

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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Report No: 50-461/98017(DRP)

Licensee: Illinois Power Company

Facility: Clinton Power Station

Location: Route 54 West  
Clinton, IL 61727

Dates: August 19 - October 1, 1998

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## EXECUTIVE SUMMARY

### Clinton Power Station NRC Inspection Report 50-461/98017(DRP)

This inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a 6-week period of resident inspection.

#### Operations

- Between May 1 and September 1, 1998, at least 15 examples of poor implementation and use of the Technical Specifications were identified by the licensee and the inspectors. This is of concern because corrective actions implemented prior to May 1, 1998, have not been fully successful in improving implementation and use of the Technical Specifications (Section O1.1).
- The inspectors noted that operations management appropriately recognized the need for additional awareness of and focus on equipment safety tagging problems by suspending operating crew activities in order to conduct a safety briefing in response to recent safety tagging events involving temporary lifting of tags (Section O1.2).
- The inspectors identified one violation which involved the failure of the area radiation monitor technician to announce annunciator alarms to the control room supervisor. The inspectors determined that this was a routine practice for certain alarms rather than a one-time occurrence. Corrective actions implemented by the licensee were sufficient to resolve the issue (Section O1.3).
- The inspectors noted mixed performance with regard to the awareness of plant conditions by operations personnel. On one occasion, operations personnel did not understand the reasons for an abnormal shutdown service water indication. However, on two occasions, operations personnel appropriately dispositioned deficiencies involving: 1) the rod control and information system while the mode switch was in startup/hot standby and, 2) the high pressure core spray pump breaker before continuing with the Division III integrated emergency core cooling system testing (Sections O2.1 and M1.3).
- The inspectors identified a failure to implement corrective actions to prevent a recurrence in the untimely performance of safety screenings and evaluations for disabled or out-of-service annunciators. As a result of the untimely performance, 13 of 27 out-of-service or disabled annunciators had not been evaluated to determine if the degraded conditions constituted defacto changes to the facility as described in the Updated Safety Analysis Report (Section O2.2).
- The licensee and the inspectors identified that tracking of compensatory actions for out-of-service or disabled annunciators was inconsistent in that 12 compensatory actions were listed in the out-of-service annunciator log but were not included in the operations turnover checklist and 4 compensatory actions which had been cleared from the out-of-service annunciator log remained on the turnover sheet (Section O2.2).

- The inspectors identified that the implementation and maintenance of the operator aid program did not meet management expectations in that: differences existed between two controlling procedures for operator aids, a lack of in-depth knowledge of the operator aid program by operations personnel contributed to inconsistent implementation of the program, and quarterly reviews of the operator aid log performed by operations personnel were not effective in identifying operator aids which had been in existence for extended periods (Section O2.3).
- The inspectors closed NRC Manual Chapter 0350, "Staff Guidelines for Restart Approval," Case Specific Checklist Items II.2, "Establish and Implement an Effective Clearance Program," and III.2, "Establish and Implement Performance Measures to Assess Performance" (Sections O8.09 and O8.10).

#### Maintenance

- The inspectors concluded that the licensee adhered to the revised molded case circuit breaker testing procedure. In addition, the newly instituted molded case circuit breaker enclosure testing and inspection program revealed a significant number of deficient conditions including incorrect fuses and degraded motor starter contactors (Section M1.2).

#### Engineering

- The inspectors identified that ineffective corrective actions had been taken for selected level 3 condition reports. Specifically, four of ten randomly selected closed engineering department condition reports either lacked an appropriate apparent cause, did not identify the extent of the condition, or implemented corrective actions which did not address the apparent cause (Section E7.1).
- One non-cited violation was identified for the licensee's identification of the failure to submit changes in the quality assurance program which constituted reductions in commitments made to the NRC (Section E8.6).

#### Plant Support

- The inspectors noted a continued improvement in decontamination efforts in that radiation protection and facilities personnel successfully decontaminated the residual heat removal "A" heat exchanger room from 60 mrad smearable to less than 1,000 dpm/100 cm<sup>2</sup> (Section R1.1).



## Report Details

### Summary of Plant Status

The facility remained shutdown during the inspection period. Major maintenance activities included a Division I outage and installation and testing of tie-ins for the feedwater keep fill modification. The modification was implemented to improve the reliability of the feedwater check valves.

### I. Operations

#### **O1 Conduct of Operations**

##### **O1.1 Implementation of Technical Specification Requirements**

###### **a. Inspection Scope (71707)**

The inspectors reviewed the licensee's response to continued deficiencies involving implementation of Technical Specification (TS) requirements.

###### **b. Observations and Findings**

The inspectors described several failures to implement TS requirements in NRC Inspection Report 50-461/97025, dated February 13, 1998. In response to the inspectors' observations, the licensee initiated adverse trend Condition Report (CR)1-98-01-059 to document the issue and to prompt a root cause analysis. The licensee determined that operators were not provided adequate training on TS interpretation and implementation and that the operations department did not demonstrate ownership for correct implementation of the TS.

Interim corrective actions for CR 1-98-01-059 involved an operations department stand-down, an evaluation of the self-assessment program to improve monitoring of TS use, crew briefings on the results of the root cause analysis, and additional TS training for operators. Additional corrective actions included long term training on TS usage, development of a behavior list for conservative decision making, implementation of an assessment tool to reinforce expectations, development of a tracking system for control of TS actions, and development of a consistent set of expectations and accountability standards regarding TS usage. The inspectors noted that the majority of the corrective actions were implemented prior to May 1, 1998.

Between May 1 and August 20, 1998, the licensee and the inspectors continued to identify multiple TS related and operability determination events, the culmination of which resulted in the initiation of CR 1-98-08-296 to document and prompt an additional root cause analysis. Examples of TS and operability determination issues identified since May 1, 1998, included: one example of exceeding TS-allowed working hours, two examples of surveillance criteria not meeting TS requirements, three examples of declaring safety-related equipment inoperable in error, four examples of a failure to



recognize TS entry conditions, one example of accepting questionable equipment conditions without determining operability, and three examples of failing to evaluate degraded conditions.

At the end of the inspection period, the licensee was performing a root cause analysis as part of the response to the issues documented in CR 1-98-08-296 and assessing the effectiveness of corrective actions developed in response to the root cause analysis performed for CR 1-98-01-059. The inspectors planned to review the licensee's corrective actions as part of the closeout activities for NRC Manual Chapter 0350, Case Specific Checklist Item II.1, "Establish and Implement Continuing Operator Training Emphasizing Technical Specification Adherence/Knowledge and the Recognition of Degraded Conditions."

c. Conclusions

Between May 1 and August 20, 1998, at least 15 examples of poor implementation and use of the TS were identified by the licensee and the inspectors. This is of concern because corrective actions, implemented prior to May 1, 1998, have not been fully successful in improving TS usage and implementation.

O1.2 Operations Safety Briefing (71707)

On September 14, 1998, operating crews suspended activities to conduct a safety briefing in response to recent safety tagging events involving the temporary lifting of tags. The inspectors noted that operations management appropriately recognized the need for additional awareness of and focus on safety tagging problems.

O1.3 Response to Control Room Annunciators

a. Inspection Scope (71707)

The inspectors observed control room operators respond to plant annunciators.

b. Observations and Findings

The inspectors noted that, in general, control room operators appropriately acknowledged, announced, and responded to plant annunciators. However, one issue was identified by the inspectors involving the response by control room personnel to area radiation monitoring (AR/PR) system annunciators. The AR/PR panel is located behind the P-680 panel in the main control room and is continuously manned by a radiation protection (RP) technician.

On September 9, 1998, the inspectors observed an annunciator alarm on the AR/PR panel. The RP technician acknowledged the alarm and notified the control room supervisor (CRS). Three minutes later, the same annunciator alarmed and the RP technician acknowledged the alarm, but did not notify the CRS. In addition, no control room operators queried the RP technician to determine which annunciator had alarmed.

The inspectors questioned operations personnel to determine why the annunciator had not been reported to control room operators and were informed that repeat or expected AR/PR annunciator alarms and AR/PR annunciator alarms for selected monitors did not need to be reported to control room personnel. The inspectors noted that when questioned, operations personnel could not specify which alarms did not need to be reported to control room personnel.

Technical Specification 5.4.1.a requires that written procedures be established, implemented, and maintained covering the activities recommended in Regulatory Guide 1.33, "Quality Assurance Program Requirements," Revision 2, Appendix A, "Typical Procedures for Pressurized Water Reactors and Boiling Water Reactors," February 1978. Regulatory Guide 1.33, Appendix A, Item 1.b, recommends the licensee develop procedures addressing the authorities and responsibilities for safe operation and shutdown conditions. Section 8.2, "Alarm Response-Main Control Room" of Procedure 1401.15, "Alarm and Transient Response," specified, in part, that the operator responding to an alarming annunciator shall announce the annunciator and whether it is expected to the CRS. The inspectors reviewed the lower tier RP Work Instruction 116, "Conduct of AR/PR Watch-station," and noted that the expectations for responding to AR/PR annunciators conflicted with upper tier Procedure 1401.15. Specifically, Step 3.5 of RP Work Instruction 116 specified that expected alarms due to planned system manipulations will not be announced even though Procedure 1401.15 specified that expected alarms be announced to the CRS. Additionally, Step 3.4 of RP Work Instruction 116 specified that the AR/PR watch-station is a part of the control room team, and reports any alarms and abnormal conditions to the line assistant shift supervisor (the line assistant shift supervisor title has been changed to the CRS). The inspectors determined that the failure to announce AR/PR annunciators to the CRS was a violation of TS 5.4.1.a. This violation is of concern because important information regarding the status of plant systems and components with specific TS, Operations Requirements Manual, or Offsite Dose Calculation Manual requirements may not have been communicated to the operations control room staff (VIO 50-461/98017-01).

The licensee stated that the indifference to announcing AR/PR annunciators had developed over several years due to poor AR/PR system reliability. The degradation of the AR/PR system resulted in frequent annunciator alarms in the control room and eventually the assignment of a full time RP technician to monitor and respond to AR/PR annunciators. After March 1998, the licensee assigned additional resources to resolve most AR/PR system deficiencies. Additionally, the licensee plans to implement a modification to upgrade the current AR/PR system prior to restart which will relocate the AR/PR alarm console to the at-the-control area of the main control room, reduce the frequency of annunciator alarms, and eliminate the need for continuous monitoring by an RP technician.

Following the inspectors' observations, the shift manager directed control room personnel and the RP technician to announce all AR/PR station alarms. The inspectors noted that the expectation to announce AP/PR alarms had been communicated to all operating shifts and AR/PR station watch-standers. The inspectors determined that the

licensee's corrective actions adequately resolved the issue involving the failure to announce AR/PR station annunciators.

c. Conclusions

The inspectors identified one violation which involved the failure of the AR/PR watch-station technician to announce annunciator alarms to the CRS. The inspectors determined that it was routine not to report certain AR/PR alarms to the CRS. Corrective actions implemented by the licensee were sufficient to resolve the issue.

O1.4 Non-Licensed Operator Tour (71707)

On August 30, 1998, the inspectors accompanied a non-licensed operator on tours of the turbine and radwaste buildings. The inspectors noted that the non-licensed operator was attentive to procedure requirements, correctly checked the status and material condition of equipment in the areas toured, was knowledgeable of the systems he was assigned to monitor, and provided good responses to questions posed by the inspectors involving equipment operation.

**O2 Operational Status of Facilities and Equipment**

O2.1 Operator Awareness of Plant Conditions

a. Inspection Scope (71707)

The inspectors evaluated operations personnel response to plant indications involving the shutdown service water (SX) system and the rod control and information system (RC&IS).

b. Observations and Findings

**Shutdown Service Water System**

On August 30, 1998, while observing activities in the control room, the inspectors noted that the flow rate indication for SX to the residual heat removal (RHR) "A" heat exchanger was indicating approximately 2500 gpm even though the system had been isolated and drained for maintenance. The inspectors questioned the CRS to determine the reason that the meter was indicating incorrectly and noted that neither the CRS nor the control room operators knew why the meter indicated 2500 gpm. After 3 hours of investigation, operations personnel determined that the meter might be reading incorrectly due to draining the reference leg on the SX flow instrument. Controls and instrumentation (C&I) technicians verified that the water in the reference leg had evaporated which caused the false reading. Operations personnel subsequently installed caution tags on the instrument with the incorrect reading.



## **Rod Control and Information System**

During observations of control room activities on September 4, 1998, the inspectors noted that the RC&IS inoperable alarm was lit on panel P-680. The inspectors questioned the reactor operator to determine if he had attempted to reset the system to clear the alarm. The inspectors were told that the operations crew had made a conscious decision not to reset the RC&IS until other unrelated work being performed in the control room was completed. Specifically, C&I personnel were in the process of performing a channel calibration on intermediate range monitor "A" when the RC&IS inoperable alarm was received. The intermediate range monitor test required that the mode switch be placed in startup/hot standby. Operations personnel informed the inspectors that if the RC&IS system had failed due to a faulty transponder card, resetting the RC&IS while the mode switch was in startup/hot standby could result in inadvertent rod movement. The inspectors considered the operations crew's decision not to reset the RC&IS while the mode switch was in startup/hot standby to be a good, conservative decision.

### c. Conclusions

The inspectors noted mixed performance with regard to the awareness of plant conditions by operations personnel. On one occasion, operations personnel did not understand the reasons for an abnormal shutdown service water indication. However, on a second occasion, operations personnel appropriately dispositioned deficiencies involving the RC&IS while the mode switch was in startup/hot standby.

## O2.2 Review of Out-of-Service Annunciator Program

### a. Inspection Scope (37551 and 71707)

The inspectors reviewed the licensee's implementation of the out-of-service annunciator tracking program as described in Procedure 1406.01, "Out-of-Service Annunciator Tracking."

### b. Observations and Findings

#### **Ineffective Corrective Actions to Resolve Known Deficiencies**

During the NRC Operational Safety Team Inspection performed in September 1996, the inspectors identified that the licensee was not performing safety screenings or evaluations in accordance with 10 CFR 50.59 to determine whether out-of-service or disabled annunciators constituted defacto changes to the plant design as described in the Updated Safety Analysis Report (USAR). The licensee initiated CR 1-96-09-143 in response to this issue. In February 1997, Procedure 1406.01 was revised to require a safety screening or evaluation for annunciators that were out-of-service or disabled for greater than 6 months.

In August 1997, operations personnel determined that the corrective actions for CR 1-96-09-143 had not been adequately implemented and initiated CR 1-97-08-057.

Due to the ineffective implementation of corrective actions, no safety screenings or evaluations were performed from February to July 1997. In response to this event, operations support personnel performed safety screenings for all out-of-service or disabled annunciators.

In February 1998, operations personnel initiated CR 1-98-02-359 to document continued problems with the timely performance of safety screenings or evaluations for out-of-service or disabled annunciators. The licensee determined that the failure to perform safety screenings in a timely manner was attributed to inadequate resource allocation since many operations support personnel were assigned additional work to complete tasks contained in the Plan for Excellence (PFE).

In April 1998, due to the lack of effective corrective actions for not performing safety evaluations, quality assurance (QA) personnel identified a breakdown in the out-of-service and disabled annunciator tracking program and initiated CR 1-98-04-415. Specifically, QA personnel identified that monthly audits of the annunciator tracking program, which were intended to verify the completeness of safety screenings or evaluations, were not performed as required by Procedure 1406.01.

In September 1998, the inspectors noted that safety evaluations for out-of-service annunciators greater than 6 months old had still not been completed. The licensee stated that operations personnel had been assigned to perform safety screenings or evaluations for all out-of-service or disabled annunciators greater than 6 months old. However, the licensee did not recognize the continued failure to perform safety screenings for out-of-service or disabled annunciators as an adverse trend even though three CRs had been written on this subject in 1.5 years. At the conclusion of the inspection, the licensee was, as a part of its response to CR 1-98-04-415, developing corrective actions to address the issue.

The inspectors also reviewed completed safety screenings and determined that they were weak in that little justification was provided to support the determination that the out-of-service or disabled annunciators were not defacto changes to the plant as described in the USAR. The additional training that had been provided on the performance of 10 CFR 50.59 screenings and evaluations was not effective. The licensee agreed with the inspectors assessment regarding the adequacy of the screenings. The licensee planned to address issues regarding the adequacy of safety screenings with additional training as described in the PFE.

Criterion XVI to Appendix B of 10 CFR Part 50 requires, in part, that measures be established to assure that significant conditions adverse to quality are promptly identified, the cause of the condition is determined, and that corrective actions are taken to preclude repetition. The failure to develop effective corrective actions to preclude a recurrence in the untimely performance of safety evaluations or screenings for disabled or out-of-service annunciators was considered a violation of 10 CFR Part 50, Appendix B, Criterion XVI. This violation constitutes an additional example of NCV 50-461/98011-01 for which enforcement discretion was exercised. No response to Violation 50-461/98011-01 was required. Corrective actions for this additional violation example are expected to be taken in conjunction with corrective actions for the previous non-cited violation. Improvements in the corrective action program will continue to be

monitored as part of the inspection activities associated with the NRC's Manual Chapter 0350, Case Specific Checklist Item III.1, "Establish and Implement Actions to Achieve and Sustain Improvement in the Corrective Action Program."

### **Review of Compensatory Action Tracking**

The licensee and the inspectors performed a comparison between the compensatory actions for out-of-service or disabled annunciators listed in the out-of-service annunciator tracking log and the compensatory actions listed on the computerized operations turnover checklist to ensure that all of the actions were included on the turnover sheet. The results of the review indicated that the tracking of active compensatory measures was inconsistent. Specifically, there were at least 12 compensatory actions that were listed in the out-of-service annunciator log but were not included in the operations turnover checklist and four compensatory actions which had been cleared from the out-of-service annunciator log but still appeared on the turnover sheet. Operations personnel initiated CR 1-98-09-403 to document this issue.

Due to the inconsistencies between the out-of-service annunciator log and the turnover sheet, the inspectors questioned operations personnel to determine if all of the current compensatory actions were being performed. Operations personnel were unable to determine if all the compensatory actions were being performed since there was no formalized method to document the successful completion of compensatory measures. In response to the inspectors' concern, operations personnel revised the operations turnover sheet to ensure that all active compensatory actions were listed. In addition, operations personnel revised Procedure 1406.01 and the operator round sheets to include formal documentation that compensatory actions were completed.

#### c. Conclusions

The inspectors identified a failure to implement corrective actions to prevent a recurrence in the untimely performance of safety screenings and evaluations for disabled or out-of-service annunciators. As a result of the untimely performance, 13 of 27 out-of-service or disabled annunciators had not been evaluated to determine if the degraded conditions constituted defacto changes to the facility as described in the USAR.

The licensee and the inspectors identified that tracking of compensatory actions for out-of-service or disabled annunciators was inconsistent in that 12 compensatory actions were listed in the out-of-service annunciator log but were not included in the operations turnover checklist and four compensatory actions which had been cleared from the out-of-service annunciator log remained on the turnover sheet.

### O2.3 Control of Operator Aids

#### a. Inspection Scope (71707)

The inspectors reviewed the licensee's program for control of operator aids. The inspectors reviewed Plant Manager Standing Order (PMSO) 027, "Control of Operator



Aids," and Procedure 1401.06, "Procedures and Operator Aids," reviewed operator aid log entries for applicability, validated the posting of operator aids in the field, inspected portions of the plant for unauthorized operator aids, and interviewed operations and engineering personnel.

b. Observations and Findings

The inspectors determined that two procedures controlling the operator aid program were in effect. The licensee had recently issued new Procedure 1401.06 on August 28, 1998, but had not canceled PMSO-027. While the guidance was similar, the inspectors identified several differences in expectations and requirements.

Operations personnel responsible for maintenance of the operator aid program indicated that the required quarterly reviews were being performed but little additional attention had been provided to the program. The inspectors reviewed the last four quarterly audits and determined that the quarterly operator aid audits were not totally effective in that the inspectors identified several deficiencies that had not been noted by the licensee which included:

- Operator Aid 93-01, "Off-gas One Line Diagram," which was posted in the control room, did not have the signatures required by PMSO-027. The recently issued Procedure 1401.06 had been changed to allow permanent operator aid postings with signatures in the operator aid log book but not on the posting.
- Reactor Feed Pump 1C motor and gear box recorder had a non-permanent label to inform operations personnel of which points recorded specific feed pump temperatures. This label was not being controlled as an operator aid. The operator aid coordinator had been previously informed of the uncontrolled posting through the CR process but had not incorporated the posting into the program.
- Two non-permanent caution labels on the off-gas panel in the control room were not controlled as operator aids.
- At least three operator aids provided simplified system operating information which was not proceduralized (e.g., single channel analog trip modules, reserve auxiliary transformer gas seal oil preservation system, and operation of the oxidation reduction potential monitor).
- Operator Aid 94-28, "Stability Control Map: Discussion," had been superseded by Operator Aid 95-30 but had not been removed from the operator aid log.
- Step 1.4.3.2 of PMSO-027 required that recommendations be provided for replacing operator aids which had been in place for two or more quarters with permanent signs or a procedure change. However, while most operator aids had been in place for more than two quarters, no recommendations had been provided for permanent signs or procedure changes during the last four quarterly reports.

- An indicating device on the reactor core isolation cooling (RCIC) overspeed trip lever had been installed to assist operations personnel in determining if the trip mechanism had been reset but was not included in the operator aid program.

The licensee initiated corrective actions which included removing the inappropriate modifications, evaluating items identified by the inspectors for incorporation into or removal from the program, and canceling PMSO-027.

c. Conclusions

The inspectors identified that the implementation and maintenance of the operator aid program did not meet management expectations in that differences existed between two controlling procedures for operator aids, a lack of in-depth knowledge of the program by operations personnel contributed to inconsistent implementation of the program, and quarterly reviews of the operator aid log performed by operations personnel were not effective in identifying deficiencies with operator aids.

**O8 Miscellaneous Operations Issues (93901)**

- O8.1 (Closed) Notice of Violation 50-461/97007-03: Inadequate fuel pool cooling system procedure. In response to the violation, the licensee revised Procedure 3317.01, "Fuel Pool Cooling and Cleanup," to provide direction on the system configuration and how to drain the fuel pool cooling surge tanks. Additionally, management expectations regarding procedure adherence and use were reinforced through training and a revision to Procedure 1005.15, "Procedure Use and Adherence." The inspectors considered the corrective actions for this issue adequate.
- O8.2 (Closed) Notice of Violation 50-461/97007-04: Failure to provide an adequate high pressure core spray (HPCS) surveillance procedure. In response to the violation, the licensee revised Procedure 9051.02, "HPCS Valve Operability Test," and satisfactorily completed HPCS surveillance testing per this procedure. Additionally, management expectations regarding procedure adherence and use were emphasized through training and a revision to Procedure 1005.15, "Procedure Use and Adherence." The inspectors considered the corrective actions for this issue adequate.
- O8.3 (Closed) Inspection Follow-Up Item 50-461/97012-02: Recirculation pump seal performance. This item involved the inspectors' observation of reactor recirculation pump seal performance during startup and pump speed shifts. This item is being administratively closed since monitoring of plant equipment during startup is part of the routine resident inspection program.
- O8.4 (Closed) Notice of Violation 50-461/97015-01: Four examples of the failure to follow procedures involving operability determinations, initiation of a CR, use of a portable battery charger, and control of transient materials. Corrective actions included, in part, providing training to operations and engineering personnel on the operability determination program; revising Procedure 1014.06, "Operability Determinations;" revising maintenance procedures affecting the conduct of maintenance, watertight doors, and battery maintenance; and briefing personnel on restraining

portable/temporary equipment. The inspectors considered the corrective actions for this issue appropriate.

- O8.5 (Closed) Notice of Violation 50-461/97019-01: Poor oversight of reactor vessel level manipulations. The licensee determined that this event was caused by inadequate oversight of activities by operations personnel. Corrective actions included counseling the individuals involved in the event, performing a fact finding review and presenting the results to operations personnel, and providing guidance to operations personnel on when a heightened level of awareness was needed in the main control room. The inspectors considered the licensee's corrective actions to be adequate in addressing the issue.
- O8.6 (Closed) Notice of Violation 50-461/97019-02: Three examples of a failure to identify conditions adverse to quality. In the first example, corrective actions to address personnel performance problems associated with the operations tagging program were not initiated. In response to this concern, the licensee implemented corrective actions to improve the safety tagging program which were reviewed by the inspectors and the results of this review documented in NRC Inspection Report 50-461/98014. In the second example, corrective actions were not implemented to prevent a second inadvertent isolation of the reactor water cleanup system. Following the second isolation, the licensee initiated revisions to the controlling procedure for RWCU system operation which contained steps that led to the isolations. No further problems were noted. The third example involved the failure to take corrective actions to prevent a second inadvertent loss of service building security lighting. As part of the corrective actions for this issue, the licensee revised drawings and procedures to ensure that those components which could cause a loss of security building lighting were clearly identified. No additional lighting deficiencies were identified during two subsequent lighting tours performed by the inspectors. The inspectors considered the licensee's corrective actions to be adequate.
- O8.7 (Closed) Notice of Violation 50-461/97025-01: Failure to implement required TS actions for secondary containment. In response to this issue, the operations department conducted a standdown to appropriately sensitize operations personnel to problems with TS implementation. Improvements were made to the operations self-assessment program to improve monitoring of TS use and application. Additionally, the licensee planned to provide training to improve the operations department's implementation of the TS as part of the PFE. The inspectors planned to review the licensee's actions to improve TS implementation as part of the closeout activities for NRC Manual Chapter 0350, Case Specific Checklist Item II.1, "Establish and Implement Continuing Operator Training Emphasizing Technical Specification Adherence/Knowledge and Recognition of Degraded Conditions."
- O8.8 (Closed) Notice of Violation 50-461/97025-02: Failure to implement the required TS actions for maintaining either the Division I or II inverter operable. In response to this issue, operations management implemented an operations department stand-down, conducted workshops, and implemented a new operability restraint data base. The licensee also planned to provide training to improve the operators' implementation of the TS as part of the PFE. The inspectors planned to review the licensee's actions as part of the closeout activities for NRC Manual Chapter 0350, Case Specific Checklist



Item II.1, "Establish and Implement Continuing Operator Training Emphasizing Technical Specification Adherence/Knowledge and Recognition of Degraded Conditions."

- O8.09 (Closed) Case Specific Checklist Item II.2: Establish and implement an effective clearance program. The licensee submitted documentation to the NRC pertaining to the establishment of an effective clearance program on September 4, 1998. Issues involving the adequacy of the licensee's clearance program and associated corrective actions were described in NRC Inspection Reports 50-461/97019 and 98014.

Inspection Report 50-461/97019 described deficiencies in the clearance program involving: inadequate tagout preparation, tagging wrong components, inadequate clearance boundaries, inadvertent release of clearances prior to completing work, improper temporary lifting of tags, commencing work on the wrong component, and performing work without being signed-on to the clearance.

Inspection Report 50-461/98014 described corrective actions which had been successful in significantly reducing tagging related errors and events. Corrective actions involved increased staffing, increased management oversight, procedure revisions, and improved training for operations and maintenance personnel. Additional corrective actions planned by the licensee included the development of a qualification card for personnel involved with clearances, replacement of the current tagging computer program, and incorporation of industry best practices into the clearance procedure.

The inspectors noted that clearance program performance indicators have been successfully used by the licensee to identify clearance program strengths and weaknesses. As a result of the performance indicator information, the licensee initiated additional reviews of the clearance program to assess an increase in the number of tagging related errors (a situation where work has been authorized to proceed without an adequate tagout) and an increase in events (a situation where a barrier's effectiveness was compromised) related to temporary lifting of tags.

The inspectors considered the licensee's corrective actions regarding the clearance program sufficient to support plant restart.

- O8.10 (Closed) Case Specific Checklist Item III.2: Establish and implement performance measures to assess performance. The licensee submitted documentation to the NRC pertaining to the establishment of performance measures to assess performance on September 4, 1998. Issues involving the adequacy of licensee performance measures were described in the NRC Demand For Information dated September 26, 1997, and the NRC Special Evaluation Team (SET) Report dated January 2, 1998.

The Demand For Information, Item 1, required, in part, that the licensee submit information describing methods to measure the effectiveness of overall improvements in the corrective action programs. The NRC's SET determined, based on an assessment of licensee performance between June 1995 through October 1997, that one of four root causes of licensee problems was that:

**Management generally did not establish and implement effective performance standards.** The SET concluded that the failure of IP [Illinois Power Company] and [Clinton Power Station] management to establish and implement effective performance standards was a root cause of the significant decline in safety performance. Management failed to establish and communicate appropriate, clearly defined expectations and priorities, and failed to monitor their implementation for the desired performance.

To demonstrate its commitment to identification and correction of problems, the licensee developed the PFE, one element of which addressed concerns with the corrective action program. The licensee's corrective action team collected data from internal and external assessments and reports, sorted the data by problems and causes, evaluated common and underlying causes, developed problem statements, and developed corrective actions to improve performance and monitor the effectiveness of the improvements. Specific actions implemented by the licensee to monitor the effectiveness of corrective actions included:

Increased management involvement in corrective action processing and oversight. Daily leadership meetings were established to review significant problems and corrective actions. Monthly senior management reviews of performance indicators were initiated to emphasize the need for action on declining trends. Departmental implementing plans were developed to describe the actions being implemented to meet nuclear policy statements. The inspectors noted that the implementing plans included performance indicators and accountability measures.

Identification of significant process conditions prior to restart. The licensee established a restart readiness review process to identify and correct significant conditions which have not been corrected prior to restart.

Root cause and apparent cause quality indices. The independent analysis group evaluates root cause and apparent cause analyses and assigns a quality index based on established attributes.

Review of corrective action effectiveness. Reviews of the effectiveness of corrective actions are required to be performed by the organization responsible for Level 1 or 2 CRs. The reviews are in addition to assessments performed by the QA organization.

Performance indicators for effectiveness and processing of corrective actions. The licensee established two sets of performance indicators for the corrective action program. The first set involved the effectiveness of corrective actions and the second set involved the timeliness of corrective actions.

Assessments. Assessments include management assessments of corrective action effectiveness, staff self-assessments of corrective actions, assessments by the corrective action group, and QA and external assessments of the corrective action program.

The inspectors noted that the licensee has used performance measures to identify both positive and negative trends in performance. During the last monthly review of performance indicators on September 14, 1998, the licensee developed a list of 35 action items, each assigned to a responsible manager. Action items involved the development of additional performance indicators to enable the licensee to more accurately assess performance in a given area and to develop additional corrective actions for areas without improved performance.

Based on the information derived from the current corrective action performance measures and the enhancements made to the corrective action process, the inspectors determined that sufficient performance measures have been established to support restart.

## II. Maintenance

### **M1 Conduct of Maintenance**

#### **M1.1 General Comments (61726 and 62707)**

Portions of the following maintenance and surveillance activities were observed or reviewed by the inspectors:

Procedure 8410.03	Motor Overload Relay Testing
Procedure 8410.04	Molded Case Circuit Breaker/Bucket Component Functional Testing and Maintenance
Procedure 9030.01C016	Analog Trip Module Channel Functional and Calibration for Channel B21-N691A, B, E, and F
Procedure 9080.23	Diesel Generator 1C - Emergency Core Cooling System Integrated Testing
Procedure 9432.23	Primary and Secondary Containment Isolation Logic System Functional
MWR D86675	HPCS Breaker Did Not Close Electronically

The inspectors noted that observed activities were performed with the procedure present and in active use. Technicians were knowledgeable of the task and used calibrated test equipment. Additional inspector observations regarding two maintenance activities are discussed in Section M1.2.



## M1.2 Molded Case Circuit Breaker and Enclosure Testing

### a. Inspection Scope (62707)

The inspectors observed maintenance personnel test molded case circuit breakers (MCCBs) and MCCB enclosures.

### b. Observations and Findings

The inspectors observed maintenance personnel test a 40 amp MCCB per Procedure 8410.04, "Molded Case Circuit Breaker/ Bucket Component Functional Testing and Maintenance," on September 1, 1998. The inspectors questioned electrical maintenance personnel to determine why the test was allowed to run for 120 cycles instead of a maximum of 10 cycles (per the latest industry guidance) and were informed that the acceptance criteria remained "a trip in less than 10 cycles" but that the test equipment was set to run for 120 cycles in order to obtain data on any breaker that did not trip within the allowed time. The inspectors also questioned why the test leads from the test equipment were twisted together before being connected to the breaker being tested since the vendor manual specified that the leads be separated when two current generators were connected in series (the present configuration). The electrician was not aware of the vendor manual recommendation but stated that the vendor manual did recommend twisting the leads to reduce impedance when testing smaller breakers. The electrician rearranged the leads; however, no notable difference was observed when testing the 40 amp breaker.

During the testing, the inspectors noted that test equipment did not register the time for the instantaneous trip because the trip occurred too quickly for the timer to lock in. In response to the issue, the electrical maintenance supervisor directed that the test current be lowered to less than the specified 125 percent of the rated instantaneous trip value. The inspectors questioned the acceptability of lowering the test current and determined that the testing methodology had been evaluated by engineering personnel and approved by the test equipment vendor. The inspectors observed the subsequent successful test of the breaker and concluded that the licensee's actions were appropriate.

On September 9, 1998, the inspectors reviewed results from inspections on the MCCB enclosures completed in accordance with Procedure 8410.04 and Procedure 8410.03, "Motor Overload Relay Testing." The licensee determined that about 20 percent of the motor starter contactors failed to meet the coil pull-in voltage acceptance criteria of less than or equal to 84 Vac. The licensee initiated CR 1-98-08-219 to document the high failure rate and operations personnel performed an operability determination for the degraded condition. The results of the operability determination indicated that the acceptance criteria were based on the manufacturer's nameplate rating and not on a specific design basis requirement. Therefore, sufficient margin existed to consider the motor starter contactors operable. As of September 25, 1998, the licensee had completed testing 94 motor starter contactors, 35 of which exceeded the 84Vac acceptance criteria. The licensee was able to show through calculations that all but one of the contactors would still be able to perform its

intended function. The remaining contactor was considered inoperable and CR 1-98-09-245 was initiated to document the condition.

The licensee planned to perform calculations of the expected voltage for all safety-related MCCB enclosure motor starter contactors before plant startup and perform additional testing if necessary. At the end of the report period, the licensee had completed approximately 150 of 500 total calculations.

In addition to the contactor degradation, the licensee's enclosure inspections revealed that 23 of 79 installed fuses were the incorrect fuse type. At the end of the inspection period, the licensee was evaluating the significance of having incorrect fuses installed in the MCCBs. The results of the licensee's MCCB and MCCB enclosure testing program will continue to be evaluated under NRC Manual Chapter 0350, Case Specific Checklist Item IV.3, "Resolve Issues Associated With Circuit Breaker Failures."

c. Conclusions

The inspectors concluded that the licensee adhered to the revised MCCB testing procedure. In addition, the newly instituted MCCB enclosure testing and inspection program revealed a significant number of deficient conditions including incorrect fuses and degraded motor starter contactors.

M1.3 Failure of High Pressure Core Spray Pump Breaker

a. Inspection Scope (62707)

The inspectors monitored the licensee's troubleshooting efforts following the failure of the HPCS pump breaker to close during testing.

b. Observations and Findings

During the performance of testing per Procedure 9080.23, "Diesel Generator 1C - Emergency Core Cooling System Integrated Testing," on August 18, 1998, the HPCS pump breaker failed to close on demand. The licensee determined that the breaker, which was racked out and in the test position, had shifted slightly and activated a mechanical interlock that prevented the breaker from operating. To resolve this condition, maintenance personnel added anti-skid material to the wheel chocks to prevent any additional breaker movement.

On August 19, the licensee re-performed the integrated testing and again the HPCS pump breaker failed to close. Based on preliminary monitoring, the licensee determined that the anti-pump relay was energized. Troubleshooting by electrical maintenance personnel revealed that the anti-pump relay remained energized until the remote operating switch was placed in the open position; however, the integrated testing procedure had not ensured that the breaker control switch was placed in the open position as an initial condition before starting the test sequence. The inspectors observed the troubleshooting and determined that the activity was performed in a

controlled manner. Once the procedural deficiencies were corrected, the HPCS breaker performed as expected.

c. Conclusions

The inspectors concluded that the licensee stopped testing and correctly identified a procedural problem associated with a circuit breaker operation before continuing with the Division III integrated emergency core cooling system testing.

**M8 Miscellaneous Maintenance Issues (93902)**

- M8.1 (Closed) Notice of Violation 50-461/97015-02: Inadequate procedure for determining new battery pilot cell following a single cell charge. The licensee deleted the provisions which allowed the performance of single cell charges from Procedure 8433.01, "Generic Procedure for 125 VDC Battery Maintenance." The inspectors considered the corrective actions for this issue adequate.
- M8.2 (Closed) Notice of Violation 50-461/97019-04: Failure to provide instructions commensurate with the knowledge, skills, and abilities of maintenance personnel involved with greasing the Division III shutdown service water pump motor. The licensee determined that this violation occurred due to the failure to fully identify vendor recommendations during work package preparation, the inappropriate application of toolbox skills, and the lack of engineering involvement in work package development. The licensee's corrective actions included: inspecting the Division III shutdown service water pump motor for damage, briefing electrical and mechanical maintenance personnel on the issue, developing a preventive maintenance technical adequacy evaluation plan, revising the motor greasing preventive maintenance tasks to ensure the guidance was adequate, and revising Procedure 1029.01, "Preparation and Routing of Maintenance Work Documents," such that an engineering review is required when the technical content or job step of a preventive maintenance task is changed. The licensee also planned to review the adequacy of maintenance skills and the effectiveness of the maintenance training program as part of the PFE. The inspectors considered the licensee's corrective actions to be adequate.
- M8.3 (Closed) Inspection Follow-up Item 50-461/98004-06: Potential Division II emergency diesel generator (EDG) overload. This issue was previously discussed in NRC Special Inspection Report 50-461/98004. Upon further review of this issue, the licensee determined that the EDG was overloaded during the performance of surveillance testing on February 11, 1998. As a result, the licensee performed several preventive maintenance and inspection tasks to identify potential damage to the EDG. No damage was identified during the inspections. The inspectors reviewed the actions taken by the licensee and determined that the actions were in accordance with the vendor's recommendations. Corrective actions taken to improve operator performance were discussed in NRC Special Inspection Report 50-461/98004. The inspectors considered the licensee's corrective actions to be adequate.



### III. Engineering

#### **E2 Engineering Support of Facilities and Equipment**

##### **E2.1 Reactor Core Isolation Cooling Tappet Stem**

While inspecting the RCIC system, the inspectors identified that the tappet stem on the mechanical overspeed trip mechanism extended approximately 1/2 inch above the tappet nut. Vendor Drawing 800490, contained in vendor manual K2801-0030, required that the tappet stem not extend greater than 1/4 inch above the tappet nut due to possible interference with the overspeed trip mechanism. Engineering personnel determined that the condition of the tappet stem being too long had existed since initial licensing and initiated maintenance work request (MWR) D84019 to shorten the length of the tappet stem. The licensee was not aware of any instance where the tappet stem interfered with operation of the trip mechanism.

#### **E7 Quality Assurance in Engineering Activities**

##### **E7.1 Review of Condition Reports Closed by the Engineering Organization**

###### **a. Inspection Scope (37551)**

The inspectors reviewed 10 randomly selected level 3 CRs closed between June 1 and August 1, 1998, to determine if engineering personnel identified the apparent cause, developed corrective actions which were appropriate for the apparent cause, assessed the safety significance, and determined the extent of the condition.

###### **b. Observations and Findings**

The inspectors determined that most of the CRs reviewed did not include sufficient information to support the apparent cause or the extent of the condition described in the CR. Four CR's completed by plant engineering personnel lacked an appropriate apparent cause, did not identify the extent of the condition, or did not specify corrective actions which addressed the apparent cause. One plant engineering CR did not document the results of the licensee's apparent cause investigation. The inspectors did not identify any significant discrepancies with the three CRs completed by design engineering personnel. Specific examples of discrepancies associated with the CRs included:

##### **Inservice Testing Failure of Containment Isolation Valve 1RF021**

Condition Report 1-98-05-274 was initiated on May 26, 1998, to document a functional failure during inservice testing of containment, auxiliary, and fuel building floor drain (RF) inboard containment isolation Valve 1RF021 on May 20, 1998. Specifically, Valve 1RF021 failed to close within its required stroke time of 10 seconds in that 13 seconds elapsed prior to the valve indicating closed. The inspectors noted that the historical average stroke time of Valve 1RF021 was approximately 5 seconds. Following the inservice test failure, (C&I) personnel

performed minor adjustments to the limit switch assembly and the valve retest was completed satisfactorily.

Engineering personnel determined that the apparent cause of the valve stroke timing failure was the valve limit switch not being aligned to provide indication of the valve condition. Additionally, engineering personnel determined that a functional failure of the valve or valve indication had not occurred since, although delayed, the valve indicated the correct position. The specific cause of the valve position indication problem was attributed to inadvertent bumping of the limit switch assembly which impacted the position indication of Valve 1RF021. Because a functional failure did not exist, the licensee downgraded the CR from level 3 to level 4 on August 3, 1998.

On August 28, during a review of closed CR 1-98-05-274, the inspectors questioned engineering personnel to determine: (1) how the alignment of the limit switch could delay the closed indication of the valve from the historical stroke time of 5 seconds to the failed stroke time of 13 seconds, (2) the reasonableness of the apparent cause, and (3) the effectiveness of corrective actions.

Following discussions with the inspectors, engineering personnel reviewed the completed surveillance test package and interviewed the operator who performed the inservice stroke test. The comments section of the surveillance test package indicated, "Valve 1RF021 stroked in 13 seconds, 3 seconds higher than the limiting stroke time (Green light seemed slow to respond) close signal to the valve seemed slow to respond." During interviews with the operator, engineering personnel determined that there was a 5 to 6 second delay between placing the control switch for Valve 1RF021 in the close position and the valve indicating intermediate. The delay in Valve 1RF021 indicating intermediate provided information to engineering personnel that the valve operating mechanism and not the valve position indication was suspect.

On September 4, engineering personnel reopened CR 1-98-05-274 in order to document the need to perform additional assessments of the failure mechanism of Valve 1RF021. Specifically: (1) engineering and maintenance personnel no longer believed an adjustment affecting the valve position indication could reduce the stroke time from 13 to 5 seconds, (2) given the location of the valve in containment and the amount of conduit and piping surrounding the valve, engineering and maintenance personnel determined that it was unlikely that the valve position indication device had been inadvertently bumped, and (3) following discussions with operations personnel, engineering personnel suspected a problem with the valve operating mechanism.

During the review of reopened CR 1-98-05-274, the shift manager and the control room supervisor determined that although Valve 1RF021 had passed an inservice stroke test, the valve was degraded and the valve should be worked prior to startup. However, the inspectors noted that operations personnel did not add Valve 1RF021 to the mode restraint list for primary containment isolation valves nor was an operability determination performed. Following discussions with the inspectors, operations personnel added Valve 1RF021 to the Modes 1, 2, and 3 restraint list.

### **High Pressure Core Spray Suppression Pool Suction Check Valve Leakage**

On June 27, 1997, the licensee initiated CR 1-97-06-307 to document a 6 inch decrease in RCIC storage tank level while transferring the suction source for the HPCS pump from the RCIC storage tank to the suppression pool. Engineering personnel initially suspected that the decrease in RCIC storage tank level was due to leakage through the HPCS suppression pool suction check Valve 1E22-F016.

On June 13, 1998, engineering personnel closed CR 1-98-06-307 to Maintenance Work Request (MWR) D78591. Maintenance Work Request D78591 had been initiated on June 26, 1997, to inspect Valve 1E22-F016. In July 1998, no discrepancies were noted by maintenance personnel during an internal inspection of Valve 1E22-F016.

On August 27, 1998, during a review of closed CR 1-97-06-307, the inspectors noted that the licensee had not identified an apparent cause for Valve 1E22-F016 leakage and the associated decrease in RCIC storage tank level prior to closing the CR to the MWR. Additionally, following the inspection of Valve 1E22-F016 internals in July 1998, no corrective action documents were reopened to assess the inspection findings identified by maintenance personnel.

During discussions with engineering personnel on August 27, 1998, the inspectors noted that prior to performing the July 1998 maintenance activity on Valve 1E22-F016, engineering personnel had assessed the decrease in RCIC storage tank level and no longer believed that leakage through Valve 1E22-F016 was the apparent cause. Instead, engineering personnel believed the apparent cause to be a potentially mispositioned valve which allowed flow from the RCIC storage tank to the suppression pool via a test line. However, this suspected apparent cause was not described in the CR and corrective actions were not implemented to address this apparent cause. Additionally, the change in engineering personnel's view of the apparent cause was not communicated to maintenance personnel. Consequently, the licensee performed an unnecessary maintenance activity on Valve 1E22-F016.

Engineering personnel stated that CR 1-97-06-307 would be reopened and the apparent cause for the decrease in RCIC storage tank level would be identified.

### **Emergency Diesel Generator Control Panel Instruments**

On August 8, 1997, the licensee initiated CR 1-97-08-077 to document the lack of an equipment identification number (EIN) for nine gauges on the Division III EDG skid-mounted engine control panel. The omission of an EIN is of concern since maintenance and calibration of equipment is scheduled and tracked by the EIN. The licensee developed EINs for each affected gauge, installed labels, and closed CR 1-97-08-077 on June 29, 1998. Engineering personnel determined that the apparent cause was due to not identifying EINs for the skid-mounted instruments during the procurement and installation of the Division III EDG.



On August 29, 1998, during a review of closed CR 1-97-08-077, the inspectors noted that a review of other skid-mounted control panels was not performed to assess the extent of the condition. After additional prompting by the inspectors, engineering personnel reopened CR 1-97-08-077 to assess the broader implications of not having EINs on other skid mounted components.

### **Crosby Relief Valve Test Failure Trend**

The licensee initiated CR 1-97-11-397 on November 20, 1997, to document a relief valve test failure trend affecting Crosby relief valves installed in the feedwater and miscellaneous vents and drains (DV) system. During bench testing, seven DV system relief valves failed to achieve the set pressure due to seat leakage. Upon further review, the licensee noted that six of the seven valves were Crosby Model JR-C valves and that the failure to document previous test failures allowed an undiscovered trend to exist for more than 1 year.

Corrective actions following the initial valve failures on the test stand involved replacement of the relief valves with a different model. Engineering personnel subsequently determined during the review of CR 1-97-11-397 that maintenance personnel failed to complete the master equipment list (MEL) verification forms with the new valve information. Additional corrective actions included revisions to procedures to require initiation of a CR for as-found test failures, submission of new MEL verification forms, training for maintenance personnel on completing MEL forms, determining if additional relief valves of the same manufacturer and model should be tested, and testing or replacing the affected additional valves.

The inspectors noted that the licensee did not determine the apparent cause for the failure mechanism of the relief valves. Engineering personnel stated that the valves had been disposed of following the test stand failures and had not been saved for inspection. The inspectors noted that five additional relief valves from the DV system were to be tested in the future and questioned engineering personnel to determine if actions had been specified to inspect the valves during testing. Engineering personnel stated that a step would be added to the affected MWRs to ensure an engineer was present during testing. In addition, engineering personnel reopened CR 1-97-11-397 to prompt investigation of the apparent cause of the DV relief valve failures.

The inspectors considered the failure to develop and implement effective corrective actions for conditions adverse to quality an example of a violation of 10 CFR Part 50, Appendix B, Criterion XVI. This violation constitutes an additional example of NCV 50-461/98011-01 for which enforcement discretion was exercised. No response to Violation 50-461/98011-01 was required. Corrective actions for this additional violation example are expected to be taken in conjunction with corrective actions for the previous non-cited violation. Improvements in the corrective action program will continue to be monitored as part of the inspection activities associated with the NRC's Manual Chapter 0350, Case Specific Checklist Item III.1, "Establish and Implement Actions to Achieve and Sustain Improvement in the Corrective Action Program."

c. Conclusions

The inspectors identified that ineffective corrective actions were taken while resolving selected Level 3 CRs. Specifically, four of ten randomly selected closed CRs either lacked an appropriate apparent cause, did not identify the extent of condition, or did not specify corrective actions which addressed the apparent cause. No significant discrepancies were identified in the three CRs completed by design engineering personnel.

**E8 Miscellaneous Engineering Issues (92700 and 92903)**

- E8.1 (Closed) Licensee Event Report 50-461/96-010: Plant shutdown due to unidentified reactor coolant system leakage from degraded reactor recirculation (RR) pump seal greater than TS limit. This event was discussed in NRC Special Inspection Report 50-461/96010. During an on-site review of this issue, the inspectors identified that the licensee replaced the "B" RR pump seal and restored the drywell floor and equipment drain sump flow monitoring systems to an operable status. In addition, the licensee performed a detailed root cause analysis on the "B" RR pump seal and determined that the long-standing seal degradation problems were caused by a poor seal design, operation of the RR system with the flow control valves less than full open, and a bowed pump shaft. At the conclusion of the inspection, the licensee was developing compensatory measures to address operating the plant with the current seal design until a new seal design could be manufactured, tested, and installed. The adequacy and appropriateness of the licensee's compensatory measures will be evaluated under NRC Manual Chapter 0350, Case Specific Checklist Item IV.6, "Complete Root Cause Analysis of Recirculation Pump Seal Failure and Develop Field Performance Measures."
- E8.2 (Closed) Notice of Violation 50-461/96015-05: Failure to perform a safety evaluation to evaluate changes in the operation of the component cooling water system and the acceptance criteria for surveillance testing of the HPCS system. In response to this violation, the licensee performed the required safety evaluations and determined that no unresolved safety question existed. The inspectors reviewed the safety evaluations and had no concerns. In addition, the licensee provided additional training on the performance of safety evaluations and screenings as part of the PFE. The inspectors considered the licensee's actions to be adequate.
- E8.3 (Closed) Notice of Violation 50-461/97015-04: Failure to ensure design requirements were translated into specifications for the diesel ventilation and hydrogen mixing compressor systems. The licensee re-performed engineering analyses and updated design documents with the appropriate information. The inspectors considered the corrective actions for the specific technical issue adequate. The licensee's corrective actions to address generic concerns involving engineering work products are being assessed as part of the inspection activities associated with the NRC's Manual Chapter 0350, Case Specific Checklist, Item VI, "Design and Configuration Control."

- E8.4 (Closed) Notice of Violation 50-461/97019-03: Failure to provide accurate information to the Commission. The licensee determined that this violation occurred because the individual assigned to author the violation response letter for NRC Inspection Report 50-461/96009-01 was inexperienced in performing the task, was not provided adequate training to perform the task, and was not adequately supervised. An inadequate review of the violation response letter by management personnel also contributed to this event. In response to this event, the licensing department implemented improved guidance and training for individuals writing responses to violations. Licensing Instruction R-1, "Preparation, Processing and Maintenance of Licensing Documents," was revised to require objective evidence for completed actions and that the objective evidence be included as part of the management review package. Through a review of correspondence to the NRC, dated between January 1996, and December 1997, the licensee identified several other deficiencies which were subsequently corrected. The inspectors considered the licensee's actions to resolve this issue adequate.
- E8.5 (Closed) Inspection Follow-up Item 50-461/97999-15: Instrument setpoint program is not well defined. During the SET inspection performed from September-December 1997, the team identified that the licensee's setpoint program was not well defined. Specifically, the SET and the licensee's Integrated Safety Assessment concluded that the licensee had failed to identify General Electric calculations which were superseded and that the results of several loop instrument and drift inaccuracy calculations were less than those specified in General Electric design specification data sheets. In response to this issue, the licensee initiated actions to review the adequacy of the instrument setpoint and calculation control programs as part of the PFE. The inspectors planned to perform additional reviews of the licensee's actions to correct setpoint and calculation control program problems as part of their followup to NRC Manual Chapter 0350, Case Specific Checklist Items VI.2, "Validate the Adequacy and Control of Calculations," and VI.3, "Validate the Adequacy and Control of the Setpoint Program."
- E8.6 (Closed) Inspection Follow-up Item 50-461/97999-22: Failure to receive prior approval for a proposed reduction in commitments to the QA program. During the performance of the licensee's Integrated Safety Assessment, the assessment team identified that the licensee implemented organizational changes which constituted a reduction in commitment to the QA program. Specifically, the licensee implemented organizational changes which altered the reporting structure of the licensing department and reassigned responsibility for the independent safety engineering group from the QA department to the nuclear safety and performance improvement department. After additional review, the licensee determined that these changes constituted a reduction in commitment in the quality assurance program and forwarded the proposed changes to the NRC for review and approval on February 25, 1998. The changes were subsequently approved by the Office of Nuclear Reactor Regulation on September 17, 1998. In addition, licensee management personnel were provided training on examples of reductions in commitments to prevent recurrence of this issue. The inspectors reviewed the licensee's corrective actions for this issue and considered them to be adequate.



10 CFR 50.54(a)(3) states, in part, that changes to the QA program description that reduce the commitments in the program previously accepted by the NRC must be submitted to the NRC and receive NRC approval prior to implementation. Therefore, the failure to submit changes in the QA program which constituted reductions in commitment to the NRC and to receive NRC approval for the changes prior to implementation was considered a violation of 10 CFR 50.54(a)(3). However, this non-repetitive, licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VI.B.1 of the NRC Enforcement Policy (NCV 50-461/98017-02).

- E8.7 (Closed) Inspection Follow-up Item 50-461/97999-23: Residual heat removal pump differential pressure limits do not account for instrument inaccuracies. In late 1997, the Integrated Safety Assessment team identified and the SET confirmed that the TS value for RHR pump differential pressure in the low pressure injection mode of operation was deficient in that it did not account for measurement inaccuracies and the effects of flow degradation over time. In addition, the SET stated that other CRs existed which identified additional examples where instrument inaccuracies were not taken into account for safety-related equipment. In response to this event, the licensee initiated actions to review the adequacy of the setpoint control program as part of the PFE. The inspectors planned to perform additional reviews of the licensee's actions as part of their followup to NRC Manual Chapter 0350, Case Specific Checklist Item VI.3, "Validate the Adequacy and Control of the Setpoint Program."
- E8.8 (Closed) Inspection Follow-up Item 50-461/97999-25: No specific criteria for shutdown service water pump intake bays or silt deposition levels. This inspection follow-up item is a duplicate of Licensee Event Report 97-026, "Inadequate procedure for inspection of shutdown service water pumps for excess silt results in shutdown service water inoperability." Therefore, the licensee's corrective actions for this event will be reviewed as part of the licensee event report closeout activities.

#### IV. Plant Support

##### **R1 Radiological Protection and Chemistry (RP&C) Controls**

##### **R1.1 Improved Access to Residual Heat Removal Rooms**

In an effort to reduce contaminated area square footage and improve access to plant equipment, the RP and facilities departments recently implemented a plan to decontaminate the RHR pump and heat exchanger rooms. During this inspection report period, three elevations of the RHR "A" heat exchanger room were decontaminated which resulted in reducing contamination levels from 60 mrad smearable to less than 1000 dpm/100 cm<sup>2</sup>; thereby eliminating protective clothing requirements.

**P8 Miscellaneous Emergency Preparedness Issues**

- P8.1 (Closed) Inspection Follow-up Item 50-461/97015-07: Missing seal on emergency operating facility airlock doors. Corrective actions involved installation of door seals on the affected doors. The inspectors considered the corrective actions for this issue adequate.

**V. Management Meetings**

**X1 Exit Meeting Summary**

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on October 1, 1998. The licensee acknowledged the findings presented. The inspectors questioned the licensee to determine whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

**X3 Management Meeting Summary**

On September 17, 1998, a meeting was held in the NRC Headquarters office to discuss licensee restart activities and improvement initiatives as well as NRC activities associated with implementation of NRC Manual Chapter 0350. Specific topics included the tagout program and the implementation of performance and effectiveness indicators.

## PERSONS CONTACTED

### Licensee

W. MacFarland IV - Chief Nuclear Officer  
G. Hunger, Manager - Clinton Power Station  
M. Wyatt, Manager - Recovery  
W. Romberg, Manager - Nuclear Station Engineering Department  
R. Phares, Manager - Nuclear Safety and Performance Improvement  
G. Baker, Manager - Quality Assurance  
J. Goldman, Manager - Work Management  
V. Cwietniewicz, Manager - Maintenance  
J. Gruber, Director - Corrective Action  
W. Maguire, Director - Operations  
J. Sipek, Director - Licensing  
J. Place, Director - Plant Radiation and Chemistry  
J. Barron, Director - Plant Engineering



## INSPECTION PROCEDURES USED

IP 37551: Engineering Observations  
IP 61726: Surveillance Observations  
IP 62707: Maintenance Observation  
IP 71707: Plant Operations  
IP 71750: Plant Support and Observations  
IP 92700: Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities  
IP 92901: Followup - Operations  
IP 92902: Followup - Maintenance  
IP 92903: Followup - Engineering  
IP 92904: Followup - Plant Support

## ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened

50-461/98017-01 VIO Failure to appropriately respond to AR/PR annunciators.  
50-461/98017-02 NCV Failure to submit reductions in commitments to the quality assurance program to the NRC for approval prior to implementation.

### Closed

50-461/96-010 LER Plant shutdown due to unidentified reactor coolant system leakage greater than TS limit.  
50-461/96015-05 VIO Failure to perform a safety evaluation to evaluate changes in the operation of the component cooling water and HPCS systems.  
50-461/97007-03 VIO Inadequate fuel pool cooling procedure.  
50-461/97007-04 VIO Failure to provide adequate HPCS procedure.  
50-461/97012-02 IFI Recirculation pump seal performance.  
50-461/97015-01 VIO Four examples of failure to follow procedures.  
50-461/97015-02 VIO Inadequate procedure for determining new pilot cell.  
50-461/97015-04 VIO Failure to ensure design requirements were translated into specifications for the diesel ventilation and hydrogen mixing compressor systems.  
50-461/97015-07 IFI Missing seal on emergency operating facility air lock doors.

50-461/97019-01	VIO	Poor oversight of reactor vessel level manipulations.
50-461/97019-02	VIO	Three examples of a failure to identify a condition adverse to quality.
50-461/97019-03	VIO	Failure to provide accurate information to the Commission.
50-461/97019-04	VIO	Failure to provide instructions commensurate with the knowledge, skills, and abilities of maintenance personnel.
50-461/97025-01	VIO	Failure to implement required TS action statements for secondary containment.
50-461/97025-02	VIO	Failure to implement TS actions for maintaining an inverter operable.
50-461/97999-15	IFI	Instrument setpoint program is not well defined.
50-461/97999-22	IFI	Failure to receive prior approval for proposed reduction in commitment in quality assurance program.
50-461/97999-23	IFI	Residual heat removal pump differential pressure limits do not account for instrument inaccuracies.
50-461/97999-25	IFI	No specific criteria for shutdown service water pump intake bays or silt deposition levels.
50-461/98004-06	IFI	Potential Division II EDG overload.
50-461/98017-01	VIO	Failure to appropriately respond to AR/PR annunciators.
50-461/98017-02	NCV	Failure to submit reductions in commitments to the quality assurance program to the NRC for approval prior to implementation.
CSC Item II.2		Establish and implement an effective clearance program.
CSC Item III.2		Establish and implement performance measures to assess performance.

## LIST OF ACRONYMS

AR/PR	Area Radiation and Process Radiation
ATM	Analog Trip Module
C&I	Controls and Instrumentation
CPS	Clinton Power Station
CR	Condition Report
CRS	Control Room Supervisor
DAC	Display and Control
DV	Miscellaneous Vents and Drains
EDG	Emergency Diesel Generator
EIN	Equipment Identification Number
HPCS	High Pressure Core Spray
IP	Illinois Power Company
MCCB	Molded Case Circuit Breaker
MEL	Master Equipment List
MWR	Maintenance Work Request
PFE	Plan for Excellence
PMSO	Plant Manager's Standing Order
QA	Quality Assurance
RC&IS	Rod Control and Information System
RCIC	Reactor Core and Isolation Cooling
RHR	Residual Heat Removal
RP	Radiation Protection
RR	Reactor Recirculation
SET	Special Evaluation Team
SX	Shutdown Service Water
TS	Technical Specifications
USAR	Updated Safety Analysis Report