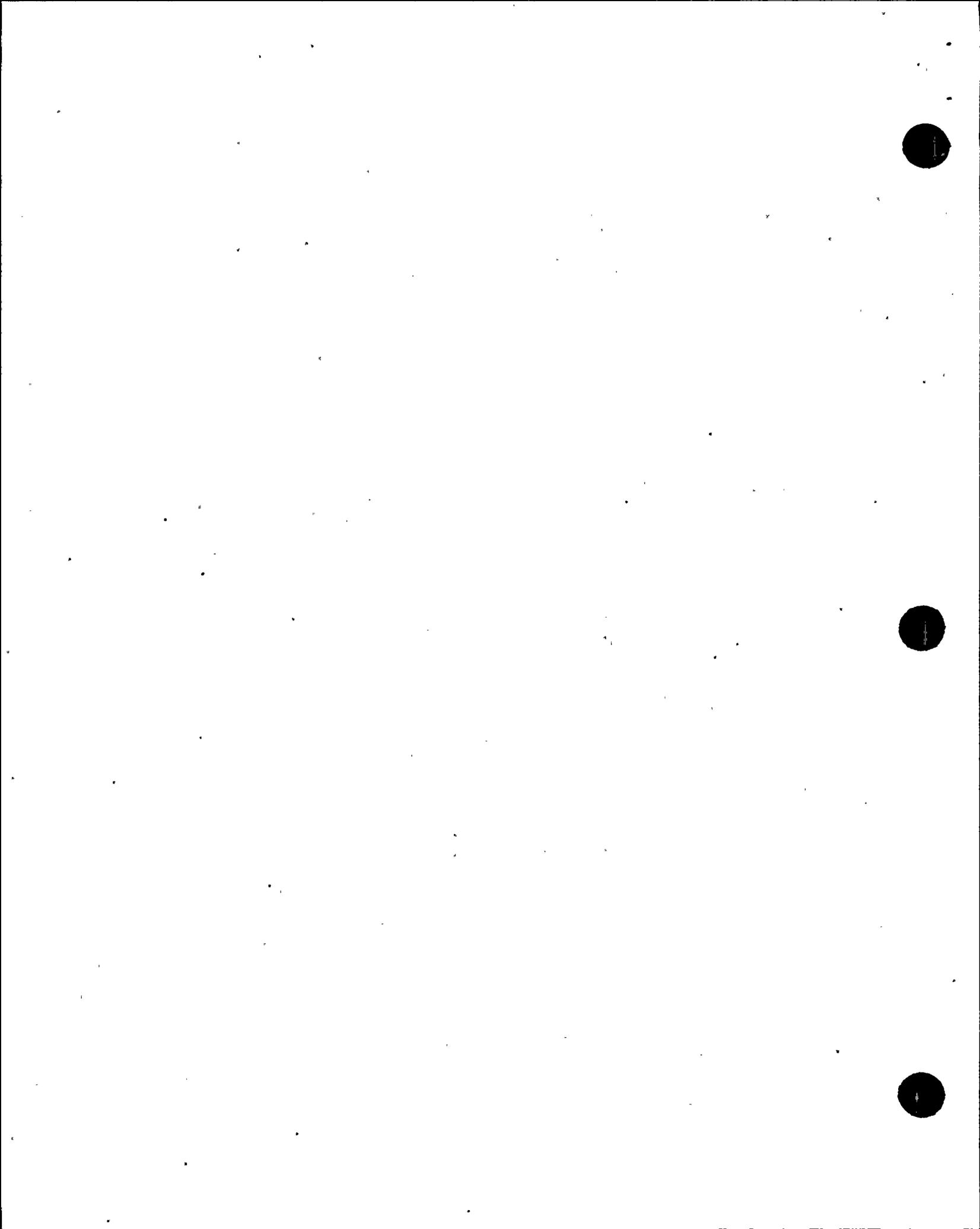
The inspectors toured the control room and observed annunciator system responses to existing plant conditions. In addition, the inspectors reviewed: (1) FSAR Figure 7.3-9, "LPCS FCD Sheet 2," Drawing 02E21-04,6,2; (2) licensee Drawing EWD-8E-011, "Electrical Wiring Diagram Low Pressure Core Spray System Bypass & Inoperable Status Indication Display ANN-ANN-LPCS," Revision 16; and (3) FSAR, Section 1.8, "Conformance to NRC Regulatory Guides," Regulatory Guide 1.47, "Bypassed and Inoperable Status Indication for Nuclear Power Plant Safety Systems," Revision 0, May 1973.

b. Observations and Findings

While touring the control room, the inspectors questioned operators as to why the reactor core isolation cooling (RCIC) system level annunciator was illuminated. The operator responded that an ongoing diesel generator surveillance caused this annunciation. The operators also identified that bypassed and inoperable status indications provided information that service water was affected by this surveillance. The inspectors questioned why the low pressure core spray system level annunciator was not illuminated. Upon questioning the operators, the inspectors determined that the annunciator response procedures reflected that, when service water was out of service, the LPCS system level annunciator would not illuminate.

The inspectors noted that FSAR Section 7.3.1.1.1.3, "Low Pressure Core Spray," stated: "Operator information displays are shown in Figure 7.3-9." Figure 7.3-9 indicated that the LPCS out-of-service annunciator was supplied by: (1) Battery B1-1 out of service, (2) Diesel Generator 1 out of service, and (3) Service Water A out of service, amongst other inputs. In addition, FSAR Section 1.8, Regulatory Guide 1.47, stated: "Auxiliary supporting system inoperability or bypass resulting in the loss of other safety-related systems will cause actuation of system level annunciators for the auxiliary supporting system as well as those safety-related systems affected."

The inspectors found that licensee Drawing EWD-8E-011 did not indicate that Battery B1-1, Diesel Generator 1, and Service Water A out-of-service signals supply the LPCS out-of-service annunciator.



The licensee initiated Problem Evaluation Request (PER) 298-2002 to evaluate the deficiency that the LPCS system level alarm did not include required inputs from service water, the diesel generator, or the battery. The licensee determined from a review of plant records that the design deficiency had existed since startup and that the original design was not consistent with the design basis specified in the license application, that is FSAR Sections 7.3.1.1.1.3 and 1.8. A written safety evaluation could not be found to support the deviation from the facility described in the FSAR. The inspectors also noted that the discrepancy was not identified through ongoing efforts to review the accuracy of the FSAR. The licensee initiated a night order describing the deficiency. In addition, from discussions with several operators, the inspectors determined that the immediate corrective actions were appropriate to ensure that operators would be aware of inoperable support components that affect the operability of the LPCS system.

The licensee also planned to: (1) evaluate existing bypassed and inoperable status indication drawings to determine if similar related deficiencies exist and (2) implement a plant modification that will alarm the LPCS A system level annunciator when problems exist with Battery B1-1, Diesel Generator 1, or Service Water A. The corrective actions are scheduled for completion on December 31 and February 28, 1999, respectively. The inspectors found the corrective actions and completion times reasonable to address the identified issue.

The failure to ensure that the design basis, as specified in the license application, was correctly translated into drawings was identified as a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control;" however, since the licensee implemented appropriate corrective actions, no response to the violation is required (50-397/98023-01).

c. Conclusion

The configuration of the LPCS out-of-service annunciator did not conform to FSAR Figure 7.3-9, in that out-of-service signals from Battery B1-1, Diesel Generator 1, and Service Water A were not supplied to the annunciator. This design deficiency was not identified through ongoing efforts to review the accuracy of the FSAR. The failure to ensure that the design basis, as specified in the license application, was correctly translated into drawings was identified as a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control." However, because the licensee implemented appropriate corrective actions, no response was required.

IV. PLANT SUPPORT

F2 Status of Fire Protection Facilities and Equipment

F2.1 Degraded Mechanical Penetration Seal

a. Inspection Scope (71750)

Inspectors performed a routine tour of the reactor building to observe material conditions. In addition, the inspectors reviewed Procedure 1.3.57, "Barrier Impairment," Revision 12; Procedure 15.4.5, "Penetration Seal Installation and Maintenance," Revision 7; Fire Protection Evaluation, Amendment 53; Calculation NE-02-84-17, "Bio-Shield Penetration

Analysis For Fire Protection," dated June 21, 1984; associated licensee letters and commitments to the NRC, and Problem Evaluation Request (PER) 298-2093.

b. Observations and Findings

During a routine tour of the reactor building, the inspectors identified that Penetration X099 filled with Kaowool barrier material looked discolored and misshapen. Upon further investigation, the inspectors noted that the Kaowool appeared loosely packed and allowed warm gas to issue from the seal. The inspectors expressed concern to the control room supervisor and shift manager that an unidentified primary containment leak might exist. Upon questioning a different shift manager the following day, the inspectors found that no turnover had occurred and no actions were taken. The inspectors considered this initial response to the concerns to be slow and not proportional to the potential safety significance of the finding. Subsequent to the second question, the licensee determined by use of an oxygen meter that the escaping gas was not void of oxygen and, therefore, was not a primary containment leak since primary containment is nitrogen-inerted.

The licensee concluded that the escaping warm gas resulted from air heating in the annular gap between the primary containment metal shell and the concrete biological shield wall. Cooler air low in the annular gap was being heated by the primary shell and was rising. The rising air expelled the air above it through penetrations located higher on the biological shield wall. The differential pressure created by the rising air resulted in additional cooler air being drawn into lower penetrations.

While not a primary containment leak, the inspectors found that this flow path did not conform to the penetration design. Licensee Drawing KW-1, Revision 0, implemented the FSAR requirements for use of Kaowool. The drawing required the use of Kaowool and stated that the Kaowool should be adequately compressed into the opening. The Kaowool barrier material in Penetration X099 was not adequately packed.

Calculation NE-02-84-17 evaluated the risk of a potential fire involving polyurethane foam in the annular gap. This calculation assumed Kaowool would act as a radiant seal and would prevent convective heat transfer, such as the hot gas movement through Penetration X099.

The licensee initiated PER 298-2039 to address the inspector's findings. The licensee determined that the seal for Penetration X099 had been inspected on September 27, 1997, as part of Basic Design Change 94-0346, "Pen Seal Upgrade Project." The licensee had found the seal to be acceptable. However, the inspection plan acceptance criteria allowed licensee personnel to visually inspect the seal from approximately 10 feet away. Further, the inspection criteria did not require the seal to be physically touched to ensure that the Kaowool was tightly packed. On November 14, 1997, the licensee revised Drawing KW-1, which was used during the implementation of the penetration inspection to provide guidance on the adequate compression of Kaowool in seals. However, Penetration X099 was never reinspected with the new criteria. Furthermore, an independent review of Penetration X099 compliance with requirements was performed on November 24, and the change in evaluation criteria was not identified. The inspector concluded that the licensee had not effectively ensured that the condition of Kaowool

seals (used as radiant energy shields and to block connective heat transfer) were in accordance with licensee drawings and not degraded, as evidenced by a loosely packed penetration seal that issued a warm gas.

After the licensee recognized the mechanism of a motive force for convective heat transfer, the licensee determined that it was even more important to ensure that Kaowool seals are properly installed. The licensee planned to: (1) rework the degraded Kaowool in Penetration Seal X099, (2) perform an inspection of the accessible primary containment biological shield wall Kaowool penetration seals that were not reworked as a result of the penetration seal project, and (3) revise Procedure 15.4.5 to provide inspection criteria for the types of seals used in the containment liner penetration. The inspectors found that the corrective actions reasonably addressed the underlying issues. This item is an inspection followup item to allow the inspector to assess the extent of condition after the licensee completes their planned inspection (50-397/98023-02).

c. Conclusion

The licensee did not effectively ensure that the fire seal for Containment Penetration X099 was in accordance with licensee drawings and not degraded, as evidenced by a loosely packed penetration seal that issued a warm gas. Based on gas analysis, the licensee confirmed that the gas was not from containment. In addition, the initial slow response to the inspectors' concern of a warm gas issuing from a penetration was not commensurate with the potential safety significance of the finding.

S4 Security and Safeguards Staff Knowledge and Performance

S4.1 Personnel Performance

a. Inspection Scope (71750)

The inspectors observed the performance of and interviewed the control room SAS on-duty security officer. In addition, the inspectors noted the condition of the SAS. The inspectors also reviewed applicable security procedures.

b. Observations and Findings

During a routine tour on December 14, 1998, the inspectors found that an on-duty SAS security officer was engaged in reading a magazine. The inspectors asked the security officer if the magazine was authorized reading material and if it was allowed at the station. The security officer indicated that the magazine was not authorized reading material and that it probably was not allowed at the station. The inspectors were concerned that the security officer would become overly distracted with the unauthorized reading material and fail to perform his monitoring responsibilities.

The inspectors had noted a similar incident on a routine tour of the Division 1 diesel generator mezzanine area. A security officer posted near the diesel generator air units during Refueling Outage R13 had been found reading a magazine and unaware of the inspectors' presence until confronted by them. The security officer put away the magazine and stated that the posting was to guard the access to the Division 2 diesel



generator room from the devitalized Division 1 diesel generator room. During the outage, the inspectors returned several times to the area and toured several other similar posts but identified no similar conditions.

The licensee took corrective actions and issued a security incident report and initiated PER 298-2049 to address the issue. The corrective actions included: (1) removing unauthorized reading material from post, (2) implementing corrective actions specific to the security officer involved, and (3) briefing other security personnel on the requirements of specific posts. The inspectors found the corrective actions reasonable to address the identified issue.

License Condition 2.E states, in part, that the licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, guard training and qualification, and safeguards contingency plans. The Commission-approved Physical Security Plan, Revision 37, indicates that the physical security plan is fully implemented by details in security procedures and contingency plans. Procedure SPIP-SEC-02, "Central and Secondary Alarm Stations," Revision 0, Section 3.2, "Secondary Alarm Station (SAS)," paragraph j. states: "Security manuals permanently posted at SAS are the only reading materials authorized for this post." In addition, it states: "NOTE: The SAS operator is allowed to read authorized material as long as the monitoring responsibilities of SAS are maintained." The failure of a security officer to read only authorized materials as specified in Procedure SPIP-SEC-02 was identified as a violation of License Condition 2.E; however, because the licensee implemented appropriate corrective actions, no response was required (50-397/98023-03).

c. Conclusion

The inspectors found a security officer reading a magazine, unauthorized material, while on duty in the SAS. This was a violation of License Condition 2.E for failure to meet the Commission-approved physical security plan; however, since the licensee implemented appropriate corrective actions, no response was required.

R1 Radiological Protection and Chemistry Controls

R1.1 Radiological Controls

a. Inspection Scope (71750)

On December 8, 1998, the inspectors toured the reactor building to verify the appropriate use of access control, posting, and labeling in the radiologically controlled area. In addition, the inspectors observed radiation protection practices for in-progress maintenance. The inspectors also reviewed several related PERs.

b. Observations and Findings

The inspectors identified that water was leaking from a contamination zone established around the RCIC barometric condenser onto the RCIC pump room floor and that the contamination zone was inconsistently marked. The licensee took prompt corrective actions by cleaning up the water, improving the barrier to prevent further water from



leaking, improving the contamination zone markings, and issuing PER 298-1979 to document the problem. The licensee determined that the water was coming from a drain box for the discharge of Pump RCIC-P-4, barometric condenser pump.

The licensee identified that PER 298-0708 had been written in June 1998, to document the same problem and indicated that corrective actions had been established to address the problem. PER 298-0708 identified that contaminated water in the area of Pump RCIC-P-4 was a recurring problem that occurred whenever the RCIC system was operated. The inspectors noted that the licensee had developed a plan to correct the deficiency, as documented in Technical Evaluation Request 97-0107. However, the interim compensatory measures, as evidenced by water leaking from an established contamination zone subsequent to RCIC system operation, were weak.

The inspectors observed personnel installing a permanent vent line on Heat Exchanger RHR-HX-1A (located in a high radiation area and contamination zone) in accordance with Work Order LYZ5. The inspectors observed that personnel were knowledgeable on area radiation levels, monitoring requirements, and accumulated dose.

c. Conclusions

The immediate corrective actions associated with water leaking from an established contamination zone were adequate. However, the corrective actions resulting from previous incidents were weak, as evidenced by water leaking from the contamination zone.

R2 Status of Radiological Protection and Chemistry Facilities and Equipment

R2.1 Material Condition

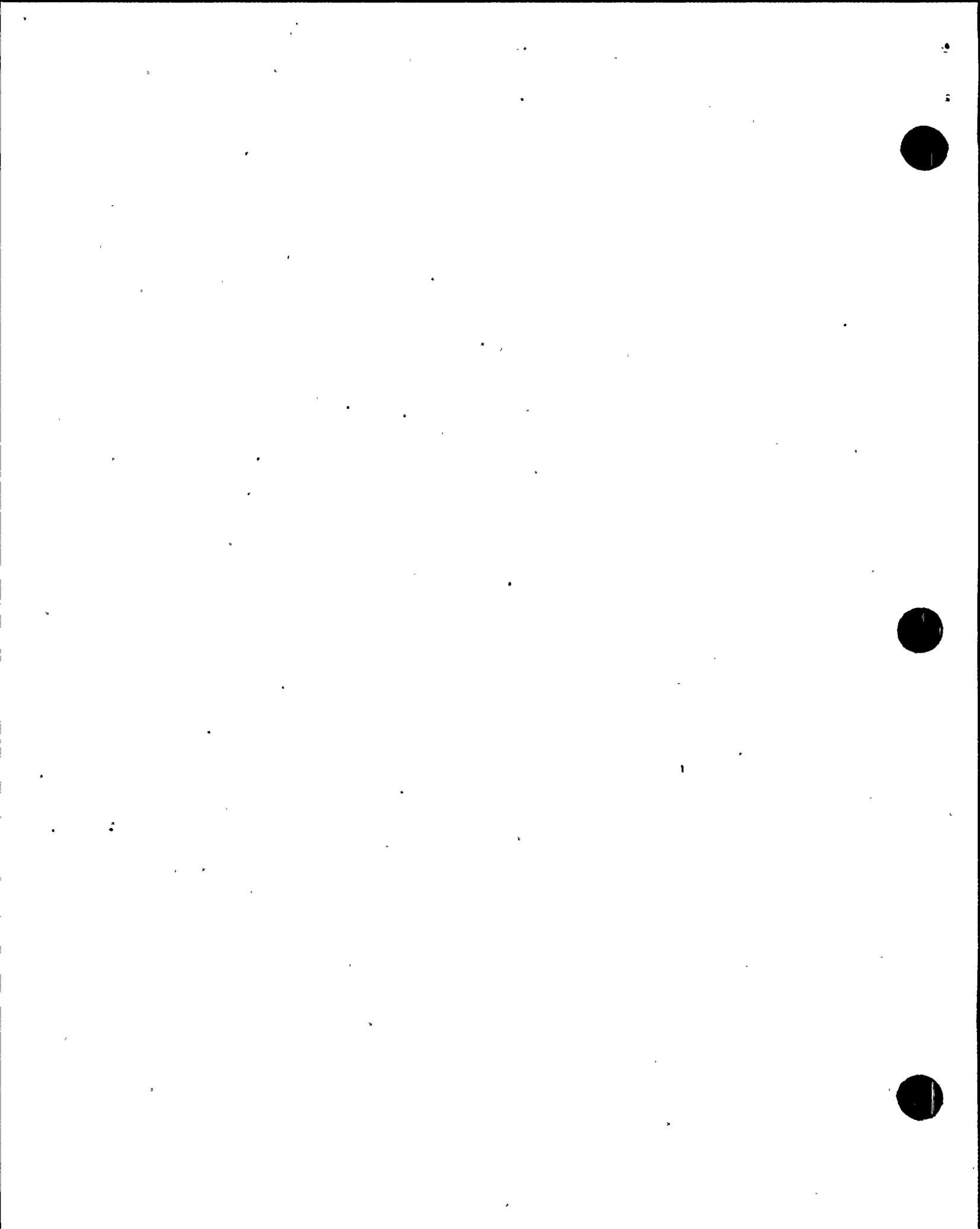
a. Inspection Scope (71750)

Inspectors on a routine tour of the reactor building observed work conditions associated with the reactor building stack monitor flow cabinet (Work Order No. NVG3) on the 606-foot elevation. In addition, the inspectors reviewed Procedures SWP-MAI-02, "Station Material Condition Inspection Program," Revision 0, and SWP-PRO-01, "Description and Use of Procedures and Instructions," Revision 2.

b. Observations and Findings

The inspectors found that the work conditions associated with the reactor building stack monitor flow cabinet met procedure requirements. However, the inspectors did note that an out-of-date procedure section and an uncontrolled instrument user's guide were posted at the cabinet. The licensee informed the inspectors that, based upon personnel interviews, the out-of-date material was most likely left at the cabinet after a previous performance of the procedure and that only the current procedure was used to perform the surveillance.

The inspectors noted that Procedure SWP-MAI-02, Revision 0, states: "A fundamental of good housekeeping is that the individual or group performing work is accountable to clean



up the work area The As Left condition of the area or equipment should be as good or better than the As Found condition." The inspectors noted that the personnel failed to implement this management expectation following work at the flow cabinet. In addition, the inspectors expressed concern that out-of-date procedures located at the point of use could result in personnel using the wrong procedure revision. The inspectors, on completion of their reactor building tour, did not identify any similar cases.

c. Conclusions

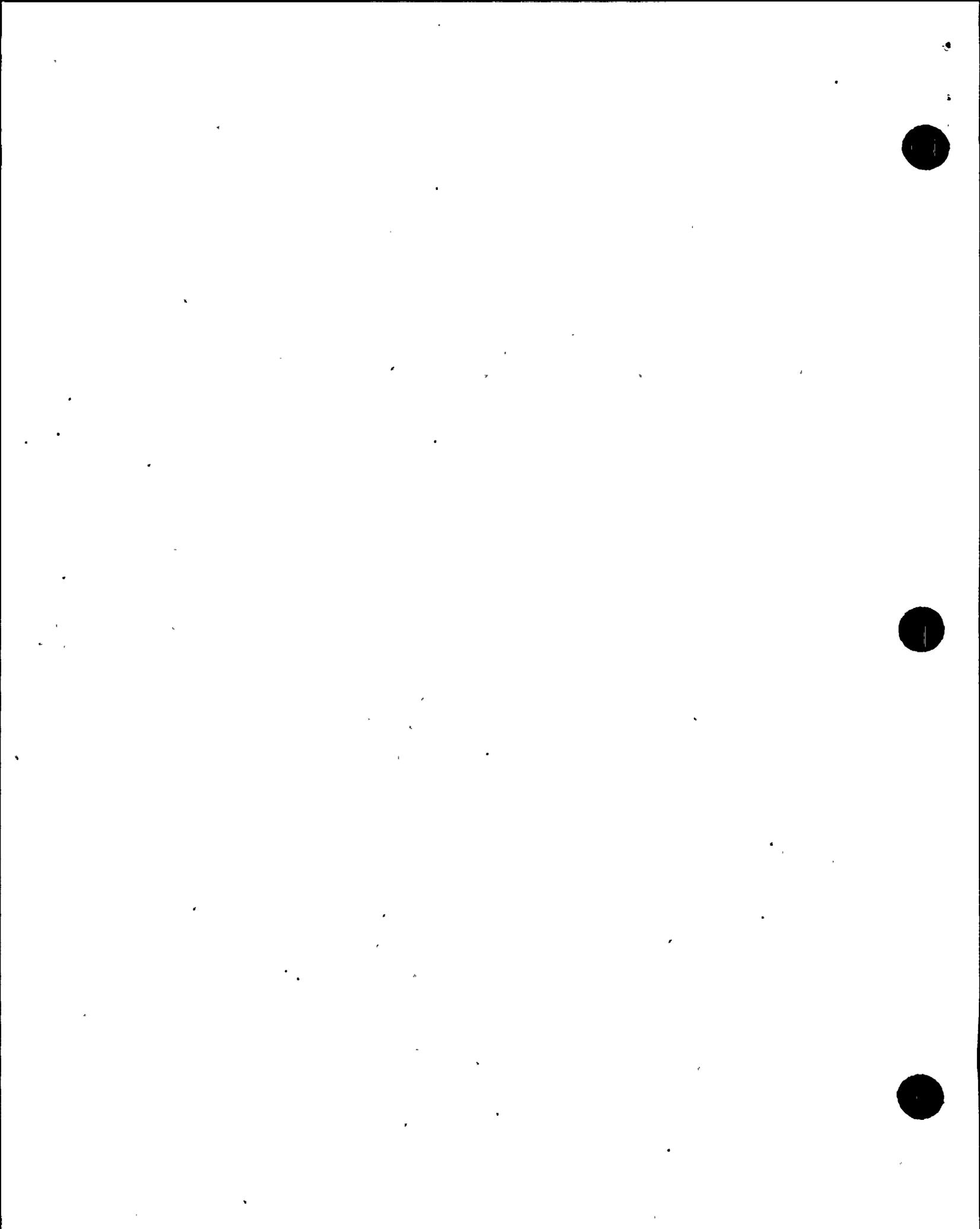
Overall, work conditions associated with maintenance on the reactor building stack monitor flow cabinet were orderly; however, contrary to management expectation, personnel had left an out-of-date procedure section and an uncontrolled instrument user's guide posted at the cabinet.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management on January 7, 1999. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.



ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

M. Ferry, Senior Engineer
J. Hanson, Chemistry Manager
W. Harper, Principal Engineer
P. Inserra, Licensing Manager
R. LaFramboise, Principal Engineer
S. Oxenford, Operations Manager
G. Smith, Vice President - Generation/Nuclear Plant General Manager
S. Wood, Engineering Systems Supervisor

INSPECTION PROCEDURES USED

IP 37551: Onsite Engineering
IP 61726: Surveillance Observations
IP 62707: Maintenance Observations
IP 71707: Plant Operations
IP 71750: Plant Support

ITEMS OPENED AND CLOSED

Opened

50-397/98023-01	VIO	LPCS out-of-service annunciator not in conformance with Final Safety Analysis Report (Section E1.1)
50-397/98023-02	IFI	Kaowool fire seal not installed per design (Section F2.1)
50-397/98023-03	VIO	Security officer reading unauthorized material at SAS (Section S4.1)

Closed

50-397/98023-01	VIO	LPCS out-of-service annunciator not in conformance with Final Safety Analysis Report (Section E1.1)
50-397/98023-03	VIO	Security officer reading unauthorized material at SAS (Section S4.1)



LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
FSAR	Final Safety Analysis Report
LPCS	low pressure core spray
NRC	U.S. Nuclear Regulatory Commission
PDR	public document room
PER	problem evaluation request
RCIC	reactor core isolation cooling
RHR	residual heat removal
SAS	secondary alarm station
VIO	violation
WNP-2	Washington Nuclear Project-2

