February 25, 2000

Mr. Michael T. Coyle
Vice President
Clinton Power Station
AmerGen Energy Company
Mail Code V-275
P. O. Box 678
Clinton, IL 61727

SUBJECT: NRC INSPECTION REPORT 50-461/2000004(DRS)

Dear Mr. Coyle:

On January 28, 2000, the NRC completed an inspection at your Clinton Nuclear Power Station. The enclosed report presents the results of that inspection.

This inspection was an examination of activities conducted under your license as they relate to actions taken to identify and correct problems. The inspection also reviewed your compliance with the Commission's rules and regulations and with the conditions of your license. The inspection consisted of a selective examination of procedures and representative records, observations of work in progress, and interviews with personnel.

The overall effectiveness of your corrective action program has improved. Your staff had a low threshold for initiating condition reports and, in general, took effective corrective actions. Improvements in the quality of apparent and root cause evaluations generally resulted in the effective resolution of issues recently raised in condition reports. However, the use of trending information as an integral part of the corrective action program has only recently been fully implemented. Therefore, adverse performance trends, such as that in the air operated valve program, have not always been promptly addressed.

Based on the results of this inspection, the NRC has determined that one violation of NRC requirements occurred. This violation is being treated as a Non-Cited Violation (NCV), consistent with Appendix C of the Enforcement Policy. The NCV concerned the failure to perform a required 10 CFR 50.59 evaluation and is described in the subject inspection report. If you contest the violation or severity level of this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, Region 3, and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with 10 CFR 2.790 of the Commissions regulations, a copy of this letter, its enclosure, and your response to this letter, if you should choose to respond, will be placed in the NRC Public Document Room.

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

/RA/

Steven A. Reynolds, Deputy Director
Division of Reactor Safety

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

Enclosure: Inspection Report 50-461/200004(DRS)

cc w/encl: P. Hinnenkamp, Plant Manager
M. Reandeau, Director - Licensing
M. Aguilar, Assistant Attorney General
G. Stramback, Regulatory Licensing
Services Project Manager
General Electric Company
Chairman, DeWitt County Board
State Liaison Officer
Chairman, Illinois Commerce Commission

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-461
License No:	NPF-62
Report No:	50-461/200004(DRS)
Licensee:	AmerGen Energy Company
Facility:	Clinton Nuclear Power Station
Location:	Route 54 West Clinton, IL 61727
Dates:	January 10 - 14 and 24 - 28, 2000
Inspectors:	P. Lougheed, Senior Engineering Inspector K. Green-Bates, Engineering Inspector R. Mendez, Engineering Inspector
Approved by:	John M. Jacobson, Chief, Mechanical Engineering Branch Division of Reactor Safety

EXECUTIVE SUMMARY

Clinton Nuclear Power Station, Unit 1
NRC Inspection Report 50-461/200004(DRS)

This was an announced inspection of the corrective action program. It was focused on the licensee's ability to identify and correct problems, especially in the post-restart period, and did not address all aspects of a routine corrective action inspection. This inspection consisted of two weeks onsite separated by an in-office week. The inspection ran from January 10 through 28, 2000, and was performed by a three member team of engineering inspectors.

This inspection was conducted to determine if the weaknesses identified in the previous corrective action inspection, documented in Inspection Report 50-461/99001(DRS), were still occurring. Inspection Report 50-461/99001(DRS), which ran from February 8 through March 25, 1999, documented concerns with the approval process for issuing condition reports, corrective action program effectiveness reviews, problem trending, and with the effective resolution of issues.

Operations

(Note: The findings presented here apply across functional areas and are discussed under Operations in accordance with the guidance of NRC Manual Chapter 0610.)

- The licensee had a low threshold for initiating condition reports and generally displayed a conservative focus when assigning the significance level (Section O7.1b1).

- Corrective actions, both immediate and long-term, were good, overall, with only one example where the corrective actions taken were not appropriate. This was the failure to perform a required 10 CFR 50.59 evaluation. One Non-Cited Violation was identified (Section O7.1b2).

- Root cause evaluations were thorough and appropriate, as were the apparent cause evaluations, with two exceptions. In both cases, failure to consider all sources of information contributed to the inadequate evaluations (Section O7.1b3).

- The inspectors concluded that the licensee had made progress on weaknesses that were identified during the previous corrective action inspection. The approval process for completed condition reports was more thorough as evidenced by the improved quality of the root and apparent cause evaluations (Section O7.1b4).

- Departmental trending was being used as an integral part of the corrective action program. However, due to its recent implementation, adverse performance trends, such as in the air operated valve program, were not always promptly addressed (Section 07.1b6).

- Self-assessments followed the requirements of the licensee's procedures. The self-assessments were performance-based and conducted by qualified and experienced individuals. The assessments identified problems that were being tracked by either

condition reports or task assignment tracking items. Providing the assessors with the opportunity to review proposed and final corrective actions was a good method to ensure that proper corrective action was taken (Section O7.2).

- Quality assurance audits were critical and adequately identified deficiencies. Corrective actions taken in response to quality assurance findings, observations and recommendations appeared appropriate (Section O7.3).

Report Details

I. Operations

O7 Quality Assurance in Operational Activities

O7.1 Review of Condition Reports

a. Inspection Scope

The inspectors reviewed 100 condition reports that were closed in 1999. Of the condition reports reviewed, 43 were initiated since startup from the extended plant outage, and 36 were written following the latest revision of the corrective action procedure. This allowed the inspectors to evaluate improvements in the program since startup from the extended outage. All condition reports are discussed in this section, regardless of which department initiated the report, or which was assigned the corrective actions. This is to avoid duplication of repetitive observations and findings and is in accordance with the guidance in NRC Manual Chapter 0610.

The condition reports were evaluated to determine the initiation threshold, the acceptability of corrective actions, and the adequacy of apparent and root cause evaluations. In addition, trending of condition reports were evaluated and the effectiveness of the corrective actions was reviewed.

b. Observations and Findings

b1. Initiation of Condition Reports

Procedure Clinton Power Station (CPS) 1016.01, “Condition Reports,” Revision 33, established a corrective action program based on the identification, classification and resolution of conditions adverse to quality. This procedure also provided guidance for assigning levels of significance and investigation for conditions adverse to quality, for evaluating the effectiveness of corrective actions and for trending of problems.

The threshold for condition report initiation was conservatively low, based upon the type of problems documented on the condition reports reviewed. The licensee used the condition reporting system to capture not only conditions adverse to quality, but also other adverse conditions such as those that could impact personnel safety or security. The condition reports generally had the appropriate significance level assigned, based upon the guidance contained in Appendix “A” of CPS 1016.01. Appendix "A" specified a three-tier significance level system, with Level 1 events being the most significant. The management daily review of condition reports provided a consistent and conservative review of condition reports for significance. The inspectors noted occasions where, during the daily review, the management review team raised a condition report's significance level due to prior instances of similar conditions adverse to quality. The inspectors evaluated the condition reports initiated during the third quarter of 1999 and noted that approximately 15 percent were categorized as Level 2,

with the remainder being Level 3. The significance levels assigned to the condition reports reviewed were appropriate.

b2. Corrective Actions

Immediate corrective actions to place the plant in a safe condition appeared to be appropriately taken and documented on the condition report, with one exception. In that case, on condition report 1-99-09-062, the inspectors verified that the appropriate immediate actions had been taken although not documented on the condition report.

Longer term corrective actions to prevent recurrence were generally effective and, in some cases, extensive. For example, after identifying a fuse problem, the licensee performed a 100 percent plant walkdown of all safety-related fuses and replaced the 20 percent that did not conform to the original design documents. In addition, the licensee issued guidance to ensure that all fuse replacements conformed to the original design documents and entered each safety-related fuse in the master equipment list. In another example, the licensee tested all the models and types of safety-related molded case circuit breakers that were showing high failure rates and established a six year preventative maintenance schedule for these breakers. These long term corrective actions were appropriate to prevent recurrence of the original problems.

However the inspectors did identify one example where the corrective actions did not appear appropriate:

Condition Report 1-99-06-108: This condition report dealt with discrepancies between the updated safety analysis report and procedure CPS 3408.01, "Containment Building/Drywell Heating, Ventilation and Air Conditioning," regarding operation of the continuous containment purge system. The apparent cause report stated that the condition report was issued for clarifications to the updated safety analysis report and concluded the changes were entirely editorial. However, the changes involved revising updated safety analysis report section 9.4.6 to allow use of the continuous containment purge system in a manner previously specifically excluded. No 10 CFR 50.59 evaluation was done either when the updated safety analysis report was changed or on either occasion when the procedure was revised to conflict with the safety analysis report.

A 10 CFR 50.59 evaluation is required to be performed if the change involves, in part, a change to the facility as described in the safety analysis report. In Revisions 8 and 13 of CPS 3408.01, the licensee revised CPS 3408.01 to incorporate a temporary modification to allow cross-connection between the refueling floor containment ventilation ductwork and the continuous containment purge system and then to allow use of the system in all modes of operation, contrary to updated safety analysis report section 9.4.6 and without performing a 10 CFR 50.59 evaluation. In August 1999, the licensee revised updated safety analysis report section 9.4.6 to match CPS 3408.01, again without performing a 10 CFR 50.59 evaluation. The inspectors ascertained that, when cross-connected with the continuous containment purge system, air from the refueling floor would have been monitored with isolation devices that automatically closed upon a high radiation signal. Therefore, the violation was considered to be of low safety significance. This Severity Level IV violation is being treated as a Non-Cited

Violation, consistent with Appendix C of the NRC Enforcement Policy. The licensee wrote condition report 2-00-01-063 to document and correct this issue.

b3. Root and Apparent Cause Evaluations

In Revision 33 of CPS 1016.01, the licensee separated the significance level of a condition adverse to quality from the investigation level needed. Three levels of investigation were established: Level A required a root cause investigation; Level B required an apparent cause review; and Level C did not require any investigation. The inspectors determined that root cause investigations were restricted to significant events and received an appropriate level of attention, while apparent cause investigations were used for a much more extensive range of events in order to improve the effectiveness of the corrective actions.

The inspectors reviewed the root cause evaluations for seven Level 2A condition reports, including two investigations resulting from quality assurance assessment findings. The root cause investigations were all completed towards the end of 1999. Root cause investigations were conducted in a thorough manner using approved root cause investigation methods. The identified root causes were deemed to be appropriate and the corrective actions appeared appropriate to fix the problem. However, the inspectors did note that three condition reports which were significant enough to require root cause evaluation basically addressed issues which had been previously identified but not corrected, indicating that earlier corrective actions had not always addressed the root problem. A lack of trending and deferral of activities until plant restart appeared to be contributing factors.

The corrective action program did not appear to have a tracking mechanism to ensure that, when condition reports were closed out to the maintenance work process, corrective actions were completed as planned. The inspectors also observed that there was no feedback loop to notify anyone when a maintenance work order was not completed as originally specified or scheduled. The licensee issued condition report 2-00-1-143 to address these concerns. Quality assurance had identified a similar issue in condition report Q-99-11-112 and a Level 2 root cause analysis had been performed. The inspectors did not identify any cases where corrective actions were inappropriately delayed or not completed.

The licensee generally performed adequate apparent cause evaluations that identified the underlying condition and specified appropriate actions to correct the condition. However, two exceptions are discussed in more detail below.

Condition Report 1-97-05-181: The inspectors were concerned that the initial condition report did not properly evaluate the proper isolation of a reactor protection circuit from a non-safety related component. The final resolution was acceptable but not for the reasons that were stated in the condition report. The condition report identified that there were no isolation devices between the non-1E back-up scram solenoid valves and the reactor protection system circuits and the class 1E power supplies. The condition report also stated that there was no analysis that evaluated the design as being acceptable. This condition was evaluated in calculation IP-C-0038. The evaluation concluded that it was acceptable to not have any isolation devices because a short

circuit in the backup scram solenoid would cause a half scram and actuate the reactor protection system. However, this conclusion was not consistent with the requirements for isolation as described in the updated safety analysis report. The updated safety analysis report stated that proper isolation consisted of at least one breaker and an analysis that demonstrated that the non-1E component would not degrade the 1E power supply.

After further discussion, the licensee was able to demonstrate that an adequate isolation was actually physically in the circuit. In addition, the licensee subsequently retrieved a General Electric analysis that discussed the acceptability of the configuration. Moreover, the licensee indicated that the amount of available current, due to a single ground in the backup scram solenoid valve, would not be sufficient to blow the fuses in the reactor protection circuit. However, none of this information was part of the initial calculation. The licensee stated the calculation would be revised and the condition report updated to reflect the analyses.

Condition Reports 1-99-10-092 and 1-99-10-093: Condition report 1-99-10-092 documented that maintenance on the reactor water cleanup recirculating pumps o-ring grooves was not performed to the latest approved engineering change notice (ECN) 31385. The licensee's investigation found the apparent cause to be “maintenance inattention to detail in preparation and review of the maintenance work package”. As part of the corrective actions, ECN 31385 was canceled and another engineering change notice, ECN 31863, generated. Condition report 1-99-10-093 was written to document that six reactor water cleanup pump shafts had o-rings machined incorrectly during the last six years.

The inspectors determined that over the last six years, five different engineering change notices were developed to address the o-ring groove machining problems (including the one developed as corrective action to 1-99-10-092). The inspectors also noted that neither condition report investigated the impact of the changing design requirements on the adverse condition. Procedure CPS 1501.02, "Work Order Execution," required maintenance staff to obtain controlled copies of engineering change notices stamped with information regarding which engineering change notices were to be used, which were current, and which were superceded. However, when the inspectors requested information on the five engineering change notices of interest, two of the engineering change notices (ECNs 27795 and 29886) referenced canceled ECN 31385 as a current document, along with its successor ECN 31863. Additionally, the inspectors noted that although ECN 29886 stated it was to be worked with both ECN 27795 and 27995, the latter two engineering change notices did not reference each other. Therefore, the inspectors considered that incomplete and/or inaccurate engineering change notice information could contribute to maintenance work inaccuracies, such as were described in condition report 1-99-10-062. The licensee wrote condition report 2-00-1-167 to address this concern.

b4. Approval Process for Issuing Condition Reports

In Inspection Report 50-461/99001, Section O7.2, a problem was discussed concerning the departmental approval process when accepting condition report root and apparent cause evaluations. During this inspection, the inspectors reviewed root and apparent

cause evaluations and identified minor problems; as discussed above. The inspectors noted that the licensee had performance indicators on both apparent and root cause evaluation quality. The performance indicator for root causes showed 100 percent acceptance of root cause quality by the experience assessment department for the months July through December 1999. This agreed with the inspectors' assessment of root causes. The performance indicator for apparent causes showed much more variance over the same time period from a high of 88 percent in September to a low of 58 percent in November 1999. The inspectors noted that following the issuance of Inspection Report 50-461/99001, the number of acceptable apparent cause evaluations decreased. The inspectors attended a weekly meeting of the experience assessment department's apparent and root cause evaluation group. The inspectors noted that the group provided a thorough, diligent review of the apparent and root cause evaluations to ensure a quality product. The inspectors determined that the licensee was making positive progress in addressing this previous weakness.

b5. Corrective Action Review for Effectiveness

Inspection Report 50-461/99001, Sections O7.1, M7.1 and R7.1, identified that the licensee's corrective action review for effectiveness program failed to ensure that corrective actions were effective. The inspection found that the effectiveness reviews were too narrowly focused, merely verified corrective action completion, or failed to document that the corrective action was challenged or completed. Following the inspection, the licensee revamped the corrective action review for effectiveness program as only applying to those items identified as significant conditions adverse to quality (i.e., those requiring a root cause investigation) and provided a more formal structure for completing the effectiveness review.

The inspectors reviewed the effectiveness review plans for the seven Level 2A condition reports and found them to appear sufficiently comprehensive to verify the effectiveness of the corrective actions. However, the inspectors were unable to actually review any completed corrective action reviews for effectiveness, because the ones associated with these condition reports had not yet been completed. The inspectors reviewed a listing of corrective action effectiveness review items from the licensee's database and determined that, as of the time of the inspection, there were no overdue effectiveness reviews. The inspectors noted that, since the plant restart, most departments were completing the effectiveness reviews in a timely fashion, with only occasional delays.

b6. Trending

Inspection Report 50-461/99001, Sections O7.5, M7.5 and R7.5, identified that the licensee had only started departmental trending of adverse conditions in early 1999. During this inspection, the inspectors reviewed the third quarter departmental trend reports for several departments and observed that departmental trending was being implemented. The inspectors also observed that the departmental coordinators were initially trending each condition report using key words based upon the described condition. These coordinators were also entering final causal code trending information, based on the evaluation results. Additionally, one individual in the experience assessment department was reviewing all condition reports that were categorized as

being due to human performance problems, in order to identify possible errors across departments.

The initial keyword trending generally appeared appropriate, as did the final causal trending, with more recent condition reports tending to contain better trending information. However, the licensee did not have established criteria for determining when an adverse trend existed, relying instead on the departmental coordinators and the experience assessment departmental reviews. The licensee stated that they frequently evaluated this process and were considering changes, but considered it to be effective at the time of the inspection. The inspectors identified one possible adverse trend concerning maintenance handling of lifted and landed leads. The licensee stated they had issued a task action tracking system action item to evaluate the possibility of an adverse trend. Since plant restart, a lack of trending information contributed to the failure to correct certain repetitive failures. For example, an adverse trend in the air operated valve program was not recognized and addressed until NRC inspectors identified repetitive problems in the program. Although the trending program has been fully implemented, recent examples of the failure to identify adverse performance trends indicate that use of trending information is not yet fully effective.

b7. Effective Resolution of Issues

Inspection Report 50-461/99001, Section O7.1, identified a concern that several weaknesses identified by the integrated safety assessment and special evaluation team inspections, such as log keeping, safety tagging and equipment status control continued to exist. As discussed in Section O7.1.b.2, the inspectors deemed the corrective actions to the condition reports reviewed to be generally adequate in preventing recurrence of problems. The inspectors performed a brief review of all condition reports closed in 1999 and did not identify continuing problems with the above concerns. The licensee appeared to be making positive progress in addressing this previous weakness.

c. Conclusions

The inspectors concluded that the licensee had a low threshold for initiating condition reports and generally displayed a conservative focus when assigning the significance level. Corrective actions, both immediate and long-term, were good, overall. However one example was identified where the corrective actions taken were not appropriate. This was the failure to perform a required 50.59 evaluation. One Non-Cited Violation was identified.

Root cause evaluations were thorough and appropriate, as were, in general, the apparent cause evaluations, with two exceptions. In both cases, failure to consider all sources of information contributed to the inadequate evaluations.

The inspectors concluded that the licensee had made progress on weaknesses that were identified during the previous corrective action inspection. The approval process for completed condition reports was more thorough, as evidenced by the improved quality of the root and apparent cause evaluations. Departmental trending was being used as an integral part of the corrective action program. However, due to its recent

implementation, adverse performance trends, such as in the air operated valve program, have not always been promptly addressed.

O7.2 Departmental Self-Assessment Capability

a. Inspection Scope

The inspectors reviewed the effectiveness of the licensee self-assessments. The inspectors also reviewed the corrective actions for the issues identified in the self-assessments. Two departmental self-assessments were reviewed. One involved the effectiveness of the main control room log keeping and the second involved a review of the CPS welding program.

b. Observations and Findings

The inspectors considered the scope of the self-assessments to be adequate. The self-assessments followed the requirements of the licensee's self-assessment procedure CPS 1005.16. The inspectors determined that each self-assessment team developed an inspection plan and included problems previously identified by the licensee staff that also included the use of industry operating experience. Both of the self-assessments were performed because problems had previously been found with the areas being assessed.

In reviewing the self-assessments, the inspectors noted that the assessments were performance based with many of the findings and condition reports being issued as a result of field observations. The self-assessments were of a critical nature, based on the number of condition reports and task assignment tracking items issued. The inspectors noted that the condition reports and the task assignment tracking items were evaluated by the licensee to verify that the identified problem was appropriately prioritized and that completion dates were assigned commensurate with the significance of the issue.

The inspectors interviewed some of the team members that were involved in the self-assessments. The team members had prior experience in performing audits and were knowledgeable in the areas audited. None of the licensee individuals indicated that they were reluctant to write a condition report or a task assignment tracking item. Additionally, team members were required to review the condition reports for proposed and final corrective action taken of the problem identified. The inspectors considered this an effective method for ensuring that effective corrective actions were taken.

c. Conclusions

The inspectors concluded the self-assessments followed the requirements of the licensee's procedures. The self-assessments were performance-based and conducted by qualified and experienced individuals. The assessments identified problems that were being tracked by either condition reports or task assignment tracking items. Providing the assessors with the opportunity to review proposed and final corrective actions was a good method to ensure that the proper corrective action was taken.

O7.3 Assessments Performed by Quality Assurance

a. Inspection Scope

The methods used to perform and control quality assurance audits and assessments were reviewed to verify adequacy and compliance with regulatory requirements. The inspectors reviewed three department performance quality assurance audits and three assessment reports as well as other selected records. The inspectors also reviewed the licensee's corrective actions for deficiencies identified during the audits.

b. Observations and Findings

Since the last corrective action inspection, the quality assurance function at Clinton had been reorganized. As part of the reorganization, the method used to perform the required 10 CFR Part 50 Appendix B audits had been changed to incorporate the requirements into a continuous assessment process. Therefore, at the time of the inspection, the licensee was using the terms "audit" and "assessment" interchangeably. The basis for this continuous assessment process was contained in a master audit plan. Assessments were performed on a quarterly basis and controls were established to ensure that critical attributes were not overlooked. The inspectors observed that audit frequencies were administratively controlled and appropriately managed.

Generally, the inspectors found the quality assurance audits provided probing, critical assessments of the assessed area. The inspectors observed that the program audits provided sufficiently in-depth information so that the assessed group could make appropriate corrections in the areas of weakness. Audits performed over the last six months were found to be generally more thorough assessments than previous assessments. The inspectors also observed that this trend was reflected in the 1999 third and fourth quarter continuous improvement quality assurance assessment reports. Quality assurance auditors issued audit findings as "Q" condition reports without concurrence of line management and the line organizations could not downgrade these "Q" condition reports without quality assurance approval. The quality assurance auditors could also issue lower-level observations as routine condition reports or recommendations as task action tracking system items. The inspectors found there to be appropriate technical assessment of quality assurance issues, with root cause determinations being done when required, and with germane corrective actions being taken.

The inspectors considered the quality assurance audits of the welding program and temporary modifications to be a strength because they clearly and comprehensively identified pertinent issues, applied performance based auditing techniques, and utilized plant trending tools to document adverse trends. Conditions adverse to quality identified by these assessments were appropriately entered into the corrective action program by initiating condition reports.

However, the inspectors ascertained that performance based audits were not being performed in all areas. For example, the last two audits of the inservice inspection program did not include observations of field activities. The quality assurance staff confirmed that performance based audits had not been conducted for the inservice

inspection program, the inservice testing program or refueling activities during the last three years. The inspectors observed that quality assurance procedures did not require that inservice inspection audits be scheduled during plant outages for performance based auditing of this program. However, the licensee had implemented a field observation program in October 1999 which should ensure that performance based audits would be performed with qualified personnel. This issue was being tracked by task action tracking system item 200001-591.

c. Conclusions

Quality assurance audits were critical and adequately identified deficiencies. Corrective actions taken in response to quality assurance findings, observations and recommendations appeared appropriate.

III. Engineering

E8. Miscellaneous Engineering Issues

E8.1 (Closed) Inspection Followup Item 50-461/99003-03: Reactor Core Isolation Cooling System Minimum Flow. The concern dealt with whether the reactor core isolation cooling system could be operated at very low flow rates, as might be required under certain operating conditions. This was due to the minimum flow orifice only being sized to pass approximately 70 gallons per minute which placed a corresponding procedural time limit of 20 seconds for full flow bypass operation. The licensee confirmed that the rationale for the 20 second time limit was to prevent damage to the pump if flow was only going through the bypass line (i.e., the pump was only passing the minimum 70 gallon per minute flow rate). For those operating cases where some flow was being injected and the remainder bypassed through the minimum flow orifice, the 20 second time limit was not applicable as sufficient flow was going through the pump to prevent damage. The inspectors had no further concerns regarding this issue. This item is closed.

E8.2 (Closed) Inspection Followup Item 50-461/99003-05: Interlock Testing Following Maintenance or Modifications. The licensee expanded the concern to ensuring adequate post- maintenance or post-modification testing in all cases. In regard to post-maintenance testing, the licensee determined that there was not adequate procedural guidance to enable the work planners to decide on appropriate post-maintenance testing. Condition report 1-99-03-063-00 was written. As part of the corrective actions to this condition report, procedure CPS 1014.05 was revised to reference the latest industry guidance on post-maintenance testing. Additionally, a detailed attachment was provided to guide the planners in determining what testing would be required following a maintenance activity. The maintenance department also reviewed 39 maintenance work orders and confirmed that adequate post-maintenance testing was performed. Only minor problems were identified, none of which concerned required testing not being performed.

In regard to post-modification testing, the engineering department reviewed 187 post-modification tests, mostly in the electrical and instrumentation and control areas.

Five of these tests had questions due to information not being readily retrievable; however, none of the cases involved required testing not being performed. The engineering department also reviewed the implementing procedures and determined that they provided adequate guidance on post-modification testing in general and interlock testing in particular.

The inspectors reviewed the root cause analysis associated with condition report 1-99-03-063-00 and discussed the corrective actions with both the maintenance and engineering department. The inspectors had no further concerns and this item is closed.

V. Management Meetings

XI Exit Meeting Summary

The inspector presented the preliminary inspection findings to members of licensee management on January 28, 2000. The licensee acknowledged the findings presented and did not identify any of the documents reviewed as proprietary.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

M. Coyle*, Vice President
P. Hinnenkamp*, Plant Manager, Clinton Power Station
G. Baker, Manager, Nuclear Support Services
K. Baker, Director, Design Engineering
V. Cwietniewicz, Director, Nuclear Training
K. Gallogly, Director, Corrective Action
J. Goldman, Manager, Work Management
M. Lukowski, Director, Project/Contract Management
W. Maguire, Director, Operations
M. Moore, Manager, Quality Assurance
M. Reandeau, Director, Licensing
R. Schenck, Manager, Maintenance
G. Tierney, Director, Work Coordination

*Telephone debrief conducted on February 9, 2000

INSPECTION PROCEDURES USED

IP 40500: Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems

ITEMS OPENED, CLOSED OR DISCUSSED

Opened

50-461/2000-04-01	NCV	Failure to Perform 50.59 Evaluation Prior to Changing System Operation as Described in the Updated Safety Analysis Report

Closed

50-461/99003-03	IFI	Reactor Core Isolation Cooling System Minimum Flow
50-461/99003-05	IFI	Interlock Testing Following Maintenance or Modifications
50-461/2000-04-01	NCV	Failure to Perform 50.59 Evaluation Prior to Changing System Operation as Described in the Updated Safety Analysis Report

Discussed

None

LIST OF ACRONYMS USED

CPS	Clinton Power Station
ECN	Engineering Change Notice
IP	Inspection Procedure
IFI	Inspection Followup Item
NCV	Non-Cited Violation

LIST OF DOCUMENTS REVIEWED

Action Requests

D75546	Replace Neon Indicating Light Sockets
D86612	HFA Relay Overheated and Started Smoking
F04406	Annunciator for Turbine Oil Lift Pump Is Locked In

Calculations

CPS-R-2000-02	Back-Up Scram Valve Design Analysis (General Electric), October 3, 1985
IPC-0038	Engineering Evaluation of Non-1E Solenoid Valves Powered Directly from Safety-Related 125 VDC Power Sources, Revision 0

Condition Reports

1-91-03-025-01	Untimely Corrective Action
1-95-07-007-00	Measuring and Test Equipment is Not Being Controlled Per Procedure
1-96-11-098-00	Discrepancies in Outage Inservice Inspection Scope
1-97-02-191-01	Reactor Core Isolation Cooling Operability During a Feedwater Line Break Outside Containment
1-97-05-181-00	Non 1E Solenoid Valves Powered by 1E DC Source Without an Acceptable Isolation Device
1-97-06-023-00	Repetitive Fuse Failures
1-97-08-223-00	Potential Failure Mode of Westinghouse DHP Breakers
1-97-11-019-00	Integrated Safety Assessment Observation on Inadequate Pump Sizing Calculation
1-98-01-008-00	Breaker Tripped While Clearing Tag
1-98-01-443-00	Diesel Generator Air Start Solenoid Valves May Contain Defect
1-98-01-452-00	Insufficient Voltage Available at Division 1 Diesel Generator Control Panel
1-98-02-385-00	Fire Rated Penetration Seal at Diesel Generator, El. 762', Has Cracks
1-98-03-467-00	Calculation 3C10-0382-002 Not Consistent With Emergency Procedure Guides or Licensing Basis
1-98-05-010-00	Inconsistent Acceptance Criteria in Surveillance Procedure
1-98-05-087-00	Deficient Welding Procedures
1-98-05-187-00	Updated Safety Analysis Report is Unclear Regarding Minimum Voltage Used for Motor Operated Valves
1-98-08-152-00	Operability of Equipment Important to Safety Not Properly Evaluated
1-98-10-386-00	Loss of System Fill and Vent - Residual Heat Removal System A
1-98-11-166-00	Fuse Type Discrepancies Found During Walkdowns
1-99-01-050-00	Deviation From Approved Design Configuration
1-99-01-082-00	Foreign Material Found in B Turbine Driven Reactor Feed Pump Lube Oil Sump
1-99-01-174-00	Deviation From Approved Design Configuration
1-99-01-192-00	Qualified Life and Output Accuracy Errors in 1153 Transmitter Documents

1-99-01-216-00	Service Water Side of Post-Accident Sampling System Cooler Plugged with Silt
1-99-01-226-00	Incorrect Relay Installation
1-99-01-287-00	Reactor Core Isolation Cooling Tank Low Level Setpoint Calculations
1-99-02-010-00	Analysis Results for 1SX01PA (Shutdown Service Water Pump A) Upper Motor Bearing Oil Sample
1-99-02-026-00	Inadequate Documentation of an Important Shutdown Service Water System Function
1-99-02-035-00	Control and Instrumentation Performed Work Without Proper Authorization
1-99-02-044-00	Molded Case Circuit Breaker Would Not Reset After Trip Testing
1-99-02-054-00	Mathematical Error in Calculation 19-D-29
1-99-02-066-00	Contactor Pickup Voltage in Excess of Available Voltage
1-99-02-067-00	Contactor Pickup Voltage in Excess of Available Voltage
1-99-02-104-00	Breaker Did Not Reset After Instantaneous Trip Test
1-99-02-131-00	Breaker Did Not Trip After High Tolerance Instantaneous Trip Test
1-99-02-170-00	Valve Out of Position
1-99-02-182-00	Weak Justification of Assumption In Calculation 01RI13 R/0
1-99-02-265-00	Deviation from Approved Design Configuration
1-99-02-266-00	Breaker Would Not Reset After High Limit Instantaneous
1-99-02-281-00	Calculation ATD-0210, Revision 0, Mod RFO Without Clearing Confirmation Required Calculations, CRRG-18
1-99-02-311-00	Problems Identified on Division 1 Battery During Maintenance
1-99-02-346-00	Failure to Perform Post Calibration Checks
1-99-02-430-00	Control Circuit Fuse Not Installed
1-99-03-063-00	Clinton Power Station 1014.05, "Preparation of Post-Maintenance Testing," Provides Insufficient Detail for Consistency and Efficiency in Identifying Post Maintenance Testing Requirements During Maintenance Work Order Planning
1-99-03-283-00	Configuration of Relay Not as per Plant Design
1-99-03-362-00	Reactor Protection System Inverter Damaged During Calibration
1-99-03-387-00	Incorrect Style Molded Case Circuit Breaker Installed in Cubicle
1-99-04-001-00	Residual Heat Removal B Will Not Maintain Fill and Vent When Securing from Shutdown Cooling Mode
1-99-04-166-00	Wires Not Terminated per Job Step
1-99-04-185-00	ASME Code Parts (Ball Valve) Were Replaced With Non-Code Parts
1-99-04-193-00	Abnormal Discharge Pressure on Residual Heat Removal B When Starting 1SX01PB (Shutdown Service Water Pump B)
1-99-04-307-00	Discrepancy Item Identified under Condition Report 1-99-04-178-00 Was Not Corrected
1-99-04-344-00	Found Disconnected Wire in Hydraulic Control Unit
1-99-04-347-00	Flow Control Valve 1SX185A Fails Inservice Testing Stroke Time Test
1-99-05-103-00	Unauthorized Temporary Modification and Inappropriate Use of D-list for Valve 1E32F003J Handwheel
1-99-05-138-00	Repeat Work on SOLA Transformer
1-99-06-108-00	Some Operating Modes of the Continuous Containment Purge May Violate the Updated Safety Analysis Report
1-99-06-119-00	Inadequate Documentation Contained in Root Cause for Condition Report 1-98-08-219-00

1-99-06-194-00	Welder Exploded - Near Miss
1-99-06-225-00	Inadequate Closure of Condition Reports
1-99-07-015-00	Incorrect Closure of Corrective Actions to Condition Report 1-98-02-026-00
1-99-07-118-00	Deficiencies in the Control of Measuring and Test Equipment
1-99-07-138-00	Several Errors Found in Calculation 1PM-0224 During Nuclear Site Engineering Design Self-Assessment Report 1999-110
1-99-08-020-00	Drywell Leakage Increase of Unknown Origin (Suspected Reactor Coolant Leakage)
1-99-08-045-00	Calculations Continue to Lack The Required Attention to Detail
1-99-08-047-00	Shorted AC Power to 1HT02JC During Troubleshooting
1-99-08-053-00	Reactor Core Isolation Cooling System Leak is Causing an Excessive Amount of Moisture to Buildup in the Reactor Core Isolation Cooling Turbine Drain Trap
1-99-08-055-00	1DG01KB 16-Cylinder Engine Lube Oil Results Indicate a Downward Trend in Flash Point and Viscosity
1-99-08-089-00	Improper Classification and Inadequate Investigation/Corrective Actions for Condition Report 1-99-02-260-00
1-99-08-199-00	Measuring and Test Equipment Found Past Calibration Due Date
1-99-09-012-00	Setpoint Was Found Incorrect
1-99-09-062-00	Multiple Containment Isolation Valves Fail Stroke Time Surveillance Test
1-99-09-111-00	As Found Wiring in Field Not in Accordance with Drawing
1-99-09-139-00	1999 Maintenance Department Self-Assessment Issues
1-99-09-140-00	A 135 Vdc Ground Was Found in Motor Control Center 1F
1-99-09-141-00	Preventative Maintenance Activity Not Recorded as Being Completed
1-99-10-004-00	Inadequate Apparent Cause
1-99-10-016-00	Valve Mis-Positioning
1-99-10-022-00	Inadequate Apparent Cause
1-99-10-043-00	CR Response Did Not Address All Identified Deficiencies
1-99-10-050-00	Inadequate Design
1-99-10-064-00	Industry Operating Experience is Not Effectively Used by Line Organizations
1-99-10-070-00	Weaknesses Exist in Content and Scope of the Preventative Maintenance Program
1-99-10-092-00	Pump Shaft(s) not Machined to Design
1-99-10-093-00	Adverse Trend for Machining Pump Shafts to Design
1-99-10-115-00	Circulating Water Pump Found Running Backward
1-99-10-147-00	Operability Determination Required for Failure of Pressure Controller PC1VCM561
1-99-10-149-00	Corrective Action for Item No. 2 on Condition Report 3-98-02-509 was Less Than Adequate
1-99-11-059-00	Administrative Errors on Performance Qualification Test Records for Welder Qualification
1-99-11-115-00	Improper Evaluation of Previous Corrective Actions
1-99-12-014-00	Reactor Core Isolation Cooling Tank's Flange Connection Near Valve 1E51-F317 Not in Accordance with Design and Improper Thread Engagement
1-99-12-055-00	Radiation Protection C-Zone Boundary Rope Found Laying Across Reactor Core Isolation Cooling Overspeed Linkage

1-99-12-062-00	Oil Analysis Results for Shutdown Service Water Pump 1SX01PA Upper Motor Bearing Indicate Bearing Degradation
1-99-12-122-00	Changes Made to Maintenance Work Order F08264 Not in Accordance with Procedural Requirements and Bypassed Quality Control Inspection Planning
1-99-12-297-00	Relays VC1AB-1 and VC1AB-1 Found Out of Specification
2-00-01-057-00	Inappropriate Closure of Condition Report 1-99-04-185
2-00-01-063-00	Inadequate Preparation of a Safety Screening
2-00-01-108-00	Incorrect Classification of Balls For ASME Section III Class 3C Ball Valves
2-00-01-143-00	Condition Report Closure Process to Action Requests
2-00-01-166-00	Work With Engineering Change Notices on Pump Shafts Are Not Cross-Referenced
3-98-02-509-00	Welding Program Deficiencies, Lack of Welding Program Ownership
Q-99-06-193-00	Inadequate Resolution of Seismic Gap Seal Issues on CR 1-98-08-328
Q-99-09-120-00	Inadequate Air Operated Valve Program Management
Q-99-11-105-00	No Mechanism to Ensure that CR Problem Statement Encompasses NCV Issues
Q-99-11-112-00	Inadequate Program to Assure Timely Corrective Action
Q-00-01-008-00	Departure From Industry Standards & Numerous Process Deficiencies Associated With Temp Mods

Drawings

CBVA 1262	McCanna Seal Inc. - 2"-600# Ball Valves, Revision B
PPD 105D5171	Ball Valve, Socket Weld End, Revision 7
MO5-1076	Reactor Water Clean-up System, Revision 2

Engineering Change Notices (ECN)

27795	Revision to Outboard O-Ring Groove Width Dimension, July 12, 1997 (revised ECN 29886)
27995	Machine Reactor Water Cleanup Pump Shaft(s), June 25, 1993
29886	Revision to Machining Tolerances for O-Ring Groove Locations of Pump Shaft, October, 12, 1996 (Revised ECN 27995)
31385	Revise Machine Tolerances For O-Ring Groove Dimension Reactor Water Cleanup Pump Shaft(s), January 27, 1999 (Revised ECN 27795 January 27, 1999, Canceled October 14, 1999)
31863	Revise O-Ring Groove Dimension Reactor Water Cleanup Pump Shaft(s), October 14, 1999

Miscellaneous Documents

Clinton Power Station Parts Stock Code NA3093; Kit, Repair, Ball Valve, Stem Seal, Seat, Bonnet Gasket, Ball, Revision 0
Clinton Power Station Strategic Calculation Improvement Program, December 5, 1999
GE Purchase Specification 21A3775, Revision 2
NPV-1 Manufacturers ASME Code Data Report for Nuclear Pumps and Valves, Part 229-721.
Listing of Corrective Action Review for Effectiveness Items (From Licensee Database), Undated Obtained January 27, 2000

Procedures

1005.16	Self-Assessments, Revision 2
1014.05	Preparation of Post Maintenance Testing, Revision 8
1016.01	Condition Reports, Revision 33
1501.02	Work Order Execution, Revision 2A
3408.01	Containment Building/Drywell Heating, Ventilation and Air-Conditioning, Revision 14
8501.66	HFA Type Multi Contact Auxiliary Relay Maintenance
9031.06	Main Turbine Stop Valve and Combined Intermediate Valve Tests, Revision 28
9070.02	Control Room HVAC High Radiation Tests, Revision 29
9431.07	Reactor Protection System Turbine Stop Valve Closure C71-N006A (B, C, and D) Channel Calibration, Revision 33
E.1	Nuclear Site Engineering Design Calculations, Revision 10
QAP 118.02	Illinois Power Quality Assurance Field Observation Program, Revision 0

Quality Assurance Audits/Assessments

Q38-95-06	Refueling Outage-5 Refueling Activities, May 5, 1995
Q38-96-16	Refueling Outage-6 Refueling Activities, May 5, 1996
1999-03-31-26	Welding Program, March 12, 1999
1999-04-30-27	Welding Heat Treatments, April 17, 1999
1999-08-30-13	Reactor Core Isolation Cooling Overspeed Trip Resolution, August 12, 1999
1999-08-30-25	Maintenance Work Activities Process, September 2, 1999
1999-10-50-01	Corrective Action Program, November 15, 1999
1999-12-10-31	Temporary Modifications, December 11, 1999
1999	Third Quarter Continuous Improvement Quality Assurance Assessment Report, Revision 0
1999	Forth Quarter Continuous Improvement Quality Assurance Assessment Report, Revision 0

Self Assessments

1999-043	Independent Safety Engineering Group Review of Calculation IP-0-0071, Revision 1, Technical Specification Indicator Loop Uncertainty for Suppression Pool Temperature, August 16,1999
1999-072	Nuclear Site Engineering Design Calculation Quality, May 27, 1999
1999-110	Nuclear Site Engineering Design Product Quality, July 28, 1999
1999-149	Mechanical Maintenance Welding Program
1999-176	Effectiveness of Main Control Room Log Keeping

Task Assignment Tracking Items

199910-0218	Develop Expectations For Crew Observers During Simulator Dynamic Scenarios To Promote/Maximize Learning
199912-0581	Review Lifting/Landing of Leads
200001-0591	Obtain Non-Destructive Examination Expertise For Quality Assurance Oversight Of Refueling Outage-7

Trend Reports

Clinton Power Station Senior Management Report - December 1999
Clinton Power Station 3rd Quarter 1999 Trend Report - Experience Assessment
Condition Report Performance Monitoring Trending Report (3rd Quarter 1999) - Nuclear Support
Licensing Trend Report (2nd and 3rd Quarter 1999)
Maintenance Department Quarterly Trend Report (3rd Quarter 1999)
Nuclear Training Department 3rd Quarter Trend Report
Work Coordination Condition Report Trend Analysis (3rd Quarter 1999)

Updated Safety Analysis Report

8.1.6.1.14	Regulatory Guide 1.75 "Physical Independence of Electrical Systems"
9.4.6	Containment Building Ventilation and Continuous Containment Purge Systems