

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-461/85050(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: September 18-20, 1985 Onsite
October 9, 1985 By Telephone

Inspectors: *M. J. Oestmann*
M. J. Oestmann

10/24/85
Date

R. B. Holtzman
R. B. Holtzman

10/24/85
Date

Approved By: *M. C. Schumacher*
M. C. Schumacher, Chief
Radiological Effluent and
Chemistry Section

10/28/85
Date

Inspection Summary

Inspection on September 18-20, and October 9, 1985
(Report No. 50-461/85050(DRSS))

Areas Inspected: Routine unannounced inspection of chemistry and radio-chemistry and the radiological environmental monitoring program (REMP), including: management controls; qualification and training; audits, implementation and results; quality assurance/quality control; and licensee action on previously identified findings. The inspection involved 60 inspector-hours onsite by two NRC inspectors.

Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

- ¹J. P. Hall, Vice President, Illinois Power (IP)
- ^{1,2}J. W. Wilson, Plant Manager, IP
- ¹E. J. Corrigan, Director, Quality Engineering and Verification, IP
- ¹J. G. Palchak, Supervisor, Compliance and Configuration Control Department, IP
- ¹D. W. Hillyer, Supervisor, Radiation Protection, IP
- ¹D. W. Wilson, Supervisor, Licensing Administration, IP
- ¹J. H. Greene, Manager, Startup, IP
- ¹J. R. Patten, Director, Nuclear Training, IP
- ¹M. P. Hedges, Supervisor-Chemistry, IP
- ¹K. A. Baker, Project Engineer, I and E Interface, Licensing Administration, IP
- J. S. Perry, Manager, Nuclear Program Coordinator, IP
- D. L. Holtzsch, Director, Nuclear Safety and Engineering Analysis, IP
- D. P. Vincent, Lead Program Engineer, Startup, IP
- P. R. Otis, Chemist-Nuclear, IP
- W. A. Lones, Chemist-Nuclear, IP
- E. McLain, Chemistry/Engineering Specialist
- R. Craig, Consultant, Enercon
- M. Brown, Training Instructor, General Physics
- J. Friend, Supervisor, Quality Assurance Audits, IP
- ²F. Spangenberg, Director, Nuclear Licensing and Configuration, IP

- ¹T. P. Gwyn, NRC Senior Resident Inspector, RIII
- P. W. McLaughlin, Licensing Qualification Branch, NRR
- P. L. Hiland, NRC Resident Inspector, RIII

The inspectors also contacted several Rad Chem Technicians, contract technicians, and other plant personnel during the course of this inspection.

¹Attended exit meeting on September 20, 1985.

²Present during telephone conference on October 9, 1985.

2. Licensee Action on Previous Inspection Findings

- a. (Open) Open Item (50-461/85017-01): Licensee to fully implement the REMP by summer 1985, including preparing sample collection procedures, placing calibration stickers on air samplers, and providing annual reports to the Region III office. During a tour of the environmental stations and discussion with licensee representatives, the inspectors observed that the REMP has been fully implemented since the summer of

1985 and a copy of the 1984 annual report was provided to Region III. This item will remain open, pending completion of the sample collection procedures to be used by the licensee within the next several months. At the present time, the licensee's contractor, Teledyne Isotopes, Inc., collects and analyzes the environmental samples.

- b. (Open) Open Item (50-461/85017-02): Licensee chemistry personnel to complete training program to meet ANSI/ANS 3.1-1978 requirements. RCT training slipped appreciably from expectations held in the spring of 1985, owing partially to delays in installation of laboratory ventilation necessary for work with open radioactive sources. This slippage may affect laboratory readiness for fuel load and will increase the need for management oversight of laboratory activities during early operation. The Supervisor-Chemistry completed vendor courses and three months of training at operating power plants. This item will remain open until completion of RCT training, including qualification in the use of the instruments and in performance of required procedures (Section 3b).
- c. (Open) Open Item (50-461/85017-03): Licensee to complete laboratory facilities and obtain necessary laboratory and counting room equipment and establish radiological controls in the hot laboratory. The licensee has recently partially completed the ventilation system to allow use of hoods in the hot laboratory until the entire system is installed within the next two months. The licensee has just obtained a NMC gas-flow proportional counter for gross alpha and beta counting, but he has not yet calibrated it. This will be done once radioactive sources become available the first of October. Another such counter is on order. Radiological controls are to be established in the hot laboratory prior to the handling of radioactive sources for the radiochemistry training program. This item was discussed at the exit meeting and it will remain open pending completion of facilities and the purchase of additional equipment.
- d. (Open) Open Item (50-461/85017-04): Licensee to calibrate and develop procedures for counting equipment. During the first two weeks of October, the licensee plans to prepare various radioactive sources and to obtain standards from Analytix, Inc. to be used to calibrate the gross beta counter and perform the necessary efficiency calibrations for numerous geometries for the gamma spectroscopy system. Several procedures on the ND6685 gamma spectrometry (CPS 6103.01), liquid scintillation counter (CPS 6102.01), strontium (CPS 6714.02), iron-55 (CPS 6708.02), and tritium (CPS 6718.01) have been reviewed and approved by licensee management. Two other procedures, efficiency and energy calibrations of the high-purity Ge detector (CPS 6103.02), and efficiency calibration of the NMC proportional counter (CPS 6105.02), are in draft and are expected to be approved by October 1, 1985. This item will remain open pending completion of the necessary counter calibrations and procedures.

- e. (Open) Open Item (50-461/85017-05): Licensee to fully implement laboratory and counting room QA/QC program. The inspector observed that the licensee has established several QC programs for laboratory analyses using atomic absorption, pH, and specific ion probes (see Section 3f). This item will remain open until the laboratory and the counting room QC programs are fully implemented.

3. Chemistry and Radiochemistry Program

a. Staffing

Chemistry group staffing consisting of the Supervisor-Chemistry, three Chemistry-Nuclear Supervisors, two Chemistry-Engineer Specialists, and 14 RCTs is at the authorized level. Only one new RCT was added rather than the six earlier anticipated RCTs¹ because responsibility for maintenance and regeneration of demineralizers is to be transferred to the Operations Department. The group is currently augmented by three technical consultants, two training consultants, and 9 or 10 contract technicians who will provide support particularly during the period when the RCTs are being trained.

The staff has good academic qualifications with most of the RCTs having bachelor degrees and nuclear navy experience. Experience in chemistry is satisfactory but experience in nuclear plant radiochemistry is limited.

b. Training and Qualifications

As noted in Section 2b, RCT training has progressed more slowly than expected. The RCTs are currently receiving Phase III training on the Post Accident Sampling System. All but one newly hired RCT have completed Phase I and Phase II training. Training in radiochemistry and gamma spectroscopy is scheduled to be given by a consultant (General Physics) in October. The RCTs will be required to complete this training and to complete OJT qualification cards required by Procedure CPS 1932.04, "Chemistry Department Training and Qualification," dated August 29, 1985, by fuel load.

The planned training program appears to be satisfactory. However, the slippage from an earlier anticipated schedule² has reduced the time available for the RCTs to complete their training and qualifications by the currently scheduled January 1986 fuel load. Any further delays will likely jeopardize chemistry group readiness by that date and will necessitate more than normal management oversight of the laboratory during early plant operation.

¹Inspection Report 50-461/85017

²Ibid

The Supervisor-Chemistry completed vendor chemistry and radio-chemistry courses and one month of observational training at Farley and two months of "hands-on" training at LaSalle. Originally, he was to have had three months of hands-on training at an operating plant. As a substitute for another month of experience at LaSalle, the licensee has agreed to retain a qualified consultant to supplement the supervisor training and to advise and assist him in providing additional oversight of laboratory activities for at least six months following fuel load.

Progress of the training program will continue to be followed under Open Item No. 50-461/85017-02.

c. Other Management Programs

The inspectors discussed with a licensee representative the progress in the development of the chemical control program, which is designed to limit the amounts of chemical materials and substances in the plant and to reduce the probability of contamination of various plant systems. This item was discussed in a previous inspection³. After discussion with other plant personnel, the representative plans to implement a training program for plant employees to make them aware of the importance of limiting the distribution of chemicals throughout the plant. This program will be further examined during a subsequent inspection. (Open Item 50-461/85050-01)

d. Implementation of the Chemistry and Radiochemistry Program

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

The laboratory facilities were suitable for the chemical and radio-chemical analyses. While all the fume hoods had sufficient ventilation, only one of the two exhaust fans was operating, which would make many analytical procedures unusable should that one fail. In addition, the makeup air supply system was not in operation, so that substantial dust was drawn into the laboratory from the construction areas of the plant. The licensee management was apprised during the exit interview of the necessity of proper ventilation for operation of the laboratory. This is especially important in the performance of the essential radiochemical analyses.

The analytical instrumentation for the chemical analyses appears to be complete, operational, and well-maintained. Except for one NMC proportional counter on order, the counting instruments are in place and operational, including the gamma spectrometry system that consists of two high-purity germanium detectors operated by a Nuclear

³Inspection Report 50-461/85017

Data ND6685 multichannel analyzer system with two associated computers. In addition, as part of this system, the Radiation Protection Department (RPD) has two similar detectors in its own laboratory. Because these computers are used for dose and other RPD calculations and record keeping, they are under the jurisdiction of the RPD. However, they are operated jointly by technicians from both departments. The Chemistry Department also has a liquid scintillation counter for tritium and Fe-55 analyses.

Operation of the counting instruments is progressing. The RCT assigned to the development and operation of the gamma spectrometer is generally knowledgeable about its operation and the uses of its programs for analysis and maintenance. Calibration sources and solutions have been ordered from Analytics, Inc. and the licensee expected to prepare the standards and calibrate the instruments in the first two weeks of October. Standards for the beta counters (NMC proportional counters) will be made by the RCTs in the course of their hands-on radiochemistry training. The LSC (Packard TriCarb Model 300) for the analyses of tritium and Fe-55 is being checked, calibrated, and made operational by a Chemist-Nuclear and a RCT.

The major weaknesses in these programs are that only a limited number of personnel are presently knowledgeable in the operation of each system (one RCT on the gamma spectrometer and one on the LSC) and that these systems are not yet calibrated and ready for use. The licensee has committed to qualify four RCTs on each instrument and four RCTs to perform chemical separations and analyze for strontium, Fe-55, and tritium by November 1985.

e. Implementation of QC/QA in the Laboratory

The inspectors observed the implementation of the QA/QC program in the laboratory in accordance with the recently approved procedure, CPS No. 6000.01, "Quality of Chemistry Activities", Revision 2, September 1985. Further review of this QC program for analyses using the atomic absorption spectrophotometer showed good reproducibility of results, mainly for iron, but to a lesser extent for other elements, such as copper and nickel. A blind sample was used for a few checks on the specific ion electrodes for chloride and fluoride, which mostly appeared to be acceptable. However, the fluoride levels were below the detectable limits and thus less meaningful than a measurable value.

The inspectors observed a Rad Chemistry Technician (RCT) collect and analyze several nonradioactive process samples for conductivity, pH, sulfide, and turbidity. He appeared knowledgeable in his work, but he demonstrated poor laboratory technique, such as recording data on a small piece of paper rather than in a notebook, using poor sample collection practices, and using dirty glassware. The Chemistry-Nuclear Supervisor was apprised of these observations and agreed to provide necessary on-the-job training to the RCT.

Overall, the QC program to check the ability of the RCTs to do the required analyses, procedure CPS 6000.01 has been implemented only to a limited extent. Prior to the issuance of a fuel load operating license (FLOL) the laboratory will have to show its readiness by demonstrating that the RCTs can do the required analyses with reasonable precision and accuracy, that they can collect and process radioactive samples, that all of the analytical instrumentation (both for chemistry and radiochemistry) are operational and calibrated, and that control charts are kept for all the instruments, where applicable. The expected precision and accuracy of the analytical methods should be assessed in order to demonstrate that the results reported are in conformance with the technical specifications.

No violations or deviations were identified.

4. Radiological Environmental Monitoring Program (REMP)

a. Management Controls

The inspectors reviewed the management controls and organization involved in implementing the REMP. D. Hillyer has recently been appointed to the position of Supervisor-Radiation Protection (RP) and reports directly to the Plant Manager. He has reorganized the Radiation Protection Department to include a separate REMP group along with three other groups involving radiation protection programs. The REMP program will be under the Supervisor-Radiological Environmental. The Radiological Project Engineer and Radiation Technician in the REMP group will be responsible for the daily activities for the conduct of the REMP. These last two people are just being hired.

The contract with Teledyne Isotopes, Inc. to collect and analyze samples will be managed by the Supervisor-Radiological Environmental. As soon as the licensee completes and approves the sample collection procedures (Section 2a), the licensee will collect his own samples to be shipped to Teledyne for analysis. Licensee representatives stated that they also plan to analyze REMP samples, concurrently with Teledyne for one year starting in 1986, and eventually to perform the entire REMP themselves. No problems were noted in the management of the REMP.

b. Implementation of the REMP

The licensee has now fully implemented the REMP by installing charcoal adsorbers on all eight air samplers and a water compositor on the intake for drinking water (Location 14) during April 1985. The licensee is also collecting grass and green leafy vegetables in place of milk because there are no existing dairy farms within five miles of the plant site. The licensee placed an additional 34 TLDs in the field in January 1985 in addition to the 41 TLDs already in place in the field. The preoperational program is in accordance

with Table 6.1-8 of the Environmental Report-OL and has been approved by the Office of Nuclear Reactor Regulation. The licensee will have met his commitments for completion of this program by FLOL.

The inspectors observed several air samplers with both air particulate filters and charcoal adsorber cartridges, TLD stations, and a water compositor during a tour of the environs stations. Several NRC TLDs were also observed. The air samplers are calibrated on a six month schedule. Each sampler observed had a calibration sticker on it. No problems were noted.

The inspectors reviewed the 1984 Annual Report for the REMP and monthly reports for 1985 to date and identified no problems. All samples were accounted for and appropriate reasons given for missing samples. No unusual trends or anomalous results were identified.

c. REMP Quality Assurance/Quality Control and Licensee Audits

The inspectors reviewed the QA/QC program used by the REMP contractor and identified no problems in the EPA cross check results and the TLD intercomparisons for 1976, 1977, 1979, 1980 and 1981. The licensee's Quality Assurance Department performed an audit (Q36-F4-17) of the REMP contractor on September 18-19, 1984 as described in a previous inspection⁴. All findings from the 1984 audit were closed out on May 20, 1985 and another audit of the REMP is scheduled in October 1985.

No violations or deviations were identified.

5. Exit Interview

The inspectors discussed the inspection findings with licensee representatives (Section 1) at the conclusion of the inspection on September 20, 1985. The inspectors noted the delays in laboratory development and the possible impact on readiness for the January 1986 fuel load. The need for completing RCT training and qualifications and for making all chemical and radiochemical instrumentation operational was emphasized. The importance of supplementing training of the Supervisor-Chemistry and for providing assistance to him in overseeing laboratory activities during early operation was discussed at this meeting and in a telephone conference on October 9, 1985. Licensee management agreed to retain a qualified radiochemistry consultant for at least six months after fuel load and to document this commitment in correspondence to the Office of Nuclear Reactor Regulation.

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

⁴Ibid