

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-295/85021(DRSS); 50-304/85022(DRSS)

Docket Nos. 50-295; 50-304

Licenses No. DPR-39; No. DPR-48

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

Facility Name: Zion Nuclear Power Station

Inspection At: Zion Site, Zion, IL

Inspection Conducted: June 17-21, 1985

P. C. Lovendale
Inspectors: P. C. Lovendale

7/19/85
Date

G. M. France, III
G. M. France, III

July 19, 1985
Date

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

7/19/85
Date

Inspection Summary

Inspection on June 17-21, 1985 (Reports No. 50-295/85021(DRSS);
50-304/85022(DRSS))

Areas Inspected: Routine, unannounced inspection of the radiation protection program including: organization and management controls, internal and external exposure controls, control of radioactive materials and contamination, facilities and equipment, transportation activities, and open items. The inspection involved 61 inspector-hours onsite by two NRC inspectors.

Results: One violation was identified in one area (failure to perform an evaluation of radiation hazards - Section 7).

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DETAILS

1. Persons Contacted:

A. Bless, Technical Staff
R. Cascarano, Technical Staff Supervisor
K. Garside, Radwaste Foreman
K. Graesser, Station Manager
*G. Kassner, Health Physicist
L. Lanes, Lead Rad/Chem Foreman
R. Neeley, QA Inspector
J. Nykoayko, QC Inspector
*J. Ramage, ALARA Coordinator
*T. Rieck, Superintendent, Services
*C. Schultz, Assistant Technical Staff Supervisor
F. Stahmer, Technical Staff
K. Wendel, Health Physicist

M. Holzmer, NRC Senior Resident Inspector
*J. Kish, NRC Resident Inspector

The inspectors also contacted other licensee employees including radiation/chemistry technicians, radiation/chemistry foremen, and members of the engineering and maintenance staffs.

*Denotes those present at the exit meeting.

2. General

This inspection, which began at 8:15 a.m. on June 17, 1985, was conducted to review the operational radiation protection program, including organization and management controls, training and qualifications, internal and external exposure controls, facilities and equipment, control of radioactive material and contamination, transportation activities, and open items. The inspectors conducted radiation and contamination surveys of selected plant areas using NRC and licensee survey instruments (Xetex 304-B and Eberline RM-14); readings were in general agreement with posted licensee data. Area postings were good. No access controls or procedure adherence problems were noted. Housekeeping appears to be improving but many auxiliary building areas need additional attention. Many minor leaks throughout the plant have been repaired, but continued attention is needed. Efforts to reduce the backlog of work requests for leak repairs are ongoing.

3. Licensee Actions on Previous Inspection Findings

(Open) Open Item (295/84015-01; 304/84015-01): Install local alarms on high radiation area doors. Six of the needed alarm systems have been received onsite. These systems will be installed on the doors that are most frequently found open.

(Open) Open Item (295/85005-02; 304/85005-02): High rate of lost film badges. The licensee is working on a system whereby the film badges will be kept with the workers' security badges. When implemented, this should greatly reduce the number of lost film badges.

(Open) Open Item (295/85005-04; 304/85005-04): Reduce the number of minor leaks in the auxiliary building. Many leaks have been repaired, but more work is needed.

(Open) Unresolved Item (295/85005-08; 304/85005-08): Technical adequacy of reported ventilation duct sealing methods. During this inspection, three representatives from NRR toured the plant to observe the control room ventilation duct sealant use and discussed the matter with licensee representatives. Guidance from NRR in this matter is needed to resolve the technical adequacy issue.

4. Radiation Protection Organization and Management Controls

The inspector reviewed the licensee's radiation protection organization and management controls for the radiation protection program, including changes in the organizational structure and staffing, effectiveness of procedures and other management techniques used to implement the program, experience concerning self-identification and correction of program implementation weaknesses, and effectiveness of audits of these programs.

The inspector discussed the organizational reporting chain of the Radiation Protection Manager (RPM) with the Services Superintendent. He agreed to try scheduling routine meetings with the RPM to allow the RPM an opportunity to relay his views regarding radiological controls problems that exist at the plant.

There are currently 35 radiation/chemistry technician positions authorized; all are currently filled. The radiation protection professional staff remains stable at the levels previously reported (50-295/84008; 50-304/84008). A radiological engineer with an MS degree in nuclear engineering has been added to the ALARA group staff.

The licensee's plans to separate the RCTs into two groups (chemistry technicians and radiation protection technicians) and implement a multi-step progression system for the technicians, is currently being pursued with the union. The licensee does not expect implementation before 1986.

A review of Radiation Occurrence Reports (RORs) written during 1985 to date revealed no significant programmatic weaknesses. Two incidents which resulted in workers exceeding their allotted daily exposure authorizations are discussed in Section 7.

No violations or deviations were identified.

5. Training and Qualifications

The inspectors reviewed the training and qualifications aspects of the licensee's radiation protection, radwaste, and transportation programs, including: changes in responsibilities, policies, programs, and methods; qualifications of newly hired or promoted radiation protection personnel; and provisions for appropriate radiation protection, radwaste, and transportation training for station personnel. Also reviewed were management techniques used to implement these programs and experience concerning self-identification and correction of program implementation weaknesses.

Training and qualifications of selected radiation protection staff members were reviewed including conformance to ANSI-N18.1-1971 selection criteria and Regulatory Guides 1.8 and 8.27. No problems were noted.

The health physicists have begun attending a two-week Westinghouse Systems Training course followed by one week of simulator training. The RCTs are also attending the systems training. This training should prove to be of significant value to the radiation protection group's understanding of plant systems and operations, and thereby improve the licensee's radiological controls program.

No violations or deviations were identified.

6. Internal Exposure Control and Assessment

The inspectors reviewed the licensee's internal exposure control and assessment programs, including: changes in facilities, equipment, personnel, respiratory protection training, and procedures affecting internal exposure control and assessment; determination whether engineering controls, respiratory equipment, and assessment of individual intakes meet regulatory requirements; planning and preparation for maintenance and refueling tasks including ALARA considerations; required records, reports, and notifications, and effectiveness of management techniques used to implement these programs and experience concerning self-identification and correction of program implementation weaknesses.

Whole body counting data, respiratory protection records, MPC-hour determinations, and air activity surveys for January 1985 to date were selectively reviewed; no problems were noted.

No violations or deviations were identified.

7. External Exposure Control and Personal Dosimetry

The inspectors reviewed the licensee's external exposure control and personal dosimetry programs, including: changes in facilities, equipment, personnel, and procedures; adequacy of the dosimetry program to meet routine and emergency needs; planning and preparation for maintenance and refueling tasks including ALARA considerations; required records, reports, and notifications; effectiveness of management techniques used to implement these programs and experience concerning self-identification and correction of program weaknesses.

A planned change to the licensee's use of NRC Form-4s for licensee employees was discussed. The licensee plans to maintain a hardcopy Form-4 on file for each CECO employee at only one licensee site in the future. The information from the Form-4 is entered in the licensee's computerized dose records system and therefore readily retrievable by all licensee sites. The change will eliminate the current practice of completing hardcopy NRC Form-4s when CECO employees temporarily visit other CECO sites. An employee who visits another nuclear facility outside the Commonwealth Edison system will still be required to update his Form-4 upon his/her return to a CECO facility. Persons who are not expected to exceed 312 mrem during a quarter will not be required to fill out a Form-4. This proposed change acceptably meets NRC regulatory requirements to know worker doses from previous quarterly and lifetime exposures.

Exposure records of plant and contractor personnel for January 1985 to date were selectively reviewed. No exposures greater than 10 CFR 20.101 limits were noted. Total exposure for 1985 through June 9, 1985, was about 750 person-rems. Of this, about 740 person-rems are attributable to the Unit 1 outage. The initial person-rem estimate for the outage was about 470 person-rems, but this estimate did not include a large amount of dose from work on a loop stop valve (82 person-rems) and other originally unsheduled work. Because of the large amount of dose received during the outage, the licensee estimates that their annual dose for 1985 will be about 1300 person-rems. This is significantly higher than the licensee's previous estimate of 1000 person-rems and is about equal to the licensee's average dose over the preceding five years (1360 person-rems).

The inspector reviewed two incidents which resulted in workers exceeding their authorized daily exposure totals. The first incident occurred on February 12, 1985, while workers were installing portable shielding on the reactor head. While performing his rounds in containment, an RCT stopped to check exposure rates to the workers installing shielding on the reactor head. The RCT observed that the exposure rates to the heads of two of the workers were higher than the exposure rates to the worker's chests where their dosimetry was placed. Exposure rates to the head were determined to be between 350 and 825 mrem/hr. Exposure rates at the chest were determined to be between 80 and 350 mrem/hr. Corrections to the two workers' exposure records resulted in assignment of about 570 mrem for their daily total, which exceeds their authorized daily exposure of 300 mrem.

The licensee's review of this incident revealed that the radiation work permit (RWP) for this work specified intermittent RCT coverage of the work but did not specifically require that an RCT be present at the start of work. Although the RWP survey appeared complete, placement of the dosimetry for the job was not readily apparent based on the survey alone due to the unpredictable positions of the workers. As corrective action, the licensee has instructed the ALARA group to include a statement on RWPs for similar jobs that will require RCT attendance at the start of the job to ensure proper dosimetry placement. However, it appears that a longer term solution is needed such as a procedure revision that would require that the RCT be in attendance at the beginning of all jobs which utilize intermittent RCT coverage to verify working area dose rates and correct dosimetry placement. This matter was discussed at the exit meeting.

The second incident occurred on April 22, 1985, while a maintenance crew was in the process of cleaning the flange around the reactor head. Prior to entry of the workers into the cavity area, a survey was conducted by an RCT. The results of this survey were verbally communicated to another RCT located on the refueling floor. The doses reported were 2.1 R/hr at the vertical plane of the outer edge of the flange and 5 R/hr at the inner edge of the flange (about 12 inches). Dosimetry on the workers included a film badge and self-reading dosimeter on the head and an alarming dosimeter on the shoulder. The RCT on the refueling floor incorrectly assumed that the working level for the workers was 2.1 R/hr and provided timekeeping for the first crew to enter the area based on that exposure rate. When the first crew exited the area, the RCT read the alarming dosimeters from the workers' shoulders and noted that all the exposures were less than the authorized 300 mrems. The self-reading dosimeters from the workers' heads were not read at that time. The second crew entered the cavity area and the RCT again used 2.1 R/hr as the working dose rate. When the second crew was finished, the self-reading dosimeters from the workers' heads were read and it was found that five of the six workers had exceeded their authorized dose. The maximum dose received was about 420 mrems.

The licensee's review of the incident revealed that the actual working dose rate for the workers was about 3 R/hr since the workers' heads were frequently located between the outer and inner edges of the flange. As in the incident which occurred in February, the licensee failed to verify the actual work area dose rates at the start of work and, as a result the dosimetry that was used for timekeeping verification was incorrectly positioned.

Failure to properly evaluate (survey) the work area to determine the correct dose rate for timekeeping and dosimetry placement purposes, is a violation of 10 CFR 20.201(b), which requires evaluations of radiation hazards present. (295/85021-01; 304/85022-01)

One violation and no deviations were identified.

8. Control of Radioactive Materials and Contamination, Surveys, and Monitoring

The inspectors reviewed the licensee's program for control of radioactive materials and contamination, including: changes in survey methods, practices, equipment, and procedures; adequacy of review and dissemination of survey data; effectiveness of methods of control of radioactive and contaminated materials; and management techniques used to implement the program and experience concerning self-identification and correction of program weaknesses.

The licensee has reduced the total floor space that is contaminated (not including the auxiliary building cubicles) to about 5000 square feet. At the beginning of the inspection the inspectors toured the auxiliary building with the Services Superintendent and pointed out several areas which need attention and several leaking valves which had been leaking for long periods of time or that had not yet been identified as needing repair (no work request written). By the end of the inspection, many of the identified problems had been corrected.

No violations or deviations were identified.

9. Facilities and Equipment

The inspector toured radiation protection facilities, observed radiation protection equipment in use, and discussed plans for improving access control facilities and equipment with the health physics staff.

No violations or deviations were identified.

10. Transportation Activities

The inspectors reviewed the licensee's transportation of radioactive materials program, including: determination whether written implementing procedures are adequate, maintained current, properly approved, and acceptably implemented; determination whether shipments are in compliance with NRC and DOT regulations and the licensee's quality assurance program; determination if there were any transportation incidents involving licensee shipments; adequacy of required records, reports, shipment documentation, and notifications; and experience concerning identification of programmatic weaknesses.

The inspector observed a radioactive waste shipment being prepared and surveyed for shipment to a licensed burial site for disposal in accordance with Procedure RP 1520-4. No problems with the survey or quality assurance activities were noted. However, the area used to perform the various shipment preparation tasks was poorly lighted and housekeeping in the area was poor due primarily to construction in the area.

A review of selected shipping records revealed several instances where the health physics reviewer block on the shipment survey sheet had not been signed. This matter was discussed with the health physicists who stated that corrective actions would be taken to minimize future instances. No other shipping problems were identified.

No violations or deviations were identified.

11. Unplanned Gaseous Release on December 11, 1984

During routine valve stroking testing on Unit 1 on December 11, 1984, the licensee noted an increase on the auxiliary building noble gas effluent monitor R-14 response. After observing that R-14's reading stayed elevated and remained relatively flat, the licensee investigated the leak-off of the valves that had been stroked and identified a valve packing leak-off flow on a boron injection valve. The licensee closed a valve stem packing leak-off isolation valve terminating the release. The leak-off drains to an open reactor building sump which allowed an airborne release. The duration of the unplanned release was about four and one-half hours. Apparently the valve packing had failed from repeated use; the valve was repaired.

The licensee calculated a maximum noble gas release rate of about 18,000 microcuries per second (30 percent of the instantaneous release rate limit), and a total release of about 13 curies. No problems with the licensee's response or quantification was noted.

No violations or deviations were identified.

12. Exit Meeting

The inspectors met with licensee representatives (denoted in Section 1) at the conclusion of the inspection on June 21, 1985. The inspector summarized the scope and findings of the inspection. The inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection. The licensee did not identify any such documents/processes as proprietary.