

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-237/90012(DRSS); 50-249/90011(DRSS)

Docket Nos. 50-237; 50-249

Licenses No. DPR-19; DPR-25

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

Facility Name: Dresden Nuclear Power Station, Units 2 and 3

Inspection At: Dresden Site, Morris, Illinois

Inspection Conducted: March 27 through April 10, 1990

Inspectors: M. A. Kunowski
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April 27, 1990
Date

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April 22, 1990
Date

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Radiological Controls and
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April 27, 1990
Date

Inspection Summary

Inspection on March 27 through April 10, 1990 (Reports No. 50-237/90012(DRSS); 50-249/90011(DRSS))

Areas Inspected: Routine, unannounced inspection of the radiation protection program (Inspection Procedure (IP) 83750) including audits and appraisals; changes in personnel; and training and qualifications of new personnel; external and internal exposure controls including ALARA considerations; and control of radioactive materials and contamination (IP 83726).

Results: Overall, the radiation protection program is adequate. Material condition improvements in Unit 2 and Unit 3 are continuing, and the number of personal contaminations in 1989 was low. However, several exposures exceeding administrative limits and an unexpected 7 Rem extremity exposure suggest weak prejob dose evaluations. In addition, an Unresolved Item (Section 7) was identified for the inadvertent release of contaminated equipment from the site.

DETAILS

1. Persons Contacted

G. Bergan, Nuclear Safety
+R. Burns, Training Department, Lead Instructor, Support Services
+E. D. Eenigenburg, Station Manager
+R. Falbo, Regulatory Assurance Assistant
+L. F. Gerner, Technical Superintendent
L. Jordan, Group Leader, Technical, Health Physics Services
+K. Kociuba, Nuclear Quality Programs (NQP) Superintendent
R. Lee, ALARA Coordinator
D. Marco, General Training Instructor
L. Oshier, Group Leader, Operations/ALARA, Health Physics Services
+K. W. Peterman, Regulatory Assurance Supervisor
@+D. Saccomando, Health Physics Services Supervisor
+J. Schrage, Nuclear Services Radiation Protection
+K. Yates, Nuclear Safety

S. DuPont, NRC Senior Resident Inspector
D. Hills, NRC Resident Inspector

+Denotes those present at the exit meeting on April 4, 1990.

@Present at telephone conference on April 10, 1990.

The inspectors also contacted other licensee and contractor personnel.

2. General

This inspection was conducted to review the licensee's operational radiation protection program. The inspectors reviewed records, interviewed personnel, and toured facilities. Dose rate and contamination surveys were also conducted.

3. Audits and Appraisals (IP 83750)

The inspectors reviewed reports of several major audits conducted since the previous NRC radiation protection inspection in May 1989 (Inspection Reports No. 50-237/89015(DRSS); 50-249/89014(DRSS)). The audits were in-depth with a good mix of programmatic and performance-based review activities. They were conducted by the onsite NQP group, the corporate radiation protection performance assessment group, and a major industry group.

The audits noted several program strengths including the station's personal contamination reduction efforts and the quality of the ALARA plan developed for the the Radwaste Upgrade Project. Significant findings included friskers rendered essentially useless for personal contamination surveying in several plant areas because of high background radiation levels, the large volume of low-level contaminated material stored onsite, and several inadequate pre-job and post-job ALARA reviews. The station

responses to audit findings were generally adequate, but observations by the inspectors during this inspection (Section 5) indicated the need for additional improvements in pre-job dose evaluations.

The inspectors also reviewed the licensee's radiological occurrence reports (RORs) to determine if programmatic problems exist and if deficiencies were promptly and adequately corrected. The first revision of the ROR program procedure has been developed by the corporate Nuclear Safety group and will be initiated soon. According to licensee representatives, the revision will enhance the ROR program. The procedure will be reviewed during a future inspection.

The inspectors reviewed RORs generated from July 1989 to March 1990. During this period, the licensee identified about fifteen incidents involving contamination controls, six incidents concerning high radiation area (HRA) controls, and several others involving administrative and exposure control problems. Of the RORs reviewed, an inordinately high number were the result of individuals not following radiation protection procedures or good health physics practices. Although the RORs were generally well investigated and timely, and adequate corrective actions were usually taken, more management attention is required to ensure that the corrective actions for RORs involving exposure control and procedural violations are sufficiently strong to prevent recurrence.

In addition, as mentioned above, several RORs concerned HRA control problems, such as missing HRA keys, and unsecured, unattended, or broken HRA doors. Although corrective actions were taken for each individual event, stronger actions will be necessary if these problems continue. This matter was discussed at the exit meeting and will be reviewed during a future inspection (Open Item No 50-237/90012-01(DRSS); 50-249/90011-01(DRSS)).

No violations of NRC requirements were identified by the inspectors.

4. Changes in Personnel and Training and Qualifications of New Personnel (IP 83750)

The inspectors reviewed major personnel changes and the training and qualifications of new personnel. No problems were identified. An experienced staff health physicist is on maternity leave and is not expected to return. A licensee representative stated that her position would be filled. Partially in response to audit findings, discussed above, a new ALARA Coordinator and an ALARA engineering assistant were selected. Discussions with these individuals and a review of some of their work indicated that they are knowledgeable, have extensive experience in nuclear power, particularly at Dresden, and are enthusiastic about their new positions. With strong station upper management support, the new ALARA staff should greatly improve the ALARA program. In addition, an individual with a Master of Science degree in Health Physics was added to the radiation protection staff, and an individual with an engineering degree and experience as a radiation protection technician

at Dresden, and as a quality assurance inspector at LaSalle was appointed supervisor of the quality assurance group at Dresden. These recent appointments should enhance the radiation protection program.

No violations of NRC requirements were identified.

5. External Exposure Control, including ALARA Considerations (IP 83750)

Station dose total for 1989, with contribution from two refueling outages and the Radwaste Upgrade project, was 1139 person-rem. The dose total in 1988 was 1407 person-rem.

Licensee representatives stated the exposures in 1989 and 1990, to date, were within regulatory limits. However, licensee records indicated three whole body exposures above administrative limits and one significantly higher (7 Rem) than expected extremity exposure occurred between December 1989 and February 1990. All were incurred during repair work on the Unit 2 cleanup heat exchanger system and involved elevated general area dose rates and localized hotspots or large dose rate gradients. Although identified by licensee audits and reviews (Section 3), the inspectors' review and discussion of these events indicated persisting weaknesses in pre-job dose evaluations that merit additional licensee attention. This matter was discussed at the exit interview and licensee followup will be reviewed in subsequent inspections (Open Item No. 50-237/90012-02(DRSS); 50-249/90011-02(DRSS)).

The inspectors conducted independent exposure surveys throughout the facilities. Observed measurements were in agreement with postings and licensee survey data, and high radiation areas were locked as required. The licensee recently implemented a hot spot tracking program and a general access exposure level reduction program. Discussions with licensee representatives and observations in the plant indicated that generally these programs were being effectively implemented; however, the inspectors observed several sections of the fuel pool cooling lines with affixed work request tags dating from January through March 1989, and measured elevated dose rates in the general areas adjacent to these lines. The work request tags were for installation of temporary shielding and installation of a connection for hydrolazing equipment. Discussions with licensee representatives indicated that shielding had not been installed because it would probably be in place for longer than the 6-month limit that the station's tech staff had set for temporary shielding. The delay for installation of the hydrolazing connection was attributed to the lack of welders certified to weld on the aluminum pipe of the cooling lines. Additional, timely management attention to reduce exposure from these lines is needed.

No violations of NRC requirements were identified.

6. Internal Exposure Control and Assessment (IP 83750)

The inspectors reviewed selected aspects of the licensee's internal exposure control and assessment programs, including: determination

whether engineering controls, respiratory equipment, and assessment of intakes meet regulatory requirements, and planning and preparation for maintenance tasks including ALARA considerations.

Air sample data were selectively reviewed. Air samples appear to be taken, counted, and evaluated in accordance with procedural requirements. The procedures appear adequate for use in determining air sample results, and type and placement of air samplers. Special air samples are collected to establish RWP requirements and job conditions, and it appears the licensee adequately uses air sample results to establish requirements for use of respirators and protective clothing.

The licensee uses a commercial standup whole body counter as the primary instrument to measure radioactive intakes and a commercial laydown system as back-up. The inspectors selectively reviewed the licensee's whole body count (WBC) procedures, the WBC facility and equipment, and discussed the program with health physics (HP) personnel. The inspectors also reviewed the results of the calibration performed on the counters by the vendor in June 1989; no problems were identified.

The inspectors requested a member of the HP staff to use Procedure DRP 1340-5, Revision 2, "Calculation of MPC-Hours (Maximum Permissible Concentration-Hours) and Organ Dose Based on Whole Body Count Data from Acute Uptakes," to convert WBC data to MPC-hours from an example given by the inspectors; the results of the staff's conversion was correct. A review of WBC results for 1989 through February 1990 indicated no intakes in excess of the 40-hour control measure.

Selected aspects of the licensee's respiratory program were reviewed. To ensure that only qualified workers receive respirators, workers' authorization information include respirator qualifications, proof of required training, and expiration date. Provisions are made during the issuance and return cycle for MPC-hour accountability. The respiratory program appears adequate.

No violations of NRC requirements were identified.

7. Control of Radioactive Materials and Contamination (IP 83750 and 83726)

The inspectors reviewed the licensee's program for control of radioactive materials and contamination including: adequacy of supply, maintenance, and calibration of contamination, survey, and monitoring equipment; adequacy of review and dissemination of survey data; and effectiveness of methods of control of radioactive and contaminated materials.

Several contamination control initiatives have been implemented since the previous NRC HP inspection (Inspection Reports No. 50-237/89015(DRSS); 50-249/89014(DRSS)) which include, relocation of routine hot shop work to the radiologically controlled area (RCA), establishment of a tool storage area on the D1 and D2/3 turbine decks, and establishment of a tool decontamination station within the RCA. These areas were visited;

no problems with design or use were noted. The licensee's continuing initiatives to control contamination and maintain the cleanliness of the operating station appear effective. The number of personal contamination events has been reduced from 1,786 in 1986 to 215 in 1989; of 40 smears taken at different locations by the inspectors, none was above 100 cpm/100 cm².

The inspectors selectively reviewed the licensee's investigation of personal contamination events (PCEs) and hot particle events. No overexposures have occurred as a result of these events. The inspectors reviewed the licensee's investigation and dose calculational methods; no problems were noted. The licensee investigates each PCE; the investigation includes interviews with the individual and a review of related work activities. For each hot particle event, a skin dose assessment is also performed. 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. Licensee and NRC calculations were in good agreement.

The inspectors reviewed monitor alarm setpoint methodology, and functional tests and calibration procedures for the RCA exit friskers (PCM-1Bs) and the gatehouse portal monitors. The required tests and calibrations appeared to have been performed in accordance with the applicable procedures. The PCM-1Bs are set to alarm at a nominal 5000 dpm/100 cm² (i.e., 2.5 nanocuries); operational source checks are made using a nominal 4-nanocurie cobalt-60 source. A more appropriate check source would be in the range of 2.5 nanocuries, the point at which the unit is set to alarm. This was discussed with a licensee representative who stated that the source and the procedure would be changed accordingly.

The inspectors also reviewed the circumstances of an incident where Dresden inadvertently shipped contaminated equipment as noncontaminated equipment to the Braidwood station. In February 1990, four drums of supposedly uncontaminated scaffold connectors (knuckles) were sent by Dresden to Braidwood. Personnel at Braidwood who were sorting the knuckles found four knuckles labeled as radioactive material. A subsequent survey by Braidwood HPs determined that they were not contaminated, but contamination was found on two other knuckles. One had 50000 dpm fixed and 2000 dpm smearable contamination; the other had 5000 dpm fixed and 1000 dpm smearable contamination. The contamination on both knuckles was limited to an approximately 25 cm² area on an inner surface. The remaining knuckles, the drums, and the workers who did the sorting were surveyed and found to be free of contamination. Dresden's investigation determined that the drums had been surveyed prior to release from Dresden, but the knuckles had not. The failure to survey the knuckles is contrary to Procedure DRP 1480-1, Revision 8, "Contamination Surveys." In addition, the failure to remove the radioactive material warning labels from the non-contaminated knuckles is contrary to Procedure DRP 1160-3, Revision 4, "Radiological Signs, Labels, Signals and Controls." This problem will be tracked as an Unresolved Item pending further NRC review (No. 50-237/90012-03(DRSS); 50-249/90011-03(DRSS)).

One Unresolved Item was identified.

8. Station Exit Controls (IP 83726)

During this and other NRC HP inspections, it has been observed that while there are many locations where final personal contamination surveys can be performed before exit to the gatehouse, under normal conditions only one location has a radiological control station (the Unit 2 trackway) which is manned only during the day shift. The other exit locations are equipped with whole body frisker booths and do not have HP technicians in attendance. During major outages, the Unit 2 station is manned only during the day and afternoon shifts, and the Unit 3 trackway exit is manned during all three shifts. Exit locations which are not manned do not provide as good a quality personal contamination and equipment control as those which are manned. Although the licensee has recently reduced the number of exit locations at the station it appears there remains a disproportionately large number of these locations compared to other Region III nuclear plants. This practice could lead to degradation of the licensee's contamination control program if significant numbers of personnel are allowed to exit the controlled area via the other locations. This matter was discussed with the health physics supervisor and will be reviewed in future inspections.

No violations of NRC requirements were identified.

9. Exit Meeting (IP 30703)

The inspectors met with the individuals, denoted in Section 1, at the conclusion of the onsite inspection, and summarized the tentative findings. Specifically, the inspectors discussed the incident involving the contaminated knuckles (Section 7); the good quality of several recent audits and reviews (Section 3); the concern about the nature of several RORs and the effectiveness of licensee corrective actions (Section 3); the noticeable improvements in plant material condition and contamination control (Section 7); the concern about administrative overexposures; and the timeliness of action regarding the relatively high rates from the fuel pool cooling lines (Section 5). In response to inspector questions, the licensee stated that the entire Unit 1 containment was controlled as a HRA because required access was minimal and the costs of erecting adequate HRA barriers throughout containment could be prohibitive. They also stated that protective clothing was required for contamination control.

On April 10, 1990, the inspectors informed a licensee representative (denoted in Section 1) that the 7-Rem extremity exposure and the administrative overexposures represented a weakness in pre-job dose evaluations and that a written reply would be requested describing the actions taken to improve job planning. The inspectors also discussed the status of efforts to reduce the number of exits from the RCA and the extent of HP coverage at these points (Section 8). The licensee acknowledged the findings and did not identify any inspection material or information as proprietary.