U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-461/88007(DRS)

Docket No. 50-461 License No. NPF-62

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

Facility Name: Clinton Nuclear Power Station, Unit 1

Inspection At: Clinton Site, Clinton, Illinois

Inspection Conducted: March 21 through April 15, 1988

Inspectors: P. R. Rescheske
Team Leader — Date: May 17, 1988

for A. M. Bongiovanni — Date: May 17, 1988

R. Mendez — Date: May 17, 1988

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Approved By: Monte P. Phillips, Chief
Operational Programs Section — Date: May 17, 1988

Inspection Summary

Inspection on March 21 through April 15, 1988 (Report No. 50-461/88007(DRS))
Areas Inspected: Special, unannounced team inspection assessing the effectiveness of the licensee's Quality Verification (QV) organizations (TI 2515/78). Areas reviewed included specific QV activities, Quality Control, C&I, Operations surveillances, and conduct of control room operations.
Results: Of the areas inspected, no violations or deviations were identified.

DETAILS

1. Persons Contacted

W. C. Gerstner, Executive Vice President
D. P. Hall, Vice President
J. S. Perry, Manager, Nuclear Program Coordination
A. M. MacDonald, Director, Nuclear Program Assessment
J. W. Wilson, Manager, Clinton Power Station
R. E. Campbell, Manager, Quality Assurance
R. D. Freeman, Manager, Nuclear Station Engineering
J. A. Miller, Manager, Scheduling and Outage Management
F. A. Spangenberg, Manager, Licensing and Safety
R. F. Shaller, Assistant Manager, Operations
J. Greenwood, Manager, Power Supply
J. A. Fertic, Director, Quality Systems and Audits
J. D. Weaver, Director, Licensing
G. L. Baker, Supervisor, Quality Systems
K. A. Baker, Supervisor, I&E Interface

All of the above persons attended the exit meeting on April 15, 1988.

The inspectors contacted other licensee management and staff during the course of the inspection, including members of the QA, Operations, C&I, and Nuclear Training Departments.

2. Introduction

The team inspection at the Clinton Power Station (CPS) assessed the licensee's quality verification (QV) organizations' ability to identify, solve, and prevent significant deficiencies in functional areas encompassing plant operations. The inspection also assessed line management's ability to ensure that identified deficiencies were dealt with promptly and completely. The functional areas primarily reviewed were operations and C&I (control and instrumentation), although the inspection was not limited to these areas. The details and results of the review are discussed in the paragraphs below. In addition, specific activities performed by the QV organizations were reviewed to aid in assessing the overall QV involvement in plant operations. A discussion of the results from this review follows.

3. QV Activities

The inspectors reviewed several specific activities and programs associated with the licensee's QV organizations. The review included programmatic discussions with Quality Assurance (QA) management and staff, and direct observation of QV activities. The objective was to assess the performance and impact of the more formal and routine QV processes on plant operation. Results from the discussions and observations follow.

a. Condition Reports (CRs) are used by the licensee to identify, report, and correct conditions adverse to quality. The assigned plant department is responsible for developing and implementing documented resolution to the deficiency. The QA department is directly involved in the process when the deficiency is quality classified. The inspectors reviewed numerous CRs during the course of the inspection, and considered the CR process to be a conservative approach in identifying and resolving conditions potentially adverse to quality.

b. The corrective action trend analysis of non-hardware deficiencies is performed under the direction of the QA department. Corrective action documents, such as CRs, LERs, NRC violations, and audit findings, are trended by assigning each a deficiency code. The trend data is analyzed weekly over a three month period to determine if a potential adverse trend exists. Upon closure of a corrective action document, the root cause is verified correct and entered in the trend analysis. The inspectors were concerned that by trending on a problem rather than the root cause, the potential existed to miss adverse trends. In addition, the inspectors questioned if the trend period of three months was an adequate length of time. The licensee had discussed similar concerns with other NRC staff recently, and stated that efforts were continuing to improve methods of trending and root cause analysis which would increase the effectiveness of these programs at CPS.

c. A critique is an informal meeting conducted by the licensee subsequent to an identified problem. Participants include persons directly involved in the activities being performed when the problem was identified and the associated department management. Informal discussions of the root cause, and immediate and long term corrective actions take place. A critique report is generated; corrective actions are generally tracked and documented using a CR. The inspectors attended a critique meeting (see Paragraph 7) and reviewed numerous reports during the course of the inspection. The concept of critiques was considered to be an effective method of identifying root causes, and appeared to be a beneficial process at CPS. Implementation of the process was successful in evaluating problems and determining the appropriate actions to resolve and prevent recurrence of problems.

d. Two of the more formal QA programs implemented at CPS are QA audits and QV surveillances. When deficiencies are observed during these activities, they are documented as audit findings and CRs. Corrective action responses are required to be documented by the applicable department and reviewed by QA. The inspectors observed an audit and surveillance being performed during operations surveillance testing in the control room.

During the observation of a limited scope audit, the inspectors noted that the auditors had not verified that an impact matrix was being used as part of the test. In accordance with the licensee's instructions, certain activities require that an impact matrix be completed prior to performance of the test. The requirement covered

this particular test; however, an impact matrix did not exist. A critique was subsequently held by the licensee (see Paragraph 7). Discussions with the QA department indicated that not all auditors were aware of the requirements or their applicability. Prior to the conclusion of this inspection, the licensee revised the audit checklists to include additional guidance concerning impact matrices, and completed QA staff training (required reading) on the impact matrix instruction.

A QV surveillance of an operations surveillance was also observed by the inspectors. The inspectors noted that one of the two QV surveillants was licensed at CPS. Problems in the conduct of control room operations and in completing the prerequisites for the test, were observed by both the inspectors and the QV surveillants (see Paragraph 7). The test was halted, then successfully completed the following day. The QV team immediately documented their observations in an Operations Monitoring Report.

The inspectors generally found that the two programs discussed above were adequate and had a positive impact on plant operations. The QA staff technical expertise was sufficient for performing their tasks. Discussions with the licensee indicated that experts from other departments are occasionally borrowed to perform QA tasks.

e. The licensee established an Operations Monitoring Program in March 1986. The program is somewhat unstructured, consisting of goals and objectives, rather than requirements and procedures. A small Ops Monitoring group exists under the direction of the QA department; however, all QA staff can document observations in an Ops Monitor report. The concept is simply to monitor and report conditions observed, and to provide feedback to plant management. When problems are identified in an Ops Monitor report, comments and resolution are generally documented by the applicable department management. The inspectors accompanied an Ops Monitor during a control room observation. The Monitor was knowledgeable and thorough in the activities and documentation being monitored. Based on observations, discussions, and review of reports, the inspectors concluded that the program and its implementation was effective and beneficial to the quality of plant operations.

4. Quality Control

The inspectors examined QC functions performed by the licensee's QV staff, and several problem areas identified by LERs, CRs, and trend reports. A discussion of the review follows.

a. Hold points are inserted in work instructions by Quality Engineering personnel. Nine CRs, written during the period from September 3, 1987, to February 25, 1988, were reviewed by the inspectors. The CRs documented missed hold points with several root causes. An increasing frequency of occurrences was noted; however, the trend was associated with outage work. The licensee's trending program identified the deficiencies as a potential adverse trend. Corrective actions included retraining personnel and rewriting work

procedures to clarify hold point requirements. QV involvement was well documented and addressed by the CR process. Corrective actions were effective, as evidenced by the sharp decline of deficiencies in this area.

b. Bolt torque problems were identified by four CRs in November 1987. Problems associated with torquing included changes in load requirements, following procedures, and missed hold points. The issues were resolved by performing engineering evaluations and stressing procedure compliance.

c. CR-1-87-09-010, dated August 26, 1987, documented an improper filter change out on AR/PR equipment (radiation monitor). The corrective action included establishing a consistent AR/RP controls policy and assigning work to six qualified system operators.

CR-1-88-03-016, dated March 4, 1988, identified that an incorrectly sized resin trap screen mesh had been installed. The licensee determined that the specification was in error. An engineering evaluation concluded that the existing strainers could be used until the proper strainers were acquired and installed. The corrective actions included correcting the specification and revising the drawing.

The results from the review of the problems discussed above indicate that the licensee was effective in identifying deficiencies and trends, and resolving the issues. The use of CRs for documenting and correcting problems was an effective QV mechanism. Corrective actions were appropriate; no significant trends were identified.

5. Control and Instrumentation (C&I)

The inspectors assessed the effectiveness of QV personnel, including the responsible C&I management, in identifying recurring problems, determining root causes, and taking the appropriate corrective actions to solve problems and prevent recurrences. The following documents were used during the review:

- LER 87004, January 21, 1987: Actuation of Division I ECCS due to a hydraulic surge during the restoration of a pressure transmitter.

- LER 87014, March 15, 1987: Actuation of Division of III ECCS caused by technician error when refilling a level transmitter.

- LER 87022, April 7, 1987: Actuation of Division III ECCS during the restoration of a level instrument.

- LER 87024, May 1, 1987: Isolation of the Reactor Water Cleanup System (RWCU) caused by flow perturbations while venting a RWCU transmitter.

- LER 87026, May 11, 1987: Actuation of Division III ECCS while returning a level instrument to service.

- LER 87052, September 2, 1987: Isolation of the RCIC system while C&I technicians were investigating spurious signals on a transmitter.

- LER 87063, November 22, 1987: Improper valve lineup after testing involving a transmitter.

- CR-1-88-01-063, February 25, 1988: Improper lineup of test and vent valves for a level transmitter identified prior to a surveillance.

Each of the documents reviewed involved the restoration of a transmitter on a pressure sensitive line, and licensee procedures CPS 8801.06, "Operation of Local Panel Calibration Stations," and CPS 8801.12," Local Mounted Instrument Valve Operation." The root causes were attributed to personnel error and/or procedural deficiency. Through review of this recurring issue and discussions with C&I management, the following observations were made:

a. Regarding LERs 87004, 87014, 87022, 87024, and 87026, the root causes were correctly identified as personnel error and inadequate procedures. In each case, the technician lacked the proper guidance on how to perform the task due to procedural deficiencies. The technicians received training on the causes of hydraulic surges in pressure sensitive lines and were made aware of the potential for a surge during restoration of a transmitter. The corrective actions taken by the licensee were effective. An ESF actuation due to a hydraulic surge has not occurred since May 1987.

b. LER 87052 resulted from an isolation of the RCIC system while troubleshooting for the cause of erratic Division II RCIC steam flow indication. This event is not related to the previous actuations discussed above, since the procedure was adequate and the work was supervised.

c. LER 87063 was a result of an improper post-test valve lineup. During a response time test, a C&I technician had manipulated the root valve of the pressure transmitter to provide double valve protection from the pressure boundary. The valve manipulation was not in accordance with the current version of the procedure. The valve position was not verified subsequent to the completion of the test, thereby leaving the reactor pressure vessel instrument isolated. Discussions with C&I management indicated that the procedure for locally mounted transmitters had been revised a few days prior to the performance of the test, and that the technician had used the superseded procedure. The licensee stated that significant procedure changes were routinely discussed with C&I personnel; however, in this particular case, the technician was not aware of the revision. This event appears to be an isolated case. The inspectors noted that, in general, communications between line management and technicians was adequate.

d. The cause analysis for CR-1-88-01-063 was not completed by the licensee prior to the end of the inspection period. Discussions with the licensee indicated that the valve misalignment was unrelated to LER 87063.

Management involvement in assuring quality in this functional area was evident. Line supervisors are required by procedure CPS 1502.03 to evaluate at least three work activities per week, and complete a task performance checklist. Discrepancies with procedures and problems with personnel which are generated by the checklists are brought to the attention of management. Weekly briefings are held with department personnel to discuss procedure changes and plant conditions. Licensee QV in this functional area appeared to be effective in determining root cause and resolving significant problems. Line management expressed a genuine interest in the activities and performance of their staff.

6. Operations - Surveillances

The inspectors examined recurring problems in the areas of missed surveillances and channel checks. The involvement of QA and QV personnel, and responsible management in identifying and preventing Technical Specification (TS) violations was assessed. The following documents were used during the review:

- LER 87008, September 29, 1986, to April 8, 1987: Channel check of containment high pressure isolation instrumentation was not performed on the proper instrument. During the review of this event, the licensee determined that four additional channel checks in surveillance procedure CPS 9000.01 had not been performed.

- LER 87015, March 9, 1987: RCIC steam tunnel timers were not tested due to inadequate functional check procedure. As a result of the deficiency, the licensee identified two additional deficiencies in the area of functional testing through an expanded scope QA audit (Q38-87-14) of TS surveillance requirements.

- LER 87032, June 4, 1987: Post maintenance test required by TS 4.6.4.1 was not performed for containment isolation valve 1VR001A. Operations personnel did not verify surveillance requirements prior to entry into Mode 2.

- LER 87035, July 22, 1987: Surveillance procedure CPS 9911.75 did not identify all requirements of TS 3.12.2 in area of Land Use Census.

- LER 87044, September 22, 1986, to June 4, 1987: Procedural channel check requirements for the Average Power Range Monitors (APRMs) were not sufficiently thorough to satisfy TS Table 4.3.1.1-1.

- LER 87046, July 29, 1987: Violation of TS Table 4.3.7.11-1 requirements for functional testing of a monitor since September 26, 1986, due to the deletion of radwaste isolation trip testing from the procedure. During the critique of the event, the licensee identified several other violations.

- LER 87049, August 19, 1987: TS required channel checks were not performed on the APRM flow biased power percent flow channel. In addition, the rod pattern low power set point channel functional test checklist was not performed.

- LER 87051, August 28, 1987: Channel functional checks were not performed on the Rod Pattern Control System, rod withdrawal limiter high power setpoint test. The licensee determined that the functional checks were not being performed at the required intervals.

- LER 87054, September 16, 1987: TS violation due to failure to track and perform a chemistry surveillance.

- LER 87061, October 14, 1987: A channel check of the containment pressure high trip function was missed due to an omission from the surveillance procedure by a licensed operator.

- LER 87069, [illegible]ber 3, 1987: TS Table 3.3.2-1 violation on failure to enter LCO [illegible]N statement due to inoperable transmitters not included in HPCS response time test surveillance.

- CR-1-88-04-019 and LER 88010, April 1, 1988: Operator failed to perform surveillances required by CPS 9000.01D002 for an entire shift. Preliminary investigation by the licensee attributes personnel error "mental lapse" as the root cause.

The above events were the result of one or more of three deficiencies. The root causes were categorized as: (1) licensed operator personnel error, (2) procedures deficient in TS equipment operability requirements, and (3) the lack of a surveillance procedure to meet TS Section 4 requirements. To assess licensee QV effectiveness in identifying and preventing deficiencies in this area, the inspectors reviewed several audits performed by the QA department. In 1987, four audits, Q38-87-14, Q38-87-28, Q38-87-44, and Q38-87-61, were conducted to verify that unit operators were complying with TS. During QA audit Q38-87-44, May 19 through June 18, 1987, the licensee identified several examples where TS surveillance requirements were not addressed within the Master List of Surveillances (MLS). This deficiency was the root cause of several LERs discussed above. As a result, the licensee committed to a 100% verification of the MLS against TS, to ensure that procedures exist for all required surveillances. The QA department was tasked with the responsibility for the verification program, to be completed within two years through their biennial review of procedures. The biennial reviews should identify inadequate procedures. The inspectors reviewed future schedules for audits in the area of TS compliance, and determined that the scope and frequencies of the audits were adequate. Discussions with the licensee indicated that when recurring problems exist, the frequency of audits in that area are increased. The changes in audit schedules to react to problems are generally accomplished through verbal communications.

In October 1987, in response to the high frequency of personnel errors, the licensee instituted a site wide program to reduce the increasing number of reportable events. The LER Reduction Plan encouraged individuals to have a greater awareness of their own actions and the consequences thereof. The goal was to motivate employees to achieve a zero initiation rate for preventable LERs. Management involvement at all levels was mandated. Since the initiation of this program, LERs attributed to personnel error have dramatically decreased. Additional corrective actions included implementing a tracking system (a status board in the control room) for

tracking short term LCOs and surveillances, to assist the licensed operators.

Licensee QV in this area appeared to be effective in determining root cause and resolving significant problems which resulted in LERs. Management involvement in reducing the number of reportable events was evident.

7. Conduct of Control Room Operations

The inspectors accompanied QA personnel and observed two operations surveillance tests being performed in the control room. The results from observing the QA activities are discussed in Paragraph 3. The following is a discussion of operations activities during the testing:

a. On April 6, 1988, operations was performing an APRM channel functional test per procedure CPS 9031.12. The inspectors observed that an impact matrix was not being used as required by Standing Order PMSO-030. This instruction required that certain surveillances must be evaluated for impact on plant equipment, and that a surveillance impact matrix be completed prior to test performance and attached to the test package. The event prompted a critique which was conducted on April 7, 1988. The discussions indicated that the operations staff was aware of the requirement, but does not always comply with it because of their familiarity with routine operations surveillances. Impact assessments were generally performed on more complex surveillances and 100% compliance was required from all other departments. Further discussions revealed that the PMSO did not reflect current practices, and that not all control room copies of the standing orders were up to date. The result of the critique was that when a procedure becomes overburdensome, it should be changed rather than not complied with. Since PMSO-030 was, in part, a commitment to the NRC, the Resident Inspector Office was notified of the licensee's intent to revise it. The inspectors had no further concerns regarding this issue. The critique process appeared to be effective, in that, the operations staff discussed the issue in depth, the possible resolutions, and the immediate actions to be taken to prevent recurrence.

b. On April 7, 1988, the inspectors accompanied a QV surveillance team to the control room to observe operations performing an IRM channel functional test (per procedure CPS 9031.14). The plant was in Mode 4 (cold shutdown); control rod withdrawal blocks were in place due to instrument air being tagged out the night before, causing the scram valves to be open and the scram discharge valves to fail shut (volume above the high level setpoint). Clearing the rod blocks was a prerequisite to the test and, since this could not be achieved under the existing conditions, the test could not be performed. This indicated a weakness in test planning and scheduling. The fact that the test was not appropriate under the existing plant conditions was not recognized during the snift turnover meeting which had taken place earlier that day. Further, the shift supervisor had not

recognized in his review that the test could not be performed, and had approved the test procedure for use. Subsequently, there appeared to be considerable confusion in the control room when performance of the test was attempted. At one point, the Line Assistant Shift Supervisor (LASS), after discussions with other licensed operators, made the decision to clear the rod blocks by moving the mode switch on the mistaken notion that this would have no adverse consequence. (In fact, this action would have resulted in a scram signal.) At no time, even though there was uncertainty on how to proceed, did the control room operators seek assistance. Due to numerous other activities in the control room, the action was not carried out immediately. Eventually (after about one hour), the LASS discovered his error and terminated the test. It appeared that the relatively straightforward conflict in plant conditions should have been detected and dealt with at one of the numerous steps in the scheduling, planning, and performance process. On April 8, 1988, the test was restarted (approximately 16 hours after the initial attempt), and was subsequently completed.

The QV surveillance team observed the activities on both days and documented their observations in Ops Monitor reports. According to the April 7 report, the following observations were made.

(1) The tagout of the instrument air was not initially identified as a restraint to performing the test.

(2) The LASS made the "suggestion" to move the mode switch to the STARTUP/HOT STBY position to see if that would remove the rod blocks. The suggestion was made without fully realizing the operational impact and without consulting the appropriate procedures and drawings. Moving the mode switch would have resulted in a scram signal (and a potential LER) under the current plant conditions.

(3) The operation status board did not indicate that instrument air was out of service, considering the operational impact.

In addition, the April 8 report documented the following problems.

(1) The test package did not reflect the fact that the test had been stopped on April 7.

(2) Two of the three prerequisites completed on April 7, were not reverified when the test was restarted on April 8.

(3) Other documentation problems were identified in control room logs and journals.

The inspectors concurred with the QV surveillants' observations, and considered the Ops Monitor reports to be very thorough in describing the sequence of events and identifying deficiencies. The operations department will be responding to both reports as a matter of routine.

As a result of the observations, the circumstances surrounding the testing, and discussions with operations management, the inspectors were concerned with the quality of activities performed in the control room. The identified problems should be reviewed by the licensee and action taken to preclude further occurrences of this type. The inspectors recommended that management attention and involvement be increased in the area of control room operations. It was evident that licensed operator personnel errors resulting in LERs have been reduced, as discussed in Paragraph 6. However, the conduct of surveillance testing can be improved, thus improving the quality of operations and preventing potential LERs. This can be achieved through increased awareness by management of control room activities and a better understanding of the causes for personnel error.

8. Exit Interview

The inspectors met with the licensee representatives (denoted in Paragraph 1) on April 15, 1988. The inspectors summarized the scope and findings of the inspection. The licensee acknowledged the statements made by the inspectors. The inspectors also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection. The licensee did not identify any such documents/processes as proprietary.