

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-461/89024(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: August-1-4, 1989

Inspector: *W. B. Grant*
W. B. Grant

8/17/89
Date

Approved By: *J. Foster for*
W. Snell, Chief
Radiological Controls and
Emergency Preparedness Section

8/17/89
Date

Inspection Summary

Inspection on August 1-4, 1989 (Report No. 50-461/89024(DRSS))

Areas Inspected: Routine, unannounced inspection of radiological protection, radwaste and transportation programs including: aspects of the licensee's operational radiation protection (IP 87750) and liquid, gaseous and solid radwaste management programs (IP 84750), including changes since the last inspection, audits and appraisals, external exposure control, ALARA, implementation of solid liquid and gaseous radioactive waste program and shipping of low-level waste for disposal. Also reviewed were open items (IP 92701) and an allegation concerning the licensee's dosimetry program.

Results: The licensee's radiation protection and radwaste management programs are good and continue to be effective in protecting the health and safety of workers and the public. No violations or deviations were identified.

DETAILS

1. Persons Contacted

- *K. Baker, Supervisor, I&E Interface
- D. Brown, Supervisor, Radiological Controls
- J. Brownell, Project Specialist, Licensing
- R. DeLong, Supervisor, Radiological Engineering
- M. Dodds, Radiological Project Engineer/ALARA Coordinator
- *R. Freeman, Manager, NSED
- *K. Graf, Director, OPS Monitoring
- *J. Greenwood, Manager, Power Supply
- *D. Hall, Senior, Vice President
- *S. Hall, Director, Nuclear Program Assessment
- *D. Holtzsch, Acting Manager, Licensing and Safety
- *G. Kephart, Supervisor, Radiological Support
- *D. Miller, Director, Plant Radiation Protection
- *J. Miller, Manager, Scheduling and Outage Management
- *R. Morgenstern, Director, Plant Technical
- *J. Perry, Assistant Vice President
- M. Reandeau, Radiological Staff Engineer
- *D. Wyatt, Manager, Nuclear Training

*R. Kopriva, NRC, Resident Inspector, LaSalle

The inspector also contacted other licensee and contractor personnel.

*Attended the exit meeting on August 4, 1989.

2. General

This inspection was conducted to review aspects of the licensee's radiation protection and radwaste management programs during normal operation including changes since the last inspection, audits, exposure control, control of radioactive material, liquid and gaseous effluents, solid radwaste shipping and transportation and ALARA.

During plant tours, no significant access control, posting, or procedure adherence problems were identified, and housekeeping was good.

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

(Closed) Open Item (461/88026-01): An unexpected increase (factor of 100) in the strontium-89 concentration was identified in the quarterly composite liquid radwaste analysis for the second quarter of 1988. This analysis was performed by a vendor. A review by plant staff and the analytical contractor determined that the initial Sr-89 value was incorrect and reanalysis determined a lower value that more closely matched previous results. An addendum to the Semiannual Effluent Report was issued. This matter is considered closed.

(Open) Open Item (451/88026-02): Evaluate the noble gas monitor results, compare grab sample results with FSAR assumed noble gas mix and establish a relationship between noble gas grab sample and off-line monitoring system results in order to properly quantify noble gas effluents. The licensee has revised Procedure CPS 7410.10, "Operation of Digital AR/PR Monitors" to require conformance with Regulatory Guide 1.21 which includes a periodic review of actual isotope mixes and adjusting of the effluent monitors calibration. A consultant has been contracted to perform this task. This matter remains open pending completion of the study and NRC review of the results.

(Closed) Open Item (461/88026-03): Establish a routine surveillance program to check for and quantify spent fuel pool liner leakage. Procedure CPS 3800.02 requires shiftly checks for deficiencies on 755' of the fuel building. This includes a specific check of the drain sight flow indicators for the containment pool liners. This matter is considered closed.

4. Changes (IP 83750, 84750)

The inspector reviewed changes in organization, personnel, facilities, equipment, program, and procedures that could affect the occupational radiation protection program.

The radwaste management staff, responsible for overall supervision of personnel assigned to the station for liquid radwaste processing, station water management, low level waste handling, and decontamination has recently been reorganized. The Supervisor, Radwaste, currently has three supervisors reporting to him: the Supervisor, Radwaste Utility/Decon, the Supervisor Radwaste Operations, and the Supervisor, Radwaste Programs. The Supervisor, Radwaste Utility/Decon will, when staffing is complete, supervise 21 workers and is responsible for solid waste handling, DAW processing, housekeeping, and decontamination. The Supervisor, Radwaste Operations supervises 20 workers and is responsible for liquid radwaste systems and equipment including the radwaste operations center (ROC). The Supervisor, Radwaste Programs supervises two people and is responsible for the Process Control Program (PCP), the solidification contractor and is the solid radioactive shipping coordinator. The new organization clearly defines supervisory responsibility and support activities.

Two additional radiation protection technicians have been hired. The position of Supervisor, Radiological Environmental has been filled.

All supervisors appear to meet or exceed the qualification requirements listed in ANSI N18.-1978 for the position they occupy.

No violations or deviations were identified.

5. Audits and Surveillances (IP 83750, 84750)

The inspector selectively reviewed the results of Quality Assurance (QA) audits and surveillances conducted by the licensee since the

last inspection. Also reviewed were the extent of the audits and surveillance, their thoroughness, and the qualifications of the auditors.

Two onsite QA audits, one of the radiation protection program and one of the radwaste program, were conducted during this period. The radiation protection audit was completed June 9, 1989 and had six findings. Responses to the finding are not complete at this time, however; none of the issues appear to be of major concern.

The radwaste audit was completed January 16, 1989 had two findings, which were answered adequately and on a timely basis.

The licensee conducted an audit of TMA/Eberline, their thermoluminescent dosimeter (TLD) vendor, in October 1988. The auditors observed that Eberline occasionally reported beta doses for Clinton personnel that appeared higher than actually received. Review of the data and discussion with Eberline personnel indicated that the TLDs were being processed correctly. However, the problem was reading beta energies using a two chip TLD. Eberline is developing a TLD which should be able to differentiate various beta energies. This should prevent future incorrect results being reported. (See Section 14)

Approximately 20 QC surveillance reports were reviewed. Corrective action on findings appeared timely and adequate. The extent of the audits and surveillances and the qualifications of auditors appeared adequate.

No violations or deviations were identified.

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 are met; planning and preparation for maintenance and refueling tasks including ALARA considerations; and required records, reports, and notifications.

The licensee's personnel dosimetry program remains essentially as described in Inspection Report No. 461/87028. Exposure records of plant and contractor personnel were selectively reviewed for 1989 through June. No exposures greater than regulatory limits (10 CFR 20.201) were noted. During the period, there were 73 requests for dose extensions above the station quarterly whole body administration guideline of 1.0 rem. The extension requests were approved to 1.2 rem.

As of the end of July 1989, approximately 1000 individuals were issued TLDs. This represents a decrease due to decreased manning after the recent refueling outage. The inspector selectively reviewed termination reports pursuant to 10 CFR 20.408/20.409 for personnel who terminated in 1989. No problems were noted.

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; and effectiveness of methods of control of radioactive and contaminated materials.

At approximately 11 p.m. on July 31, 1989, an unplanned forced outage plus a large water inventory (caused partially by water in-leakage into the radwaste system) caused water to backup in the floor drains on the 702' level in the radwaste building. The water contaminated about 33,000 square feet of the 55,000 square feet of the 702' level. Initial contamination levels ranged up to 12 mRad/hr. Floor areas were surveyed and roped off and posted as contaminated areas. No personnel contamination resulted. Decontamination efforts began on August 1, 1989 and the initial decontamination reduced the highest contaminated areas to 10,000 dpm/100 cm². Decontamination efforts are continuing.

Prior to the July 31, 1989 incident, the licensee was continuing to reduce the area of contaminated floors within the Radiation Control Area (RCA) following the outage.

The licensee's reporting criterion for personnel contamination event is 100 cpm above background on skin or clothing. Through July 1989, which includes a 140 day maintenance/refueling outage, 73 personnel contamination events were identified, 45 clothing and 28 skin. During the month of July 1989, 2 clothing and 0 skin contaminations were identified.

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 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 June is approximately 334 person-rem of which about 285 person-rem was attributed to the 140 day maintenance/refueling outage. The 1989 ALARA goal is 350 person-rem.

Since the end of the outage, the ALARA staff was reduced to the full time ALARA Coordinator and an ALARA Planning Engineer who works with the maintenance planners. The inspector has been assured that another full time ALARA Engineer will be added to the staff, but until that happens the ALARA group appears to be understaffed to implement normal (non-outage) ALARA activities, plan and prepare for the next outage and

to gather the data base of historical dose information for job planning and dose tracking necessary for an effective ALARA program. This matter was discussed with Station and Company management and will be reviewed during future inspections.

No violations or deviations were identified.

9. Liquid Radioactive Waste (IP 84750)

The inspector reviewed the licensee's liquid radwaste management program, including: determination whether liquid radioactive waste effluents were in accordance with regulatory requirements; adequacy of required records, reports, and notifications; and experience concerning identification and correction of programmatic weaknesses.

The licensee's liquid radwaste system, instrumentation, controls, and release pathways remain essentially as previously described (Inspection Report No. 461/87028). Liquid effluents are released on a batch basis (following sampling and analysis) to a single monitored liquid radwaste discharge line. The liquid radwaste effluent flow combines with plant service water flow and plant circulating water flow in the seal well prior to entering the discharge flume to Lake Clinton. The plant service water discharges continuously and is monitored (alarm function only) with a Process Radiation Monitor (PRM) prior to combining with the circulating water in the seal well.

Analyses of batch releases remains as previously described (Inspection Report No. 461/87028). The concentrations of each nuclide, as well as the actual discharge and dilution flow rate, are input into a computer program which provides the MPC fraction for each nuclide, the sum of MPC fractions, the allowable radwaste discharge flow rate, and the setpoint (above background) of the monitor on the discharge line; this monitor has alarm and isolation functions. Dilution flow provided by circulating water is not utilized in the release calculations. The inspector selectively reviewed release records for 1989 to date; no significant problems were noted. Analysis methods and frequencies appear to meet technical specification (T/S) requirements. T/S action statements for the liquid radwaste discharge monitor, considered temporarily inoperative, were met during effluent releases. Semiannual effluent reports were reviewed for the last half of 1988. About 85 millicuries of gross activity (excluding tritium) were released in liquid effluents during that period.

No violations or deviations were identified.

10. Gaseous Radioactive Wastes (IP 84750)

The inspector reviewed the licensee's gaseous radwaste management and effluent program, including: gaseous radioactive waste effluents for compliance with regulatory requirements; adequacy of required records, reports, and notifications; and experience concerning identification and correction of programmatic weaknesses.

Gaseous effluents are exhausted via the HVAC and SGTS stacks; containment vents and purges are exhausted via the HVAC system. The licensee quantifies gaseous releases under normal conditions from monthly stack grab samples for noble gas and weekly particulate filter and charcoal samples. The gaseous effluent measured by the HVAC and SGTS off-line monitoring systems are not used to quantify the noble gas releases reported in the semiannual effluent reports. The licensee has committed to periodically review the actual isotope mixes as determined by grab samples and to adjust the effluent monitor calibrations and setpoints based on the comparison of results as required by Regulatory Guide 1.21. A consultant has been contracted to perform this study.

The inspectors reviewed semiannual effluent reports for the last half of 1988 and selectively reviewed gaseous effluent release records for 1989 to date; no significant problems were noted. Technical Specification gaseous effluent collection and analysis requirements appear to be met. About 3300 curies of noble gas effluent were reportedly released from July 1988 through December 1988.

No violations or deviations were identified.

11. Solid Radioactive Waste (IP 84750)

The licensee's solid radioactive waste management program was reviewed, including: determination of whether changes to equipment and procedures were in accordance with 10 CFR 50.59; adequacy of implementing procedures to properly classify and characterize waste, prepare manifests, and mark packages; overall performance of process control and quality assurance programs; adequacy of required records, reports, and notifications; and experience concerning identification and correction of programmatic weaknesses.

In 1989, solid radioactive waste processing and shipping programs were substantially upgraded:

- The radwaste solidification process was changed from using 55 gallon drums and Bitumen, to using 170 Ft³ concrete solidified liners and dewatering resins. Through the use and shipment of larger containers the licensee was able to reduce the radwaste storage backlog from about 4200 cubic feet in early 1989 to about 900 cubic feet in July 1989.
- Contaminated protective clothing (PCs) is sent to a vendor for laundering thereby reducing the volume of water generated in the plant.
- A vendor was contracted to receive and dispose of the station's dry active waste (DAW). The DAW is shipped to the vendor in 92 Ft³ B-25 boxes or in 1352 FT³ Sea/Land containers. The vendor supercompacts the DAW prior to shipping it to the waste burial site. The use of a vendor and the large shipping containers enabled the licensee to effectively dispose of the large volume of DAW generated during the outage.

No violations or deviations were identified.

12. 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 are 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 radioactive material shipments made during the last half of 1988 and 1989 to date were reviewed. In the last half of 1988, the licensee made 19 shipments of radioactive waste as Low Specific Activity (LSA) materials in exclusive use vehicles. In 1989 to date, 107 shipments have been made. 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.

13. Instrumentation (IP 84750)

The inspector reviewed calibration and channel functional test procedures and results for process radiation monitors (PRM) on gaseous systems (main steam line radiation monitors and the air ejection-off-gas radiation monitors - post treatment). Calibration methods appear appropriate and meet technical specification frequency requirements.

Although not specifically reviewed during the inspection, the inspector was informed that the liquid radwaste discharge monitor was not operable. During the course of the inspection, repair attempts on the monitor were unsuccessful. The inspector verified that applicable technical specifications action statements were implemented for liquid discharges made during the time the monitor was out of service. No problems were noted.

No violations or deviations were identified.

14. Allegation Followup (AMS No. RIII-89-A-0080)

Discussed below are several specific allegations relating to the radiation protection program at the Clinton Power Station which were evaluated during this inspection. The evaluation consisted of record and procedure review and interviews with licensee personnel.

Allegation: The dosimetry clerical staff has been reduced from six to three personnel and the reduced staff may not be capable of performing required tasks as a result. Non-dosimetry

clerical tasks assigned to dosimetry clerks is not in keeping with the spirit of the licensee's March 6, 1987 response to a Notice of Violation.

Discussion:

In May 1989, the Generating Station Clerical Staff (Dosimetry Clerks) was reduced from six to three personnel. The reduction was a result of downsizing the Clinton staff. The dosimetry section's responsibilities include: collecting TLDs, shipping TLDs to the vendor, processing forms NRC-4 and 5, providing exposure termination reports and updating daily dose reports.

The inspector selectively reviewed Forms NRC-4 and NRC-5 for personnel issued dosimetry in 1989. As of August 2, 1989, all applicable NRC Form 5's, "Current Occupational External Radiation Exposures" were found to include radiation exposure information through the second calendar quarter of 1988 (ending June 30). Also, current quarterly exposure information equivalent to NRC Form 5 is available to the licensee through the vendor's monthly reports. Termination records were reviewed to determine compliance with termination reporting requirements to the NRC and to the employee. Records for individuals who were issued personal dosimetry and terminated employment in May or June 1989 were selectively reviewed. All termination reports reviewed were provided within the 30 days after the exposure of the individual had been determined or 90 days after termination (whichever is shorter), as required. Dosimetry personnel indicated that staffing limitations and other priorities were causing delays in filing records and in placing records in the vault for storage. In response to the Radiation Protection Staff concerns, an additional clerk/typist was added to the dosimetry staff in June and three additional positions including a dosimetry specialist and two Generating Station clerks have been approved and will be added. The licensee has committed to continue to evaluate staffing levels in the dosimetry group to assure the quality of work is not compromised.

Finding:

The allegation was not substantiated. The required regulatory functions of the dosimetry staff continue to be adequately performed. In addition, the staff size has been increased and will soon be returned to its former level.

Allegation:

No onsite TLD reading capability.

Discussion:

There is no regulatory requirement for onsite TLD reading capability. However, the licensee has provided funds for an onsite system in the 1990 budget.

Finding: The allegation was substantiated, however, there is no requirement for such capability.

Allegation: The thermoluminescent Dosimeter (TLD) used at the Clinton site is unable to adequately discriminate for Beta radiation.

Discussion: The licensee's dosimetry vendor periodically reports beta doses for Clinton Power Station personnel that appear to be higher than those actually received. Radiation protection management is aware of this situation and is determining what action is required. Licensee review of the data and discussions with their dosimetry vendor indicate that the TLDs are being processed correctly. The vendor is NVLAP approved. Inspector review of historical data indicates the situation occurs approximately one percent of the time. The typical beta doses reported range from about 100 mrad to 200 mrad with little or no associated gamma dose for the month. The licensee stated that given enough time and people to investigate the doses they could probably eliminate most of them. They do not have the time or the people so they are assigning the reported doses to the workers.

The vendor is developing a TLD which will be better able to differential various beta energies. The licensee has also funded for a onsite TLD system. Currently, there is no additional action which can be taken.

Finding: This allegation is substantiated. The TLD used by the licensee apparently does not adequately discriminate all beta energies, however; it is state-of-the-art. The licensee's corrective actions are adequate and conservative.

Allegation: The allegor brought his staffing concerns to the attention of his supervisors and also used the Quality Concern Hotline. The allegor received no response from the Hotline call.

Discussion: The Quality Control Hotline was established to receive, log, and answer quality concerns. The individual responsible for the hotline stated that they try to respond to hot line concerns in about ten days. He said the allegors anonymous concern was received on May 8, 1989 and sent to the Plant Manager the same day. A response, increasing the dosimetry staff size, was received by the hotline manager on July 21, 1989. The response was posted on Plant bulletin boards, which is the policy for anonymous concerns. The licensee's representatives said the delay in answering the allegor's concern involved additional staffing and probably took more time for approval.

Finding: This allegation was not substantiated.

15. Exit Meeting (IP 30703)

The inspector met with licensee representatives (denoted in Section 1) at the conclusion of the inspection on August 4, 1989, to discuss the scope and finding 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.