U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-461/85048(DRS)

Docket No. 50-461

License No. CPPR-137

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

Facility Name: Clinton Nuclear Power Station, Unit 1

Inspection At: Clinton Site, Clinton, Illinois

Inspection Conducted: August 24 through October 10, 1985

Inspectors: S. G. DaPont for

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R.D. Feil for

Approved By: M. A. Ring, Chief Test Program Section

Inspection Summary

Inspection on August 24 through October 10, 1985 (Report No. 50-461/85048(DRS)) Areas Inspected: Preoperational procedure verification, preoperational procedure review, preoperational test witnessing, preoperational test result review and plant tours. The inspection involved 201 inspector-hours by three NRC inspectors onsite including 18 inspector-hours during off-shifts. <u>Results</u>: Of the five areas inspected, no violations were identified in four areas. One violation was identified in the remaining area (procedure not appropriate to the circumstances - Paragraph 3).

11/1/85 Date

1/1/85 Date

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11/1/85



DETAILS

1. Persons Contacted

- *F. A. Spangenberg, Manager, Licensing and Safety
- *J. W. Wilson, Plant Manager
- *J. H. Green, Manager of Startup
- *E. J. Corrigan, Director, Engineering and Verification, QA
- *J. F. Palchak, Supervisor, Plant Support Services
- *D. C. Shelton, Manager, Nuclear Station Engineering
- *H. E. Daniels, Manager, Construction
- J. Miller, Director, Startup Programs
- D. Holesinger, Director, Startup Testing

The inspectors also interviewed other licensee employees, including members of the quality assurance, startup and operating staff.

*Denotes those attending the exit interview on October 10, 1985.

2. Preoperational Test Procedure Verification

The inspector verified that the following preoperational test procedures were written, reviewed, and approved in accordance with the requirements of Regulatory Guide 1.68, the startup manual, the FSAR, the SER, and the QA Manual, and found them satisfactory:

PTP-AR/PR-01, "Area and Process Radiation Monitoring" PTP-CD/CB-01, "Condensate/Condensate Booster" PTP-CM-01, "Containment Monitoring" PTP-CW-01, "Circulating Water System" PTP-EM-01, "Environmental Monitoring" PTP-FH-01, "Inclined Fuel System" PTP-FH-02, "Fuel Handling System" PTP-FH-02, "Fire Protection PGCC" PTP-FW-02, "Feedwater Control System" PTP-HC-01, "Containment Polar Crane" PTP-HC-02, "Fuel Handling Building Crane" PTP-HC-02, "Fuel Handling Building Crane" PTP-LD/O1, "Containment ILRT Drywell Leak Rate Test" PTP-LD-01, "Leak Detection System" PTP-LM-01, "Loose Parts Monitoring" PTP-NR-01, "Startup Range Neutron Monitoring System" PTP-NR-02, "Power Range Neutron Monitoring System" PTP-NR-02, "Off Gas Glycol" PTP-RD-01, "Control Rod Drive Hydraulic System" PTP-RE-01, "Containment, Auxiliary and Fuel Building Equipment Drains" PTP-RR-01, "Reactor Recirculation Flow Control" PTP-RR-01, "Reactor Recirculation Pump, Motor and Logic System"

PTP-RR-03, "Reactor Recirculation Flow Control Valve Hydraulic System"
PTP-RT-01, "Reactor Water Cleanup"
PTP-SC-01, "Standby Liquid Control"
PTP-SIT-01, "Structural Integrity Test"
PTP-SP-01, "NSPS Self-Test and Analog Trip Subsystem"
PTP-SV-01, "Safety Relief Valve Monitoring System"
PTP-TE-01, "Turbine, Off Gas, Radwaste, Control and DG Building
Equipment Drains"
PTP-TF-01, "Turbine, Off Gas, Radwaste, Control and DG Building Floor
Drains"
PTP-TP-01, "TIP"
PTP-VA-01, "Auxiliary Building HVAC"
PTP-VD-01, "Diesel Generator Room HVAC"
PTP-VF-01, "Fuel Building HVAC"
PTP-VO-01, "Off Gas Building HVAC"
PTP-VQ-01, "Drywell Purge"
PTP-VR-01, "Containment Building HVAC"
PTP-VT-01/02, "Turbine Building HVAC"
PTP-VW-01, "Radwaste Building HVAC"
PTP-VX-01, "Switchgear Heat Removal"
PTP-WE-01, "Equipment Drain Radwaste Reprocessing"
PTP-WF-01, "Floor Drain Radwaste Reprocessing"
PTP-WY-01. "Laundry Equipment and Drain Radwaste Reprocessing"
PTP-W7-01, "Chemical Radwaste Reprocessing"

No violations, deviations, or unresolved items were identified.

3. Preoperational Test Procedure Review

The inspector reviewed the following preoperational test procedures for compliance with the FSAR, the SER, Regulatory Guide 1.68, and the Startup Manual and found them satisfactory except as noted:

PTP-LL-01, "Emergency Lighting System" PTP-SX-02, "Shutdown Service Water Vortex Test" PTP-AX/AY-01, "Integrated Auxiliary Power Logic Test" PTP-VG-01, "Standby Gas Treatment" PTP-RH-01, "Residual Heat Removal" PTP-IP-01, "Instrument Power" PTP-NB-04, "Containment Isolation" PTP-SC-01, "Standby Liquid Control System," Revision 1

With respect to the review of PTP-SC-01, the inspector noted that the testing of certain design safety requirements appeared to be missing from the test procedure. Regulatory Guide 1.68, Revision 2, Appendix A, Paragraph 1.b.(3), as committed to by the licensee in the Final Safety Analysis Report (FSAR), Table 1.8-1, states, in part, "Verify proper mixing of solution and adequacy of sampling system." The inspectors review of PTP-SC-01 determined that the only testing that was performed on the Standby Liquid Control System (SLCS) storage tank air-sparger (used to mix the solution) portion of the system was to fill the tank with demineralized water, commence air flow through the sparger, and verify that an even distribution of air bubbles was observed. This test methodology

is considered inadequate to demonstrate the above requirement in that it does not demonstrate that the air sparging sub-system of SLCS is capable of mixing the sodium pentaborate solution to uniformity after the maximum time allowed between Technical Specification (TS) surveillances (approximately 39 days). In addition, it does not determine how much sparging time is required to ensure that the dip samples from the liquid surface taken for the TS surveillances are representative of the tank contents. The above must be demonstrated since the sodium pentaborate solution stratifies over time with a high concentration layer near the bottom and a lower concentration layer near the top.

Subsequent to the inspector identifying this issue to the licensee, the licensee responded that Section 7.4, "Sodium Pentaborate Solution Preparation," demonstrated the above requirements. The inspector's review of this section, however, did not confirm this. Section 7.4 references surveillance procedure CPS No. 3314.02, "Standby Liquid Control Fill and Chemical Changes." Section 8.1, "Initial Fill of SLC Storage Tank," of CPS No. 3314.02 basically requires the tank to be filled with water, the water heated, the air sparger started and run while predetermined amounts of chemicals are added and a minimum of at least sixteen additional hours of sparging before sampling the solution in accordance with CPS No. 9915.01, "Standby Liquid Control System Operability." CPS No. 3314.02 then requires that samples be taken (with additional sparging as necessary) until two consecutive analyses agree within ±5%. CPS No. 9915.01 is the procedure that will routinely be used to demonstrate compliance with the TS surveillance requirement on sodium pentaborate concentration and it only requires a minimum of 1 hour air-sparging prior to taking any samples. Thus, the preoperational test procedure as written does not demonstrate that the air-sparging sub-system of SLCS is capable of mixing the sodium pentaborate solution to uniformity after the maximum time allowed between TS surveillances (approximately 39 days) and does not validate the minimum 1 hour sparger time of CPS No. 9915.01 by collecting raw data. The data collected is masked by the sixteen hour sparging per CPS No. 3314.02 and no data is collected to verify that sampling per CPS No. 9915.01 is representative of the solution throughout the entire storage tank. This item is considered to be a violation of 10 CFR 50, Appendix B, Criterion XI (461/85048-01).

No violations, deviations, or unresolved items other than those discussed above were identified.

4. Preoperational Test Witnessing

The inspector witnessed the following preoperational testing to ascertain through observation and record review that testing was conducted in accordance with approved procedures and the requirements of the Startup Manual. The tests were found to be satisfactory:

PTP-RH-01, "Residual Heat Removal" PTP-LP-01, "Low Pressure Core Spray" PTP-AX/AY-01, "Integrated Auxiliary Power Logic Test" No violations, deviations, or unresolved items were identified.

5. Preoperational Test Results Evaluation

The inspector partially reviewed the following preoperational test results for acceptance and completion of test objectives in accordance with the FSAR and SER. In addition, the licensee's test results evaluation was reviewed for adequacy and found satisfactory except as noted:

PTP-DC-01, "125VDC Subsystem 1A" PTP-AZ-01, "480V Auxiliary Power" PTP-SC-01, "Standby Liquid Control System"

- a. With respect to the review of PTP-DC-O1 and PTP-AZ-O1, the inspector noted that the actual sequence of testing performed could not be determined by review of the test director's log. This is a continuation of an administrative problem identified in detail in Paragraph 4.a of inspection report 50-461/85036 and is identified by unresolved item 461/85036-O1 which states "...that sequence control needs clarification and that the actual sequence in which the test was performed should be in the Test Summary Report (TSR)." This review supports the previous finding in that, without the actual sequence noted within the TSR, it is difficult for the reviewer to verify that the test objectives were accomplished. This item will continue to be followed as an unresolved item.
- With respect to the review of PTP-SC-01, the inspector identified b. that 10 CFR 50.62(c)(4) requires that each Boiling Water Reactor (BWR) have a SLCS with a minimum flow capacity and boron content equivalent in control capacity to 86 gallons per minute (gpm) of 13 weight percent (%) sodium pentaborate solution. In an NRC letter (Generic Letter 85-03) to all BWR licensee's and applicants dated January 28, 1985, it was noted that the 86 gpm flow rate had been normalized from a 251-inch-diameter vessel plant and that the equivalence could be met by increasing the flow rate, boron concentration or boron enrichment. The letter, at an example, described how a flow rate of 66 gpm in a 218-inch-diameter vessel plant is equivalent to 86 gpm in a 251-inch-diameter vessel plant, all else being equal. General Electric (GE) has a formula (reference NEDC-30921) which allows individual plants to demonstrate compliance with the equivalency requirement without performing plant unique assessments of Anticipated Transient Without Scram (ATWS) mitigation similar to the generic evaluations reported in NEDE-24222, "Assessment of BWR Mitigation of ATWS, Volumes I and II."

Clinton has a 218-inch-diameter vessel and, with all else being equal, the required flow rate for the SLCS would be 66 gpm as noted above. However, the licensee's current draft technical specification, as well as the subject test procedure, indicate that the minimum concentration allowed in the storage tank is approximately 9.85% sodium pentaborate. Therefore, it is necessary to correct for this and any other deviations from the original basis for the equivalency design requirement. After determination of the plant specific parameters (SLCS flow rate, mass of water in the reactor vessel and recirculation system at hot-rated conditions, minimum expected sodium pentaborate solution concentration, and minimum expected boron-10 isotope enrichment) necessary for the GE equivalency formula, it is a simple matter for the licensee to demonstrate whether or not their system complies with the equivalency design requirement.

The inspector's review of PTP-SC-01 determined that while the licensee did run the SLCS in the two pump configuration, no acceptance criterion was applied nor were any calculations required to be performed that would demonstrate compliance with the required equivalency design requirement. The inspector considers that sufficient information was gathered by the test to allow the required demonstration to be made. However, this was not an objective of the approved test. Prior to completion of the inspection, the licensee did provide the results of the equivalency formula calculation and indicated that the draft Technical Specification limit of 9.85% sodium pentaborate would be changed to 10% to comply with the design requirement.

The inspector found during the inspection that the licensee had completed all preoperational testing required by PTP-SC-O1, with the exception of initial system fill, that all reviews of the completed testing were complete, and that the system had been turned over from the startup organization to the operations organization. However, none of the above deficiencies were identified during those reviews and the inspector considers that there is no apparent program to ensure that the required testing would be performed.

The above requirements are identified in a licensee interoffice memorandum, "Status Report - Closure of Licensing Issues Program (CLIP) - Week Ending August 16, 1985," as an issue that requires IP action. However, it is not scheduled for closure on the 1985 through 1988 schedule. Because of the apparent lack of control of 10 CFR 50.62(c)(4) requirements, the licensee should demonstrate and provide in detail that the requirements would have been met under the licensee's current program.

The apparent lack of control of the specific 10 CFR 50.62(c)(4) requirement is not considered a violation because the required implementation is prior to the licensee exceeding 5% thermal power; the general subject of implementation of 10 CFR 50.62 and other similar requirements is, however, an administrative control concern and will be followed as an unresolved item (461/85048-02).

No violations, deviations, or unresolved items other than those discussed above were identified.

6. Plant Tours

The inspector toured the following rooms: Reactor Core Isolation Cooling (RCIC), Residual Heat Removal (RHR) and the Low Pressure Core Spray

(LPCS). Even though preoperational testing is approximately completed for RHR and LPCS, the rooms did not demonstrate adequate controls. Some of the instrumentation racks were under plant staff control while others were still under startup jurisdictional control. The instrumentation observed was not protected from accidental impact or intrusion of materials and dirt that could make the instrumentation inoperable. An example of this is the RHR conductivity instruments which had excessive dirt and materials on and around the instruments. In addition to instrument control, several valves were covered with discarded welding blankets including valves currently under Local Leak Rate testing. These are examples of poor jurisdictional control of testing or tested systems and subsystems. Once a system has completed preoperational testing, that system must be maintained in the same state of quality, as when tested, throughout the turnover and transfer process. SAP-27, "Housekeeping and System Cleanliness," supports the inspector's concern and states, in part, "At turnover (construction to testing), startup becomes responsible for the internal cleanliness of systems and equipment. The internal equipment cleanliness requirements are established and maintained to ensure that testing will not be affected and equipment is not degraded. Startup must further ensure that proper system and equipment layup requirements are followed. The required layup conditions for systems, components and materials must be followed, particularly during periods between tests, disassembly of components during testing and the time between testing and release to Plant Staff." It should also be noted that Plant Staff has the same responsibilities after release of a system. The condition of the systems toured by the inspector is such that if aggressive management actions are not taken, systems and components may be degraded by inadequate internal cleanliness or required layup conditions may be violated prior to or after release to Plant Staff. The resident inspectors are currently monitoring the licensee's response to the inspector's concerns identified above as continuation of their followup to a previous violation in this area (416/84-43-01).

No violations, deviations, or unresolved items were identified.

7. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of violation or deviations. An unresolved item disclosed during the inspection is discussed in Paragraph 5.b.

8. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) on October 10, 1985. The inspector summarized the scope and findings of the inspection. The inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify any such documents/processes as proprietary. The licensee acknowledged the statements made by the inspector with respect to the findings.