

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-254/82-21(DETP); 50-265/82-23(DETP)

Docket Nos. 50-254; 50-265

Licenses No. DPR-29; DPR-30

Licensee: Commonwealth Edison Company  
Post Office Box 767  
Chicago, IL 60690

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

Inspection At: Quad-Cities Site, Cordova, IL

Inspection Conducted: October 26-29, 1982

*L. J. Hueter*  
Inspectors: L. J. Hueter

11/23/82

*D. E. Miller*  
D. E. Miller

11/23/82

*L. R. Greger*  
Approved By: L. R. Greger, Chief  
Facilities Radiation  
Protection Section

11/23/82

Inspection Summary

Inspection on October 26-29, 1982 (Reports No. 50-254/82-21(DETP);  
50-265/82-23(DETP))

Areas Inspected: Routine, unannounced inspection of normal operational and refueling radiation protection activities including: staffing; training; radiation protection procedures; planning, preparation, and ALARA; external exposure; internal exposure; posting and control; material control; effluent control instrumentation; testing of air cleaning systems; transportation; and status of certain NUREG-0737 items. The inspection involved 70 inspector-hours onsite by two NRC inspectors.

Results: No items of noncompliance or deviations were identified.

## DETAILS

### 1. Persons Contacted

P. Behrens, Chemist  
W. Bielasco, Health Physicist  
\*R. Carson, Lead Health Physicist  
G. Gary, Lead Chemist  
\*L. Gerner, Assistant Superintendent, Administrative and Support Services  
\*D. Gibson, QA Supervisor  
\*N. Kalivianakis, Plant Superintendent  
\*T. Kovach, Radiation/Chemistry Supervisor  
F. Moore, Engineering Assistant, Chemistry  
V. Neels, Chemist  
J. Piercy, ALARA Coordinator  
R. Tank, Engineering Assistant, Health Physics  
M. Warren, Training Instructor  
J. Wunderlich, Staff Assistant  
M. Zinnen, Radiation/Chemistry Foreman  
  
\*N. Chrissotimos, NRC Senior Resident Inspector

\*Denotes those present at the exit interview.

### 2. General

This inspection, which began about 8:00 a.m. on October 26, 1982, was conducted to review the refueling radiation protection program and selected aspects of the operational radiation protection program. Tours included the reactor building, the turbine building, the rad-waste building, the trackways, the high radiation sample system buildings, the maintenance machine shop, and the administration building. Radiological controls and housekeeping appeared good for outage conditions. Some needed improvements in rope barriers and postings were noted.

### 3. Rad/Chem Department Staffing

Since previously reported in Inspection Reports No. 50-254/81-18; 50-265/81-18, several organizational changes have been made, including:

- a. J. McMillan, former Engineering Assistant and M. Zinnen, former Rad/Chem Technician (RCT) have been promoted to Rad/Chem Foreman. Rad/Chem Foreman staffing level has been increased from two to four.
- b. T. Bush, former RCT, has been promoted to Health Physics Engineering Assistant (HPEA). There are now two HPEAs.

- c. RCT staffing had been increased to 30. One RCT has since been demoted and two have been promoted within the department resulting in current staffing of 27.

The department has budgeted for addition of a Staff Assistant, a GS Coordinator, and an ALARA Engineering Assistant. Also budgeted is an increase in full staffing levels for radiation/chemistry foremen from four to six, health physicists from three to four, chemists from four to five, and RCTs from 27 to 32.

During the current refueling outage, the Rad/Chem Department has been augmented with 18 RCTs plus a Rad/Chem Foreman from Byron Station. These have been utilized primarily in specialized jobs. No contract RCTs have been obtained for this outage.

No items of noncompliance or deviations were identified.

4. Training

The inspectors attended an initial orientation training class, and found it provides the instructions to workers required by 10 CFR 19.12. No significant problems were identified.

5. Radiation Protection Procedures

The inspector reviewed the following recently revised radiation protection procedures. They appear to be compatible with regulatory requirements and FSAR commitments.

QRP 1350-1	Revision 1	Operation and Use of the Respirator Fitting Test System
QRP 1350-2	Revision 1	Operation of the NMC Continuous Air Monitor (General)
QRP 1350-3	Revision 1	NMC Continuous Air Monitor Source Check
QRP 1350-4	Revision 1	Use of the Eberline Model RAP-1/RAS-1 Air Sampler
QRP 1350-6	Revision 1	Use of Staplex Air Samplers
QRP 1350-10	Revision 1	Use of Eberline AMS-3 Beta Continuous Air Monitor
QRP 1530-1	Revision 1	Receipt, Inventory and Leak Testing of Radioactive Byproduct Sources
QRP 1530-2	Revision 1	Receipt of Radioactive Material Shipments

During a previous inspection,<sup>1</sup> the licensee agreed to complete by October 1, 1982, revision of procedures for receiving and opening packages of radioactive material. Further, the licensee agreed that the revised procedures would require checking incoming package survey

<sup>1</sup> Report No. 50-254/82-15; 50-265/82-17

readings against those indicated by the shipper and require notification of supervisory personnel when differences are observed. Also, the revised procedures were to require that packages containing radioactive gases be opened under a hood. The inspectors observed that Revision 1 to Procedure QRP 1503-1, titled "Receipt, Inventory, and Leak Testing of Radioactive Byproduct Sources" was effective on September 22, 1982, and contained the specified revisions. (254/82-05-01; 265/82-06-01)

6. Planning, Preparation, and ALARA

Since previously reported in Inspection Reports No. 50-254/81-18; 50-265/81-18, additional ALARA related activities have occurred, including:

- a. A new computer based dose accountability system has been instituted, replacing the previous REP system. The new system includes a dosimeter card which is filled out daily by individuals who enter controlled areas. The completed card includes name, RWP number, time, and dose in and out, date, and film badge number. Information from the card is entered into the dose accountability system daily.
- b. The ALARA Coordinator reviews work requests each morning at a plan-of-the-day meeting. The review is performed to identify work which should receive ALARA considerations. Work requests which are hand-carried through the review process to expedite work may not be reviewed by the ALARA Coordinator, or a rad/chem representative, because there is no requirement to do so. Also, there is no requirement for ALARA review of proposed plant modifications. These matters were discussed with the licensee and will be further reviewed during future inspections.
- c. The ALARA Coordinator routinely reviews terminated RWPs to identify ALARA related concerns which should be factored into future similar work.

7. External Exposure

The licensee was about mid-way through a refueling and maintenance outage on Unit 1. The outage includes some major activities such as In-Service-Inspection (ISI), sparger nozzle replacement, hanger installation, and replacement of a portion of the reactor water cleanup system piping. The total exposure to personnel for 1982 through early September, when this outage began, was about 740 person-rems. Contributing to this exposure was a several week unplanned outage on Unit 2 to partially replace and partially repair some reactor water cleanup system piping. Thus far in this outage, about 2560 person-rems have been accumulated. Major contributors thus far are: hanger installations work (700 person-rems); sparger work (350 person-rems), and ISI work (140 person-rems). While the sparger job is nearing completion,

much work remains to complete hanger installations. Replacement of some reactor water clean-up system piping had not yet begun. Due to previous experience on Unit 2, and ALARA efforts, it appears the sparger work on Unit 1 will be completed with about 40 percent less exposure than similar work done on Unit 2, while average radiation levels were comparable. The extensive maintenance activities, along with the elevated radiation levels throughout the reactor water system associated with the history of high corrosion products (primarily cobalt-60), will likely result in a high cumulative exposure for the outage and the calendar year.

Review of licensee records showed that only eight individuals have exceeded two rems whole body exposure (2.38 rem maximum) during the current calendar quarter, and no individual has exceeded five rems for the year. The highest exposure for the year to date was 4.66 rems received by a GE contract employee. The licensee continues to use the daily exposure data and alert list which are based on the most recent (normally every two weeks) film badge results and summation of subsequent daily dosimeter readings. Film badges for individuals approaching specified control levels are processed more frequently. The licensee applies a multiplication factor of 1.5 to daily dosimeter readings used in the daily exposure updates. This serves as a precaution against overexposure due to differences between dosimeter data and the subsequent "official" film badge data.

The inspectors reviewed the licensee's methods of obtaining past exposure history information for use in completing NRC form 4s for new permanent employees and contractors. In general, the licensee's method of verification of past personal exposures appears acceptable. However, the licensee's practices could allow acceptance of unsubstantiated previous dose information provided in certain circumstances. The inspectors discussed with the licensee the need to verify previous dose information which is not substantiated. The licensee agreed to review this matter and take necessary corrective actions.

No items of noncompliance or deviations were identified.

#### 8. Internal Exposure

Review of selected airborne surveys and whole body count data showed no indication of exposures approaching the 40 MPC-hour control measure. Whole body count data was reviewed for about 2100 counts conducted in 1982 on company and contractor personnel. Included were some counts conducted in the early part of the current outage. The inspectors also reviewed an airborne activity problem that existed for several hours in the reactor building on October 6-7, 1982, due to temporary shutdown of the ventilation system for maintenance. The event resulted in potential airborne activity exposure to about 72 people. Due to minor levels of external contamination on some of these individuals, elevated whole body counts were initially observed. Following decontamination efforts, subsequent counts diminished.

Review of airborne activity survey data collected during and following reactor head removal showed no evidence of significant airborne iodine activity.

No problems were identified in a cursory review of the respiratory protection program.

No items of noncompliance or deviations were identified.

9. Posting and Control

Postings and controls for radiation and high radiation areas, airborne activity areas, and contaminated surface areas of the plant were checked during plant tours. Several instances of rope barriers being down and signs for contaminated areas not being readily observable due to physical conditions or location of the signs, were noted. The need for some attention to rope barriers and postings was discussed at the exit meeting.

No items of noncompliance or deviations were identified.

10. Material Control

The inspectors reviewed the licensee's methods and procedures for movement and control of radioactive material and potentially contaminated material within the controlled area and for removal from the controlled area. An RCT is stationed at the trackway exit from the controlled area to ensure that exiting individuals use the portal monitor provided at that location, to survey items being removed from the controlled area for contamination, and to provide clearance tags for releaseable items. As a precaution, a system is also provided for surveying trash generated in "clean" areas of the plant before being released for disposal. All trash from the controlled area is considered contaminated and packaged for transfer and disposal at a licensed burial facility. Licensee efforts to minimize the quantity of contaminated trash from the controlled area are essentially unchanged from that described in previous inspection reports.

No items of noncompliance or deviations were identified.

11. Effluent Control Instrumentation

The inspectors reviewed records of quarterly calibrations performed on the plant chimney and reactor building ventilation duct monitoring systems during CY 1982. Calibrations, using plant gases, appear to have been performed at the frequency required by Technical Specification 4.8.A. However, the inspector noted that no acceptance criteria were established to aid in identification of abnormal deviations in calibration results. The inspectors discussed with the licensee the desirability of establishing such acceptance criteria. The licensee stated that acceptance criteria would be established.



The inspectors reviewed records of quarterly calibrations performed on the liquid effluent release monitor during 1982. Calibrations, performed using liquid solutions containing Cs-137 in a mockup configuration, have been performed at the frequency required by Technical Specification 4.8.D.

No items of noncompliance were identified.

12. Testing of Air-Cleaning Systems

The inspectors reviewed records of performance testing of the Standby Gas Treatment System required by Technical Specification 4.7.B.2. In-place efficiency testing of HEPA filters and carbon beds were performed as required during the current and previous outage with collection efficiencies meeting requirements. Testing of charcoal adsorber test canister was performed as required; collection efficiencies met requirements. Automatic initiation testing, last performed during December 1981, is scheduled to be performed during the current outage. Testing of inlet heaters is being performed as required.

No items of noncompliance were noted.

13. Transportation

The inspectors reviewed records maintained by the licensee of 19 radwaste shipments of LSA material made in July 1982 to the radwaste burial facilities at Barnwell, South Carolina and Richland, Washington. The shipments included metal bins, boxes, and 55-gallon drums containing such materials as compacted wastes and solidified spent resins. Drums, in general, were shipped in 14-drum certified shipping casks. Records appeared to contain required information, including signatures. Records included: a copy of the shipment maintenance instructions, signed by the truck driver; shipment description; individual package and transportation vehicle survey results; signed certification regarding the shipment; and the six page radioactive shipment checklist. The latter identified (where applicable) the cask certificate of compliance, cask loading procedure, procedure used for determining curie content, completion of surveys, and signed concurrence by the QA inspector for release of the shipment.

No items of noncompliance or deviations were identified.

14. Status of NUREG-0737 Items

a. Extended Range Noble Gas Effluent Monitor (Task II.F.1.1)

As discussed in Inspection Report No. 50-254/82-15; 50-265/82-17, the calibration performed on the low range detectors of the SPING-4 monitoring systems appeared satisfactory, but the calibration performed on the medium range detectors appeared unsatisfactory due to not adequately checking linearity of response. The licensee has since performed a linearity check of the medium range detectors

using solid and liquid Cs-137 sources. This check covered the bottom third, middle, and upper third of the scale. The results of the linearity check indicate that the detector response is relatively linear. The inspectors have no further concerns at this time regarding the low and medium range detectors.

For the high range detectors, one vendor has now completed all nine gas "calibrations" (three source strengths each of krypton-85, xenon-127, and xenon-133) to determine the energy dependence of the monitors. From a separate vendor, the licensee had just received the calculational procedures developed to convert instrument readings to release rates per unit time (based on exhaust airflow considering radionuclide spectrum distribution as a function of time after shutdown). The licensee was in the process of reviewing and evaluating these procedures. The licensee has committed to complete this item by December 1, 1982.

The extended range noble gas effluent monitor remains an open item pending completion of the high range calibration.

b. High Range Iodine and Particulate Effluent Sampling and Analysis (Task II.F.1.2)

The licensee stated that due to further delays in receipt of the Victoreen accident range particulate and iodine shielded sampling system, the implementation date for this system will be delayed six months to July 1, 1983. The licensee submitted a letter on October 14, 1982, to NRR, Division of Licensing, advising of the revised implementation date.

The high range iodine and particulate effluent sampling and analysis system remains an open item pending delivery and installation of the shielded sampling system.

c. Containment High Range Radiation Monitors (Task II.F.1.3.)

The Shepherd calibrator needed for the source calibration was received from the vendor after this inspection. The licensee has committed to complete the source calibration by December 1, 1982. The electronic calibration has been completed.

The containment high range radiation monitor remains an open item pending source calibration.

15. Exit Interview

The inspectors met with licensee representatives (denoted in Section 1) at the conclusion of the inspection on October 29, 1982. The following matters were discussed:

- a. Purpose and scope of the inspection.
- b. The licensee agreed to review the rope barrier and posting situations in the plant and provide attention where needed. (Section 9)



DIVISION: DETP

Branch: TPB

[Jo 645]

FACILITY \_\_\_\_\_

Inspector \_\_\_\_\_

TRANSMITTAL LETTER AND REPORT (Facilities)

4.3 Letter to licensee (original) w/inspection report & Notice of Violation

FOR: Plant Managers/others  
Intervenors  
RIII - PRR

8 Letter to licensee (concurrence) w/inspection report & Notice of Violation

FOR: Inspector  
Section Chief  
RIII FILES (docket #'s)  
MIS  
Resident Inspector  
DPRP  
DETP

1 Report Only

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THANK YOU LETTER

       Letter to licensee (original) Only

FOR: Plant Managers/others

       Letter to licensee (original) w/licensee's letter dated \_\_\_\_\_ w/attachments

FOR: Intervenors  
RIII PRR

       Letter to licensee (concurrence) w/licensee letter dated \_\_\_\_\_ w/attachments

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