

ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

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Report No.: 50-397/99-06
Licensee: Washington Public Power Supply System
Facility: Washington Nuclear Project-2
Location: Richland, Washington
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Inspector(s): Larry Ricketson, P.E., Senior Radiation Specialist
Plant Support Branch
Approved By: Gail M. Good, Chief
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Division of Reactor Safety
Attachment: Supplemental Information

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EXECUTIVE SUMMARY

Washington Nuclear Project-2 NRC Inspection Report 50-397/99-06

This announced, routine inspection reviewed engineered safety feature filter ventilation system in-place filter testing; implementation of the liquid, gaseous, and particulate radioactive effluent monitoring program; effluent radiation monitor calibration; and quality assurance oversight.

Maintenance

- The licensee implemented a satisfactory testing program for the control room emergency filtration system. The testing interval and method met Technical Specification requirements (Section M3.1).

Plant Support

- The licensee maintained a good radioactive effluent management program. Radioactivity in effluent releases was low. The licensee's radioactive effluent sampling, analysis, and dose projection program met the requirements of the Offsite Dose Calculation Manual (Section R1.1).
- Effluent radiation monitors were calibrated at intervals typically used by nuclear power facilities. The radwaste and turbine building effluent radiation monitor alarm setpoints were not calculated with Offsite Dose Calculation Manual methodology in violation of Technical Specification 5.5.1. This Severity Level IV violation is being treated as a noncited violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Problem Evaluation Request 299-1207. The licensee had an opportunity to identify and correct the alarm setpoint problem in September 1995, but the corrective action program was weak and did not ensure that the problem was addressed completely (Section R2).
- Offsite Dose Calculation Manual changes did not decrease the radioactive effluent release controls. However, neither the Offsite Dose Calculation Manual nor its changes provided term definitions. The lack of defined terms contributed to inconsistent installation of alarm setpoints (Section R3).
- Quality assurance personnel conducted a good audit of the radioactive effluent monitoring program in 1998. The audit team included a technical specialist who provided performance-based findings and recommendations. The audit scope, while not completely comprehensive, provided licensee management with good insights into program performance (Section R7).

Report Details

II. Maintenance

M3 Maintenance Procedures and Documentation

M3.1 Engineered Safety Feature Filter Ventilation System Equipment Testing Results

a. Inspection Scope (84750)

The inspector reviewed the following:

- In-place filter testing records of control room emergency filtration system high efficiency particulate air filters and charcoal adsorbers
- Laboratory tests records of control room emergency filtration system charcoal adsorbers

b. Observations and Findings

In October 1998, the NRC identified problems with the licensee's tests of the standby gas treatment charcoal. Maintenance personnel did not perform testing procedure steps in the correct sequence, and the testing procedure did not provide adequate guidance to ensure correct mixing of the challenge gas. The problems were detailed in NRC Inspection Report 50-397/98-22. Since then, the licensee revised the testing method and surveillance procedures. Maintenance personnel were scheduled to be trained on the procedure revisions in June 1999. The inspector reviewed the revised procedures and identified no problems.

The licensee had conducted no tests on the standby gas treatment charcoal adsorbers since October 1998. However, tests were conducted on one control room emergency filtration subsystem. According to the system engineer, inadequate challenge gas mixing during charcoal testing was not a problem with the control room emergency filtration systems. The systems' configuration was not the same as the standby gas treatment systems' configuration and not conducive to a similar problem.

Technical Specification 5.5.7 required in-place testing of filters and adsorbers once per 24 months. The inspector confirmed, through record reviews, that the licensee tested the control room emergency filtration system (Subsystem A) in November 1997 and April 1999. The licensee's surveillance procedures for in-place testing of high efficiency particulate air filters and charcoal adsorbers followed the guidance in Regulatory Guide 1.52, Revision 2, and ASME N 510-1989.

The inspector also confirmed that laboratory testing of charcoal adsorber samples was performed in accordance with Technical Specification 5.5.7(c).

c. Conclusions

The licensee implemented a satisfactory testing program for the control room emergency filtration system. The testing interval and method met Technical Specification requirements.

IV. Plant Support

R1 Radiation Protection and Chemistry Controls

R1.1 Implementation of the Liquid, Gaseous, and Particulate Radioactive Waste Program

a. Inspection Scope (84750)

The inspector interviewed licensee personnel and reviewed the following documentation:

- 1998 annual effluent release reports
- Release permits
- Quarterly and monthly sampling results

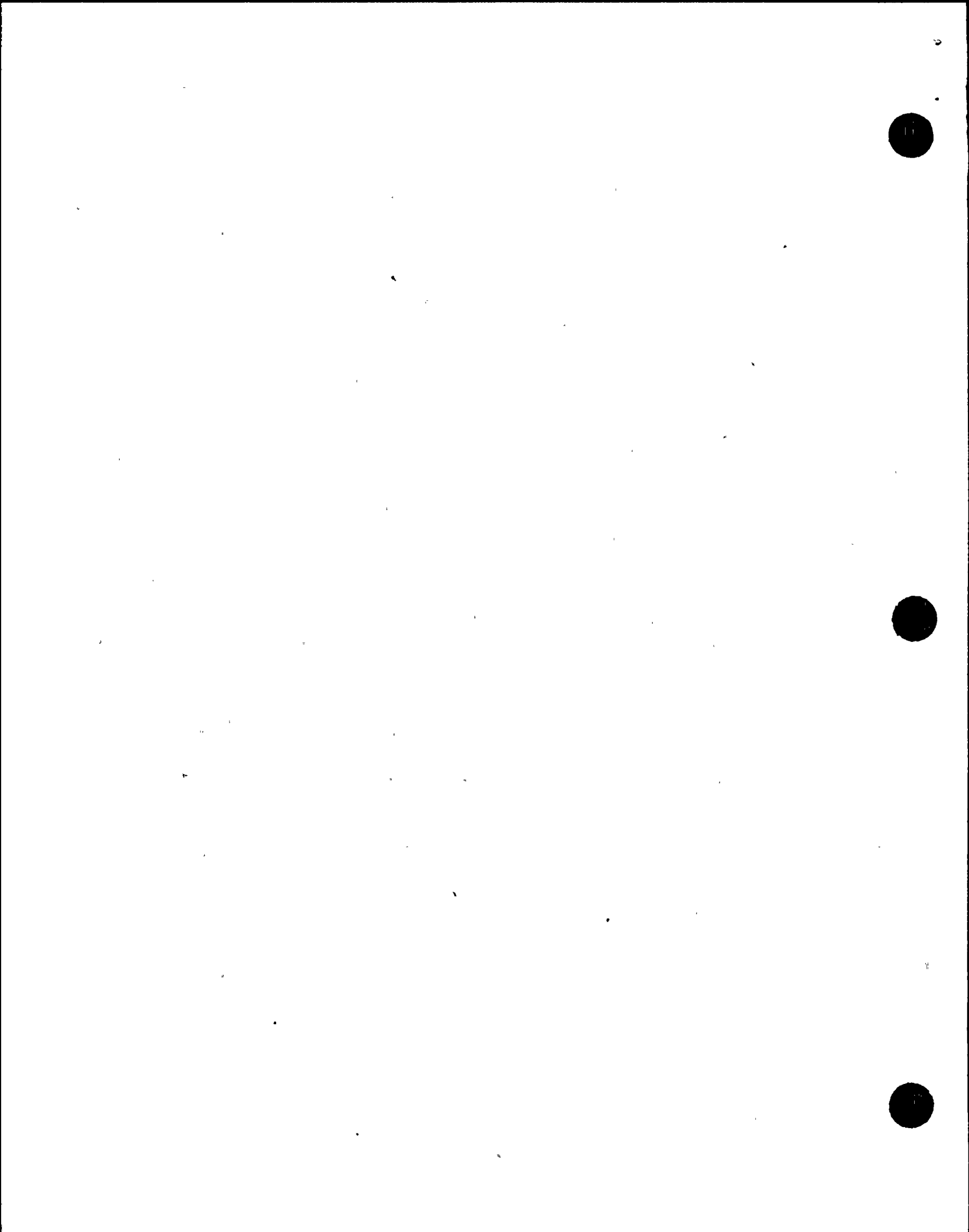
b. Observations and Findings

From the latest annual report effluent release report, the inspector determined that radioactivity released through effluents was low. Radioactivity concentrations and calculated personnel doses were well below regulatory requirements and did not exceed the commitments within the Final Safety Analysis Report. Through a review of industry information supplied by the licensee, the inspector determined gaseous radioactivity released by the licensee was low compared to similar facilities. Liquid effluent volume increased because of a flooding event that occurred June 17, 1998. This event was discussed in NRC Inspection Reports 50-397/98-13, 50-397/98-16, and 50-397/98-18.

The inspector reviewed sampling results and confirmed that sampling was performed in accordance with Tables 6.2.1.1.1-1 and 6.2.2.1.2-1 of the Offsite Dose Calculation Manual. The inspector randomly selected liquid radioactive effluent release permits, and the cognizant technical specialist successfully verified the computer-generated calculations through manual calculations. The inspector concluded that the licensee correctly calculated the cumulative dose contributions from liquid and gaseous radioactive effluents once per 31 days in accordance with the methodologies and parameters in the Offsite Dose Calculation Manual.

c. Conclusions

The licensee maintained a good radioactive effluent management program. Radioactivity in effluent releases was low. The licensee's radioactive effluent sampling, analysis, and dose projection program met the requirements of the Offsite Dose Calculation Manual.



R2 **Status of Radiation Protection and Chemistry Facilities and Equipment**

a. Inspection Scope (84750)

The inspector interviewed licensee personnel and reviewed the following items:

- Effluent radiation monitor calibrations
- Effluent radiation monitor setpoint calculations

b. Observations and Findings

Monitor Calibration

Offsite Dose Calculation Manual Tables 6.1.1.1.1-1 and 6.1.2.1.1-1 provided the calibration frequencies for liquid and gaseous effluent radiation monitors. The effluent radiation monitor channel calibration frequency was listed as "R." The inspector noted that neither the Offsite Dose Calculation Manual nor the Technical Specifications provided a definition of "R" or other letters used to denote calibration frequencies. Licensee representatives stated that the frequency notations were formerly included in the Technical Specification definition section. However, when the licensee implemented the revised Technical Specifications in March 1997, the frequency notations were not included, and they were not moved to the Offsite Dose Calculation Manual. According to licensee representatives, the previous definition of "R" was, "Once every 18 months." The inspector acknowledged that 18 months was a typical calibration frequency for effluent radiation monitors. Licensee representatives stated that the frequency notations would be included in the next revision of the Offsite Dose Calculation Manual.

The inspector reviewed calibration records for selected effluent radiation monitors and determined that calibration intervals did not exceed 18 months.

Monitor Setpoints

Technical Specification 5.5.1.a. requires that methodology from the Offsite Dose Calculation Manual be used to calculate effluent monitor alarm setpoints and trip setpoints. Offsite Dose Calculation Manual Chapters 2.5.4 and 3.6.2 establish the methods for calculating monitor setpoints for liquid and gaseous monitors, respectively.

The inspector reviewed the Instrument Master Data Sheet and recorded the alarm setpoints installed in the low ranges of the reactor building stack, the radwaste, and the turbine building effluent radiation monitors. The alarm setpoints are shown in the table below.

The Instrument Master Data Sheet listed two installed alarm setpoints for some effluent radiation monitors. Both the radwaste and turbine building effluent radiation monitors had high alarm and high-high alarm setpoints. The licensee's Offsite Dose Calculation Manual established only a single alarm setpoint. However, Procedure 12.11.5, "Radiation Monitor Setpoint Calculations," Revision 2, Section 5.18.1, discussed both the high alarm setpoint and the high-high alarm setpoint. The procedure required that

the high-high alarm setpoints on the radwaste and turbine building effluent radiation monitors be equal to or less than the Offsite Dose Calculation Manual alarm setpoints.

Monitor	Designation	Calculated Alarm Setpoint	Installed Alarm Setpoint (Master Data Sheet)
Plant Stack	PRM-RE-1A	600,000 cps	500,000 cps (single alarm)
Radwaste - low	WEA-RE-14	9000 cpm	High-High 12,000 cpm High - 6000 cpm
Turbine - low	TEA-RE-13	1700 cpm	High-High - 3350 cpm High - 1680 cpm

The inspector requested the official monitor setpoint calculation records to verify that Offsite Dose Calculation Manual methodology was used. Licensee representatives were unable to retrieve the bases for the installed alarm setpoints by the end of the inspection. Because the bases could not be retrieved, the inspector compared the installed alarm setpoints with unofficial alarm setpoint calculations performed by the licensee's technical specialist in November 1995. The inspector verified that the calculations used Offsite Dose Calculation Manual methodology.

The inspector determined that the installed high-high alarm setpoints for the radwaste and turbine building effluent radiation monitors were not supported by the technical specialist's calculations. Therefore, the installed alarm setpoints were not calculated in accordance with Offsite Dose Calculation Manual methodology. Without the original calculations, neither the reason for the setpoint differences nor the duration of the condition could be determined. The inspector identified the failure to use Offsite Dose Calculation Manual methodology to calculate effluent radiation monitor alarm setpoints as a violation of Technical Specification 5.5.1 (50-397/9906-01). This Severity Level IV violation is being treated as a noncited violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Problem Evaluation Request 299-1207.

The inspector noted that the calculated alarm setpoints for both the radwaste and turbine building effluent alarms were less than the installed high-high alarm setpoints. The inspector stated that this appeared to be a nonconservative error. Licensee representatives responded that the error was negated by the operators' response to the effluent radiation monitor high alarms. Specifically, Procedure 4.12.2.1, "Abnormal Release of Radioactive," Revision 0 (January 1984) and Revision 12 (April 1999) directed operators, upon receiving a high monitor alarm, to locate the origin of the radioactive gas and isolate the leak. High alarm setpoints were based on an increase in the background radiation levels and were less than the calculated Offsite Dose Calculation Manual setpoints. Additionally, licensee representatives stated that there had never been effluent concentrations that exceeded the high alarm setpoints. The inspector concluded that the possibility of an abnormal release was low and, should one



occur, the operators' response to high alarms would prevent radioactive releases that exceeded regulatory limits.

Through personnel interviews, the inspector determined that the licensee had an opportunity to identify and correct the alarm setpoint problem in September 1995. The cognitive technical specialist identified that there was inconsistency in the installation of effluent radiation monitor setpoints and initiated Problem Evaluation Request 295-1058. The technical specialist found that the Offsite Dose Calculation Manual alarm setpoints were installed in the high-high alarms of most effluent radiation monitors, but not all.

As a corrective action, Procedure 12.11.5 was revised, in December 1995, to require that Offsite Dose Calculation Manual alarm setpoints be assigned to the high-high alarms of radwaste and turbine building effluent radiation monitors. The technical specialist calculated radiation monitor setpoints, identified setpoint discrepancies, and initiated Instrument Setpoint Change Requests 1273 and 1274 to update the setpoint values for the radwaste and turbine building effluent radiation monitors. However, the setpoint change requests, initiated November 20, 1995, were subsequently voided by licensee personnel during the review process, and the setpoint calculations were never entered into the licensee's record management system. The technical specialist was never informed that the setpoint change requests were voided.

The inspector asked why the process failed to implement the new alarm setpoints. After reviewing the matter, licensee representatives determined that the setpoint change requests were voided because the alarm setpoints for the radwaste and turbine building effluent radiation monitors were controlled by an approved plant procedure (Procedure 12.11.5). This meant that the instrument setpoint change request process was not valid for the specific setpoints. The inspector noted that the problem evaluation request corrective action was closed when the setpoint change request was submitted, rather than when the new setpoint was implemented. As a result, the inspector concluded that the corrective action program was ineffective in this example from 1995. Licensee representatives stated that, in their opinion, the current corrective action program would require more and be more effective.

c. Conclusions

Effluent radiation monitors were calibrated at intervals typically used by nuclear power facilities. The radwaste and turbine building effluent radiation monitor alarm setpoints were not calculated with Offsite Dose Calculation Manual methodology, in violation of Technical Specification 5.5.1. This Severity Level IV violation is being treated as a noncited violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Problem Evaluation Request 299-1207. The licensee had an opportunity to identify and correct the alarm setpoint problem in September 1995, but the corrective action program was weak and did not ensure that the problem was addressed completely.

R3 Radiation Protection and Chemistry Procedures and Documentation

a. Inspection Scope (84750)

The inspector interviewed licensee personnel and reviewed Offsite Dose Calculation Manual changes. The inspector also confirmed that the licensee reviewed each Offsite Dose Calculation Manual change in accordance with 10 CFR 50.59 to ensure that the changes did not involve a change to the Technical Specifications or an unreviewed safety question.

b. Observations and Findings

The inspector determined that the Offsite Dose Calculation Manual did not have a definition section. Section R2 discussed the lack of monitor calibration frequency notations, typically included in definition sections, and the inconsistency with which calculated setpoints were installed as alarm setpoints. The latter problem occurred because of the lack of either a definition for "setpoint," or specific instructions for setpoint use. When reviewing the most recent Offsite Dose Calculation Manual changes, the inspector noted that one of the changes introduced an undefined term. Before the change, Offsite Dose Calculation Manual Section 6.2.2.6.2.a stated:

Prior to use of the purge system through the standby gas treatment system, assure that both the gas treatment system trains are operable whenever the purge system is in use.

The revised requirement stated:

When venting or purging through the 2-inch exhaust lines through the standby gas treatment system, the standby gas treatment system used for venting or purging will be functional for filtration of the primary containment effluent.

Licensee representatives acknowledged that the deleted term, "operable," was defined in the Technical Specifications, but the new term, "functional," was not defined in either the Technical Specifications or the Offsite Dose Calculation Manual. However, licensee representatives stated that the term meant:

The ability of the system or component to perform its intended service with recognition that one or more applicable Technical Specification requirements or licensing/design basis assumptions may not be satisfied.

The definition was drawn from Procedure 1.16.8, "Outage Management and Shutdown Safety," Revision 10. The inspector concluded that, while the definition may be acceptable, the procedure had no relevance in the context of Offsite Dose Calculation Manual requirements. Licensee representatives initiated Problem Evaluation Request 299-1173 to document and correct the lack of a definition of "functional."

c. Conclusions

Offsite Dose Calculation Manual changes did not decrease the radioactive effluent release controls. However, neither the Offsite Dose Calculation Manual nor its changes provided term definitions. The lack of defined terms contributed to inconsistent installation of alarm setpoints.

R7 Quality Assurance in Radiation Protection and Chemistry Activities

a. Inspection Scope (84750)

The inspector interviewed quality assurance personnel and reviewed the following:

- 1998 quality assurance audit of the radioactive effluent monitoring program
- Effluent audit checklists
- Auditor resumes

b. Observations and Findings

The audit included reviews of the radiological environmental monitoring program and the radiological effluent monitoring program. The inspector focused only on the effluent monitoring review.

The 1998 quality assurance audit of the radioactive effluent monitoring program included input from a technical specialist from another nuclear power facility. The technical specialist provided performance-based findings and recommendations for program improvement. The auditors reviewed a wide range of effluent monitoring program elements. The audit scope included reviews of radiological effluent monitoring equipment maintenance, laboratory and surveillance observations, quality control practices, effluent sampling practices, annual effluent release report contents, and procedural guidance. However, the audit did not review effluent dose calculation methodology or radiation monitor setpoint calculation methodology and installation. (Section R2 documented a violation related to radiation monitor setpoints.) The auditors identified seven findings for which problem evaluation requests were initiated, but concluded that the radioactive effluent monitoring program met regulatory requirements.

c. Conclusions

Quality assurance personnel conducted a good audit of the radioactive effluent monitoring program in 1998. The audit team included a technical specialist who provided performance-based findings and recommendations. The audit scope, while not completely comprehensive, provided licensee management with good insights into program performance.

R8 Miscellaneous Radiation Protection and Chemistry Issues

8.1 (Closed) Inspection Followup Item 50-397/9804-01: Review of effects of modification on reactor building sampler efficiency and review of modification program compliance

During the previous inspection of the radioactive effluent monitoring program, the inspector determined that the current reactor building iodine and particulate sampler configurations differed from the original. The modification resulted in the sampling lines having additional bends. At the exit meeting on March 19, 1998, the Vice President of Operations Support committed to review the effects on collection efficiency caused by the relocation of the main vent particulate and iodine samplers. The licensee documented the item in Problem Evaluation Request 298-0251.

The inspector confirmed that the licensee coached responsible individuals on the expectations related to documenting engineering judgment, reviewed the process radiation monitoring sampling systems for similar omissions, and performed new sample line plateout and deposit calculations using ANSI N13.1 methodology. No similar problems were identified.

V. Management Meetings

X1 Exit Meeting Summary

The inspector presented the inspection results to members of licensee management at an exit meeting on May 27, 1999. The licensee acknowledged the findings presented. No proprietary information was identified.



ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

A. Alexander, Effluents Technical Specialist
D. Bennett, Effluents Minimization Supervisor
R. Brownlee, Licensing Engineer
D. Coleman, Manager, Regulatory Affairs
D. Giroux, Standby Gas Treatment System Engineer
J. McDonald, Plant Production Manager
S. Oxenford, Manager, Operations
G. Smith, Vice President - Generation/Nuclear Plant General Manager
C. Zeamer, Control Room Emergency Filtration System Engineer

NRC

R. Lantz, Acting Resident Inspector

INSPECTION PROCEDURES USED

84750 Radioactive Waste Systems

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-397/9906-01 NCV Effluent radiation monitor alarm setpoint calculation error
(Section R2)

Closed

50-397/9804-01 IFI Review of effects of modification on reactor building sampler
efficiency and review of modification program compliance
(Section R8.1)

50-397/9906-01 NCV Effluent radiation monitor alarm setpoint calculation error
(Section R2)

LIST OF DOCUMENTS REVIEWED

WNP-2 Organization Chart (4/17/99)
Chemistry Department Organization Chart (4/17/99)

1998 WNP-2 Radioactive Effluent Release Report
WNP-2 Performance Indicator Report (April 1999)
Chemistry Department Monthly Report for April 1999

Quality Department Audit Report 297-073, Revision 1 (May 22, 1998)
Quality Department Audit Report 298-051 (October 28, 1998)

Problem Evaluation Request Summary Report (1/1998 - 5/1999)

Radioactive Effluent Monitoring Procedures

12.11.1A Radiological Effluent Calculations - Gaseous, Revision 2
12.11.1B Radiological Effluent Monitoring - Liquid, Revision 3
12.11.5 Radiation Monitor Setpoint Calculations, Revision 2
16.10.1 Radioactive Liquid Waste Discharge to the River, Revision 4

In-Place Filter Testing Program Procedures

MSP-WMA-B101 Control Room DIV-A Emergency Filtration System HEPA Filter Test, Revision 0
MSP-WMA-B102 Control Room DIV-B Emergency Filtration System HEPA Filter Test, Revision 0
MSP-WMA-B103 Control Room DIV-A Filtration System - Carbon Adsorber Test, Revision 0
MSP-SGT-B101 Standby Gas Treatment System Unit A HEPA Filter Test, Revision 0
MSP-SGT-B102 Standby Gas Treatment System Unit B HEPA Filter Test, Revision 0
MSP-SGT-B104 Standby Gas Treatment Filtration System - Unit B Carbon Adsorber Test, Revision 0