U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-461/86011(DRSS)

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

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

Facility Name: Clinton Nuclear Power Station, Unit 1

Inspection At: Clinton Site, Clinton, IL

Inspection Conducted: February 24-28, 1986 (onsite)
March 6, 1986 (by telephone)

Inspectors: R. B. Holtzman — Date: 3/19/86

M. J. Oestmann — Date: 3/19/86

Approved By: M. C. Schumacher, Chief
Radiological Effluents
and Chemistry Section — Date: 3/19/86

Inspection Summary

Inspection on February 24-28, and March 6, 1986, (Report No. 50-461/86011(DRSS))
Areas Inspected: Routine, announced inspection of chemistry and radiochemistry including; management controls; training and qualifications; implementation and results; quality assurance, quality control; water chemistry control; and licensee action on previously identified findings. The inspection involved 68 inspector-hours onsite by two NRC inspectors.
Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

[1]D. Hall, Vice President, Illinois Power (IP)
[1]J. W. Wilson, Plant Manager, IP
[1]J. G. Cook, Assistant Plant Manager, IP
[1]D. C. Shelton, Manager, Nuclear Station Engineering Department (NSED), IP
[1]J. S. Perry, Manager Nuclear Program Coordinator, IP
[1]W. Connell, Manager, Quality Assurance (QA), IP
[1]J. E. Loomis, Construction Manager, IP
[1]F. A. Spangenberg, Manager, Licensing and Safety, IP
[1]H. R. Lane, Manager, Schedule and Outage Management, IP
[1]J. H. Greene, Manager of Startup, IP
[1]J. Greenwood, Manager, Power Supply, Soyland/WIPCo Cooperative
[1]H. E. Daniels, Jr., Project Manager, IP
[1]D. J. Schlatka, Project Manager, Baldwin Associates (BA)
[1]J. W. Hawkins, Manager of Quality Assurance, BA
[1]J. L. Thompson, Manager of Quality Engineering, BA
[1]N. C. Williams, Director, Support Services, IP
[1,2]W. P. Mullins, Chemistry Supervisor, IP
[1]W. F. Hahn, C/S Supervisor, NSED, IP
[1]D. W. Hillyer, Director, Radiation Protection, IP
[1]K. A. Baker, Supervisor, I and E Interface Licensing Administration, IP
[1]J. A. Brownell, Licensing Specialist, IP
M. P. Hedges, Assistant Chemistry Supervisor, IP
E. McLain, Chemistry/Engineering Specialist, IP
K. Harper, Chemistry/Engineering Specialist, IP
J. Stonestreet, Chemist, Nuclear, IP
P. Otis, Chemist, Nuclear, IP
R. Pohto, Startup Chemist, General Electric (GE)
P. Beeton, Chemist, Consultant
R. Craig, Consultant, Enercon

[1]C. J. Paperiello, Director, Division of Reactor Safety, NRC
[1]S. M. Hare, NRC Inspector
[1]T. P. Gwynn, NRC Senior Resident Inspector
[1]D. E. Keating, NRC Resident Inspector

The inspectors also interviewed several Rad/Chem Technicians (RCT), Contract Technicians, and other plant personnel during the course of this inspection.

[1]Attended exit meeting on February 28, 1986.
[2]Telephone discussion March 6, 1986

2. Licensee Action on Previous Inspection Findings

a. (Closed) Open Item (50-461/85017-01): Licensee to prepare sample collection procedure for the Radiological Environmental Monitoring Program (REMP). This item was closed out in a letter to the licensee, dated January 7, 1986.

b. (Open) Open Item (50-461/85017-02): Licensee chemistry training program to meet ANSI/ANS3.1-1978 requirements. The licensee recognized that the total on-the-job training program described in approximately 40 qualification cards could not be completed by the licensees anticipated FLOL date of March 31, 1986. The licensee identified 23 qualification cards that need to be completed by that date and proposed to have seven Radiation Chemistry Technicians (RCT's) complete these by then with the remaining cards to be completed by five percent power. The inspectors, in a March 6, 1986 telephone discussion with the Radiochemistry Supervisor, identified three additional cards on miscellaneous laboratory analyses, offgas sampling, and response to abnormal analytical results that should be completed. It was agreed that the seven RCT's would also complete these qualification cards by FLOL.

c. (Closed) Open Item (50-461/85017-03): Licensee to complete laboratory facilities and obtain necessary laboratory and counting room equipment. The licensee has completed the ventilation system and is presently making adjustments to balance the system. Radiological controls have been established to control access to the hot laboratory area. The licensee obtained a second NMC gas-flow proportional counter to be used primarily for alpha counting. This item is therefore considered closed.

d. (Open) Open Item (50-461/85017-04): Licensee to calibrate and develop procedures for counting equipment. The licensee has calibrated both HPGe detectors for gas and other geometries. Procedures on efficiency and energy calibration of these detectors (CPS 6103.02) and on efficiency calibration of the NMC proportional counter (CPS 6105.02) have been completed and appear to be satisfactory. However, the licensee has not completed an efficiency calibration of the NMC proportional counter for alpha counting. This item will remain open until the licensee completes an efficiency calibration of this counter for alpha counting.

e. (Open) Open Item (50-461/85017-05): Licensee to fully implement laboratory and counting room QA/QC program. The licensee has established the QC programs for the laboratory instrumentation, but has not implemented procedure CPS No. 6000.01 to fully assess the abilities of the technicians to perform the required analyses. At the exit meeting, the licensee agreed to implement this procedure for seven technicians for Technical Specification required analyses by FLOL.

f. (Open) Open Item (50-461/85050-01): Training program for plant employees to make them aware of the importance of limiting the distribution of chemicals throughout the plant. There is no change in status of this open item. This item is not critical to issuance of the FLOL and will remain open pending licensee completion of training on this subject.

g. (Closed) Open Item (50-461/85058-01): Implementation of a suitable analytical procedure and testing of the RCTs on procedure CPS 6403.02 "Boron Determination (Potentimetric)". The licensee revised (February 18, 1986) and is currently using this procedure. When used in conjunction with procedure CPS No. 9915.01, "Standby Liquid Control Sampling," Revision No. 20, February 2, 1986, is suitable for the collection and analysis of samples from the Standby Liquid Control (SLC) storage tank. The testing of the RCTs will be followed in the implementation of the QA/QC program (Section 2e, above) This item is considered closed.

h. (Open) Open Item (50-461/85058-02): Licensee to analyze another spiked sample that contains Sr-89 and Sr-90 and gamma emitters. The licensee is in the process of analyzing for Sr-89 and Sr-90 in a spiked sample sent to him from the NRC Reference Laboratory (Radiological and Environmental Sciences Laboratory). The licensee also analyzed gamma emitters. The gamma results showed all agreements and are reported in Table II in this report. Acceptance criteria for the comparisons are in Attachment 1. This item will remain open pending licensee's completing the Sr-89 and Sr-90 analysis.

3. Chemistry and Radiochemistry Program

a. Staffing

The licensee recently appointed a new Supervisor, Chemistry, W. C. Mullins, to replace M. Hedges. The inspectors' review of his résumé indicates he has good qualifications, in health physics and management, including 3 years experience as radiation chemistry supervisor at an operating nuclear power plant, but limited direct experience in chemistry/radiochemistry. The licensee plans to issue a new amendment to the FSAR which will include Mr. Mullins' résumé. This has been forwarded to the Licensing Qualification Branch of the Office of Nuclear Reactor Regulation (NRR) for review. Mr. Hedges continues to provide technical expertise as Assistant Supervisor, Chemistry to the Chemistry Department. No other changes to the staffing have occurred. The Chemistry Department continues to have three technical consultants, 14 RCTs, nine or ten contract technicians who provide support during the period when the RCTs are being trained, three Chemists, Nuclear and two Chemistry Engineer/Specialists. Staffing appears satisfactory to perform the necessary chemistry operations for plant support.

b. Training and Qualifications

The inspectors reviewed RCT training progress. As noted in Section 2b., the seven RCTs most advanced in their training are to complete 26 OJT qualification cards by FLOL. They had completed approximately 19 of the 26 cards and were taking a two week radiochemistry course. Completion of the necessary 26 cards is expected by the end of March. The licensee plans to have at least one RCT on each shift qualified to perform each major chemistry and counting room procedure. The licensee has also committed to having the seven RCTs complete the remaining qualification cards by 5% power. (Open Item 50-461/86011-01).

The remaining seven RCTs are also participating in training to complete the OJT qualification cards in the use of specific chemistry and counting room instruments.

c. Implementation of the Chemistry Program

The inspectors reviewed the chemistry and radiochemistry program, including the physical facilities, laboratory operations, procedures, and QA/QC practices in the laboratory.

The licensee has completed the ventilation system of the laboratory hoods and facilities and is presently balancing air flow in the system. The inspectors noted that with activation of the makeup air supply, the laboratories appear to be much cleaner than previously, and ventilation appeared adequate in the hoods.

Laboratory facilities appear adequate for handling all chemistry/radiochemistry operations. The required chemistry instruments appear to be functional, calibrated and well-maintained and appropriate procedures are in place. The inspectors observed a number of RCTs perform different chemistry/radiochemistry operations and noted that some improvements in practice are needed. This includes the use of log books by RCTs rather than small pieces of paper to document information, the proper use of pipets designed "to deliver", and the proper use of plastic gloves for handling radioactive materials.

The inspectors noted that the licensee has completed setting up the counting laboratory. He has two NMC gas-flow proportional counters, one a thin window beta counter and the other, a windowless alpha counter. The licensee is in the process of calibrating the latter instrument (see Section 2d).

The licensee has completed the calibration of the two gamma spectrometers with High Purity Ge detectors for all sample types expected, including gas samples (section 2d). The calibrations were checked against additional standard samples that the Radiation Protection Department used to calibrate its three High Purity Ge detectors. The Chemistry group is modifying various aspects of the gamma spectrometry software to improve the redundancy of the systems, so that samples may be analyzed on any of the five detectors, which, in turn, may be operated from either of the two ND 6685 analyzer systems.

All of the RCTs are now qualified to count samples on the gamma spectrometer systems, and two are trained for system management, such as writing jobstreams and modifying the data storage system. In a discussion with one of the latter RCTs, the inspector found him to be very knowledgeable about the system. The chemistry instrumentation appeared to be completely operational and well maintained.

d. Implementation of the QA/QC Program in the Laboratory

The inspectors observed improved implementation of the QA/QC program since the previous inspection.[1] The licensee appeared to keep the instrumentation under good control with control charts on one or more parameters. The control charts for gamma spectrometer efficiency showed high variability, which licensee representatives attributed to faulty sample holders that have since been corrected.

The licensee has only partially implemented procedure CPS No. 6000.01, "Quality of Chemistry Activities," Revision No. 2, September 22, 1985, to assess the RCTs' abilities to perform analyses. Results from blind spiked samples were available for only two procedures: chloride determined with specific ion electrodes and boron with a fluoborate electrode to be used with the Post Accident Sampling System (PASS). A detailed review of the chloride results showed that after revision of the procedure, the variabilities were reasonably low. At the exit meeting, the licensee agreed to complete by FLOL this program for analytical procedures required by the Technical Specifications: chloride both by ion chromatography (the primary method), and specific ion probe, boron (titration method), conductivity, and pH. (Section 2e.). The licensee also agreed totally implement the the QA/QC program of procedure 6000.01 within six months after FLOL. (Open Item 50-461/86011-02)

e. Laboratory Safety

The inspectors observed during a tour of the laboratory facilities and of the plant that the licensee has installed showers, eye-wash equipment, fire extinguishers, and other laboratory safety equipment at appropriate locations in the laboratory and in the plant. No nonradiological health and safety hazards were observed.

No violations or deviations were identified.

4. Implementation of a Water Chemistry Program

a. Water Chemistry Control Program

The inspector determined that the licensee has recently issued a corporate nuclear procedure (CNP) on Chemistry Control Program dated January 27, 1986, which is based on the BWR Owners Group Water Chemistry guidelines. The procedure defines responsibilities, operation and program performance requirements to assure the guidelines are met. Included are training, Chemistry Department activities, and QA/QC program requirements. The licensee has also

[1]Inspection Report No. 50-461/85058

issued an Administrative Procedure CPS 1819.00, "Plant Water Chemistry Control," on January 28, 1986, which includes action levels to be imposed on plant operations to assure system reliability and to minimize stress corrosion cracking. This procedure is just being implemented. The licensee also issued a Clinton Chemistry Group "Mission Statement" that reflects the Chemistry Department's control of hazardous chemicals throughout the plant and also chemistry process monitoring and sampling program to assure all necessary surveillances are performed. The inspector, through interviews with the chemistry technical staff, determined that a good water chemistry control program is underway and is expected to be fully implemented during plant operations. The licensee is budgeting adequate resources of staffing, equipment, funds and organization to implement an effective program.

b. Water Sampling and Analysis, Monitoring and Processing

The inspector determined through a review of procedures and a tour of the plant, that the licensee has provided for adequate sampling and monitoring of chemical parameters in various plant water systems. The licensee has about 12 sample panels that include in-line monitors, all of which have been tested during different phases of preoperational testing. Operational and calibrated conductivity, pH, and chloride monitors were observed. A problem noted during a tour of sample panes was improperly functioning silica monitors on the feedwater line which need repair. This item will be examined in a subsequent inspection. This is not critical to the FLOL, but should be ready by 5% power. (Open Item 50-461/86011-02)

At the present time, four of 116 grab sample lines are plugged. Work is underway to clear these four lines. The RCTs routinely collect samples from the sample points, perform the appropriate analyses, and record the in-line monitor data on appropriate log sheets. Review of representative log sheets revealed no problems. Times for purging each sample line have also been determined to assure representative samples are obtained. The following procedures adequately address the sampling and analyses requirements and use of in-line instruments to monitor necessary chemical parameters:

CPS No. 6001.01, Sampling and Analysis Requirements, Revision 1, November 2, 1984.

CPS No. 6204.02N, Beckman Model 7001 Oxygen Monitor, Revision 1, November 10, 1982.

CPS No. 6205.01N, Gam-Rad Fluid Analyzer (Turbidimeter) Revision 0, May 4, 1981.

CPS No. 6205.02, Hach Low Range Turbidimeter, Revision 2, March 9, 1981.

CPS No. 6206.01, Chlorine Residual Monitor, Revision 2, March 9, 1984.

CPS No. 6207.01N, Orion SLeD Sodium Monitor, Revision 1, October 1, 1982.

CPS No. 6208.01N, Melton Roy Silica Analyzer, Revision 1, September 30, 1982.

c. Plant Systems Affecting Plant Water Chemistry

The inspectors observed that three out of the nine condensate polishers were operational. All nine polishers have been tested and are functional and have been turned over to the Plant Operations Department. The Reactor Water Cleanup System has also been tested and is functional and operating satisfactorily.

The plant condensers have been checked for air and water in-leakage and the system appears tight. No problems were observed during the reading of the dissolved oxygen (DO) monitors.

The demineralized water system is operational, providing the necessary demineralized water to various plant systems including the chemistry laboratory. The RCTs routinely test the conductivity of this water to assure its purity. No problems were observed in the plant systems affecting water chemistry.

No violations or deviations were identified.

5. Open Items

Open items are matters that have been discussed with the licensee, which will be reviewed further by the inspectors, and which involve some action on the part of the NRC or licensee or both. Open items are discussed in Sections 3b and 4b.

6. Exit Interview

The inspectors discussed the inspection findings with licensee representatives (Section 1) at the conclusion of the inspection on February 28, 1986. The licensee agreed to complete the following by FLOL:

- necessary training of seven RCTs (Sections 2b and 3b),
- calibration of the alpha counter (Section 2d), and
- testing of seven RCTs on T/S required analyses in accordance with procedure CPS 6000.01. (Sections 2e and 3d).

The licensee also agreed to complete all qualification cards for seven identified RCTs by 5% power (Section 3b) and to fully implement the QA/QC program of procedure CPS 6000.01 within six months after FLOL.

Additional telephone discussion was held on March 6, 1986, with a licensee representative concerning RCT training. The inspectors identified three additional qualification cards to be completed by FLOL (Section 2b).

During the inspection, the inspectors discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspections during the inspection. Licensee representatives did not identify any such documents or processes as proprietary.

Attachments:
1. Table II, Confirmatory Measurements Program
2. Criteria for Comparing Analytical Measurements

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Attachments:
1. Table II, Confirmatory Measurements Program
2. Criteria for Comparing Analytical Measurements