APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-397/95-01

License: NPF-21

Licensee: Washington Public Power Supply System
3000 George Washington Way
P.O. Box 968, MD 1023
Richland, Washington

Facility Name: Washington Nuclear Project-2

Inspection At: Richland, Washington

Inspection Conducted: January 9-12, 1995

Inspector: J. B. Nicholas, Ph.D., Senior Radiation Specialist
Facilities Inspection Programs Branch

Approved: Blaine Murray 2/1/95
Blaine Murray, Chief Date
Facilities Inspection Programs Branch

Inspection Summary

Areas Inspected: Routine, announced inspection of the liquid and gaseous radioactive waste management programs including quality assurance; radioactive liquid and gaseous effluent systems; reports of radioactive effluents; engineered-safety-feature air cleaning ventilation systems; and a review of Licensee Event Reports 397/94-012, 397/94-019, and 397/94-021.

Results:

- The radioactive waste effluent management program was being properly implemented (Section 1.1).
- The chemistry department organizational structure and staffing met requirements (Section 1.1).
- The chemistry department had experienced very low turnover of technical personnel (Section 1.1).
- Comprehensive quality assurance audit and assessment programs of the radioactive waste effluent program and Offsite Dose Calculation Manual were implemented (Section 2.1).

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- The corrective action program was implemented properly (Section 2.1).
- A thorough quality assurance audit was performed of the contractor used to perform the engineered-safety-feature (ESF) air cleaning systems' surveillance tests (Section 2.1).
- Good liquid and gaseous radioactive waste effluent programs were being properly implemented (Sections 3.1 and 4.1).
- Radioactive Effluent Release Reports were submitted in a timely manner and contained the required information (Section 5.1).
- A good program was established for testing the high efficiency particulate air (HEPA) filter and charcoal adsorption units in the (ESF) air cleaning systems (Section 6.1).

Summary of Inspection Findings:

- Licensee Event Reports 397/94-012, 397/94-019, and 397/94-021 were reviewed (Section 7).

Attachments:

- Attachment 1 - Persons Contacted and Exit Meeting
- Attachment 2 - Summation of all Liquid Effluent Releases
- Attachment 3 - Summation of all Airborne Effluent Releases
- Attachment 4 - Maximum Annual Doses from Gaseous and Liquid Effluent Releases
- Attachment 5 - Liquid Effluent Release Summary
- Attachment 6 - Gaseous Effluent Release Summary

DETAILS

1 ORGANIZATION AND MANAGEMENT CONTROLS (84750)

The inspector reviewed the organization and staffing regarding the radioactive waste effluent program to determine agreement with commitments in the Updated Safety Analysis Report and compliance with the requirements in Technical Specification 6.2.

1.1 Discussion

The inspector verified that the organizational structure of the chemistry department, which is responsible for the implementation of the radioactive waste effluent program, was as defined in the Updated Safety Analysis Report and Technical Specifications. It was noted that the chemistry department was assigned the sole responsibility for implementing the radioactive waste effluent program effective October 1993. The chemistry department organization had three functional areas each headed by a supervisor or technical specialist who reported directly to the chemistry manager. One of these functional areas was responsible for implementing the radioactive waste effluent program. The assignment of the chemistry department placed the implementation of the radioactive waste effluent program all within one department under the operations department.

Management control procedures were reviewed for the assignment of responsibilities for the management and implementation of the radioactive waste effluents program. The chemistry department was assigned the responsibility for preparing radioactive waste release permits, evaluating the radioactive waste effluent releases, calculating the radiation doses resulting from the releases to the environment, and maintaining the radioactive waste effluent release data. The inspector determined that the duties and responsibilities of the chemistry department specified in the procedures were being implemented. A group of 15 chemistry technicians staffing 6 rotational shifts within the chemistry operations functional area along with a senior radiochemist and technical specialist assigned to the radioactive waste effluents functional area were responsible for collecting and analyzing radioactive waste effluent samples, preparing the effluent release permits, and implementing the radioactive waste effluents program. The inspector interviewed several of the chemistry staff responsible for the implementation of the radioactive waste effluents program and determined that they were familiar with the requirements of the radioactive waste effluents program and maintained a high level of performance.

The inspector reviewed the staffing of the chemistry department and determined it to be adequate and in accordance with licensee commitments. There had been a very low turnover of personnel within the chemistry department since the previous NRC inspection of this area in August 1993.

1.2 Conclusions

The chemistry department organizational structure and staffing met Technical Specification requirements. The radioactive waste effluent management program was being implemented in accordance with station procedures. The chemistry department had experienced a very low turnover of personnel during the past 17 months.

2 QUALITY ASSURANCE PROGRAM (84750)

The inspector reviewed the quality assurance audit and assessment programs regarding the radioactive waste effluent program activities to determine agreement with commitments in the Updated Safety Analysis Report and compliance with the requirements in Technical Specification 6.5.2.8.

2.1 Discussion

The inspector reviewed the quality assurance audit schedules for 1993, 1994, and 1995; audit plans and checklists; and the qualifications of the quality assurance auditors who performed the audits of the radiological and non-radiological environmental and effluent monitoring programs, and Offsite Dose Calculation Manual. The review of the quality assurance audit schedules indicated that the audit of the radiological environmental monitoring and radiological effluent programs was scheduled on a 12 month frequency. The quality assurance audit of the Offsite Dose Calculation Manual was scheduled on a 24 month frequency. The audits were scheduled in compliance with Technical Specification audit frequency requirements.

Reports of quality assurance audits performed during the period January 1993 through December 1994 of the areas related to the performance of the radioactive waste effluent program were reviewed for scope, thoroughness of program evaluation, and timely followup of identified deficiencies. The audits were performed in accordance with quality assurance procedures and schedules by qualified auditors. The reviewed audits of the radiological and non-radiological environmental and effluent monitoring programs, and Offsite Dose Calculation Manual and its implementing procedures were of good quality and provided satisfactory oversight and evaluation of the licensee's performance in implementing the radioactive waste effluent program and meeting the Technical Specification and Offsite Dose Calculation Manual requirements.

The inspector reviewed Quality Assurance Audit Report 293-618, "Radiological and Non-Radiological Environmental and Effluent Monitoring," dated November 19, 1993, which was conducted by an audit team that included members with radiochemistry and radioactive waste effluent program experience. Regulatory Guide 4.15, Revision 1, "Quality Assurance for Radiological Monitoring Programs-Effluent Streams and the Environment," was used as the basis for development of the audit scope and checklists. The inspector reviewed the audit checklist and found it to be appropriate in that it addressed all aspects of the radiological liquid and gaseous effluent program. The audit reviewed the radiological liquid and gaseous effluent monitoring programs

including sampling, analyses, and radiological effluent release procedures; instrument calibration (i.e. isotopic calibration of the new reactor building elevated release point stack monitor); and procedure implementation of Regulatory Guide 4.15 and Offsite Dose Calculation Manual requirements. The audit identified two findings which were closed during the audit and eight recommendations for improvement. No deficiencies were identified with the radiological liquid and gaseous effluent monitoring programs.

The inspector reviewed Quality Assurance Audit Report 294-066, "Radiological and Non-Radiological Environmental and Effluent Monitoring Programs," dated November 18, 1994, which was conducted by an audit team that included members with radiochemistry and radioactive waste effluent program experience. The audit reviewed, in part, the radiological liquid and gaseous effluent monitoring programs and the implementation of Offsite Dose Calculation Manual requirements. The audit results indicated that the radiological and non-radiological environmental and effluent monitoring programs were properly implemented and met program and regulatory requirements. However, the audit identified six program deficiencies which were documented in Problem Evaluation Requests (the station corrective action document).

Two Problem Evaluation Requests (PER 94-0911 and PER 94-0943) were initiated to document identified problems with the timely completion of commitments associated with pre-operational testing of the reactor building stack effluent monitor. The two Problem Evaluation Requests were closed in a timely manner.

PER 94-0926 documented several identified activities required by the Offsite Dose Calculation Manual which were associated with the operation of the gaseous radwaste system, the land use census, and atmospheric dispersion factors and were not addressed in the Plant Procedure Manual. The audit noted that no procedure steps were found which would initiate or implement main plant vent release monitor setpoint changes in the event of running the Standby Offgas Treatment System in the charcoal bypass mode. The audit also noted that chemistry procedures did not contain guidance on evaluating the Land Use Census results for inclusion in the Radioactive Effluent Release Report or the Offsite Dose Calculation Manual. Atmospheric dispersion factors from the station's meteorological tower were to be evaluated annually; however, there was no procedure guidance for performing the annual evaluation of the atmospheric dispersion factors, and the audit team could not find any documentation of the annual evaluation of the atmospheric dispersion factors being performed in 1994. Responses to PER 94-0926 were currently being prepared by the chemistry department for evaluation and acceptance by the quality assurance department for closure of the Problem Evaluation Request.

PER 94-0927 documented the findings that an incorrect reporting format was used to identify the Process Control Program revisions in the 1993 Radioactive Effluent Release Report, and that the chemistry department person calculating the 31 day gaseous effluent dose was not performing the calculations properly and did not have a through understanding of the GASPAR II computer code. Responses to PER 94-0927 were currently being prepared by the chemistry department for evaluation and acceptance by the quality assurance department

for closure of the Problem Evaluation Request. The audit team's review of Offsite Dose Calculation Manual implementing procedures resulted in the issuance of three suggestions and one recommendation for program procedural improvements.

The inspector reviewed Quality Assurance Technical Assessment Report 93-006, "Sulfuric Acid Transfer To The Circulating Water Basin," dated June 30, 1993. Approximately 1000 gallons of concentrated sulfuric acid were inadvertently transferred from the acid storage tank to the neutralization tank in the makeup water treatment system in the basement of the General Services Building. Neutralization with caustic was attempted, but leakage of acid through fittings prevented completion of the neutralization with only about a third of the acid being neutralized. The acid was then pumped to the circulation water basin and neutralized with soda ash. The technical assessment presented a very through evaluation of the potentially dangerous situation.

The licensee used a contractor to perform in-place filter testing and laboratory charcoal adsorber analyses on the station's ESF air cleaning systems. The licensee used an audit of the air cleaning systems filter testing contractor performed by a Nuclear Procurement Issues Committee audit team led by the licensee during the period November 15-17, 1994, to evaluate the performance of the contractor to perform the required tests and to retain his current status on the licensee's qualified suppliers list. The inspector reviewed the audit performed on the contractor and determined that the audit was satisfactory to evaluate the contractor's abilities to perform the Technical Specification required analyses and surveillance activities. The audit identified three deficiencies which were documented in Quality Finding Reports. Responses to the Quality Finding Reports were not due from the contractor until January 20, 1995. Therefore, the responses were not available for review at the time of the inspection. The deficiencies did not directly impact the contractor's performance of the filter system testing or the charcoal testing. The inspector verified that the licensee had also performed annual evaluations of the contractor's program as required to retain its current status on the licensee's qualified suppliers list.

2.2 Conclusions

Quality assurance audits of the radioactive waste effluent program and Offsite Dose Calculation Manual were performed as required. These audits were technically comprehensive and provided good program evaluation and management oversight, identified deficiencies, and made recommendations for program improvement. The corrective action program was implemented properly. A good quality assurance technical assessment which monitored the neutralization of approximately 1000 gallons of sulfuric acid was performed. A good audit and annual evaluations of the contractor used to perform safety-related air cleaning systems' surveillance testing and analyses were performed as required to retain the contractor's current status on the licensee's qualified suppliers list.

3 LIQUID RADIOACTIVE WASTE EFFLUENTS (84750)

The inspector reviewed the liquid radioactive waste effluent program including liquid waste processing, liquid waste sampling and analyses, procedures for control and release of radioactive liquid waste effluents, and surveillance tests to determine agreement with commitments in the Updated Safety Analysis Report and compliance with the requirements in Technical Specifications 6.8.1, 6.8.4.d, and 6.14; and the Offsite Dose Calculation Manual Section 6.2.1 and Table 6.2.1.1.1-1.

3.1 Discussion

The inspector reviewed the licensee's implementation of the liquid radioactive waste effluent program and Offsite Dose Calculation Manual to ensure compliance with sampling and analyses requirements, analyses sensitivities, analytical results, surveillance tests, radioactive waste liquid effluent control procedures, and offsite dose results from radioactive liquid effluents.

The inspector reviewed selected procedures governing the release of liquid radioactive waste effluents. These procedures provided for the following: recirculation and sampling of the radioactive liquid waste; radionuclide analyses of the radioactive liquid waste prior to release; calculation of effluent release rate, effluent radiation monitor setpoints, projected offsite radionuclide concentrations, and offsite doses prior to release; and the verification and recording of effluent discharge flow rates, effluent volume discharged, effluent discharge radiation monitor readings, and dilution parameters during the release.

The inspector reviewed a representative number of batch radioactive waste liquid release permits for the period January 1, 1994 through December 31, 1994. It was determined that the processing, sampling, and analyses of radioactive waste liquid effluent and the approval and performance of batch liquid radioactive waste discharges were conducted in accordance with Offsite Dose Calculation Manual requirements. Quantities of radionuclides released in the liquid effluents were within the limits specified in the Offsite Dose Calculation Manual. Offsite doses were calculated according to the Offsite Dose Calculation Manual and were within the required limits. The inspector verified that the licensee was performing the Offsite Dose Calculation Manual required analyses on composite samples of batch radioactive liquid releases for gross alpha, tritium, strontium-89, strontium-90, and iron-55.

The inspector inspected the chemistry laboratory and radiochemistry counting facility and determined that the licensee had sufficient state-of-the-art analytical instrumentation to perform the required radiochemistry analytical measurements of the radioactive waste effluents. The inspector inspected the radwaste building and the liquid radioactive waste processing equipment including the liquid radioactive waste floor drain tank and the two equipment drain tanks and the local sample points at each of the liquid radioactive

waste storage tanks for collecting representative samples from the respective tanks prior to preparing effluent release permits. The liquid radioactive waste processing and storage systems were installed as described in the Updated Safety Analysis Report and operated in accordance with station procedures to ensure compliance with Offsite Dose Calculation Manual requirements.

The inspector determined that no design modifications had been made to the liquid radioactive waste management systems during 1992, 1993, and 1994.

3.2 Conclusions

The licensee was implementing a liquid radioactive waste effluent program in accordance with the Technical Specifications and the Offsite Dose Calculation Manual. The quantities of radionuclides released in the liquid radioactive waste effluents were within the Offsite Dose Calculation Manual limits. Offsite doses to the environment from the liquid radioactive waste effluents had been calculated using Offsite Dose Calculation Manual methodologies, and the dose results were within Offsite Dose Calculation Manual limits. The licensee had not made any major equipment or design modifications to the radioactive liquid waste management systems during 1992, 1993, and 1994.

4 GASEOUS RADIOACTIVE WASTE EFFLUENTS (84750)

The inspector reviewed the gaseous radioactive waste effluent program including gaseous waste processing, gaseous waste sampling and analyses, and procedures for the control and release of gaseous waste effluents to determine agreement with commitments in the Updated Safety Analysis Report and compliance with the requirements in Technical Specifications 6.8.1, 6.8.4.d, and 6.14; and the Offsite Dose Calculation Manual Section 6.2.2 and Table 6.2.2.1.2-1.

4.1 Discussion

The inspector reviewed the licensee's implementation of the gaseous radioactive waste effluent program and Offsite Dose Calculation Manual to ensure compliance with sampling and analyses requirements, analyses sensitivities, analytical results, surveillance tests, radioactive waste gaseous effluent control procedures, and offsite dose results from radioactive gaseous effluents.

The inspector reviewed selected procedures governing the continuous and batch releases of gaseous radioactive waste effluents. These procedures provided for the sampling and analysis of the radioactive gaseous waste effluents, calculation of effluent release rate, calculation of projected offsite radionuclide concentrations and doses, and calculation and verification of gaseous effluent radiation monitor setpoints prior to release; recording of dilution parameters during the release; and verification of effluent discharge flow rates and effluent volume discharged.

The inspector reviewed selected gaseous waste sample analyses for samples from the main plant vent, turbine building vents, and radwaste building vent continuous releases and selected gaseous waste release permits for batch releases for containment vents and purges for the period January 1, 1994 through December 31, 1994. It was determined that the sampling, analyses, and discharge of the radioactive gaseous effluents and the approval of the radioactive gaseous waste containment vents and purges were conducted in accordance with Offsite Dose Calculation Manual requirements. Quantities of gaseous and particulate radionuclides released were within the limits specified in the Offsite Dose Calculation Manual. Offsite doses had been calculated according to Offsite Dose Calculation Manual methodologies and were within required limits. Particulate effluent composite sample analyses for gross alpha, strontium-89, and strontium-90 had been performed and met Offsite Dose Calculation Manual requirements. The inspector determined that no major equipment or design modifications had been made to the radioactive gaseous waste management systems during 1993 and 1994.

4.2 Conclusions

The licensee was implementing a gaseous radioactive waste effluent program in accordance with the Technical Specifications and the Offsite Dose Calculation Manual. The quantities of radionuclides released in the gaseous radioactive waste effluents were within the Offsite Dose Calculation Manual limits. Offsite doses to the environment from the gaseous radioactive waste effluents had been calculated using Offsite Dose Calculation Manual methodologies, and the dose results were within Offsite Dose Calculation Manual limits. The licensee had not made any major equipment or design modifications to the radioactive gaseous waste management systems during 1993 and 1994.

5 REPORTS OF RADIOACTIVE EFFLUENTS (84750)

The inspector reviewed reports concerning radioactive waste systems and effluent releases to determine compliance with the requirements of 10 CFR Part 50.36(a)(2), Technical Specifications 6.9.1.11 and 6.14, and the Offsite Dose Calculation Manual Section 6.4.2.

5.1 Discussion

The inspector reviewed the Semiannual Radioactive Effluent Release Reports for the time periods January 1, 1992 through June 30, 1992, and July 1, 1992 through December 31, 1992, and the Annual Radioactive Effluent Release Report for the time period January 1 through December 31, 1993. The reports were written in the format described in NRC Regulatory Guide 1.21, Revision 1, June 1974, and contained the information required by the Offsite Dose Calculation Manual. During the time period January 1 through December 31, 1992, the licensee performed 161 liquid batch releases, 75 containment vents, and 15 containment purges. During the time period January 1 through December 31, 1993, the licensee performed 201 liquid batch releases, 52 containment vents, and 19 containment purges.

The licensee reported two abnormal releases of radioactive liquid waste during 1992 and no abnormal effluent releases during 1993. Problem Evaluation Requests 292-0622 and 292-0671 documented the 1992 abnormal release events. During the performance of the monthly batch release composite for the month of May 1992, one batch release sample out of 24 batch releases for that month was found to be missing. The missing sample was attributed to the fact that the original entry of the batch release in the Liquid Release Log was voided. The voided log entry resulted in the disposal of the sample as a terminated release. The loss of the sample had very little impact on the analytical results of the monthly and quarterly composite analyses for tritium, gross alpha, strontium-89, strontium-90, and iron-55. The inspector reviewed the licensee's description and followup actions concerning the missing sample and determined that the licensee had determined the root cause of the event and had taken appropriate corrective action. At no time were any Offsite Dose Calculation Manual dose or release concentration limits exceeded.

The second abnormal release event happened on June 11, 1992, with a partial release of Floor Drain Tank TK-9 before its radioactivity analysis was completed. Using a release authorization permit for Equipment Drain Tank TK-4B, the radwaste control room operator mistakenly started to release Floor Drain Tank TK-9, which he knew had been sampled. However, the radioactivity analysis and release authorization for Floor Drain Tank TK-9 had not been completed. The radwaste control room operator terminated the release of Floor Drain Tank TK-9 when he noted no decrease in the Equipment Drain Tank TK-4B tank level he thought he was releasing. Approximately 11,750 gallons of radioactive liquid waste effluent were released from Floor Drain Tank TK-9 to the river before the release was terminated. The inspector reviewed the licensee's description and followup actions concerning the abnormal release event and determined that the licensee had determined the root cause of the event and had taken appropriate corrective action. At no time were any Offsite Dose Calculation Manual dose or release concentration limits exceeded. Both Problem Evaluation Requests were closed by the licensee.

Effluent monitoring instrumentation had not been out of service in excess of Technical Specification requirements during 1992 and 1993.

The inspector reviewed changes (Amendments 11, 12, 13, 14, 15, and 16) to the Offsite Dose Calculation Manual, which were made and approved by the Plant Operations Committee during 1992 and 1993. The changes were well documented in the Radioactive Effluent Release Reports as required by the Offsite Dose Calculation Manual.

Summaries of the radioactive liquid and gaseous effluent releases and associated doses for 1992 and 1993 are presented in Attachments 2 through 6 to this inspection report.

5.2 Conclusions

The licensee had submitted the Radioactive Effluent Release Reports for 1992 and 1993 in a timely manner, and the reports contained all the required information presented in the format described in NRC Regulatory Guide 1.21. The abnormal radioactive liquid effluent releases did not exceed any Offsite Dose Calculation Manual limits. Changes to the Offsite Dose Calculation Manual were properly documented.

6 AIR CLEANING SYSTEMS (84750)

The inspector reviewed the engineered-safety-feature air cleaning systems testing program to determine agreement with the commitments in the Updated Safety Analysis Report and compliance with the requirements in Technical Specifications 4.6.5.1, 4.6.5.3, and 4.7.2.

6.1 Discussion

The inspector reviewed selected procedures and surveillance test results and records for the surveillance testing of the ESF air cleaning systems which contained HEPA filters and activated charcoal adsorbers. The inspector verified that the procedures and surveillance tests provided for the required periodic functional checking of the ESF air cleaning systems' components, evaluation of the HEPA filters and activated charcoal adsorbers, and the replacement and in-place filter testing of the filter systems. Selected records and test results for the time period January 1993 through December 1994 for the standby gas treatment system and control room emergency filtration system were reviewed. The in-place filter testing, activated charcoal laboratory tests, and the control room emergency filtration system pressure testing were performed in accordance with approved procedures by a contract laboratory and the licensee, and the test results were verified to be within Technical Specification limits except for the test results documented in Licensee Event Reports 94-012, 94-019, and 94-021. The inspector noted that the ESF air cleaning systems' operating hours was being tracked by the control room on the daily shift log to meet the Technical Specification requirement for testing the two ESF air cleaning systems' activated charcoal adsorber material at least every 18 months or after every 720 hours of operation.

6.2 Conclusions

The ESF air cleaning systems conformed to the commitments in the Updated Safety Analysis Report and met the Technical Specification requirements. The ESF air cleaning systems were tested in accordance with Technical Specification requirements, and the test results were within Technical Specification limits except for the test results documented in Licensee Event Reports 94-012, 94-019, and 94-021.

7 ONSITE REVIEW OF LICENSEE EVENT REPORTS (92904)

7.1 (Open) Licensee Event Report 397/94-012: Control Room Emergency Filter WMA-FU-54B Inoperable Due to Leaking Deluge Supply Isolation Valve

On June 23, 1994, approximately five inches of water was discovered in the bottom of the control room emergency filter unit, WMA-FU-54B. The water came from leakage past a deluge system isolation valve (FP-V-WMA/21), which had been observed to be leaking in March 1994 but had not been repaired. This caused the control room emergency filter unit's charcoal filter to be inoperable. Spring-loaded check valves installed in the filter unit's bottom drain lines trapped the water in the filter unit wetting the charcoal filter bed and causing it to be not available to perform its design safety function. Immediate corrective action taken by the licensee included replacing the leaking deluge system isolation valve, cleaning the filter unit, and replacing and testing the charcoal filter bed.

The inspector reviewed the licensee's corrective actions and the safety significance of the event. In the event of an accident, the filter unit actuates to protect the control room personnel from airborne particulate and iodine radioactivity by pressurizing the control room with filtered air. Because five inches of water had collected in the bottom of the filter unit, the iodine removal efficiency of the charcoal filter bed was significantly reduced, and the charcoal filter unit was not able to perform its design safety function. The inspector reviewed the radiological dose significance of the event in the case of an accident during the time the filter unit was not available to filter and remove radioactive iodine from the incoming air to the control room and the subsequent radiation dose to the control room personnel.

As described below, the inspector reviewed the licensee's radiological dose calculations performed to determine the safety significance and potential radiological consequences as a result of the event. Formal resolution and closure of this event will be documented in NRC Inspection Report 50-397/94-34.

7.2 (Open) Licensee Event Report 397/94-019: Gasket Missing From Main Control Room Air Handler WMA-AH-51B Precludes Associated Emergency Fan WMA-FN-54B From Sufficiently Pressurizing The Control Room

On November 21, 1994, with the plant at 100 percent power, control room emergency fan unit WMA-FN-54B failed to pressurize the main control room sufficiently to meet Technical Specification surveillance requirements. A missing gasket, removed October 26, 1994, from access door 3 of the main control room air handling unit WMA-AH-54B, caused air leakage around the door with the missing gasket and precluded sufficient main control room pressurization to meet Technical Specification surveillance requirements. Pressurization of the main control room during the event of an accident is part of the design function of the control room emergency air handling unit to protect control room personnel and maintain control room habitability. During a loss of coolant accident, a protection signal automatically isolates the

normal control room ventilation system and initiates emergency pressurization of the control room. Technical Specifications require that each emergency fan unit be capable of pressurizing the main control room to 0.125 inches of water column with respect to adjacent areas to prevent unfiltered air inleakage. During the surveillance testing of control room emergency fan unit WMA-FN-54B, the emergency fan unit only pressurized the main control room to 0.05 inches of water column failing the surveillance test. A new door gasket was installed on access door 3 on November 22, 1994, and the main control room air handling unit WMA-AH-54B and associated emergency fan unit WMA-FN-54B were retested on November 23, 1994. The main control room air handling unit again failed its surveillance pressurization test due to an unrelated work activity performed on November 22, 1994, as described in Licensee Event Report 94-021.

As described below, the inspector reviewed the safety significance and potential radiological consequences as a result of the event. Formal resolution and closure of this event will be documented in NRC inspection report 50-397/94-34.

7.3 (Open) Licensee Event Report 397/94-021: Holes Cut In Main Control Room Floor Penetration 5016 Precludes Redundant Emergency Fans WMA-FN-54A(B) From Pressurizing The Control Room Sufficiently To Meet The Applicable Surveillance

On November 23, 1994, with the plant at 100 percent power, it was determined during the performance of a routine pressurization surveillance test of the main control room that a flow path created by a barrier impairment in the main control room floor to the cable spreading room through penetration 5016 located under instrument panel H13-P682 prevented emergency fan unit WMA-FN-54B from pressurizing the main control room sufficiently to meet Technical Specification requirements. The main control room barrier impairment was caused by two holes cut in the main control room floor into the cable spreading room below the main control room on November 22, 1994. This event prevented both redundant control room emergency fans, WMA-FN-54A(B), from pressurizing the main control room sufficiently to meet Technical Specification surveillance requirements. The licensee's assessment of the surveillance test results indicated that the main control room still would have been amply pressurized to prevent infiltration of air during a postulated accident involving a radioactive release. The two holes in penetration 5016 were sealed approximately one hour after the failure of the initial pressurization surveillance test of the main control room. The main control room pressurization surveillance test was performed, and the main control room pressurization capability by both emergency fans WMA-FN-54A(B) was verified.

As described below, the inspector reviewed the safety significance and potential radiological consequences as a result of the event. Formal resolution and closure of this event will be documented in NRC inspection report 50-397/94-34.

During the inspection, the inspector reviewed the design and operation of the main control room emergency air handling and associated filtration units identified in the three related Licensee Event Reports summarized above. The inspector interviewed the system engineer responsible for the main control room emergency air handling units, performed a walkdown of the main control room emergency air handling units and inspected the failed equipment identified in the Licensee Event Reports for repair and operability. The inspector also reviewed how the failed equipment affected the designed performance of the main control emergency air handing units and the consequences its failure caused in radiologically protecting the control room personnel and maintaining control room habitability in the event of an accident.

As a result of the first event reported in Licensee Event Report 94-012, inoperability of the charcoal filter bed in the main control room filter unit WMA-FU-54B, the licensee performed an evaluation to determine the radioactive iodine dose to control room personnel from a hypothetical dropped fuel bundle accident during the time the main control room emergency air handing unit charcoal filter bed was not available to perform its design function. The licensee used the postulated dropped fuel bundle design basis accident scenario to evaluate the radiological consequences to the control room personnel since the reactor had been in cold shutdown for a maintenance outage since April 26, 1994. The licensee used the computer code "PADD" with design basis source term input of the isotopic concentrations of iodines and noble gases taken from the Updated Safety Analysis Report, Table 15.7-20 for airborne radioactivity in the secondary containment due to a fuel handling accident, to perform the radiological dose calculations for the postulated scenario. The results of the evaluation, assuming that the accident happened 35 days after shutdown of the reactor and no filtration was available, indicated that the 30 day integrated radiation dose to the control room personnel would be quite low. The calculated radiation dose results indicated that the whole body 30 day integrated dose to control room personnel would be approximately 2.6 E-04 Rem, and the 30 day integrated thyroid dose would be approximately 2.7 E-03 Rem.

The inspector postulated a "worst case" accident which could have happened while the reactor was at 100 percent power prior to the shutdown April 26, 1994, since there was indication of leakage past the deluge valve in March 1994. The inspector requested the licensee to perform radiation dose calculations based on the postulated designed basis loss of coolant accident scenario as an additional evaluation of the radiological consequences resulting from the events described in the above Licensee Event Reports. The licensee used the computer code "PADD" with source term input of the isotopic concentrations of iodines and noble gases taken from design basis source term calculations performed by the computer code ORIGIN which very closely approximated the iodine and noble gas isotopic airborne radioactivity isotopic concentrations presented in the Updated Safety Analysis Report, Table 15.6-13 for airborne radioactivity in the primary containment due to a design basis loss of coolant accident, to perform the radiological dose calculations for the postulated scenario. The calculated radiation dose result indicated that

the 30-day integrated thyroid dose would be approximately 8.6 Rem based on the assumptions of no main control room air filtration, a primary containment to secondary containment leak rate of 0.05 percent per day, and a secondary containment bypass leak rate of 0.33 standard cubic feet per hour as measured during the plant's eighth refueling outage in the summer of 1993. These values were below the General Design Criterion 19 of Appendix A, to 10 CFR Part 50, values of 5 Rem whole body gamma dose, 30 Rem beta skin dose, and 30 Rem thyroid dose from exposure to direct radiation from external sources and from airborne radioactivity within the control room to control room personnel. Therefore, a significant, but not an overexposure, thyroid radiation dose could have been received by control room personnel during the time the main control room air filtration unit was possibly inoperable and the reactor was operating at 100 percent power and all other redundant safety systems were also inoperable and not available.

ATTACHMENT 1

1 PERSONS CONTACTED

1.1 Licensee Personnel

*J. Parrish, Vice President, Nuclear Operations
J. P. Albers, Radiation Protection Manager
*A. L. Alexander, Lead Effluents Technical Specialist, Chemistry
R. J. Barbee, Manager, Technical Services
A. S. Barber, Technical Specialist, Quality Assessments
*P. R. Bemis, Manager, Regulatory Programs
*D. A. Bennett, Acting Chemistry Manager
I. M. Borland, Technical Specialist, Quality Assessments
*W. S. Davison, Manager, Plant Support Assessments
*K. B. Lewis, Compliance Engineer, Regulatory Programs
*M. P. Hedges, Corporate Chemist
R. L. Koenigs, Manager, Design Engineering
C. R. Madden, Technical Specialist, Quality Assessments
*R. D. Madden, Technical Specialist, Quality Assessments
J. W. Massey, Technical Specialist, Operations Event Analysis Resolution
*J. J. Muth, Manager, Plant Assessments
*L. M. Nolan, Radwaste Supervisor
*J. M. Pedro, Compliance Engineer, Regulatory Programs
C. J. Schwarz, Operations Manager
J. D. Snyder, Plant Support Engineering
*J. H. Swailes, Plant Manager
*D. A. Swank, Licensing Manager, Regulatory Programs
B. L. Twitty, Principal Engineer, Quality Assessments
J. C. Wiles, Technical Specialist, Quality Assessments
C. J. Zimmer, System Engineer

1.2 NRC Personnel

R. Barr, Senior Resident Inspector
D. Prouix, Resident Inspector

In addition to the personnel listed above, the inspector contacted other personnel during the inspection.

* Denotes personnel that attended the exit meeting on January 12, 1995.

2 EXIT MEETING

An exit meeting was conducted on January 12, 1995. During this meeting, the inspector reviewed the scope and findings of the report. The licensee did not express a position on the inspection findings documented in this report. The licensee did not identify as proprietary, any information provided to, or reviewed by, the inspector during the inspection.

ATTACHMENT 2

SUMMATION OF ALL LIQUID EFFLUENT RELEASES

	1992				1993			
	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
1. Number of Batch Releases	16	53	70	22	28	41	77	55
2. Fission & Activation Products (Curies)	4.7 E-03	6.5 E-02	2.2 E-02	3.0 E-03	7.0 E-03	6.8 E-02	1.1 E-01	1.8 E-02
3. Tritium (Curies)	4.5 E-01	2.6 E+00	4.9 E+00	2.8 E+00	1.3 E+01	7.7 E+00	7.9 E+00	5.6 E+00
4. Dissolved & Entrained Noble Gases (Curies)	<5.0 E-04	<1.1 E-04	1.0 E-03	1.3 E-03	<2.3 E-04	1.2 E-04	3.4 E-03	1.4 E-03
5. Waste Volume Released (liters)	9.2 E+05	3.0 E+06	4.0 E+06	1.3 E+06	1.6 E+06	2.4 E+06	4.4 E+06	3.1 E+06

ATTACHMENT 3

SUMMATION OF ALL AIRBORNE EFFLUENT RELEASES

	1992				1993			
	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
1. Number of Vents/Purges Released	33/2		42/13		52/19			
2. Fission & Activation Products (Curies)	7.8 E+01	6.6 E+00	3.3 E+01	3.3 E+01	4.3 E+01	9.2 E+00	7.8 E+01	1.2 E+01
3. Total Iodine-131 (Curies)	2.4 E-03	2.1 E-03	1.4 E-03	2.6 E-03	8.4 E-03	2.5 E-03	1.4 E-03	7.0 E-04
4. Particulates with Half Lives > 8 days (Curies)	2.3 E-02	4.5 E-03	2.4 E-03	5.8 E-03	3.5 E-03	2.3 E-03	4.2 E-03	1.3 E-02
5. Tritium (Curies)	6.4 E+00	2.3 E+00	1.4 E+01	2.6 E+01	5.1 E+01	4.8 E+01	3.7 E+01	1.5 E+01

ATTACHMENT 4

MAXIMUM ANNUAL DOSES FROM GASEOUS AND LIQUID EFFLUENT RELEASES

	1992 Dose	Annual Limit Per Unit	Percent of Limit
Liquid Effluents Whole Body Organ (Liver)	 0.03 mrem 0.04 mrem	 3 mrem 10 mrem	 1.1% 0.4%
Gaseous Effluents Noble Gas Gamma (Air Dose) Beta (Air Dose)	 0.12 mrad 0.11 mrad	 10 mrad 20 mrad	 1.20% 0.53%
Iodine-131, Iodine-133, Tritium, and Particulates with Half Lives > 8 days	0.14 mrem	15 mrem	0.92%

	1993 Dose	Annual Limit Per Unit	Percent of Limit
Liquid Effluents Whole Body Organ (Liver)	 0.12 mrem 0.19 mrem	 3 mrem 10 mrem	 4.0% 1.9%
Gaseous Effluents Noble Gas Gamma (Air Dose) Beta (Air Dose)	 0.10 mrad 0.07 mrad	 10 mrad 20 mrad	 1.02% 0.34%
Iodine-131, Iodine-133, Tritium, and Particulates with Half Lives > 8 days	0.18 mrem	15 mrem	1.19%

ATTACHMENT 5

LIQUID EFFLUENT RELEASE SUMMARY

PARAMETER	TOTALS FOR RELEASES DURING 1992	TOTALS FOR RELEASES DURING 1993
Number of Batch Releases	161	201
Total Fission and Activation Products Released (Curies)	9.5 E-02	2.1 E-01
Total Tritium Released (Curies)	1.1 E+01	3.4 E+01
Total Dissolved and Entrained Gases Released (Curies)	2.3 E-03	5.0 E-03
Total Gross Alpha Released (Curies)	0.0 E+00	5.2 E-10
Waste Volume Released (liters)	9.2 E+06	1.1 E+07
Total Whole Body Dose (mrem)	3.3 E-02	1.2 E-01
Maximum Organ Dose (mrem)	4.0 E-02	1.9 E-01

ATTACHMENT 6

GASEOUS EFFLUENT RELEASE SUMMARY

PARAMETER	TOTALS FOR RELEASES DURING 1992	TOTALS FOR RELEASES DURING 1993
Number of Vents & Purges	88	71
Total Fission and Activation Products Released (Curies)	1.5 E+02	1.4 E+02
Total Iodine-131 Released (Curies)	8.3 E-03	1.3 E-02
Total Particulates with Half Lives >8 Days Released (Curies)	3.6 E-02	2.3 E-02
Total Gross Alpha Released (Curies)	0.0 E+00	1.3 E-10
Total Tritium Released (Curies)	4.9 E+01	1.3 E+02
Gamma Air Dose (mrad)	0.12E+00	0.10E+00
Beta Air Dose (mrad)	0.11E+00	0.07E+00
Maximum Organ Dose (mrem)	0.14E+00	0.18E+00