# APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-285/92-32

Operating License: DPR-40

Licensee: Omaha Public Power District
444 South 16th Street Mall
Mail Stop 8E/EP4
Omaha, Nebraska 68102-2247

Facility Name: Fort Calhoun Station

Inspection At: Fort Calhoun Station, Washington County, Nebraska

Inspection Conducted: December 14-18, 1992

Inspector: A. D. Gaines, Radiation Specialist
Facilities Inspection Programs Section

Approved: for Blair Spitzberg, Acting Chief
Facilities Inspection Programs Section — Date 1/11/93

Inspection Summary

Areas Inspected: Routine, announced inspection of the solid radioactive waste management and transportation of radioactive materials programs including audits and appraisals; changes; training and qualifications of personnel; solid radioactive waste management; radioactive waste classification, waste characterization, and shipping requirements; transportation activities; and internal exposure controls as they pertained to Unresolved Item 285/9219-01.

Results:

- Excellent audits and surveillances were performed by qualified individuals (Section 1.1).
- Audits and surveillances identified pertinent findings and corrective actions for the findings were timely (Section 1.1).
- There had been no major changes in facilities, equipment, programs, or procedures (Section 2.1).
- The radioactive waste operations department had an adequate, well qualified staff to meet staffing requirements (Section 3.1).

- An excellent training program for radwaste personnel was in place (Section 3.1).
- Good implementing procedures for the radioactive waste management program were maintained (Section 4.1).
- An excellent job of identifying and shipping radioactive waste for burial in 1992 was performed (Section 4.1).
- The low-level radioactive waste disposal program was conducted in accordance with the requirements (Section 5.1).
- Excellent implementing procedures that addressed waste classification and characterization, selection of packages, preparation of packages, and delivery of the completed packages to the carrier were maintained (Section 6.1).
- Individuals responsible for transportation of radioactive waste activities were knowledgeable of the regulatory requirements and burial site license conditions (Section 6.1).
- The review and handling of the uptake incident was excellent (Section 7.1).
- The final root cause analysis was very good and helped the licensee to self identify the weaknesses that occurred (Section 7.1).
- Corrective actions to the uptake incident were prompt and comprehensive (Section 7.1).
- The licensee did an excellent job of confronting the transuranic issue (Section 7.1).
- The violations that occurred do not indicate a programmatic breakdown of the radiation protection program (Section 7.1).

Summary of Inspection Findings:

- Failure to revise a radiation work permit when radiological conditions changed (Section 7.1).
- Failure to perform beta radiation dose rate measurements (Section 7.1).
- Failure to count samples for gross alpha activity (Section 7.1).
- Failure to review survey data for adequacy (Section 7.1).
- Failure to start an air sample at the beginning of work likely to cause airborne activity (Section 7.1)
- Failure to post an Airborne Radioactivity Area (Section 7.1).

- Failure to use engineering controls to the extent practicable to limit airborne concentration limits (Section 7.1)
- Unresolved Item 50-285/9219-01 was closed (Section 7.1).
- Inspection Followup Item 50-285/9207-01 was closed (Section 8.1).
- Inspection Followup Item 50-285/9207-02 was closed (Section 8.2).
- Inspection Followup Item 50-285/9207-03 was closed (Section 8.3).
- Inspection Followup Item 50-285/9207-04 was closed (Section 8.4).
- Inspection Followup Item 50-285/9207-05 was closed (Section 8.5).
- Inspection Followup Item 50-285/9207-06 was closed (Section 8.6).

Attachment:

- Attachment - Persons Contacted and Exit Meeting

## DETAILS

### 1 AUDITS AND APPRAISALS (86750)

The inspector reviewed the quality assurance audit and surveillance programs regarding the solid radioactive waste and transportation of radioactive materials programs to determine agreement with commitments in Chapters 12 of the Updated Safety Analysis Report and compliance with the requirements in Technical Specification 5.5.2.8.

#### 1.1 Discussion

The inspector reviewed Quality Assurance Audit 63 and the qualifications of the quality assurance auditors who performed the audit and surveillances of the solid radioactive waste and transportation programs. Audit and surveillance reports of quality assurance activities performed since the last NRC inspection of the solid radioactive waste and transportation programs in July 1991 were reviewed for scope, thoroughness of program evaluation, and timely followup of identified deficiencies. Quality Assurance Audit 63 was performed in November 1991 in accordance with quality assurance procedures and schedules. The audit was performed by qualified auditors, who were knowledgeable in the solid radioactive waste and transportation programs, and their applicable requirements for nuclear power facilities. The inspector noted that the audit identified pertinent findings and that prompt corrective actions were taken to correct the findings. The audit of the solid radioactive waste and transportation programs was of good quality and satisfactory to evaluate the licensee's performance in implementing the solid radioactive waste and transportation programs.

The inspector reviewed the quality assurance surveillances performed during the period July 1991 through November 1992 in the areas related to the performance of the solid radioactive waste and transportation programs. The quality assurance surveillances were of excellent quality and satisfactory to evaluate the licensee's performance and provide periodic management oversight.

#### 1.2 Conclusion

Excellent audits and surveillances were performed by qualified individuals. The audits and surveillances identified pertinent findings and corrective actions for the findings were timely.

### 2 CHANGES (86750)

The inspector reviewed the organization, management controls, staffing, and the assignment of solid radioactive waste and transportation program responsibilities for changes and to determine agreement with commitments in Chapter 12 of the Updated Safety Analysis Report and compliance with the requirements in Technical Specification 5.2.

2.1 Discussion

The inspector noted that there had been no major changes since the last inspection in facilities, equipment, programs, and procedures that would have adversely affected the solid radioactive waste management and transportation of radioactive materials programs. The inspector noted that the position of Supervisor Radwaste Operations was filled, temporarily, by the Radwaste Operations Coordinator. The individual who had held the position of Supervisor Radwaste Operations was no longer employed by the licensee. The licensee stated that they hoped to fill the vacancy in the near future.

2.1 Conclusion

There had been no major changes in facilities, equipment, programs, or procedures. The position of Supervisor Radwaste Operations was temporarily filled by the Radwaste Operations Coordinator with no apparent adverse affects on operation of the program.

## 3 TRAINING AND QUALIFICATIONS (86750)

The inspector reviewed the training and qualification programs for personnel responsible for implementing the solid radioactive waste and transportation of radioactive materials programs to determine agreement with commitments in Chapter 12 of the Updated Safety Analysis Report and compliance with the requirements in Technical Specification 5.3 and the licensee's response to NRC Bulletin 79-19.

3.1 Discussion

The inspector reviewed individual staff computerized training records and qualification cards for selected individuals. The licensee's training records indicated that a vendor radwaste training course was conducted December 1992. Members of the radioactive waste department, quality control, and the training department attended the vendor training. The training included Department of Transportation regulations, 10 CFR Part 61 and 20.311, mixed waste, and site-specific requirements for low-level waste burial sites. It was determined that the radioactive waste operations department had a qualified staff to perform radioactive waste activities.

3.2 Conclusion

The radioactive waste operations department had a qualified staff to meet staffing requirements. The licensee had maintained an excellent training program for radwaste personnel.

## 4 SOLID RADIOACTIVE WASTE MANAGEMENT (86750)

The inspector reviewed the licensee's solid radioactive waste management program to determine compliance with the requirements of Technical Specifications 2.9.2 and 3.12.2 and 10 CFR Part 61 and agreement with commitments in Chapter 11 of the Updated Safety Analysis Report.

4.1 Discussion

The inspector reviewed selected radioactive waste procedures that implemented the licensee's solid radioactive waste management program. The inspector noted that the procedures were adequate for the processing and disposal of low-level radioactive waste and met the requirements of the licensee's Technical Specifications.

The inspector reviewed the licensee's records for low-level radioactive waste shipped since 1988. The following tabulation shows the total volume and curie content of the low-level radioactive waste shipped for the period 1988 through December 11, 1992.

| Year | Volume - Cubic Feet | Curie Content |
|---|---|---|
| 1988 | 1,722.4 | 17.5 |
| 1989 | 6,195.0 | 8.8 |
| 1990 | 4,310.1 | 7.0 |
| 1991 | 1,334.5 | 19.7 |
| 1992 | 2,181.5 | 440.5 |

In 1992 approximately 439.4 curies of the curie content that was shipped was from the licensee's shipments of spent resins and resin filters. The licensee did a very good job of identifying and shipping for burial the majority of radioactive waste on site before January 1, 1993, to preclude the uncertainties of future burials and interim onsite storage.

4.2 Conclusion

The licensee had good implementing procedures for the radioactive waste management program. The licensee performed an excellent job of identifying and shipping radioactive waste for burial in 1992.

## 5 RADIOACTIVE WASTE CLASSIFICATION, WASTE CHARACTERIZATION, AND SHIPPING REQUIREMENTS (86750)

The inspector reviewed the licensee's program for disposal of low-level radioactive waste including shipping manifests, waste classification, waste form and characterization, shipment labeling, tracking of waste shipments, and burial facility license conditions to determine compliance with the requirements of 10 CFR 20.311, 61.55. and 61.56.

5.1 Discussion

The inspector reviewed the licensee's radioactive waste procedures and found the licensee's program for classification and characterization of radioactive waste to meet the requirements of 10 CFR Part 61. The licensee and a contractor laboratory performed radiochemical analyses on samples of various radwaste types to meet the requirements in 10 CFR 61.55 and 61.56. The test sample analyses results were used for determination of radwaste classification and isotopic composition of the radwaste sources. The licensee performed isotopic analysis on each batch of radioactive waste packaged for shipment and

burial and employed correlation factors for characterization of isotopes not directly identified.

The inspector reviewed selected radioactive waste shipment manifests and shipping papers that accompanied the licensee's shipments of radioactive waste. The inspector determined that the completed manifests complied with the requirements of 10 CFR 20.311.

5.2 Conclusion

The licensee's low-level radioactive waste disposal program was conducted in accordance with the requirements of 10 CFR 20.311, 61.55, and 61.56.

## 6 TRANSPORTATION ACTIVITIES (86750)

The inspector reviewed the licensee's transportation program for shipment of radioactive materials and radioactive waste to determine compliance with the requirements of 10 CFR Parts 20, 61, and 71, and 49 CFR Parts 172-189.

6.1 Discussion

6.1.1 Quality Assurance Program

The licensee has maintained an approved Quality Assurance program in accordance with 10 CFR Part 71, Subpart H, for the transportation of radioactive materials (Approval 0256, Revision 3). The approval expires July 31, 1994.

6.1.2 Procurement and Selection of Packages

The licensee used strong-tight containers for the shipment of radioactive waste. Of the 81 shipments made to date in 1992, 31 were laundry shipments in steel containers. Most of the other shipments were in sea and/or land containers which contained uncompacted waste that was shipped to a vendor who segregated and repackaged the radioactive waste. The licensee was on the user's list for all NRC and Department of Transportation certified packages used. The licensee maintained current documentation on the manufacturer's design testing, maintenance, and the NRC Certificate of Compliance for all radioactive material packages used by the licensee.

6.1.3 Preparation of Packages for Shipment

The inspector verified that the licensee had procedures and checklists for the preparation of radwaste shipments. These procedures provided for visual inspection of the package prior to filling the container, instructions for closing and sealing the container, marking and labeling requirements, and determination of compliance with radiation and contamination limits. The licensee routinely used a checklist to assure that procedures were followed and that packages were prepared properly for shipment in accordance with NRC, Department of Transportation, state, and burial site requirements.

Discussions with licensee personnel indicated that the individuals involved in the transportation of radioactive waste and/or materials possessed a working knowledge of the licensee's procedures and NRC and Department of Transportation regulations pertaining to the preparation of packages for shipment.

6.1.4 Delivery of Completed Packages to Carriers

The inspector verified that the licensee's procedures included the required NRC and Department of Transportation regulations. A review of selected records and shipping papers for radioactive waste shipments indicated that the licensee had prepared appropriate manifests and shipping papers in accordance with approved procedures and that the shipping papers included the necessary information to comply with regulatory requirements. The licensee only used exclusive use carriers for all radioactive waste shipments and assured that the following items were in accordance with NRC and Department of Transportation regulations and station procedures: radiation levels were within required limits, transport vehicles were placarded properly, surface contamination on packages did not exceed requirement levels, and blocks and/or braces were in place to prevent damage or shifting of the load during transit.

6.1.5 Records, Reports, and Notifications

The inspector reviewed selected records of 15 radioactive waste shipments made by the licensee during 1992. The licensee's shipments were adequately documented to meet NRC and Department of Transportation regulations. The licensee maintained records of all radioactive waste and/or materials shipments as required. The records included all shipping documentation, radiation surveys, and required notification data.

6.2 Conclusion

The licensee maintained excellent implementing procedures that addressed waste classification and characterization, selection of packages, preparation of packages, and delivery of the completed packages to the carrier. Individuals responsible for transportation of radioactive waste activities were knowledgeable of the regulatory requirements and burial site license conditions. The licensee's shipments of radioactive waste and/or materials had met applicable transportation requirements.

## 7 INTERNAL EXPOSURE CONTROL (83750)

The inspector reviewed the details concerning a licensee-identified internal exposure intake to determine compliance with 10 CFR 20.103 requirements.

7.1 Discussion

7.1.1 Intake Incident

On April 16, 1992, during the change-out of the Reactor Letdown Filters CH-17A and B, a radiation protection technician received an intake of airborne radioactive material. The radiation protection technician who received the

intake of radioactive material was originally stationed outside Room 11 where the reactor system letdown filters were being replaced. His function was to escort the sealed drums containing the used filters to a storage area. Respiratory protection equipment was not required for this function. Both filter assemblies were changed out successfully, and the drums containing the used filters were transported to storage escorted by the radiation protection technician. The radiation protection technician returned to Room 11 expecting to see the maintenance personnel exiting the area.

Since the maintenance personnel were not in the process of exiting Room 11, the radiation protection technician proceeded into Room 11A to see if assistance was needed since the process of changing out the filters was physically demanding and was compounded by the protective clothing and respiratory protection equipment requirements. When the radiation protection technician reached the boundary of the highly contaminated area, he observed two of the maintenance personnel in obvious physical stress and still dressed in protective clothing and wearing respirators. The radiation protection technician immediately began helping undress the stressed maintenance workers. The highly contaminated clothing was removed, placed in a bag, and left near the highly contaminated area boundary. The radiation protection technician escorted the stressed workers to an area where they could rest and recover, and he returned to Room 11 to see if further assistance was needed. The radiation protection technician then assisted a second radiation protection technician inside the highly contaminated area in transferring the highly contaminated protective clothing across the highly contaminated area boundary.

The assisting radiation protection technician had not been required by the radiation work permit to wear respiratory protection equipment in conjunction with his original work assignment. According to interviews with the two radiation protection technicians involved, the intake of radioactive material by the assisting technician probably took place during the process of placing a bag of highly contaminated clothing into a clean bag for transport. At that time, a localized airborne radioactivity area was generated allowing the inhalation of radioactive material by the technician not wearing respiratory protection equipment.

The event was discovered when the radiation protection technician attempted to exit the radiation controlled area and caused the personnel contamination monitor to alarm. The radiation protection technician was placed on an exclusion from the radiation controlled area, and in vivo and in vitro bioassay sampling and measurements were initiated. The radiation protection technician showed possible internal contamination from whole-body counts and positive nasal smears. Respirator cartridges and air sampler filters were retained for analysis. Air sample activity was subsequently verified to be higher than expected because of airborne alpha contamination.

7.1.2 Licensee's Exposure Determination

On April 16, 1992, the licensee started their initial investigation of the event. Four urine samples and one fecal sample from the affected radiation protection technician, one air sampler filter, and two respirator cartridges were sent to a contractor laboratory for analyses. Based on the initial gamma

isotopic analysis results of the four urine samples, the licensee requested a transuranic analysis on one of the urine samples. The initial gamma isotopic results of the urine samples were used for preliminary dose calculations as documented in Radiological Occurrence Report 92-030. This report assigned 45.52 MPC-hours to the radiation protection technician as a result of his intake of radioactive material.

Upon receipt of the results from the initial gross alpha, gross beta, and gamma isotopic analyses of the air sampler filter, the two respirator cartridges, and the fecal sample, the licensee requested that a transuranic analysis of the air sampler filter be performed. The transuranic analysis of the first urine sample showed a positive plutonium-238 result. On July 17, 1992, initial dose calculations were performed by the licensee using the transuranic analysis results from the radiation protection technician's urine sample. These dose calculations indicated a possible exposure in excess of the 520 MPC-hour limit specified in 10 CFR 20.103. The licensee met with the NRC resident inspectors and informed them of the preliminary results from the dose calculations and provided the resident inspectors with a copy of the Radiological Occurrence Report 92-030 which contained the preliminary analysis of the incident. The exposed radiation protection technician was also informed of the analytical results of the bioassay samples and the preliminary analysis of the event and associated dose commitment.

On July 31, 1992, the licensee informed the NRC Region IV office of the event and the licensee's plans for a followup investigation. Arrangements were made by the licensee with a consultant to assist in performing the MPC-hour calculations. Additional results from the urine samples were received from the contractor laboratory on August 7, 1992, and dose calculations based on these transuranic analytical results indicated a possible intake of radioactive material in excess of 1800 MPC-hours. However, the consultant's calculated MPC-hours, based primarily on the radiation protection technician's whole-body count data, projected an MPC-hour exposure value of approximately 363 MPC-hours.

On August 20, 1992, the licensee informed the NRC Region IV office of the projected internal exposure of 363 MPC-hours. A second consultant was contracted by the licensee to assist in the investigation and dose assessment. The second consultant had submitted a draft report which indicated a calculated upper bounds dose of 514 MPC-hours for the transuranics, 1 MPC-hour for cobalt-58 and cobalt-60, and 2 MPC-hours for the remaining activation and fission product contribution to the total dose. Therefore, the preliminary upper bounds dose was estimated at 517 MPC-hours. However, the second consultant also indicated that the most probable intake dose result would be close to the 363 MPC-hours calculated by the first consultant and that the value was probably conservative.

7.1.3 NRC Assessment of the Licensee's Exposure Determination

At the time of the August 31 through September 4, 1992, NRC inspection, the licensee had not completed their investigation of this incident and had not made a final assignment of the internal exposure to the radiation protection technician. The licensee had therefore, not determined whether this individual

had exceeded the 520 MPC-hour internal exposure limit specified in 10 CFR 20.103. This issue was documented as an Unresolved Item in Inspection Report 50-285/92-19 pending completion of the final MPC-hour evaluation and an NRC review of radiological controls associated with the event (Unresolved Item 285/9219-01).

Subsequently, the licensee submitted Licensee Event Report 92-29 dated November 6, 1992, which documented the April 16, 1992, event. In the Licensee Event Report, the licensee stated that they were assigning the value of 366 MPC-hours to the individual, even though the internal dosimetry experts were in agreement that the actual exposure was less. The 366 MPC-hours assigned to the individual is less than NRC's regulatory limit of 520 MPC-hours per quarter and appeared to be a conservative estimate. Just prior to the exit meeting, the licensee had another internal dosimetry expert review the data. This review determined that the intake may have been as low as 19 MPC-hours. The licensee indicated to the inspector that they would review these findings and, if they were found to be valid, they would revise the individuals intake results accordingly.

7.1.4 Licensee's Root Cause Analysis

The licensee had performed a root cause analysis for the uptake incident and had their quality assurance group review the root cause analysis and the supporting documents. The quality assurance review revealed several nondocumented noncompliances, one of which appeared to be a repeat of a violation identified in NRC Inspection Report 50-285/92-07. The review also indicated that the root cause analysis was incomplete in that it had not addressed issues outside of the identified transuranic uptake. Because of the review, the licensee performed a second in-depth root cause analysis of the incident.

The inspector reviewed the Root Cause Analysis Report and the incident. This second root cause analysis was excellent and helped the licensee to self identify ten apparent violations of procedures. The inspector did not identify any further violations during the review of the incident and Root Cause Analysis Report. Through discussions with licensee personnel and an in-depth review of the ten apparent violations that the licensee noted, the inspector determined that two of the apparent violations were not valid. Also, the licensee had identified two apparent procedural violations that the inspector determined were more appropriately cited as one violation under 10 CFR Part 20. Therefore, the inspector noted that there were seven licensee identified violations, six of which were procedural violations, and one violation associated with 10 CFR Part 20. All procedural violations stemmed from Technical Specification 5.8.1.

Technical Specification 5.8.1 states, in part, that written procedures and administrative policies shall be established, implemented, and maintained that meet or exceed the minimum requirements of Sections 5.1 and 5.3 of ANSI N18.7972 and Appendix A of Regulatory Guide 1.33.

Regulatory Guide 1.33, Appendix A, Section 7.e(1) states, in part, that access control to radiation areas by a radiation work permit system should be covered

by written procedures. Radiation Protection Procedure RP-201, Section 7.6.2.A(2), states, in part, that a radiation work permit should be revised when radiological conditions change requiring additional controls. The licensee identified that on April 16, 1992, radiological conditions had changed during the change-out of the letdown purification filters, and the contract radiation protection technician did not stop the job and have the radiation work permit revised. Specifically, the letdown filters were found to be drier than usual and caused more of an airborne radioactivity problem than was anticipated. Therefore, this was identified as a violation of Technical Specification 5.8.1 (285/9232-01).

Regulatory Guide 1.33, Appendix A, Section 7.e(2) states, in part, that radiation surveys should be covered by written procedures. Radiation Protection Procedure RP-202, Section 7.1.1.B(1)(a), states, in part, that beta radiation dose rates shall initially be measured at contact when internal surfaces of primary or radwaste systems are accessible and worked on. The licensee identified that on April 16, 1992, when the letdown purification filters of the Chemical and Volume Control System were changed out, beta radiation dose rates were not measured. Therefore, this was identified as a violation of Technical Specification 5.8.1 (285/9232-02).

Regulatory Guide 1.33, Appendix A, Section 7.e(2) states, in part, that radiation surveys should be covered by written procedures. Radiation Protection Procedure RP-202, Section 7.1.2.C(1), states, in part, that loose surface contamination samples taken during breach of primary systems are to be counted for gross alpha activity. The licensee identified that the loose surface contamination samples taken on April 16, 1992, during the breach of the Chemical and Volume Control System to change the letdown filters, were not counted for gross alpha activity. Therefore, this was identified as a violation of Technical Specification 5.8.1 (285/9232-03).

Regulatory Guide 1.33, Appendix A, Section 7.e(2) states, in part, that radiation surveys should be covered by written procedures. Radiation Protection Procedure RP-202, Section 7.5.2 states, in part, that the Radiological Operation Coordinator, or his designee, shall review all surveys. Section 7.5.4.A, states, in part, that the review shall address the adequacy of survey data with respect to the reason for performing the survey. The licensee identified that reviews of the surveys performed on April 16, 1992, in support of the letdown filter change-out, did not address the adequacy of the survey data. Specifically, the reviews did not detect that beta dose rates and alpha counts should have been performed and were not. Therefore, this was identified as a violation of Technical Specification 5.8.1 (285/9232-04).

Regulatory Guide 1.33, Appendix A, Section 7.e(5) states, in part, that respiratory protection should be covered by written procedures. Radiation Protection Procedure RP-203, Section 7.1.2.A and B, states, in part, that job coverage air samples shall be taken as directed by the Radiation Work Permit at the start of work likely to cause airborne activity, such as disassembly of highly contaminated components and during work requiring respiratory protection. The licensee identified that on April 16, 1992, an air sample was not taken at the start of work in Room 11 to support Radiation Work

Permit 92-025 work which required respiratory protection. Specifically, one of the letdown filters had already been changed out before the air sample in Room 11 was started. Therefore, this was identified as a violation of Technical Specification 5.8.1 (285/9232-05). The inspector noted that the licensee had started air samples in the corridor outside Room 11 and in an area above Room 11 where other individuals were working before the first filter was changed out. The inspector determined that this violation was a repeat violation of Violation 285/9207-04 which was for failure to perform an air sample on a job that required respiratory protection. The inspector noted that the individual, who on April 16, 1992, failed to start the air sample before the work began in Room 11, had attended a March 1992 briefing which went over the violations that were documented in NRC Inspection Report 50-285/92-07. The briefing stressed the need to comply with the procedures that were violated.

Regulatory Guide 1.33, Appendix A, Section 7.e(5) states, in part, that respiratory protection should be covered by written procedures. Radiation Protection Procedure RP-204, Section 7.2.7, states, in part, that the licensee post Airborne Radioactivity Areas where the concentration of airborne radioactive materials exceed 25 percent of 1 MPC. The licensee identified that on April 16, 1992, Room 11 where the letdown filters were changed out was not posted as an Airborne Radioactivity Area. Past job evolutions indicated that the concentration of the airborne radioactive materials in Room 11 exceeded 25 percent of 1 MPC when the filters were changed and the concentration exceeded 25 percent of 1 MPC on April 16, 1992. Therefore, this was identified as a violation of Technical Specification 5.8.1 (285/9232-06).

10 CFR 20.103(b)(1) requires that the licensee, as a precautionary procedure, use process or other engineering controls, to the extent practicable, to limit concentrations of radioactive materials in air to levels below those which delimit an airborne radioactivity area as defined in 10 CFR 20.203(d)(1)(ii). 10 CFR 20.203(d)(1)(ii) states, in part, that an airborne radioactivity area is any room, enclosure, or operating area in which airborne radioactive material composed wholly or partly of licensed material exists in concentrations which, averaged over the number of hours in any week during which individuals are in the area, exceed 25 percent of the amounts specified in Appendix B, Table I, Column 1 of Part 20. Discussions with the licensee indicated that the Radiation Protection Supervisor had requested that a high efficiency particulate air filter unit be used during the letdown filter change in Room 11. The licensee stated that it would have been practicable to use a filter, but the high efficiency particulate air filter was not used and this decision was not forwarded to the Radiation Protection Supervisor who had requested it be used. The concentration of airborne radioactive material in Room 11 exceeded 25 percent of the amounts specified in Appendix B, Table I, Column 1 of Part 20. Therefore, the licensee identified that on April 16, 1992, engineering controls were not used to the extent practicable to limit concentrations of radioactive materials in air to levels below those which delimit an airborne radioactivity area as defined in 10 CFR 20.203(d)(1)(ii). Therefore, this was identified as a violation of 10 CFR 20.103(b)(1) (285/9232-07).

A review of the incident and the Root Cause Analysis Report, combined with interviews of individuals that were involved with the incident, indicated that what occurred was not indicative of a programmatic breakdown of the radiation protection program. However, the inspector indicated his concern to the licensee because of the number of procedural violations that occurred.

The inspectors noted that the licensee's Root Cause Analysis Report contained comprehensive corrective actions, and that the licensee had promptly proceeded with implementation of corrective actions identified in the Root Cause Analysis Report. As part of their immediate corrective actions, the licensee had completed a records review of all air sample data to determine if any similar events had occurred. The licensee determined that there were no similar incidents where personnel had encountered airborne alpha contamination without having respiratory protective equipment. The licensee noted that an entry underneath the reactor vessel had taken place during the July 1992 loss of coolant accident in which long-lived alpha contamination was later identified. The licensee determined that the proper respiratory equipment had been assigned based on expected conditions. After reviewing the licensee's documentation, the inspector agreed that the conditions that ultimately were found to have been encountered were not expected and that the licensee's selection of respiratory protective equipment was proper at the time. Therefore, the respirator selection for the job was not in violation of 10 CFR 20.103(3)(c).

Since the licensee has assigned the individual a conservative internal exposure and a thorough review of the radiological controls associated with the event has been completed, Unresolved Item 285/9219-01 is considered closed.

7.2 Conclusion

The licensee's investigation and assessment of the uptake was excellent. The final root cause analysis was very good and helped the licensee to self-identify several violations that occurred. The licensee's corrective actions to the uptake incident were prompt and comprehensive. The licensee did an excellent job of confronting the transuranic issue. The violations that occurred do not appear to indicate a programmatic breakdown of the radiation protection program.

## 8 FOLLOWUP (92701)

8.1 (Closed) Inspection Followup Item (285/9207-01): Ensuring That Radiation Work Permit Requirements Are Complied With

This inspection followup item was identified in NRC Inspection Report 50-285/92-07 and involved the failure of a radiation protection technician to ensure that radiation work permit requirements were complied with. Specifically, the technician instructed personnel to work without respiratory protection, even though the radiation work permit required respiratory protection. The inspector reviewed the licensee's corrective actions and randomly selected radiation work permits that required respiratory protection. The inspector noted that respiratory protection had been used on

the radiation work permits that required the use of respiratory protection. The inspector determined that the licensee's corrective actions for this item were satisfactory to close this item.

8.2 (Closed) Inspection Followup Item (285/9207-02): Documentation of Personnel Contaminations

This inspection followup item was identified in NRC Inspection Report 50-285/92-07 and involved the failure to document personnel skin and/or clothing contamination events on Form FC-RP-207-1. The inspector reviewed the licensee's corrective actions and randomly selected personnel contamination reports for review. The inspector noted that the personnel contamination events that were reviewed had been documented on Form FC-RP-207-1. The inspector determined that the licensee's corrective actions for this item were satisfactory to close this item.

8.3 (Closed) Inspection Followup Item (285/9207-03): Documentation of Respiratory Protection Equipment Selection

This inspection followup item was identified in NRC Inspection Report 50-285/92-07 and involved the failure to attach a respiratory protection equipment selection Form FC-RP-201-6 to a radiation work permit which required respiratory protection. The inspector reviewed the licensee's corrective actions and randomly selected radiation work permits that required respiratory protection. The inspector noted that the radiation work permits that were reviewed had Form FC-RP-201-6 attached. The inspector determined that the licensee's corrective actions for this item were satisfactory to close this item.

8.4 (Closed) Inspection Followup Item (285/9207-04): Air Sampling

This inspection followup item was identified in NRC Inspection Report 50-285/92-07 and involved the failure to perform an air sample on a job with radiation work permit required respiratory protection. The inspector determined that the licensee's immediate corrective actions for this item were not sufficient in that there was a similar occurrence. This item is being closed, and followup of the licensee's corrective actions will be tracked under 285/9232-05.

8.5 (Closed) Inspection Followup Item (285/9207-05): Performance of Whole-Body Counts for Facial Contamination

This inspection followup item was identified in NRC Inspection Report 50-85/92-07 and involved the failure to perform a whole-body count for an individual who had exhibited skin contamination in the area of the mouth and nose. The inspector reviewed the licensee's corrective actions and randomly selected personnel contamination reports that involved facial contaminations for review. The inspector noted that for the contamination reports that were reviewed, the licensee had performed whole-body counts on individuals who had exhibited skin contamination in the area of the mouth and nose. The inspector determined that the licensee's corrective actions for this item were satisfactory to close this item.

8.6 (Closed) Inspection Followup Item (285/9207-06): Calibration of Airborne Radiation Monitors

This inspection followup item was identified in NRC Inspection Report 50-285/92-07 and involved the failure to calibrate an airborne monitor at the proper frequency. The inspector reviewed the licensee's corrective actions and randomly selected airborne monitors while touring the radiologically controlled area to verify if the instruments had been calibrated at the proper frequencies. The inspector noted that the instruments that were reviewed had been calibrated at the proper frequencies. The inspector determined that the licensee's corrective actions for this item were satisfactory to close this item.

ATTACHMENT

## 1 PERSONS CONTACTED

### 1.1 Licensee Personnel

*R. L. Andrews, Division Manager, Nuclear Services
*S. K. Gambhir, Division Manager, Production Engineering
B. H. Blome, Supervisor, Corporate Quality Assurance
M. A. Breuer, Technician, Radioactive Waste Operations
*J. W. Chase, Acting Plant Manager
*G. M. Cook, Supervisor Station Licensing
*A. G. Christensen, Supervisor, Radiation Protection Operations
F. F. Franco, Manager, Radiological Services
*W. G. Gates, Vice President, Nuclear Operations
*J. K. Gasper, Manager, Nuclear Training
S. W. Gebers, Health Physicist, Radiological Services
R. G. Haug, Supervisor,Chemistry/Radiation Protection Training
*R. L. Jaworski, Manager, Station Engineering
C. J. King, Technician, Radiation Protection Operations
*L. T. Kusek, Manager, Nuclear Safety Review
*D. L. Lovett, Supervisor, Radiation Protection
*J. M. Mattice, Acting Supervisor, Radioactive Waste Operations
*W. W. Orr, Manager, Quality Assurance/Quality Control
T. L. Patterson, Plant Manager
*R. L. Phelps, Manager, Design Engineering
*H. J. Sefick, Manager, Security Services
*R. W. Short, Manager, Nuclear Licensing
L. D. Sills, Senior Quality Assurance Auditor
*C. F. Simmons, Station Licensing Engineer
K. E. Steele, Acting Supervisor, Radiological Health and Engineering

### 1.2 NRC Personnel

*R. P. Mullikin, Senior Resident Inspector

*Indicates those present at the exit meeting on December 18, 1992.

## 2 EXIT MEETING

An exit meeting was conducted on December 18, 1992. During this meeting, the inspector reviewed the scope and findings of the report. The licensee stated that in January 1993, they were going to have an outside technical expert audit their Radiation Protection Program for indications of programmatic problems. The licensee did not identify as proprietary, any of the materials provided to, or reviewed by the inspector during the inspection.