U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-461/85028

Docket No. 50-461 License No. CPPR-137

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

Facility Name: Clinton Power Station, Unit 1

Inspection At: Clinton Site, Clinton, IL

Inspection Conducted: July 15-19, 1985

Inspector: R. A. Paul for 8/8/85
Date

Approved By: L. R. Greger, Chief 8/8/85
Facilities Radiation Protection Section Date

Inspection Summary

Inspection on July 15-19, 1985 (Report No. 50-461/85028(DRSS))
Areas Inspected: Routine, announced inspection of preoperational radwaste and radiation protection programs, including: organization, staffing, and qualifications; ALARA; receipt of radioactive materials; internal and external exposure control program; procedures and preoperational tests of liquid and gaseous effluent, process, and area monitors; and the solid radwaste solidification system. Also reviewed was a radiography incident. The inspection involved 43 inspector-hours onsite by one NRC inspector.
Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

J. Brownell, Staff Specialist-Licensing
J. Funk, Supervisor-Radiological Operations
*J. Greene, Manager of Startup
D. Hillyer, Supervisor-Radiation Protection
*R. Haight, Corporate Health Physicist
*E. Kant, Assistant Manager-NSED
A. Mueller, Jr., Supervisor-Quality Technical Support
*J. Palchak-Supervisor ECCO
*J. Perry, Manager of Nuclear Programs Coordination
*F. Spangenberg, Director-Nuclear Licensing
*J. Wilson-Plant Manager

P. Gwynn, Reactor Projects Section Chief
*P. Hiland, Resident Inspector

The inspector also contacted other licensee employees and contractors including radiation protection technicians.

*Denotes those present at the exit meeting on July 19, 1985.

2. General

This inspection, which began at 11:00 a.m. on July 15, 1985, was conducted to review: the status of preoperational testing of the liquid, gaseous, and solid radwaste systems; the preoperational radiation protection program, including health physics staffing and radiation monitoring systems; and the status of FSAR and procedural changes. In addition, a review was made of the circumstances surrounding a radiography incident involving minor radiation exposure to four unmonitored personnel. Extensive tours of the licensee's facility were made during the inspection.

3. Licensee Action on Previous Inspection Findings

(Closed) Open Item (461/84009-02): Review of shielding and administrative controls for the fuel transfer system. The licensee has reviewed shielding for the fuel transfer system, and is developing radiological controls (surveys, procedures, etc.) for fuel transfer.

(Closed) Open Item (461/84026-02): Problems noted in certain procedures concerning content and intent of the procedures. These problems have been satisfactorily addressed by the licensee. The corrections were reviewed by the inspector; no additional problems were noted.

(Closed) Open Item (461/84004-17): On-the-job training (OST) for the radiation protection staff. The licensee continues sending radiation protection supervisors and technicians to operating plants to receive OJT during normal and refueling operations, and has recently made arrangements to include most of the professional staff.

4. Radiological Protection, Organization, Staffing, and Qualifications

Since the previous inspection (Report No. 50-461/85004), the licensee has appointed a new Plant Manager and a new Supervisor-Radiation Protection who is also the Radiation Protection Manager (RPM); the RPM reports to the Plant Manager. Also appointed was a new Supervisor-Radiological Operations who reports to the RPM. Both supervisors are qualified as RPM's as specified in ANSI/ANS 3.1-1978. Currently, there are five Radiation Protection Shift Supervisors, four are qualified as supervisors not requiring NRC Licenses as specified in Section 4.3.2 of ANSI/ANS 3.1-1978. In addition, there are three radiation helpers (with two open positions to fill) and thirteen radiation protection technicians; all meet the technician qualification requirements specified in ANSI/ANS 3.1-1978. The licensee intends to have at least fifteen technicians in the near future, as required by the FSAR. Also reporting to the Supervisor-Radiation Protection is an Assistant Supervisor-Radiation Protection and a Supervisor for Radiological Support and Radiological Engineering. Most of the engineer and supervisor positions have been filled.

The qualifications of the Supervisor-Chemistry, and the licensee's requested exception to the ANSI/ANS 3.1-1978 requirements for the person filling this position, is discussed in Inspection Report No. 50-461/85017.

No violations or deviations were noted.

5. ALARA

During a previous inspection (50-461/85004), it was noted that the analysis and findings of ALARA reviews were submitted to the ALARA Committee for consideration after the findings had been reviewed by the ALARA Coordinator. During this inspection, it was noted that the ALARA Committee had since suggested that many of the findings could be resolved by administrative action and that those findings should be sent to the specific department head involved with the ALARA finding. This action was taken by the licensee. However, it appears that more than fifty percent of the findings sent to the department heads were not returned to the ALARA Coordinator for further actions; therefore, the ALARA Coordinator could not review and re-submit the findings to the ALARA Committee. Other problems identified concern: the licensee's need to ensure that radiological controls and ALARA engineering practices and procedural requirements are part of the ALARA program for major radiation producing jobs; and that there is an awareness on the part of workers and first line supervisors for the need to employ radiological controls, good work practices, and ALARA for all jobs.

To correct the identified problems, the licensee has reorganized the Radiological Engineering Section and has hired a consultant to improve and strengthen the ALARA program. These matters were discussed at the exit meeting and will be further reviewed during future inspections. (461/84026-03)

No violations or deviations were noted.

6. Liquid Radwaste Systems Preoperational Test Procedures

The following is the status of the preoperational tests and test procedures for the liquid radwaste system:

Procedure No.	Procedure Title	Status
PTP-WY-01	Laundry Equipment Drain Radwaste Reprocessing and Disposal	Procedure approved, pre-op tests completed, and system released to plant staff
PTP-WE-01	Equipment Drain Radwaste Reprocessing and Disposal	Procedure approved, released for use, pre-op tests in progress
PTP-TE-01	Turbine, Off Gas, Radwaste Control and DG Building Equipment Drains	Procedure approved, pre-op tests completed, system released to plant staff
PTP-WF-01	Floor Drain Radwaste Reprocessing and Disposal	Procedure approved, released for use, pre-op tests to begin
PTP-WZ-01	Chemical Radwaste Reprocessing and Disposal	Procedure approved, pre-op tests completed, test results in review
PTP-RE-01	Containment Auxiliary and Fuel Building Equipment Drains	Procedures approved, pre-op test to begin
PTP-RF-01	Containment Auxiliary and Fuel Building Floor Drains	Procedures approved, pre-op test completed, test results in review
PTP-TF-01	Turbine, Off Gas, Radwaste, Control and DG Building Floor Drains	Procedures approved, pre-op test approximately 85 percent complete

No problems were identified during selective review of these test procedures by the inspector. The status of the testing program will be further reviewed during future inspections. (461/84001-02)

No violations or deviations were noted.

7. Liquid Effluent Process Radiation Monitors

The procedures for testing and calibration have been developed and approved. No preoperational testing or calibrations have been performed. Two of the six monitors have been functionally tested. This matter will be further reviewed during future inspections. (461/84026-01)

No violations were identified.

8. Radwaste Solidification System

During previous inspections, it was noted that the licensee was redesigning parts of the permanently installed radwaste solidification system to support portable solidification which will be used in lieu of the permanent system. The licensee is completing the hard piping installation from the permanent system to the portable system. The portion of the permanent system that will not be used has been mechanically isolated.

The portable system is owned by Associated Technologies Incorporated (ATI) and is a volume reduction/bitumen solidification system which uses an evaporator to remove free water from radioactive waste and mixes the remaining solids with a bitumen binder. Solidification occurs upon cooling of the binder. According to the licensee, no other ATI system is currently operating at nuclear stations in the United States. However, ATI claims that use of the system is commencing in other countries.

The systems will be tested by ATI in the latter part of 1985; the tests will include solidifying waste materials expected to be found in BWR waste streams (resins, sludge, etc.). Before the licensee approves use of the system, they will observe some of the tests and review test results to verify the system meets licensee acceptance criteria. The licensee also intends to perform an ALARA review of the installed system and associated piping and support accessories.

The licensee has revised the FSAR to incorporate the use of the portable system, and submitted to NRR the Process Control Program (PCP) for the system. The PCP requires NRR approval in accordance with Technical Specification 6.14. Based on NRR acceptance of the PCP, inspector review of the use of the PCP, and demonstration tests and ALARA review of the system, it appears the portable unit will function as described in the vendor's Topical Report ATI-VR-001-P which has been submitted to NRR.

During this inspection, a licensee representative and the inspector walked down selected portions of the recently installed hard piping which will support the portable unit. This piping is located in the storage facility of the radwaste building. Included in the walkdown was the truck bay area where the portable system will be located. During the walkdowns, special consideration was given to identifying potential radiological problems including; shielding requirements for that part of the installed piping system located in the truck bay area; possible effect of sky shine from the storage facility; provisions for contamination control in case of waste spillage; and provisions and methods for direct and smear survey and decontamination of high level solidified waste barrels. No plans have been made to provide shielding in the waste barrel monitoring and decontamination area, nor have provisions been made to monitor high level barrels remotely; with these exceptions, it appears the licensee has given adequate attention and taken sufficient actions to ensure acceptable radiological controls.

No violations or deviations were noted.

9. Radiation Monitors

No tests or calibrations of the main vent and SGTS monitors have yet been performed. Five of the six calibration procedures for the SGTS monitors, and four of the five calibration procedures for the main vent monitors, have been approved. The licensee intends to complete flush and hydro tests before starting the pre-op tests which are scheduled to begin in September 1985. The flush and hydro test procedures are being revised. To date, thirteen of the 46 Area Radiation Monitors (ARM's) have been calibrated and ten portable Constant Air Monitors (CAM's) have been functionally tested and calibrated. Selected calibration, checkout, and test procedures for portable ARM's, CAM's, and process monitors were reviewed by the inspector; no problems were noted. The results of the calibrations and tests will be reviewed at a future inspection.

No violations or deviations were noted.

10. Gaseous Radwaste System

To date there has been no pre-op testing of the system. The flush and hydro tests are to begin after the flush and hydro procedures have been revised. The results of the tests will be reviewed at a future inspection. (461/84009-01)

11. Exposure Control Program-External

The licensee intends to issue vendor TLD's and self-reading dosimeters (SRD's) for personal monitoring. The TLD's will be processed by the vendor each month. The TLD's will be distributed and collected at the guard house along with security badges. The SRD's will be read, recorded, and recharged by the radiation protection department. Procedures have been written which address personal dose limits, external exposure monitoring,

exposure control dose extension, visitor dosimetry, and exposure control. The inspector selectively reviewed these procedures; they appear sufficiently detailed to implement a good exposure control program.

The licensee will use Radiation Work Permits and the Authorized Personnel Time Records to track radiation doses for the station, individual tasks, work groups, and individuals. Overall trends will be recorded for collective doses, number of persons exceeding regulatory standards, internal and external contamination instances, and extent of contaminated area.

No violations were noted.

12. Exposure Control Program-Internal

The licensee will use two commercially available chair-type whole body counters. The counters include lung, trunk, and thyroid sodium iodide detectors, which through collimation can selectively count different sections of the torso. Data collected by a spectrum analyzer are processed to give total activity and percent of MPOB. Results are based on standard man parameters and are not corrected for height and weight variances. The system will be calibrated yearly; channel energy and efficiency checks are performed daily and in accordance with ANSI N343-1978 recommendations. Calibrations and checks will be done using vendor supplied phantoms with NBS traceable quantities of several isotopes. The four phantom sources will be used to generate efficiency curves as a function of gamma energies.

Procedures for operating the whole body counter are being revised. The facility in which the whole body counter is located has shower facilities, and friskers will be provided.

During this inspection, the inspector presented the licensee with several (practical) problems concerning the use of whole body count data, and converting the data to MPC-hours; no significant problems were noted with the licensee's computed results for the presented problems.

No violations or deviations were noted.

13. Receipt of Radioactive Material

The licensee has initiated twelve internal condition reports concerning problems encountered during receipt of licensed (mostly exempt quantities) radioactive material. Most of the condition reports identify violations of a licensee procedure (OAP19087.01) which requires that the radiation protection department; (1) be notified by stores personnel upon arrival of readily identifiable radioactive materials (2) take surveys within three hours after the material arrives; and (3) be given all known

information pertaining to the shipment prior to shipment. One of the condition reports identified receipt of an explosion detection device containing 1.05 curies of tritium, which was in excess of the licensee's byproduct license which permits possession of 500 millicuries of tritium. Upon receipt, the licensee informed the NRC Region III Byproduct Material Licensing Section who informed the licensee to keep the material locked in storage (which they already had done) and initiate an amendment to their license to increase the tritium possession limit.

During this inspection the licensee indicated to the inspector that recent corrective actions should strengthen this program. One of these actions consists of initiating a letter from the Vice President advising all persons who order and/or purchase radioactive material of their responsibility to so notify radiation protection. The licensee is also considering deleting the procedural requirement for surveying material three hours after receipt of the material. This matter will be reviewed during a future inspection. (461/85028-01)

No violations were identified by the inspector.

14. Review of Radiography Incident

The inspector reviewed the licensee's investigation of the circumstances surrounding a radiation exposure incident during a radiography operation in the containment building, involving four unmonitored craft workers (surveyors). The radiographic operations were conducted by U.S. Testing Company under NRC License No. 37-15445-02 which authorizes radiography at field locations.

Radiography was performed on a pipe joint on the 768 foot elevation of Containment on May 29, 1985. Radiation area boundaries were established from the 737 foot to the 803 foot containment elevations outside the drywell. The areas were evacuated and perimeter guards stationed at the area boundaries. U.S. Testing notified operations and Security that radiography was about to commence at the 768 foot elevation of containment outside the drywell. Bullhorn and gaitronics announcements were made at ten minute intervals prior to the first exposure. Two thirty second exposures were made, after which the source was secured and the lead radiographer returned to the darkroom to develop the film. After the film was developed, it was determined that more shots would be required. During this time, the perimeter guards and boundaries were maintained. Before exposing the source to take the second set of shots, the radiographer used the bullhorn to inform a perimeter guard located on the 781 foot elevation that the source was being cranked out. The guard used his bullhorn to inform another perimeter guard located at the 803 foot elevation that the "shot" was being cranked out. This guard did not hear the words "shot coming out" and thought he was instructed to break down the barrier, which he did, subsequently allowing four craft workers into the area. The workers descended a stairway from the 803 foot elevation to the 781 foot elevation. The perimeter guard on the 781 foot elevation noticed the four workers and

told them to immediately exit the area. When the radiographer was informed of the breach of perimeter integrity, he immediately secured radiographic operations. A survey, taken by U.S. Testing, indicated the highest observed dose rate was 8 millirem per hour in the area where the craft workers were. Personal exposures were calculated to be less than 1 millirem for each craft worker. The licensee's subsequent evaluation (re-enactment) confirmed this dose assessment.

After review of this matter, U.S. Testing took disciplinary action against the perimeter guard who was located on the 803 foot elevation; U.S. Testing personnel had been instructed that if they were not sure of instructions they were to verify the instructions before removing area boundaries. Also, the guard failed to comply with U.S. Testing procedures which require that the removal of barriers, signs, and barrier lights be performed only when directed by the designated radiographer.

No inspector identified violations were noted.

15. Exit Interview

The inspector met with licensee representatives (denoted in Section 1) at the conclusion of the inspection on July 19, 1985. The scope and findings of the inspection were summarized. The inspector also discussed the likely information content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee identified no such documents/processes as proprietary. In response to certain items discussed by the inspector, the licensee acknowledged the inspector's comments concerning the status of the ALARA program, the need for improvement of the radioactive material receipt program, and, the need for reinforcing to plant personnel the importance of adhering to radiological procedural requirements.