

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-461/89037(DRSS)

Docket No. 50-461

License No. NPF-62

Licensee: Illinois Power Company
500 South 27th Street
Decatur, IL 62525

Facility Name: Clinton Power Station

Inspection at: Clinton Site, Clinton, Illinois

Inspection Conducted: December 11-15, 1989

C. F. Gill/Son
Inspector: W. B. Grant

1/12/90
Date

C. F. Gill/Son
Approved by: W. Snell, Chief
Radiological Controls and
Emergency Preparedness Section

1/12/90
Date

Inspection Summary

Inspection on December 11-15, 1989 (Report No. 50-461/89037(DRSS))

Areas Inspected: Routine, unannounced inspection of the radiological protection program during power operation including: audits and surveillances; changes in organization personnel or facilities; planning and preparation; training of new personnel; exposure control; control of radioactive materials, contamination and surveys; maintaining occupational exposures ALARA; and shipping of low-level wastes for disposals. The inspector also reviewed the licensee's corrective actions following an inadvertent exposure incident.

Results: Two violations were identified (failure to evaluate the radiation hazard - Section 10; failure to post a High Radiation Area - Section 10).

DETAILS

1. Persons Contacted

*T. Arnold, Staff Engineer, Licensing and Safety
J. Bradburne, Supervisor, Radiological Engineering
D. Brown, Supervisor, Radiological Controls
*M. Dodds, Supervisor, Radiological Operations (Acting)
*K. Graf, Director, Operations Monitoring QA
J. Hill, Radiation Protection Shift Supervisor
*M. Hollon, Nuclear Program Assistance Groups
*G. Kephart, Supervisor Radiological Support
*D. Korneman, Supervisor, Outage Maintenance Support
M. Lewis, Dosimetry Supervisor
*L. McKay, Manager, Technical Services
*D. Miller, Director, Radiation Protection
*J. Palchak, Manager Nuclear Plant Support
*J. Perry, Vice President
*D. Reoch, Radiation Protection Technician
*T. Weaver, Director Licensing
*D. Wellman, Senior Radiation Protection Technician

*S. Ray, NRC, Resident Inspector

*Attended the Exit Meeting on December 15, 1989.

2. General

This inspection was conducted to review aspects of the licensee's radiation protection program during normal operation including changes since the last inspection, audits, exposure control, control of radioactive material, ALARA and shipping and transportation. During plant tours, no significant access control, posting or procedural adherence problems were identified. Housekeeping was good.

3. Licensee Action on Previous Inspection Findings (IP 92701)

(Closed) Open Item (No. 461/89037-03): Review RP improvement plan and actions to correct weaknesses identified in internal assessment of RP program. The improvement plan has been completed. Additional improvement plans have been developed and are underway. This item is closed.

(Closed) Unresolved Item (No. 461/89027-02): Investigate and correct weaknesses in procedures and training concerning operation of Technical Specification radiation monitors. Procedures have been revised and training on the revised procedures has been conducted. This item is considered resolved and closed. (LER 89-034-00)

4. Changes (IP 83750)

The inspector reviewed changes in organization, personnel; facilities, equipment, program, and procedures that could affect the occupational radiation protection program. The following organizational changes were noted. A radiological project engineer was promoted to Supervisor, Radiological Engineering; the ALARA coordinator was named acting Supervisor, Radiological Operations; the Supervisor, Radiological Controls terminated effective December 15, 1989; an experienced Dosimetry Supervisor was hired; a radiological staff engineer was named the Respiratory Protection Specialist; and a radiation protection technician was appointed to Dosimetry Specialist. The Supervisor, Radiological Controls and the ALARA Coordinator positions remain vacant as of December 15, 1989.

Six contract radiation protection technicians and a site supervisor have been added to the radiation protection staff for the current minor outage through the Spring maintenance outage.

All supervisors meet or exceed the qualification requirements listed in ANSI N18.1 - 1978 for the positions they occupy.

The licensee is installing a comprehensive in-house computer system (SR-31) which when complete in 1990 will allow computer controlled RCA access and egress, dose entry and documentation, RWP writing, record respirator issue and provide control and storage of dose and survey data from previous jobs for ease of data acquisition for ALARA.

The licensee has also purchased a stand up whole body counter (fast scan) and a Panasonic TLD system.

No violations or deviations were identified.

5. Audits and Surveillances (IP 83750)

The inspectors selectively reviewed the results of Quality Assurance (QA) audits and Quality Control (QC) surveillances conducted by the licensee since the last inspection. Also reviewed were the extent of the audits and surveillances, their thoroughness, and the qualifications of the auditors.

Two onsite QA audits, one of the radiation protection program and one of the REMP/ODCM were completed during this period. The radiation protection audit was completed in June 1989, resulting in six findings. The findings and responses were reviewed and no problems were noted. The REMP/ODCM audit covered training, procedures, testing, calculation, records, sample collection and technical specification implementations, resulting in four deficiencies and five recommendations. Corrective actions appeared adequate and were timely.

In October 1989, the licensee conducted an audit of TMA/Eberline, their thermoluminescent dosimeter (TLD) vendor, to evaluate the adequacy and effectiveness of TMA/Eberline's QA program. No problems were noted.

Approximately 25 QC surveillance reports were reviewed. Corrective action on findings appeared timely and adequate. The extent of the audits and surveillances and the qualifications of the auditors appeared adequate.

No violations or deviations were identified by the inspector.

6. External Exposure Control (IP 83750)

The inspector reviewed the licensee's external exposure control and personal dosimetry program, including: changes in the program; use of dosimetry to determine whether requirements were met; planning and preparation for maintenance and refueling tasks including ALARA consideration; and required records, reports and notifications.

The licensee's personnel dosimetry program has added a dosimetry specialist to its staff which now consists of a Dosimetry Supervisor, Dosimetry Specialist and five dosimetry clerks. Exposure records of plant and contractor personnel were selectively reviewed for 1989 through November. No exposures greater than 10 CFR 20.101 limits were noted.

As noted in Section 4 the licensee has purchased a complete Panasonic TLD system and intends to do their own personnel monitoring when it is installed and functional.

No violations or deviations were identified.

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

The inspector 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; effectiveness of survey methods, practices, equipment, and procedures; adequacy of review and dissemination of survey data; effectiveness of methods of control of radioactive and contaminated materials.

On August 29, 1989, a hot particle was found on the forearm of a radiation protection technician (RPT) who had been performing routine work in the radiologically controlled area (RCA). The RPT had worked in the RCA for approximately six hours in his street clothes moving and storing equipment such as elephant trunks from portable ventilation systems. Upon exiting the RCA he alarmed the PCM-IB whole body frisker once but passed on the second try and left the area, which is allowed by procedure. When the RPT tried to exit the plant the Gamma-10 portal monitor in the guard house alarmed. The RPT returned to the RCA where a whole body frisk using an RO-2 found the particle on his forearm. The particle was determined to be CO-60 approximately one-half microcurie (approximately 900,000 dpm).

The RPT's dose was calculated to be 10 rem to the skin of the extremity based on his total time in the RCA that day. The licensee conducted extensive testing to determine why the PCM whole body frisker had apparently failed to detect the hot particle. The actual particle was used in various tests including on a forearm phantom to determine if the PCM would detect the particle during various frisking positions. According to the licensee the PCM detected the particle during all tests. The particle had been sent to Pacific Northwest Laboratory (PNL) for exoelectron analysis. The inspector reviewed the licensee's actions, no problems were noted.

The licensee's reporting criterion for a personnel contamination event is 100 cpm above background on skin or clothing. Through December 15, 1989, 92 personnel contamination events were identified, 31 skin and 61 clothing.

No violations or deviations were identified.

8. Maintaining Occupational Exposures ALARA (IP 83750)

The inspector reviewed the licensee's program for maintaining occupational exposures ALARA, including changes in ALARA policy and procedures, worker involvement in the ALARA program, and establishment of goals and objectives and effectiveness in meeting them. Also reviewed were management techniques used to implement the program and experience concerning self-identification and correction of program implementation weaknesses.

The 1989 radiation dose through December 15, 1989, was approximately 370 person-rem of which about 285 person-rem was attributed to the 140-day maintenance/refueling outage. The 1989 ALARA goal was 350 person-rem.

Because the ALARA coordinator was promoted to Supervisor, Radiological Operations, the ALARA staff had been reduced to only an ALARA Planning Engineer. The inspector was assured that a contractor would be added to the ALARA staff in the near future to augment the staff until a replacement coordinator was named and an ALARA Engineer was added to the staff.

No violations or deviations were identified.

9. Transportation of Radioactive Materials (IP 83750)

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

Records of the 139 radioactive material shipments made during 1989 to date were reviewed. These shipments included DAW, solidified waste, contaminated equipment radioactive sources, chemistry samples and contaminated laundry. No problems were noted.

No violations or deviations were identified.

10. Event Description - Inadequate Survey of High Radiation Area (IP 93702)

On December 5, 1989, two maintenance workers were allowed to enter the WE filter pit to erect scaffolding, even though an adequate survey of the pit area had not been conducted. The worker's doses after completion of the work, as measured by the TLD's they were wearing, were 183 millirem and 166 millirem whole body.

On December 3, 1989, with the plant at 65 percent power, RWP 89001139 was written to remove and inspect WE Filter C. The RWP included removal of the shield plugs from above the WE filter pit. Prior to the plug removal, the pit was inaccessible; therefore, no surveys were conducted. Although historical data from prior entries to this pit were available, they were apparently not reviewed.

On December 4, 1989, the shield plugs were removed; however, entry into the pit was delayed for the rest of the day while awaiting clarification of confined space entry requirements (nonradiological) which had been recently changed. Following removal of the plugs, a Radiation Protection Technician (RPT) performed a cursory survey by extending a teletector probe about 6-8 feet into the 20-30 foot deep pit. The RPT reported a reading of less than two millirem/hr. However, this survey result was not documented until December 5 and the licensee was unable to duplicate the results during later surveys.

Late in the afternoon on December 4, the requirements for confined space entry were clarified, but no entry into the pit was made. Between December 4 and December 5 there was a radiation protection (RP) shift turnover, but there apparently was no mention of the radiation survey status on the RWP. On December 5, 1989, at 0730, the two carpenters reported to access control to sign their Personnel Time Record (PTR) for work on RWP 89001139. The RP office technician only acknowledged the RWP had been issued for the work, and offered a copy of the RWP to the crew foreman and asked the carpenters if they had any questions about the RWP, while apparently failing to see that there was no survey data to support the RWP. At about 0830, a confined space air sample showed the air was satisfactory in the pit and the two carpenters entered to construct the scaffold. The carpenters were in full protective clothing and were wearing proper whole body dosimetry, including TLD's and 0-200 mr/hr self-reading dosimeters (SRD), as required by the RWP.

At approximately 0930 the carpenters completed their work and exited the pit. Their SRDs showed greater than 200 millirem and 175 millirem. The carpenters informed the RP office of the high dosimeter readings. The carpenters' TLDs were sent to a vendor for immediate processing and on December 6, 1989, whole body TLD doses were confirmed at 183 millirem and

166 millirem. When RP management was notified of the high SRD readings a detailed radiation survey of the work area was initiated and a licensee investigation of the event began. The failure to adequately evaluate the radiation hazard present in the WE filter pit prior to entry by the two workers was a violation of 10 CFR 20.201(b), which requires that: each licensee shall make or cause to be made such surveys as (1) may be necessary for the licensee to comply with the regulations in this part and (2) are reasonable under the circumstances to evaluate the extent of radiation hazards that may be present. (No. 50-461/89037-01)

Apparent Causes

RWP 89001139 was issued for work with no supporting radiological survey data. A PTR was also provided which constituted authorization for pit entry even though radiological conditions were unknown. Significant radiation fields had been seen on previous entries into the WE pits, but that fact was not recognized and the two millirem/hr dose rate from the December 4, 1989 survey with the teletector was not challenged by the duty Radiation Protection Shift Supervisor (RPSS) as unrepresentative.

The licensee's detailed followup radiation survey of the WE filter pit showed areas accessible to personnel in which the radiation field was 800 mrem/hr, which could cause personnel to receive in any one hour a dose in excess of 100 millirem. Although handrails had been installed at the edge of the pit, there were no markings or posting to indicate that high radiation levels existed. This is a violation of 10 CFR 20.203(c) which requires such "High Radiation Areas" to be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words "Caution - High Radiation Area." (No. 50-461/89037-02)

The shift turnover process was weak. The communication of pertinent information required to control work in progress failed.

During the conduct of the job briefing, it was not determined that an adequate survey had been made to support the work task. No guidelines on the content of job briefings existed.

Historical data was not consulted. Similar work on this filter and associated filters had previously occurred and associated survey data was available. However, there was no review of the historical data related to the performance of this task.

There was no hold point written in the RWP. Although the RWP was approved, additional surveys were required. There was no mechanism to identify to the RP office technician at the desk that additional surveys were required.

There were personnel errors in radiation protection. The initial radiological survey of the filter pit was inadequate, and the inadequacy was not recognized by the duty RPSS.

Corrective Action

The shift turnover sheet was revised to include jobs in progress to alert the on-coming crews of work in progress.

A Radiological Operations Group Work Instruction was implemented which provides guidelines for conduct of RWP briefings. The briefing is required to include a review of radiological survey data to ensure it is adequate for the assigned task.

11. Exit Meeting (IP 30703)

The inspector met with licensee representatives (denoted in Section 1) at the conclusion of the inspection on December 15, 1989, to discuss the scope and findings of the inspection. Included in the discussion were the two violations related to entry into the WE filter pit on December 5, 1989, and inspector concerns regarding staffing levels in the ALARA group. 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.

In response to certain matters discussed by the inspector, the licensee:

- a. acknowledged the apparent violations (Section 10);
- b. acknowledged the inspector concern regarding the staffing problems in the ALARA group (Section 8).