

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-254/92005(DRSS); 50-265/92005(DRSS)

Docket Nos. 50-254; 50-265

Licenses No. DPR-29; DPR-30

Licensee: Commonwealth Edison Company
Opus West III
1400 Opus Place
Downers Grove, IL 60515

Facility Name: Quad Cities Nuclear Power Station, Units 1 and 2

Inspection At: Quad Cities Site, Cordova, Illinois

Inspection Conducted: January 27 - 31, 1992

Inspectors: M.A. Kunowski for
R. A. Paul

2-21-92
Date

A. G. Januska
A. G. Januska

2/21/92
Date

Approved By: M.A. Kunowski for
M. C. Schumacher, Chief
Radiological Controls and
Chemistry Section

2-21-92
Date

Inspection Summary

Inspection on January 27 - 31, 1992 (Reports No. 50-254/92005(DRSS);
50-265/92005(DRSS))

Areas Inspected: Routine unannounced inspection of the licensee's radiation protection program (IP 83750): including changes; internal and external exposure controls; training; ALARA; radiological controls; plant tours; independent surveys; and previous inspection findings.

Results: One violation was identified for recurrent failures to maintain high radiation areas locked except when access is required (Section 4). Station dose, the number of personnel contamination events, and the contaminated decrease in 1991.

DETAILS

1. Persons Contacted

- *R. Bax, Station Manager
- *J. Burkhead, Nuclear Quality Programs
- B. Elkin, Health Physics Staff
- D. Goff, Health Physics Staff
- *L. Hamilton, Regulatory Assurance
- B. Hill, Health Physics Staff
- *D. Kanakares, Regulatory Assurance
- A. Lewis, Health Physics Services Supervisor
- *A. Misak, Regulatory Assurance Supervisor
- P. Moore, Health Physics Staff
- G. Moran, Health Physics Staff
- *G. Powell, Lead Health Physicist, Technical
- *R. Stols, Station Program Supervisor
- *J. Tietz, Technical Superintendent
- J. Weaver, Maintenance Training Group Leader
- *M. Zinnen, Lead Health Physicist, Operational

- *T. Taylor, Senior Resident Inspector
- *D. Nelson, Region III Inspector

* Present at the exit meeting on January 31, 1992.

The inspectors also contacted other licensee employees.

2. Licensee Action on Previous Inspection Findings (IP 83750)

(Closed) NCV (254/90024-01; 265/90023-01): Failure to control access to high radiation areas where R doors/locks/gates were left unlocked and/or open. The licensee initiated a number of corrective measures to prevent recurrence of these events, however, during 1991 similar events continued to occur and are discussed in Section 4.

3. Changes (IP 83750)

The radiation protection group has changed slightly since last examined (Inspection Reports No. 50-254/91012(DRSS); 50-265/91008(DRSS)). The group consists of 40 technicians of which 24 are fully qualified "A" techs, six are upgraded "A" techs who meet all the qualifications except time, six are fully qualified "B" techs, and four are upgraded "B" techs who have not satisfied training and time requirements. Responsibilities are essentially unchanged and the staff continues to be stable.

No violations or deviations were identified.

4. External Exposure Control (IP 83750)

The inspectors examined the licensee's program for securing High Radiation Area (HRA) doors, reviewed licensee-identified problems in this area for 1991, and discussed the program with the licensee. The licensee has 140 total HRA doors of which 60-70 are greater than 1000 millirem per hour (mrem/hr), nine greater than 15 rem per hour (rem/hr) and the remainder less than 1000 mrem/hr. The licensee's current Technical Specification (TS) requires adherence to the 10 CFR 20 requirement for locking HRAs at 100 mrem/hr.

A non-cited violation was issued in Report Nos. 50-254/90024(DRSS); 50-265/90023(DRSS) for licensee identified unlocked high radiation doors in 1990. Corrective actions for that non-cited violation included specially convened plant-wide discussions, safety meetings, discussions with affected personnel, postings and other reminders to relock doors and return keys, and institution of additional surveillance of the HRA doors. In early 1991, after a written warning by the plant manager, the station began taking disciplinary action against identified offenders.

Despite these efforts, the licensee continued to identify problems with unlocked HRA doors and unreturned keys during 1991 including two areas posted for levels above 1000 millirem per hour. As in 1990, none involved areas where doses exceeded 15 rem per hour. The licensee was slow to implement an earlier proposed action of requesting a standard TS waiver to lock HRAs at 1000 mrem/hr instead of the 10 CFR 20 required 100 mrem/hr which would have eliminated all but the two occurrences on August 25, 1991 and November 25, 1991. This request was submitted to the NRC in late 1991 and amended in January 1992. A violation is being cited because of failure of the earlier corrective actions to effectively correct this problem and prevent recurrence. Failure to maintain HRA doors locked is a violation of 10 CFR 20.203(c)(2)(iii)(violation 254/92005-01; 265/92005-01).

One violation was identified.

5. Audits and Appraisals Reports (IP 83750)

The inspectors reviewed Radiation Occurrence Reports (RORs) generated pursuant to station procedure QRP 1110-TI for 1991 and Radiation Protection Deficiency Reports (RPDRs) initiated in January 1992. The licensee trends and categorizes RORs by work group and type of occurrence under the major classifications of cause. RORs are generally written for violations of station radiological control procedures and to identify performance problems associated with significant radiological events. The RORs are investigated to determine root cause, initiate corrective actions to prevent recurrence, and inform upper station management of the events. RPDRs are used to identify infractions of radiological procedures and other minor radiological control problems. The RPDRs are tracked, and normally investigated by the Radiation Protection Department (RPD). If RPDRs are upgraded to RORs they are generally done so at the discretion of the RPD.

Of the twenty-two RORs reviewed, most were associated with HRA control problems (see Section 4). None of the others reflected significant radiological events which, assuming the RORs are used to capture significant events, indicates good performance. However, there were a few RPDRs that appeared to the inspectors to meet the guidance for initiating an ROR. The licensee indicated that since they were sufficiently handled to identify the root cause and prevent recurrence initiating an ROR was unnecessary. The licensee's use of both problem identification systems was discussed at the exit meeting and will be reviewed during future inspections.

No violations or deviations were identified

6. Maintaining Occupational Exposure ALARA (IP 83750)

The ALARA group is currently staffed with an ALARA coordinator, four planners, a shielding specialist and a contamination controller. In addition to their responsibility for implementing the ALARA program, the staff is responsible for the contamination control program. The ALARA staff appears to have the necessary qualifications, dedication and management support to implement an effective ALARA program. Although there is no formal training requirement for the ALARA staff, they have attended special contractor training courses, participate in team assessments, and attend the Radiation Protection continuing training course.

Based on discussions with the licensee staff, substantial improvements in working interactions and communication between all work groups have been made. However, additional efforts need to be made to resolve the lack of well developed mechanical maintenance and contractor historical and lessons learned files, and problems obtaining lessons learned information after job completion and the ALARA group not receiving the work package earlier in the job scheduling process for lower dose rate jobs. The licensee acknowledged the need for improvement in these areas.

The total station dose for 1991 was approximately 510 person-rem which is about fifty percent less than 1990. The dose came primarily from a 116 day extension of the fall 1990 outage. For the 1991 outage the licensee achieved about 155 person-rem dose saving through chemical decontamination of the recirculation system and about 20 person-rem from RWCU chemical decontamination and other dose saving initiatives such as use of lead shielding. The licensee's goal for 1992 is about 1100 person-rem which includes two major refueling outages with several one time jobs. However, the projected dose does not include work activities such as repair of manway covers on the shroud plate and other repairs which may be needed depending on component inspection findings.

No violations or deviations were identified.

7. Control of Radioactive Materials and Contamination, Surveys, and Monitoring (IP 83750)

The inspectors reviewed records and calibration data for IPM-8 whole body friskers and PM-7 portal monitors. Calibrations are performed

semiannually or after work is performed on the systems. Calibrations and daily quality control (QC) checks were performed in accordance with licensee procedures. However, the daily check source technique used does not truly verify the alarm set points established during the semiannual calibration. Recently the licensee has purchased new calibration standards to replace the aging standards currently in use and are planning to use these sources for calibration and daily checks. The inspector pointed out the importance of using a separate, independent source for daily checks to avoid possible degradation of the calibration sources from daily use. The licensee acknowledged the inspectors comments and agreed to review this matter (Open Item 254/92005-02; 265/92005-02).

The inspectors discussed the detection of electron-capture (EC) nuclides (Zn-65, Fe-55, Mn-54, Co-58, Cr-51) with the licensee as they relate to personnel surveys and release of material. These nuclides are difficult or impossible to detect using conventional survey instruments. The licensee has annual analyses made of waste streams by a vendor to determine nuclide distribution within the station. The 1991 results indicated that the percentages of the EC nuclides are small compared to Co-60 which is readily detectable. The station does not have any aggregate clean waste leaving access control and has a zero contamination threshold for release of material and personnel from access control. Based on a study performed by the licensee, Fe-55 and Zn-65 would not be seen on the normally used HP-210 probe and the EC nuclides whose energies are located between these two would be only partially detected. The licensee recognizes this as a potential problem should the quantity of EC nuclides increase.

During tours of contaminated and potentially contaminated areas of the station, the inspectors identified the machine shop as having a potential for loss of control of contamination and contamination spread. The machine shop houses a decontamination facility where equipment is decontaminated, and machines for working (milling, grinding, etc.) on contaminated and clean equipment are located. Portions of the machine shop are designated as temporary radiologically controlled areas (RCAs) and surrounding these areas are areas designated as clean areas. Within the machine shop, smoking, drinking, and eating is permitted in areas adjacent to designated RCAs, which includes the decontamination facility which has no roof. Employees leaving the machine shop RCAs are required to whole body frisk. The present mixed use of the machine shop and the radiological potentials posed by such use were discussed with the licensee during the inspection and the exit meeting.

The licensee was requested by the inspectors to compute skin dose for some hypothetical hot particle incidents using different radioisotopes at a skin depth of 7 mg/cm² (averaged over 1 cm² at varying shielding thicknesses). The licensee used the VARSKIN computer program and the calculations were in good agreement with those of the inspectors.

The inspectors noted that the licensee has continued to reduce the number of personnel contamination incidents which numbered 105 events during 1991

with 116 outage days. The goal for 1992 with two planned outages of 140 total days is 180. During 1991 the licensee also reduced the percent of plant contaminated areas from 54 to 12 which is ahead of their planned target schedule of 10 percent by the end of 1992.

No violations or deviations were identified.

8. Internal Exposure Control (IP 83750)

The inspectors reviewed the licensee's methodology of relating an individual's whole body count results to regulatory requirements (MPC-hours). The inspectors requested the staff to use procedure QRP-1340-7 entitled "Calculation of MPC-hours and Organ Dose Based on Whole Body Counter Data From Acute Uptake" to convert WBC data to MPC-hours from several examples given by the inspectors. With the exception of a minor discrepancy the licensee's procedure was used correctly.

The inspectors reviewed the licensee's Whole Body Counter (WBC) program. Calibration is performed annually by the manufacturer's representative using a mixed gamma standard and a phantom; QC checks are performed shiftily when the system is in use using nominal 90 nanocurie (nCi) Co-60 and 180 nCi Cs-137 standards. The calibrations and the QC checks appeared to be proper. Monthly trend plots of QC data were also reviewed and have improved.

No violations or deviations were identified.

9. Surveillance-Plant Tours (IP 83750)

Based on several tours of the plant including the drywell, reactor building corner rooms and torus, the radwaste area and turbine building, the inspectors noted that: (1) Workers were staged in low dose areas outside the drywell; appropriate posting, temporary shielding, portable ventilation equipment were noted inside the drywell; no workers appeared to be loitering; and a knowledgeable drywell coordinator and Radiation Protection technicians were covering the work; (2) A "E" operator on a routine round of the Unit 1 reactor and turbine building was not inhibited from access to rooms/locations due to areas being controlled as contaminated and was required to use protective clothing (plastic shoe covers) on only one occasion; (3) On three occasions workers were handling potentially contaminated equipment without gloves, discrepancies that were corrected after they were pointed out by either the inspectors or licensee personnel; (4) The results of numerous smears taken by the inspectors of floors and equipment indicated no activity above background detected using a hand-held frisker.

No violations or deviations were identified.

10. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspectors, and which involve some action

on the part of the NRC or licensee, or both. Open items disclosed during the inspection are discussed in Sections 4 and 7.

11. Exit Interview

The scope and findings of the inspection were discussed with licensee representatives (Section 1) at the conclusion of the inspection on January 31, 1992. The inspectors discussed the HRA door problems, the radiological potential in the machine shop, the ROR and RPDR program and the ALARA program. Licensee representatives did not identify any documents or processes reviewed during the inspection as proprietary.