

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 50-456; 50-457  
License Nos: NPF-72; NPF-77

Report No: 50-456/99009(DRS); 50-457/99009(DRS)

Licensee: Commonwealth Edison Company

Facility: Braidwood Generating Station, Units 1 and 2

Location: RR #1, Box 84  
Braceville, IL 60407

Inspection Dates: May 17 - June 23, 1999

Inspector: M. Mitchell, Radiation Specialist

Approved by: G. L. Shear, Chief, Plant Support Branch  
Division of Reactor Safety

9907260053 990720  
PDR ADOCK 05000456  
G PDR

## EXECUTIVE SUMMARY

Braidwood Generating Station, Units 1 & 2  
NRC Inspection Report 50-456/99009(DRS); 50-457/99009(DRS)

This announced inspection included an evaluation of the effectiveness of aspects of the licensee's radiation protection (RP) program. Specifically, the following areas were reviewed: the circumstances surrounding an April 28, 1999, gatehouse monitor exiting incident; contract RP technician training; general RP practices and job controls; as-low-as-is-reasonably-achievable (ALARA) planning; and external and internal dosimetry for the Unit 2 refueling outage.

### Plant Support

The following conclusions were reached:

- Plant walkdowns of the radiologically controlled area (RCA) revealed that plant housekeeping was effective in maintaining areas free of unnecessary equipment and debris. Radiological posting and labeling in the plant was appropriate. Contamination control actions were effectively implemented during the outage. (Section R1.1)
- Proper ALARA planning contributed to the lowest cumulative dose for a Braidwood station refueling outage. The staff's planning was thorough, and dose estimates were challenging. The RP staff properly controlled work activities and implemented the ALARA program. (Section R1.2)
- The licensee used the corrective action program to document and track actions related to a variety of deviations from expected performance. This program was successfully used to trend worker performance and allowed the licensee staff to analyze the potential for significant performance declines. (Section R1.3)
- The licensee effectively implemented the internal dosimetry program. Specifically, radiation workers were effectively monitored for internal deposition of radioactive material via the passive monitoring program, and the licensee properly evaluated internal contaminations during the refueling outage. (Section R1.4)
- The licensee effectively maintained individual and cumulative occupational dose during the aggressive refueling outage schedule. While the total dose for the Unit 2 refueling outage (121.6 Person-Rem) was about 20 percent higher than the licensee's original estimate, it was the lowest outage dose in the station history. This demonstrated effective RP oversight and proper use of the external dosimetry program. (Section R1.5)
- The RP staff properly evaluated the use of respiratory protection equipment. The staff's evaluation process was based on sound ALARA principles. The staff maintained an effective respirator equipment maintenance and fit testing program. (Section R1.6)

- The licensee identified one non-licensed individual who failed to adhere to the station policy regarding attentiveness to duty inside the radiologically controlled area. Upon identification, the licensee took immediate disciplinary action. The fact that the attentiveness to duty policy was not clearly delineated in station procedure represents a procedural weakness. (Section R1.7)
- The licensee continued to limit the areas of contamination within the plant. Licensee staff demonstrated effective recovery techniques and radiation monitoring during plant start-up and changing conditions. (Section R2.1)
- Contract personnel involved in the RP program were properly trained. Training lesson plans were comprehensive and presented a broad review of the radiation protection program. In addition, the licensee had expanded the RP technician training to address added responsibilities. (Section R5.1)

## Report Details

### IV. Plant Support

#### **R1 Radiological Protection and Chemistry (RP&C) Controls**

##### R1.1 Walkdowns within the Radiologically Controlled Area (RCA)

###### a. Inspection Scope (83750)

The inspector examined various areas of the radiologically controlled area (RCA), including the Auxiliary Building, Containment and the Radioactive Waste Building. During these walkdowns, plant housekeeping, radiological posting and labeling, and general equipment condition were inspected. In addition, the inspector interviewed radiation protection (RP) staff regarding radiological conditions and controls within the plant during the outage.

###### b. Observations and Findings

During plant walkdowns, the inspector found plant areas to be clean and free of unnecessary materials. The inspector measured radiation levels in various plant areas to verify the proper placement of radiological postings. No discrepancies were found in the areas of posting or labeling. Also, the inspector noted that the licensee had properly posted and controlled the Unit 2 Auxiliary Building. The Auxiliary Building curved wall areas were controlled as locked high radiation areas (LHRAs), prior to the outage, primarily due to the source term associated with a leaking antimony secondary source. During the refueling outage, radiation levels in these areas decreased, such that locked barriers were not required. The inspector noted that these posting changes were identified on area survey maps.

Plant walkdowns in the Containment Building and cross-town area of the Fuel Handling Building found the areas well organized and staff activities conducted in a safe manner. Containment entrance and egress was controlled during the outage, in an effort to limit or eliminate contamination in the cross-town area. The survey results and personnel contamination events (PCE) indicated that this effort was successful.

###### c. Conclusions

Plant walkdowns of the RCA revealed that plant housekeeping was effective in maintaining areas free of unnecessary equipment and debris. Radiological posting and labeling in the plant was appropriate. Contamination control actions were effectively implemented during the outage.

## R1.2 ALARA Planning and Work Control Activities

### a. Inspection Scope (83750)

The inspector reviewed the ALARA planning process conducted prior to the refueling outage. The inspection consisted of a review of dose projections and walkdowns of the radiologically controlled areas during work activities. The inspector also observed work control activities in progress, attended pre-job briefings, reviewed planning documentation presented to the staff and interviewed RP staff.

### b. Observations and Findings

The RP staff was challenged with the normal refueling outage planning issues and a leaking antimony source in the primary system. The planning was thorough, logical and included a broad multi-discipline approach to the analysis. The leaking antimony source provided additional challenges to the staff, which included researching a variety of possible contingencies to reduce the dose to personnel during the outage.

A unique portion of the pre-outage planning for the outage was the "Unit 2 Secondary Source Leak Action Plan." This was a multi-discipline planning effort that encompassed the months leading up to the outage. The analysis included a broad assessment by RP, plant chemistry and operations staffs both at the plant and corporate levels. The planning for this unusual source term required the staff to gather information from industry experience on quantifying the leakage and cleaning the primary system. The staff reviewed similar events both within the corporate organization and from other utilities. This multi-discipline approach was effective in proper assessment and planning for dose control during the outage.

During reactor shutdown for the outage, the antimony source term reduction plan called for a 40 to 50 hour acid-reducing chemistry phase and 30 hours of reactor coolant pump (RCP) runtime. However, chemistry monitoring indicated that changes to the clean-up schedule would be advantageous to source term reduction. Consequently, plant management committed to extend the clean-up time. This was a decision that was effective in further reducing the source term and outage dose rates, in support of ALARA program.

ALARA planning allowed the staff to reach the lowest total dose for a Braidwood station refueling outage. The staff formulated a challenging dose goal for the outage of 100 Rem. The goal was developed through the assessment of each planned work project for the outage and on historical data. Further, the estimates from the leaking antimony source were added. The staff was then challenged by the corporate health physics staff, after professional review, and the final outage goal was defined. The final dose for the outage was 121.6 Person-Rem, which was the lowest refueling outage cumulative dose in the station's history. In addition, this outage was the shortest refueling outage ever conducted by the company's Nuclear Generation Group, 26 days.

However, the short duration of the outage may have contributed to exceeding the dose goal by causing work planning limitations. For example, work sequencing delayed steam generator flooding and required staff on a variety of jobs in containment to work in elevated dose fields. During the post-outage review, the licensee planned to analyze items like this for performance improvement during future outages.

The inspector reviewed samples of pre-job planning records. During the review, the inspector found the licensee's planning and implementation were in accordance with plant procedures. In addition, the inspector observed that post-job comparisons of projected and actual dose totals were investigated and resolved in an attempt to improve future outage work. This information was used during the pre-job briefs attended. Also, the RP staff effectively analyzed outage operations and reassigned the contract radiation protection technicians (CRPT) for better utilization in specific outage work. This decision reduced the total cumulative dose allocated for the CRPT group, allowed for the transfer of planned dose to the plant health physics technicians, and resulted in a lower total dose.

The inspector attended two pre-job briefings associated with the refueling outage work. The briefings were orderly, thorough and professional. The RP staff posed thoughtful questions, and a good exchange on the topics related to safety enhancement was observed.

The activities the inspector observed following the briefings confirmed good implementation of the information communicated. The inspector observed that the RP staff made effective use of the low dose waiting areas. Time in the higher dose areas was limited to the essential activities. The inspector noted that some of the work observed could have been conducted in a manner to further reduce the dose to the RP staff. For example, the staff could have used additional remote monitoring to reduce dose. This matter was discussed with the health physics management and will be considered for assessment during analysis of performance improvement for future refueling outages.

c. Conclusions

Proper ALARA planning contributed to the lowest cumulative dose for a Braidwood station refueling outage. The staff's planning was thorough, and dose estimates were challenging. The RP staff properly controlled work activities and implemented the ALARA program.

R1.3 Response to RP Incidents During the Outage

a. Inspection Scope (83750)

The inspector reviewed the RP staff's use of the licensee's corrective action system in response to incidents identified during the outage. This review included a review of

Problem Identification Forms (PIFs) and interviews of staff members knowledgeable of the incidents and associated responses. The following PIF documents were reviewed:

- PIF No. A1999-01585, "Numanco Radworker Practice Events" (May 12, 1999);
- PIF No. A1999-01406, "Documentation LHRA Posting/Barricade Deviations" (May 4, 1999); and
- PIF No. A1999-01230, "Failure to Notify RP After Gatehouse Monitor Alarms" (April 28, 1999).

b. Observations and Findings

The licensee used the corrective action program to document and track actions related to a variety of deviations from expected performance. The system for performance improvement using the PIF and corrective actions was effective in identifying appropriate response to incidents identified during the outage.

The licensee continued to review trends in worker performance that may lead to more significant events. PIF No. A1999-01585, "Numanco Radworker Practice Events," dated May 12, 1999, was an example of tracking and investigating performance trends. Specifically, a group of employees in one work production classification exceeded the licensee's administrative limit of 1.0 event per 10,000 Radiation Work Permit hours within a 12 month period. This led to an investigation of the error production rate and potential common cause factors in order to help eliminate future deviations in performance. This matter was under review during the inspection, and the findings of the investigation were not reviewed. Nonetheless, the RP staff properly used the PIF System to identify and to respond to performance trends.

The inspector reviewed the licensee's response to PIF No. A1999-01230, "Failure to Notify RP After Gatehouse Monitor Alarms," dated April 28, 1999. During the outage the licensee identified an incident of procedural non-compliance and took immediate corrective action to prevent health and safety consequences. A CRPT was identified on an RP gatehouse video monitor to alarm the PM-7 portal radiation monitor 15 times. The RP staff contacted the security desk adjacent to the PM-7 monitors in an attempt to direct the individual to stay in the area until RP personnel could assist. The individual exited the gatehouse and the parking lot before security could make contact. The RP staff took immediate action to limit potential contamination of areas outside the controlled area and radiation dose to the individual and the public by locating the individual at a local hotel, returning the individual to the plant, and by surveying the individual's car and hotel room. The source of contamination was identified as isolated (15,000 disintegrations per minute) to the individual's left pant leg. No contamination was found in the individual's car or hotel room. The staff that investigated the incident stated that the CRPT thought the alarms were caused by radon gas, not byproduct material contamination.

The station management contacted Numanco management to inform them that the CRPT was locked out of the RCA in response to the incident. The Numanco management dismissed the individual and retrained the remaining CRPTs. The incident

was discussed with station supervisors who reminded the station staff of the procedural requirements for exiting the RCA and the controlled areas using the PCMs.

After further review of this incident, the NRC will determine if any NRC enforcement actions are applicable (Unresolved Item Nos. 50-456/99009-01 and 50-457/99009-01)

In addition, the inspector noted a number of technical errors in PIF No. A-1999-0123. These details did not change the significance of the licensee's findings, however, they were contradictory to the support data reviewed by the inspector.

c. Conclusions

The licensee used the corrective action program to document and track actions related to a variety of deviations from expected performance. This program was successfully used to trend worker performance and allowed the staff to analyze the potential for significant performance declines.

R1.4 Internal Dose Assessment

a. Inspection Scope (83750)

The inspector evaluated the licensee's internal dosimetry program. Specifically, the inspector interviewed personnel and reviewed the following documents, that were examples of application of the licensee's internal monitoring program during the outage:

- PIF No. A1999-01205 Unplanned Intake (April 27, 1999);
- PIF No. A1999-01242 Facial Contamination (April 28, 1999); and
- PIF No. A1999-01308 Personnel Contamination Event (May 5, 1999).

b. Observations and Findings

The licensee maintained beta sensitive portal contamination monitors (PCMs) at the exit to the cross-town area of the fuel handling building and RP access control area, which were used to survey personnel exiting the RCA. The licensee also maintained additional gamma sensitive PCMs at the exits to the controlled area and the protected area, which were used to detect gross contamination or diversion of radioactive material. As required by the licensee's procedures, personnel were required to use these PCMs upon exiting the RCA and the protected area. In addition, the licensee maintained a bioassay program to detect and to quantify intakes of radioactive material. As part of this program, the licensee performed "whole body screenings" using a more sensitive PCM, which was located in the RP offices.

The inspector reviewed the licensee's evaluation of internal contaminations, which were performed during the outage. In accordance with procedure BwRP 5400-1, a member of the RP staff evaluated the intakes to determine if the intakes met or exceeded the

licensee's derived investigation level (DIL), which was one percent of an annual limit of intake. If the DIL was met or exceeded, the licensee was required to perform additional investigations and to determine and record the internal dose.

The inspector interviewed personnel involved in assessing the extent of contamination events and quantifying the intakes. The staff took a conservative approach to assessing intake by conducting several bioassays (i.e., whole body counts). The counts were conducted both prior to and after extensive decontaminations and again on scheduled time intervals following initial release of personnel. In each case, the RP staff properly reviewed and accounted for dose due to incidents that result in intakes of radioactive material.

The licensee did experience several internal contaminations. Additionally, all facial contaminations were analyzed for potential internal contamination. However, no intakes resulted in greater than one percent of the annual limit of intake.

The personnel contamination events (PCE) during this outage presented a particular challenge due to containment building environmental control issues. This resulted in personnel perspiring through the protective clothing (PC) and small amounts of contamination migrating through the wet garments to the skin. All contaminations were properly evaluated, and the highest shallow dose equivalents were determined to be less than 2 percent of the 10 CFR Part 20 limits.

c. Conclusions

The licensee effectively implemented the internal dosimetry program. Specifically, radiation workers were effectively monitored for internal deposition of radioactive material via the passive monitoring program, and the licensee properly evaluated internal contaminations during the refueling outage.

R1.5 External Dosimetry Program

a. Inspection Scope (83750)

The inspector reviewed the licensee's outage dose records and observed staff implementation of the external dosimetry program during outage related work.

b. Observations and Findings

The inspector reviewed the licensee's accumulated dose for the refueling outage. The highest individual dose was 711 millirem. External dose assessment was made using thermoluminescent detectors (TLDs) and electronic detectors (EDs). Prior to the Unit 2 refueling outage, the licensee had projected an outage dose of 100 Person-Rem. The actual total dose was 121.6 Person-Rem. The difference between the planned and actual doses was in part due to antimony source term and an aggressive outage goal of 26 days.

The staff implemented changes to limit dose during the outage based on problems identified during the last Unit 1 outage (Fall 1998). The inspector interviewed members of the ALARA planning and assessment staff regarding individual project results. During the Unit 1 refueling outage, a planning problem was identified with the root cause determined as communication errors. The RP staff planned to incorporate lessons learned from this activity into the planning for this Unit 2 refueling outage to assure that the communication was improved. For the most part the staff was successful in implementing better communications. The staff identified fewer work schedule overlap problems as a result.

c. Conclusions

The licensee effectively maintained individual and cumulative occupational dose during the aggressive refueling outage schedule. While the total dose for the Unit 2 refueling outage (121.6 Person-Rem) was about 20 percent higher than the licensee's original estimate, it was the lowest outage dose in the station history. This performance was an indicator of effective RP oversight and proper use of the external dosimetry program.

R1.6 Respiratory Protection Evaluations

a. Inspection Scope (83750)

The inspector reviewed the licensee's process for maintenance, fit testing and issuance of respiratory equipment during outage work activities. The inspector walked down respirator storage, cleaning and test areas, reviewed procedures, interviewed staff and observed staff demonstrations of procedure usage.

b. Observations and Findings

Prior to issuing respirators, the RP staff evaluated the work scope against known and anticipated radiological conditions to develop expected airborne conditions using several variables (e.g., current/historical air sample data, the levels of surface contamination, the degree of surface agitation, area ventilation, and surface consistency). If the derived air concentration (DAC) fraction was expected to be greater than or equal to 0.3, the RP staff was required to evaluate the use of respiratory protection. Procedure BwRP 5500-1 contained a graphical method, which indicated when respiratory protection was appropriate to maintain the total effective dose equivalent ALARA. While the licensee used a 20 percent efficiency reduction factor (i.e., it was estimated that donning a respirator increased work duration by 20 percent), consistent with industry guidance the procedure allowed the use of respiratory protection in situations where there was a large uncertainty in the magnitude of airborne concentration on a case-by-case basis.

During the refueling outage the licensee issued 41 respirators under 3 different radiation work permits. Based on the inspector's review, the licensee properly evaluated the activities to determine respiratory protection requirements. Work requiring respirator use was limited to the steam generator inspections and fuel transport system modifications.

One incident of respirator use resulted in a facial contamination; however, no internal contamination or significant shallow dose equivalent (SDE) resulted.

The inspector reviewed equipment maintenance, cleaning and inventory controls with the staff that issue the equipment. The inspector found the staff knowledgeable of the procedures used for maintaining and issuing respiratory equipment. The storage facilities were organized and well stocked with working equipment.

The inspector reviewed the licensee's fit testing program. The staff demonstrated the use of fit testing equipment and procedures. The staff was trained and knowledgeable in the use of the fit testing procedures and demonstrated proficiency in the fit testing process. The facilities provided for the fit testing were adequate for the number of fit tests conducted at the plant site. The area was organized and all equipment was operable.

c. Conclusions

The RP staff properly evaluated the use of respiratory protection equipment. The staff's evaluation process was based on sound ALARA principles. The staff maintained an effective respirator equipment maintenance and fit testing program.

R1.7 RP Staff Attentiveness to Duty

During the inspection, the licensee identified and investigated an incident where an individual was sleeping inside the RCA. On May 22, 1999, an RP day shift supervisor identified a potential sleeping area in a cable tray on the 426' level of the RCA. During the shift turnover, the RP day shift supervisor stated he had identified a potential sleeping area in a RP supply room and reviewed the location with the night supervisor. On May 23, 1999, in the early morning hours, while reviewing staff activities, the RP night shift supervisor noticed that one of the radiation protection technicians (RPTs) was not at his assigned duties. He asked several other staff if they knew where he could be located. None of the staff indicated that they had seen him. When the RPT could not be located, the RP night supervisor remembered the potential sleeping area and upon further investigation found the RPT sleeping in that location.

This sleeping location was inside the RCA. However, the dose rate and contamination levels measured by the RP staff and verified by the inspectors, were at background levels. Therefore, the RPT was not loitering in a radiation area, contrary to the ALARA policies. The RPT stated that he was not able to schedule sufficient sleep prior to reporting for duty and that this was the first time he used the sleeping area. He further stated that he was not aware of any others who had used the area for sleeping.

The Station Policy Memorandum "Attentiveness to Duty" dated April 20, 1999, clearly outlines the company expectation for staff behavior and performance. Specifically, the policy states, "On duty requires being attentive not only to your assigned duties and responsibilities but to surrounding equipment and conditions . . . this means clearly that

sleeping or the appearance of sleeping (periods with eyes closed) or other acts of inattentiveness to duty are not permitted and will not be accepted."

The station management took immediate action by removing the items in the cable tray sleeping area (foam mats and alarm clock), relieving the individual of assigned shift duties, sending the individual home and directing the individual to take three days off without pay in accordance with station personnel disciplinary policies. The entire RP staff was notified of the incident and the company policy and expectation was reviewed with the RP staff.

While the station policy is clear, the licensee did not clearly delineate the policy in specific procedures relating to the conduct of station personnel. Specifically, BwAp 100-10, "Conduct of Station Personnel" and 300-1, "Conduct of Operations" clearly state that sleeping is not authorized in the station control room. However, specific instructions or procedures referencing the Station Policy Memorandum, "Attentiveness to Duty" in other areas of the plant were not defined and do not specifically restrict sleeping in other low dose areas of the station. Station management acknowledged the procedural and policy difference and stated that the policy was known by the station staff. Management stated that the procedures would be reviewed.

## **R2 Status of RP&C Facilities and Equipment**

### **R2.1 Plant Recovery (Decontamination) and Radiation Control**

#### **a. Inspection Scope (83750)**

The inspector reviewed the licensee's actions associated with plant recovery and radiation assessment at the end of the outage and during start-up. Specifically, the inspector interviewed personnel, reviewed plant survey data and made confirmatory measurements.

#### **b. Observations and Findings**

Plant personnel were interviewed regarding the progress of reclaiming areas that became contaminated during the outage operations. Prior to the outage the plant had approximately 298 square feet of contaminated area. During the outage approximately 3900 square feet of the plant was controlled as contaminated area. The staff planned to return 3,594 square feet of contaminated area to clean contamination free area following demobilization of outage equipment mainly stored in the fuel handling building, thus leaving approximately 298 square feet of contaminated area. The inspector observed significant progress in returning these areas. The staff was actively decontaminating equipment and releasing areas. The staff used appropriate safety precautions during the observed processes.

The inspector reviewed the licensee's survey documentation for the Auxiliary Building, Fuel Handling Building, and Control Room at the end of the outage and during start-up. All surveys were current and projected changing conditions in the plant. The staff

interviewed demonstrated a thorough understanding of the radiation conditions in the plant. The inspector made confirmatory measurements and found the readings in good agreement with the licensee's posted survey readings. All areas surveyed were properly posted and restricted as required.

c. Conclusions

The licensee continued to limit the areas of contamination within the plant. Staff demonstrated effective recovery techniques and radiation monitoring during plant start-up and changing conditions.

**R5 Staff Training and Qualification in RP&C**

R5.1 Training of Contract RP Technician Personnel

a. Inspection Scope (83750)

The inspector reviewed the training of contract RP personnel. Specifically, the inspector reviewed the scope of the licensee's training through review of records and interview of those personnel involved in the training program.

b. Observations and Findings

The inspector reviewed the training and experience records for the contract RP technicians (CRPT) for the outage. The 27 CRPT staff were an experienced and knowledgeable group. All but one of the 27 were senior RPTs. Most of the CRPTs had just completed staffing a refueling outage at a similar plant within the licensee's corporate system. Staffing assignments were planned and made based on continuation of similar duties from the other station. Twenty-two CRPT staff were returning from the Unit 1 steam generator replacement outage. The licensee did reassign 14 RPT from other corporate stations for the outage. All RPTs except one had worked at the station on previous occasions.

The inspector reviewed course lesson plans and noted that the training was comprehensive and provided personnel with instructions commensurate with their duties. The instructor stated that course lesson plans were followed and students were attentive and responsive during the course presentations.

In providing assurance of continued CRPT proficiency, the licensee administered three exams prior to the outage. All three individuals passed the exams. Eight CRPT staff were specifically trained for steam generator inspection coverage during the outage. Training staff indicated that this training was conducted in addition to the site specific training for all CRPT.

c. Conclusions

The inspector concluded that contract personnel involved in the RP program were properly trained. Training lesson plans were comprehensive and presented a broad review of the radiation protection program. In addition, the licensee had expanded the RP technician training to address added responsibilities (i.e., steam generator inspection coverage)

**V. Management Meetings**

**X1 Exit Meeting Summary**

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on May 21, 1999. The licensee acknowledged the findings presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

## PARTIAL LIST OF PERSONS CONTACTED

K. Aleshire, Health Physics Technician  
M. Beyers, Training Instructor  
M. Cassidy, Regulatory Assurance  
J. Coughlin, Radiation Protection Supervisor  
M. Finney, Lead Operational Health Physicist  
P. Griggs, Outage ALARA Coordinator  
A. Haeger, Health Physics Supervisor  
H. Harroun, Chemistry System Engineer  
R. Pratt, Radiation Protection Supervisor  
M. Sayers, SGRP Radiation Protection Supervisor  
D. Scharenberg, Health Physics Instructor  
G. Schwartz, Plant Manager  
T. Simpkin, Regulatory Assurance Manager  
T. Talon, Site Vice President  
R. Thacker, Lead Health Physicist

## INSPECTION PROCEDURES USED

IP 83750: Occupational Radiation Exposure

## ITEMS OPEN, CLOSED, AND DISCUSSED

### Opened

50-456; 50-457/99009-01    URI    Failure to properly respond to portal monitor alarms when exiting the controlled area. (Section R1.3)

### Closed

None

### Discussed

None

## LIST OF ACRONYMS USED

ALARA	As-Low-As-Is-Reasonably-Achievable
ALI	Annual Limit on Intake
CEDE	Committed Effective Dose Equivalent
CRPT	Contract Radiation Protection Technician
DAC	Derived Air Concentration
DIL	Derived Investigation Level
ED	Electronic Dosimeter
IFI	Inspection Follow-up Item
IP	Inspection Procedure
NCV	Non-Cited Violation
LHRA	Locked High Radiation Area
PCE	Personnel Contamination Event
PCM	Portal Contamination Monitor
PIF	Problem Identification Form
RCA	Radiologically Controlled Area
RP	Radiation Protection
RPT	Radiation Protection Technician
RWP	Radiation Work Permit
SDE	Shallow Dose Equivalent
TLD	Thermoluminescent Detectors
TS	Technical Specifications
UNR	Unresolved Item

## DOCUMENTS REVIEWED

### Unit 2 Secondary Source Leak Action Plan

CCP-12 (Revision 1) "Radiation Protection Policy Memo #CCP-12, Crosstown Contamination"  
CCP-11 (Revision 0) "Radiation Protection Policy Memo #CCP-11, Air-powered Face Shields"  
Training Lesson Plan T4-RP-XL-113, "Site Specific Training"

PIF#A1999-01205 Unplanned Intake (April 27, 1999);  
PIF#A1999-01242 Facial Contamination (April 28, 1999);  
PIF#A1999-01308 Personnel Contamination Event (May 5, 1999).  
PIF#A1999-01585 Numanco Radworker Practice Events (May 12, 1999);  
PIF#A1999-01406 Documentation LHRA Posting/Barricade Deviations (May 4, 1999); and  
PIF#A1999-01230 Failure to Notify RP After Gatehouse Monitor Alarms (April 28, 1999).

### RADIATION WORK PERMITS:

RWP996003 ALARA Post Job Review - ISI;  
RWP996045 ALARA Post Job Review - Fuel Transport System Modification;  
RWP996026, 6027, 6028, 2029, 2034 ALARA Post Job Review - Reactor Head Work";  
RWP-08 (Revision 6), "Steam Generator Platform/Bull Pen Set-up Checklist";  
RWP-07 (Revision 3), "Steam Generator Platform/Bull Pen Closeout Checklist"; and  
RWP-16 (Revision 0), "ALARA Pre-job Briefing".

### PROCEDURES:

BwRP 5200-7T1 (Revision 0), "Radiation Exposure Investigation Form";  
BwRP 5210-4 (Revision 3), "Dose Assessments from Contamination";  
BwRP 5400-1 (Revision 2), "Guidelines for a Comprehensive Bioassay Program";  
BwRP 5410-11(Revision 0), "Operation and Calibration of the Eberline PM-7 for Whole Body Screening;"  
BwRP 5500-1 (Revision 6), "Radiological Respiratory Control Program":  
BwRp 5510-03 (Revision 4), "Operation of TSI 8020 Portacount Plus Respirator Fit Test System";  
BwRP 5510-23 ( Revision 2E2), "Selection, Issuance and Control of Radiological Respiratory Protective Equipment";  
BwRP 5720-4T2 (Revision 2), "Hot Particle Contamination Event";  
BwRP 5822-3 (Revision 0), "Operation and Calibration of the Eberline PM-7 Portal Monitors";  
BwRP 6020-3A3 (Revision 1), "Basepoint Surveys During Transient Operations";  
BwRP 6210-16T1 (Revision 1), " HEPA Checklist";  
BwRP 6210-16T2 (Revision 1), " HEPA Unit Location Log";  
BwRP 6210-16T3 (Revision 0), " HEPA Survey Sheet";  
BwRP 6210-16T1 (Revision 0), " HEPA Log Sheet"; and  
NSP RP-5003 (Revision 0), "Control for High Radiation Areas and Very High Radiation Areas".

### TECHNICAL SPECIFICATIONS:

Technical Specification 5.7 (Revision 98), "High Radiation Area"  
Technical Specification 5.4 (Revision 98), "Procedures"