

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-461/95011(DRP)

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: June 25 - August 7, 1995

Inspectors: M. J. Miller  
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Approved By: Brent Clayton  
Brent Clayton, Chief  
Reactor Projects Branch 1

8/25/95  
Date

Inspection Summary

Inspection from June 25 through August 7, 1995 (Report No. 50-461/95011(DRP))

Areas Inspected: Routine safety inspection by the resident inspectors of licensee actions on previous inspection findings, operations, maintenance, engineering, and plant support.

Results: No violations or deviations were identified in the areas inspected.

## Executive Summary

### Plant Operations

- Some long term equipment deficiencies continued to present operational challenges. For example, equipment deficiencies and poor administrative controls resulted in the second overflow of a radioactive waste sludge tank. Corrective actions following the first overflow were ineffective in preventing the second event.

### Maintenance

- Increased management focus was beginning to result in resolution of some other long term equipment deficiencies. Emergency diesel generator oil piping modifications and control rod drive pump replacements were examples.

### Engineering

- Strong efforts by engineering were evident in source term reduction. Clinton became the first plant in the country to install pre-filters on the condensate polishing system following initial construction. Good coordination between all departments was noted during the installation.
- Engineering was slow in resolving diesel generator fuel oil transfer pump testing difficulties.

### Plant Support

- Good communications between security and operations resolved an inadvertent switch repositioning event in a timely manner.

### Self Assessment/Quality Verification

- Good overall self assessment capability was noted in Inspection Report 95010. Self assessment challenges were noted within certain line organizations.
- Increased management focus on the timely resolution to equipment problems was evident. Actions to address some specific long term equipment deficiencies that were of previous concern were noted. In contrast, examples of untimely resolution to some other previously identified equipment problems continued to occur. However, licensee recognition and determination to address the broader material condition concern was positive. The licensee was generally effective in addressing broader performance concerns once they become management focus areas.

## DETAILS

### 1.0 OPERATIONS (71707)

The plant operated at power levels up to 100 percent for the entire report period.

The inspectors reviewed the facility for conformance with the license and regulatory requirements. On a sampling basis, the inspectors observed control room activities for proper control room staffing; coordination of plant activities; adherence to procedures or technical specifications; operator cognizance of plant parameters and alarms; electrical power configuration; and the frequency of plant and control room visits by station managers. Various logs and surveillance records were reviewed for accuracy and completeness. Walkdowns of select engineered safety features (ESF) were performed.

### 1.1 Operator Workaround Resulted in Radioactive Waste Sludge Tank Spill

On July 10, 1995, the "A" radioactive waste sludge tank was overflowed which resulted in contaminated water flowing into a clean area. An overflow of the tank also occurred on January 12, 1995. Corrective actions following the earlier event were ineffective in preventing the recent event.

The spill was the result of operators having to work around several equipment deficiencies and operating under poor administrative controls. For example, level instrumentation for the tank had been unreliable since initial operations and the tank's overflow line had been blocked since 1992. On March 29, 1995, the high-high level alarm for the tank was deactivated following several nuisance alarms. The inventory tracking system used to compensate for the lack of level indication only tracked the estimated sludge transferred to the tank and did not account for the liquid added during each transfer. The procedure did not limit the number of transfers to the tank before decanting or the run time of transfer pumps adding inventory to the tank. The sludge tank fluid level was also effected by inventory outside the control of the operator being randomly added to the tank from a waste solidification process without informing the operator.

The safety significance of this event was minimal as proper actions were taken and the cleanup effort resulted in minimal dose. However, the event demonstrated the tolerance of degraded equipment and administrative attempts to work around such equipment. Following the second event, the licensee reactivated the high-high level alarm, cleared the blockage in the overflow line, and revised the administrative controls. A modification to install new level detection instrumentation was also scheduled. The radioactive waste system was not subject to 10 CFR 50, Appendix B, corrective action requirements. Nevertheless, the ineffective corrective actions following the first event, and the tolerance by management to burden operators with

unnecessary workarounds, were considered weaknesses. The inspectors will continue to follow the modification process.

## 1.2 Recurring Reactor Recirculation Pump Seal Degradation

On July 9, the inboard seal on reactor recirculation pump "B" began to degrade after only 1.5 months of operation. The outboard seal on the "B" recirculation pump, which normally operated at 510 psig, was operating at approximately 654 psig at the conclusion of the inspection and continued to exhibit a linear degradation of approximately 4 psig/day. Good sensitivity to this problem was displayed by both the operations and engineering departments when a trending program was initiated to monitor the outboard seal's performance.

Premature failure of recirculation pump seals was a concern. Both "A" and "B" pump seals degraded and were replaced during the last operating cycle. One of these seals again exhibited degradation going into the recent refuel outage. The licensee replaced both pumps' seals during that refuel outage prior to the latest example. The licensee had taken significant previous actions including establishing a clean room for seal work. The licensee was evaluating further corrective action possibilities. The inspectors will continue to evaluate progress in this area.

No violations or deviations were identified in this area.

## 2.0 MAINTENANCE (61726 and 62703)

Station maintenance activities affecting the safety-related and important to safety systems and components listed below were observed or reviewed to ascertain that they were conducted in accordance with approved procedures, regulatory guides, and industry codes or standards, and did not conflict with technical specifications. Surveillance testing required by technical specifications, the safety analysis report, maintenance activities, or modification activities were observed or reviewed. Areas of consideration while performing observations were procedure adherence, calibration of test equipment, identification of test deficiencies, and personnel qualification. Areas of consideration while reviewing surveillance records were completeness, proper authorization and review signatures, test results properly dispositioned, and independent verification documented.

The following maintenance and surveillance activities were observed or reviewed:

- D62786 Control Rod Drive Pump "A" Replacement
- 9051.01 High Pressure Core Spray Pump Operability Test
- 3304.01 Control Rod Hydraulic and Control (Pump Operability Test)

## 2.1 Equipment Replacement Resulted In Some Improved Material Condition

The licensee began to address some additional long term material condition issues, signifying an increased sensitivity to operator workarounds by all departments. (Lack of timeliness in resolving some previously identified problems was documented in past inspection reports (95008, 94015, 94014)). Notable examples of problems now being addressed included the following:

- Oil piping on the Division 1 emergency diesel generator (EDG) was replaced with swagelock fittings as part of a continuing effort to reduce the number of fluid leaks in the plant. The licensee planned to replace the piping for both the Division 2 and 3 EDGs later this year.
- The "A" control rod drive (CRD) pump was replaced in response to the degraded performance of both pumps as described in Inspection Report 95008. Good coordination was noted between all departments and maintenance workers were knowledgeable of the work performed. The licensee planned to overhaul the degraded pump that was removed such that the "B" CRD pump can be replaced in November 1995.

Although a number of challenges remained, this effort was viewed as positive. The inspectors will continue to evaluate licensee actions to ensure degraded equipment is properly assessed, prioritized, and followed to resolution in a timely manner.

No violations or deviations were identified.

## 3.0 ENGINEERING (37551)

The inspectors evaluated the licensee's engineering activities and the effectiveness of the engineering organization to perform routine and reactive site activities, including the identification and resolution of technical issues and problems.

### 3.1 Strong Engineering Efforts Emphasizing Source Term Reduction

Continuing efforts to minimize total plant dose were supported by the engineering department through installation of a new pre-filter unit on the "A" condensate polisher following refueling outage 5. Clinton Power Station was the first nuclear plant in the country to install this type of modification post-construction. The licensee believed, that once installed on all condensate polishers, this extra filtering action may result in a 25 percent increase in iron removal (reducing the source term) and extend the life of the polisher resin approximately 18 months.

Engineering was central in all phases of this effort. The licensee analyzed various options to reduce source term. The modification was designed largely in-house with assistance from the vendor. Initially,

pre-filters from different vendors were to be installed on three polishers. Engineering then planned to evaluate which was the most effective prior to installation on the remaining polishers.

Excellent coordination between all departments was noted during the modification work performed on the "A" condensate polisher. Maintenance workers were consulted concerning the space requirements needed for future work. Radiation protection technicians monitored the work area for possible dose rate concerns. Coordination efforts between engineering and operations resulted in "trouble-free" testing of the first pre-filter unit and provided hands-on training for the operations department system expert. Good supervisory oversight was also noted during the installation and testing.

The inspectors will evaluate the effectiveness of this modification in conjunction with overall source term reduction efforts.

### 3.2 Hydraulic Transient Experienced During Condensate Pump Testing

In late July the condensate system experienced a hydraulic transient during post-maintenance testing on the "C" condensate pump. The system engineer initiated a system walkdown following the event which identified damage to two pipe supports and a broken yoke on the minimum flow line control valve. In addition, the chain operator wheel for a manual valve in the minimum flow line broke off at the stem immediately following the pump start.

A team consisting of operations, maintenance, and engineering personnel was formed to determine possible root causes and corrective actions. A thorough action plan was developed by the team and good teamwork was displayed by all involved. All damage to the system, with the exception of the valve yoke, was repaired at the conclusion of the inspection; however, the licensee's investigation of the event was still in progress. The NRC will complete review of this event once the licensee has concluded its actions.

### 3.3 Untimely Resolution To Diesel Generator Fuel Oil Transfer Pump Testing Difficulties

Due to suspected inaccuracies in diesel generator fuel oil transfer pump testing methodology, the licensee continued to experience challenges to maintenance, engineering, and operating personnel. These inaccuracies, involving determination of pump flow rate, had not been successfully addressed:

- A cumbersome testing procedure required significant engineering and maintenance involvement to resolve surveillance failures.
- Acceptance criteria for the Division 2 pump were changed in November 1994 when measured flow rates increased 2 gpm from historical values. The acceptance criteria was changed back to

the previous values in July 1995 when flow rates were returned to near historical values.

- A proposed modification to install a flow meter to improve test accuracy was put on hold due to uncertainties concerning the cause of the problem.

Root cause determination and resulting corrective actions were not heavily pursued since the pump continued to meet the revised acceptance criteria. In addition, the revised acceptance criteria could have masked actual problems with the system. At the conclusion of the inspection, the licensee was reconsidering the possible installation of a flow meter as proposed in 1994.

No violations or deviations were identified.

#### 4.0 PLANT SUPPORT (71750)

On a routine basis, the inspectors toured accessible areas of the facility to assess worker adherence to radiation controls and the site security plan, housekeeping or cleanliness, and control of field activities in progress.

##### 4.1 Good Response to Abnormality Encountered During Security Drill

During a recent security drill a security force member (SFM) inadvertently operated two switches on a safety related panel when repositioning himself in response to changes in the drill. Good communications were displayed by security and operations during this event. Control room operators immediately notified security when the annunciator associated with the switch repositioning alarmed in the control room. The security force communicated the control room's concern to all SFMs in the area and were quickly notified of the cause of the alarm. Although security personnel were sensitive to inadvertently operating equipment during drills, the realism displayed by the SFMs during the drill was a strength.

No violations or deviations were identified.

#### 5.0 SELF ASSESSMENT/QUALITY VERIFICATION (40500)

##### 5.1 Good Self Assessment Capability

An evaluation of licensee self assessment capability using inspection procedure 40500 was performed during the inspection period to review self assessment functions. Overall, the licensee's performance in this area was very good. Self assessment challenges were noted within certain line organizations. Specific inspection results are documented in Inspection Report 95010.

## 5.2 Increased Management Focus On Timely Resolution To Equipment Problems

The licensee had recently increased management focus on the timely resolution of equipment problems and was beginning to take actions to address some specific long term equipment deficiencies. (See paragraph 2.1 for examples of improved material condition.) The broader concern involving engineering and operations weaknesses contributing to untimely actions for some equipment problems was discussed in previous inspection reports and the recent systematic assessment of licensee performance (SALP) report. Progress on addressing root causes of the broader concern and therefore long term effectiveness will be evaluated as the licensee implements associated corrective actions.

The licensee was generally effective in addressing broader performance concerns once they become management focus areas. (See paragraph 2.1 for an example concerning continued emphasis on minimizing radiation dose to workers.) Some examples of untimely resolution to previously identified equipment problems continued to occur. (See paragraph 1.1 on second radioactive waste sludge tank spill and paragraph 3.3 on diesel generator fuel oil transfer pump testing difficulties.) However, in reference to strong improvements on previous focus areas, licensee recognition and determination to address the overall concern (untimely resolution to some equipment problems) was positive.

## 6.0 MANAGEMENT MEETINGS (40500)

### 6.1 Preliminary Inspection Findings (Exit)

The inspectors contacted various licensee operations, maintenance, engineering, and plant support personnel throughout the inspection period.

At the conclusion of the inspection on August 7, 1995, the inspectors met with licensee representatives (denoted below) and summarized the scope and findings of the inspection activities. The licensee acknowledged the inspector's comments. The inspectors also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors. The licensee did not identify any such documents or processes as proprietary.

J. Cook, Vice President  
R. Morgenstern, Manager - Clinton Power Station  
J. Miller, Manager - Nuclear Station Engineering Department  
R. Wyatt, Manager - Nuclear Assessment  
D. Thompson, Assistant Manager - Nuclear Assessment  
J. Palchak, Manager - Nuclear Training and Support  
L. Everman, Director - Radiation Protection  
P. Yocum, Director - Nuclear Assessment  
W. Clark, Director - Plant Maintenance  
K. Moore, Director - Plant Operations  
A. Mueller, Director - Plant Support Services  
C. Elsasser, Director - Planning & Scheduling



R. Phares, Director - Licensing  
R. Kerestes, Director - Nuclear Safety and Analysis  
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