U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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Report No:	50-315/99017(DRP); 50-316/99017(DRP)
Licensee:	American Electric Power Company 500 Circle Drive Buchanan, MI 49107-1395
Facility:	D. C. Cook Nuclear Generating Plant
Location:	1 Cook Place Bridgman, MI 49106
Dates:	July 17 through August 25, 1999
Inspectors:	B. L. Bartlett, Senior Resident Inspector B. J. Fuller, Resident Inspector J. D. Maynen, Resident Inspector
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EXECUTIVE SUMMARY

D. C. Cook Units 1 and 2
NRC Inspection Report 50-315/99017(DRP); 50-316/99017(DRP)

This inspection included aspects of licensee operations, maintenance, engineering, and plant support. The report covers a 6-week period of resident inspection activities and includes follow-up to issues identified during previous inspection reports.

Operations

- The licensee successfully off-loaded both units' reactor cores to the spent fuel pool. The licensee identified several minor material condition issues with the fuel handling equipment. The licensee corrected these after the first fuel assembly was safely stored in the spent fuel pool. The inspectors observed that the reactor core off-load fuel handling was conducted in a controlled, precise manner. (Section O1.2)

- The licensee's clearance process for work on the Unit 2 reactor coolant system was inadequate. Workers inadvertently drained several hundred gallons of primary coolant from the Unit 1 volume control tank while draining the Unit 1 and Unit 2 chemical and volume control system crosstie piping. Because the Unit 1 reactor core had already been off-loaded to the spent fuel pool, this event had no actual safety significance. (Section O1.3))

- A condition report issued in June 1999 identified an adverse trend involving equipment clearances. Corrective action to conduct training on the clearance process was narrowly focused and did not address errors made by the centralized clearance group or requesting organizations. (Section O1.3)

- The licensee's resolution of previously-identified regulatory non-compliances was weak. A cited violation was identified for failing to restore compliance from a previous non-cited violation. This non-cited violation, identified on March 9, 1999, involved failure to perform a safety evaluation following a change to a residual heat removal system surveillance procedure. In May 1999 the licensee again performed the procedure without having performed the safety evaluation. (Section O7.1)

- The licensee exhibited corrective action program implementation weaknesses, including examples of inaccurate description of issues on condition reports and inadequate completion of past due corrective actions. Case Specific Checklist item 2B, "Inadequate Corrective Actions for Previously Identified Conditions Adverse to Quality," remained open at the end of the inspection period.

Maintenance

- The inspectors concluded that troubleshooting activities were performed on the Unit 2 C/D D/G governor without a formal troubleshooting plan, contrary to management expectations. The licensee was still developing guidance for when use of the troubleshooting guidance would be required. (Section M1.2)

- A vendor technical representative made an unauthorized adjustment to the Unit 2 CD emergency diesel generator engine governor during troubleshooting. Based on the

unexpected engine speed change, the operators tripped the diesel. The licensee investigated the event and concluded that, although roles and responsibilities had been discussed prior to beginning the troubleshooting, there was inadequate control of the vendor technical representative. Effective control of troubleshooting continues to be a weakness. (Section M1.2)

- Workers improperly installed a strainer drain valve on the Unit 1 West ESW pump. As a result, the pump failed to meet its in-service test criteria for differential pressure. (Section E1.1)

- The licensee implemented several Technical Specification surveillance program initiatives to improve surveillance scheduling and review. Other planned improvements were in progress to provide a more effective method for ensuring compliance with Technical Specification requirements. Case Specific Checklist item 1 remained open at the end of the inspection period. (Section M7.1)

Engineering

- The licensee had not performed an engineering evaluation to determine if the Unit 1 West Essential Service Water pump was capable of supporting the Unit 1 West Residual Heat Removal pump during de-fueling operations following the identification of low differential pressure. The licensee resolved the cause of the low differential pressure condition and corrected it prior to beginning de-fueling operations. (Section E1.1)

- The Engineering Action Plan to resolve the resolve the low differential pressure condition on the Unit 1 West Essential Service Water pump was comprehensive and thorough. (Section E1.1)

Report Details

Summary of Plant Status

Unit 2 started the inspection period in Mode 6 (Refueling). On July 17, 1999, the licensee commenced off-load of the Unit 2 reactor core. On July 24, 1999, Unit 2 core off-load was completed.

Unit 1 started the inspection period in Mode 5 (Cold Shutdown). On August 6, 1999, the licensee commenced off-load of the Unit 1 reactor core. On August 9, 1999, Unit 1 core off-load was completed.

Both units remained defueled at the end of the report period, and the licensee was proceeding with bulk work activities on Unit 2.

I. Operations

O1 Conduct of Operations

O1.1 General Comments

The inspectors conducted frequent observations of control room and in-plant operation of equipment during the extended outage of both reactor units. Overall, plant operations were performed using approved operating procedures and reflected good operating practices. Specific events and noteworthy observations are detailed in the sections below.

O1.2 Core Off-load

a. Inspection Scope (71707)

Licensee management decided to off-load to the spent fuel pool all of the fuel assemblies in each reactor core in order to decrease the potential safety risk and to facilitate the efficient planning and conduct of work activities. The inspectors reviewed the documentation and procedures, and observed portions of the fuel movement evolution.

b. Observations and Findings

Specific comments about each unit are noted below:

Unit 2 Core Off-load

On July 17, 1999, the licensee began off-loading the Unit 2 reactor core to the spent fuel pool. The licensee soon experienced a problem with the fuel handling equipment. After placing the first fuel assembly in the upender and lowering it to the horizontal position, the fuel transfer cart would not move. The licensee verified that the upender was fully horizontal, and the fuel assembly was manually transferred to the spent fuel pool side of the transfer canal. Operators then placed the fuel assembly in the spent fuel pool and halted all further fuel movement.

The licensee's investigators determined that the transfer cart motor had failed. Workers replaced the Unit 2 transfer cart motor with a like-for-like replacement, and fuel movement resumed on July 21, 1999. The inspectors determined that the licensee had taken conservative action to place the fuel assembly in the spent fuel pool rather than leave it in the transfer cart. The licensee also corrected several other minor material condition deficiencies during this time.

A small leak around the reactor vessel seal required the operators to halt fuel movement and pump down the reactor cavity sump approximately every 90 minutes. The seal leak did not result in a significant drop in the refueling cavity level. The Senior Reactor Operator - Core Alterations (SRO-CA) was informed of all sump level alarms and appropriately halted fuel movement until containment integrity could be re-established.

The inspectors determined that overall, the licensee conducted fuel movement in a controlled, precise manner. The Unit 2 reactor core off-load was completed on July 24, 1999.

Unit 1 Core Off-load

On August 6, 1999, the licensee began off-loading the Unit 1 reactor core to the spent fuel pool. Similar to the Unit 2 core off-load, the inspectors noted deliberate and precise fuel handling. The licensee identified several fuel assemblies with apparent damage to the grid straps; these assemblies were recorded, and the licensee planned further evaluation prior to replacing the assemblies back into the reactor vessel. The Unit 1 core off-load was completed on August 8, 1999.

c. Conclusions

The licensee successfully off-loaded both units' reactor cores to the spent fuel pool. The licensee identified several minor material condition issues with the fuel handling equipment. The licensee corrected these after the first fuel assembly was safely stored in the spent fuel pool. The inspectors observed that the reactor core off-load fuel handling was conducted in a controlled, precise manner.

O1.3 Licensee Response to Clearance Request Errors

a. Inspection Scope (62707)

On August 18, 1999, the control room operators identified that an equipment clearance request was incorrect. The licensee issued a stop work order to the centralized clearance group, which stopped the processing of new equipment clearance requests. On August 20, 1999, the stop work was expanded to include the entire plant after a clearance error led to the inadvertent draining of the Unit 1 volume control tank. The licensee previously identified an adverse trend in configuration control, including equipment clearance errors. The inspectors followed up on the licensee's actions for both the recent clearance error and the previously identified errors.

b. Observations and Findings

Recently Identified Clearance Request Errors

On August 18, 1999, the Unit 1 control room operators identified that a clearance request for the west diesel-driven fire pump differed from an earlier clearance on the east diesel-driven fire pump. Both clearances were written for similar work. Upon further investigation, operations personnel noted that several other clearance errors had occurred in the past month. The licensee wrote Condition Report (CR) 99-21103 and issued a stop work order to the centralized clearance group. The licensee developed interim measures to preclude further clearance request errors.

On August 20, 1999, operators began to drain the Unit 2 reactor coolant system (RCS) after placing the Unit 2 RCS clearance in effect. Part of the Unit 2 RCS drain path used the Unit 1 West Centrifugal Charging Pump (CCP) discharge header in order to drain the chemical and volume control system cross-tie piping.

During the draining process, operators received a low level alarm on the Unit 1 volume control tank (VCT), and the operators isolated the VCT. The licensee determined that the Unit 1 VCT had been inadvertently draining through the Unit 1 West CCP discharge header, because the Unit 1 West CCP suction valves were not on the clearance order and were open. The licensee calculated that between 700 and 800 gallons of reactor coolant system water was drained from the Unit 1 VCT, through the Unit 1 West CCP discharge header to the auxiliary building sump. However, because the Unit 1 reactor core had been off-loaded to the Spent Fuel Pool, this event had no actual safety significance.

As a result of the unexpected draining of the Unit 1 VCT, plant management expanded the stop work order to prevent any work on already cleared components until the adequacy of the clearance boundaries could be determined. Operations management sent a letter to all department heads and supervisors which described changes to the clearance request process and emphasized expectations. The inspectors considered plant management's decision to stop work until personnel and equipment protection could be verified to be appropriate. On August 23, 1999, after verifying that the "B" Train electrical clearance was adequate to provide protection, the Site Vice President authorized the resumption of "B" Train electrical work.

The recent errors indicated that the centralized clearance group had several weaknesses. The licensee immediately implement increased management oversight of the clearance request process and more clearly defined the roles and responsibilities of the members of the centralized clearance group. In addition, the licensee planned to add a senior licensed operator review to all clearance requests.

Previously Identified Clearance Request Errors

On June 29, 1999, the licensee wrote CR 99-17286 to document an adverse trend involving equipment clearances. The licensee required that a full root cause investigation be performed and assigned a due date of October 8, 1999. The licensee closed several other CRs related to clearance order problems to CR 99-17286.

One of the actions the licensee took in response to CR 99-17286 was directing that hanging and removing of clearance orders be stopped. The licensee developed a training plan to brief the operators on the recent errors and on procedural requirements for hanging and removing clearances. The training plan included descriptions of the recent errors and management expectations for clearance orders. The licensee lifted the stop work order on July 5, 1999, after all of the operating crews had been trained.

The inspectors determined that the training plan for the earlier clearance errors appeared to have been narrowly focused on the operators. Condition Report 99-17286 referred to clearance request errors was narrowly focused. The training was focused on the operators and did not address errors made by clearance requesting organizations or the need for a detailed review of the work boundaries.

c. Conclusions

The licensee's clearance process for work on the Unit 2 reactor coolant system was inadequate. Workers inadvertently drained several hundred gallons of primary coolant from the Unit 1 volume control tank while draining the Unit 1 and Unit 2 chemical and volume control system crosstie piping. Because the Unit 1 reactor core had already been off-loaded to the Spent Fuel Pool, this event had no actual safety significance. Plant management had an existing stop work order in effect to preclude clearance request errors, and expanded the order after this draining event to include already cleared components. A CR issued in June 1999 identified an adverse trend involving equipment clearances. Corrective action to conduct training on the clearance process was narrowly focused and did not address errors made by the centralized clearance group or requesting organizations.

O7 Quality Assurance in Operations

O7.1 Case Specific Checklist Item 2B, "Inadequate Corrective Actions for Previously Identified Conditions Adverse to Quality"

a. Inspection Scope (40500, 92901, and 92902)

The inspectors reviewed the corrective actions for Non-Cited Violations (NCVs) 50-315/316/99001-02, 50-315/316/99004-01, and 50-316/99004-04 as they related to NRC Manual Chapter 0350 Case Specific Checklist Item 2B, "Inadequate Corrective Actions for Previously Identified Conditions Adverse to Quality."

b. Observations and Findings

Appendix C of the Enforcement Policy required that for Severity Level IV violations to be dispositioned as NCVs, they be appropriately placed in the licensee's corrective action program. Implicit in that requirement was that the corrective action program be fully acceptable. The D. C. Cook Plant corrective action program was not adequate and has been the focus of significant attention by the licensee to improve the program. The licensee's staff and the NRC have not yet concluded that the corrective action program is fully effective; however, the corrective action program improvement efforts are underway and addressed in the D. C. Cook Plant Restart Plan under the formal oversight of the NRC through the NRC Manual Chapter 0350 process, "Staff Guidelines for Restart Approval."

NRC Inspection Report 50-315/99001; 50-316/99001 documented several Severity Level IV violations that were dispositioned as NCVs based on the above discussion. NRC Inspection Report 50-315/99004; 50-316/99004 also documented several Severity Level IV violations which were dispositioned as NCVs based on the above discussion. Specific comments regarding NCVs 50-316/99004-04, 50-315/316/99001-02, and 50-315/316/99004-01 are provided in the sections below.

b.1 Non-Cited Violation 50-316/99004-04

As discussed in NRC Inspection Report 50-315/99004; 50-316/99004, the inspectors reviewed the safety evaluation screening for Change No. 2 to Surveillance Procedure 02-OHP 4030.STP.054E, "East Residual Heat Removal Train Operability Test - Shutdown," Revision 7. The procedure change allowed the operators to balance RHR heat exchanger and heat exchanger bypass flow. The change also allowed the operators to maintain RCS temperature by adjusting component cooling water (CCW) system flow to the RHR heat exchanger.

The safety evaluation screening did not document Change No. 2 as a change to the operation of the plant as described in the Updated Final Safety Analysis Report (UFSAR). The licensee concluded that a full safety evaluation in accordance with 10 CFR 50.59 was not required. The safety evaluation screening stated that choosing a flow balance that minimized flow perturbations and using the CCW system to regulate RCS temperature did not represent direction outside the UFSAR requirement.

The UFSAR, in Section 9.3, "Residual Heat Removal," stated that, "The cooldown rate of the reactor coolant is controlled by regulating the flow through the tube side of the residual heat exchangers. A bypass line, which serves both residual heat exchangers, is used to regulate the temperature of the return flow to the reactor coolant system as well as maintain a constant flow through the RHR system." The inspectors noted that the use of the CCW system to regulate RCS temperature was contrary to UFSAR Section 9.3. Therefore, the licensee was required to perform a full safety evaluation.

NRC Inspection Report 50-315/99004; 50-316/99004 contained a non-cited violation for failing to perform a full safety evaluation for Change No. 2. The inspectors identified this non-cited violation on March 9, 1999.

On August 17, 1999, the inspectors determined that the licensee performed Procedure 02-OHP 4030.STP.054E, Revision 7, without a full safety evaluation on May 21, 1999. The procedure changes made under Change 2 were still in effect. In addition, the inspectors noted that the applicable sections of the Updated Final Safety Analysis Report had not been changed to reflect the licensee's desired operation of the plant.

On June 1, 1999, the licensee initiated began an evaluation of this issue and wrote CR 99-14175. The CR stated that Normal Operating Procedure 01-OHP 4021.017.001, "Operation of the Residual Heat Removal System," was similarly changed and received a full safety evaluation. The procedure changes to 01-OHP 4021.017.001 involved throttling the component cooling water (CCW) flow to the residual heat removal (RHR) heat exchanger to control reactor coolant system temperature while the plant was in Mode 5. Because the full safety evaluation for the change to Normal Operating Procedure 01-OHP 4021.017.001 concluded that no unreviewed safety question (USQ)

existed, then the licensee concluded that no USQ existed for Change No. 2 to Procedure 02-OHP 4030.STP.054E.

The inspectors agreed that throttling the CCW flow to the RHR heat exchangers in Mode 5, while contrary to the plant operation as stated in the Updated Final Safety Analysis Report, did not result in a USQ. However, the licensee did not initiate Condition Report 99-14175 prior to performing Procedure 02-OHP 4030.STP.054E on May 21, 1999. Furthermore, the condition reporting system was not the approved means for performing and documenting safety evaluations.

The inspectors had the following additional observations regarding CR 99-14175:

- The CR did not include the licensee's inconsistent use of safety evaluation screenings versus full safety evaluations.

- The CR did not address the initial failure to perform an adequate safety screening.

10 CFR 50.59 required, in part, that the licensee shall maintain records of changes in procedures made pursuant to this section, to the extent that these changes constitute changes in the facility as described in the safety analysis report. These records must include a written safety evaluation which provides the bases for the determination that the change does not involve an unreviewed safety question. The inspectors considered the failure to perform a safety evaluation for Change 2 to Surveillance Procedure 02-OHP 4030.STP.054E, prior to using the procedure on May 21, 1999, to be a violation (Violation 50-316/99017-01(DRP)). The inspectors determined that the licensee failed to restore compliance after the previous violation (NCV 50-316/99004-04) was identified.

b.2 Non-Cited Violation 50-315/316/99001-02

Non-Cited Violation 50-315/316/99001-02 documented that Plant Managers Procedure (PMP) 2110.CPS.001, "Clearance Permit System," Revision 1, was not appropriate to the circumstances, in that it did not contain instructions to place tags at all locations where out-of-service equipment may be operated. The inspectors considered the failure to provide appropriate instructions in the clearance permit procedure a violation of 10 CFR Part 50, Appendix B, Criterion V. The licensee wrote CR 99-0452 to evaluate NCV 50-315/316/99001-02.

As of the date of this current inspection, licensee procedure Plant Manager Procedure 2110.CPS.001 had not been revised to address the NCV. Although some interim corrective measures were implemented, no long term actions, such as revising the PMP, had been performed. Furthermore, a licensee employee requested that the PMP be revised; however, the CR had no action items to revise the PMP.

Condition Report 99-0452 was open as of August 23, 1999. The due date for this CR was May 28, 1999. The inspectors concluded that the timeliness of the licensee's corrective actions was poor.

b.3 Non-Cited Violation 50-315/316/99004-01

Non-Cited Violation 50-315/316/99004-01 documented that the licensee had failed to determine the cause and take corrective actions to preclude repetition for significant conditions adverse to quality as described in CR 99-06607, "Procedures for Performing Maintenance," and CR 99-07213, "Operations Charging Pump Surveillance Fails to Show Adequate Pump Protection." The inspectors considered the inappropriate classification of these two CRs to be a violation of 10 CFR Part 50, Appendix B, Criterion XVI.

The licensee wrote CR 99-08345 to document that CR 99-06607 was mis-classified. Condition Report 99-06607 had been written to document maintenance procedural quality issues. Condition Report 99-08345 documented that CR 99-06607 was assigned as a "Condition Adverse to Quality - Resolve" (Classification 3) but should have been assigned as a "Significant Condition Adverse to Quality - Root Cause" (Classification 2). The inspectors noted that CR 99-06607 had been upgraded from Classification 3 to Classification 2 on April 1, 1999.

In addition, the licensee wrote CR 99-13693 to document that CR 99-07213 was mis-classified. Condition Report 99-07213 had been written to document operations procedural quality issues. Condition Report 99-13693 documented the licensee's failure to determine cause and take corrective actions to preclude repetition for significant conditions adverse to quality as described in CR 99-07213. The inspectors noted that CR 99-07213 had been upgraded from a Classification 3 to Classification 2 on April 14, 1999.

The inspectors reviewed CRs 99-08345 and 99-13693 to assess the other corrective actions taken in response to the NCV. The inspectors had the following additional observations regarding CR 99-08345:

- The inappropriate classification of CR 99-06607 was accurately documented; however, an additional statement in the CR, "This issue represents a potential bypass of the 50.59 requirements," did not accurately describe the issue.

- A memo contained within the CR 99-08345 package documented that a maintenance department representative believed that CR 99-06607 had been properly classified (i.e., the non-compliance did not exist). This position had been reviewed and approved by a member of the corrective action department.

The inspectors had the following additional observations regarding: CR 99-13693

- The description of the problem was well documented;

- Initially CR 99-13693 had been classified as a level 2 but had been downgraded to a less significant CR (level 3) on June 21, 1999. There was an additional request to downgrade this CR further, but this was not approved. Licensing was consulted and did not object to the CR downgrade. The reason stated in the CR for the downgrade was that, "The investigation into this issue determined that there really is not a problem. The conditions identified do not exist."

- Condition Report 99-13693 remained open at the end of the report period with extensive assessments and corrective actions in progress. However, while the precise non-compliance had been corrected, the broader issue of the corrective action screening committee's failure to correctly classify a significant condition adverse to quality had not been addressed by the corrective action program.

c. Conclusions

The licensee's resolution of previously-identified regulatory noncompliances was weak. A cited violation was identified for failing to restore compliance from a previous NCV. This NCV, identified on March 9, 1999, involved failure to perform a safety evaluation following a residual heat removal system surveillance procedure change. In May 1999, the licensee again performed the procedure without having performed the safety evaluation. Other corrective action program implementation weaknesses identified by the inspectors included examples of inaccurate description of issues on condition reports and the inadequate completion of past due corrective actions. Case Specific Checklist item 2B, "Inadequate Corrective Actions for Previously Identified Conditions Adverse to Quality," remained open at the end of the inspection period.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

The inspector reviewed or observed portions of the following activities:

- 12-OHP [Operations Head Procedure] 4050.FHP.005, "Core Unload/Reload and Incore Shuffle," Revision 0.
- 12-QHP [Quality Assurance Head Procedure] 4050.QC.002, "Fuel Assembly Damage Assessment," Revision 0.
- Action Request (AR) A188279, Unit 2 CD emergency diesel generator (D/G) failed to meet the frequency requirements of Technical Specification (TS) 4.8.1.1.
- A188428, Perform Engineering Action Plan 99-219 on Unit 1 West Essential Service Water (ESW) pump
- AR A188647, Repair leakby on Unit 1 West ESW pump strainer discharge outlet valve, 1-WRV-762
- Job Order (JO) C50327, Investigate Unit 2 CD D/G not meeting frequency requirements
- JO C50448, Investigate Unit 2 CD D/G not meeting frequency requirements

The inspectors concluded that the observed work was performed in accordance with procedures. The current revision of the appropriate procedures were in use at the work

sites, and proper work safety and radiological protection practices were noted. Specific comments regarding the troubleshooting on the Unit 2 CD emergency diesel generator are discussed below in Section M1.2.

M1.2 Troubleshooting Weaknesses Identified During Emergency Diesel Generator Maintenance (Unit 2)

a. Inspection Scope (61726 and 62707)

On July 30, 1999, the Unit 2 CD emergency D/G failed to meet the TS 4.8.1.1 acceptance criteria during load reject testing. The licensee initiated CR 99-19978 and Action Request A188279 to document the test failure. The inspectors followed up on the licensee's investigation and corrective actions.

b. Observations and Findings

On August 2, 1999, instrument and control (I & C) technicians began troubleshooting the Unit 2 CD D/G with the assistance of a vendor technical representative. The inspectors reviewed Job Order (JO) C50327 which was used to troubleshoot the Unit 2 CD D/G.

The first activity under JO C50327 directed the instrumentation and control (I & C) technicians to perform tests and checks as directed by engineering and the vendor technical representative. However, the inspectors observed that no documented testing methodology or troubleshooting guidance was provided, and Plant Managers Procedure (PMP) 2291.TRS.001, "Troubleshooting," was not referenced.

During the troubleshooting on the Unit 2 CD D/G, a vendor technical representative was in the D/G room providing technical guidance and recommending specific adjustments to be made to the D/G governor. After six adjustments had failed to correct the load rejection frequency response problem, the operators were preparing to load the diesel for the next adjustment. Prior to paralleling the diesel, the vendor technical representative made an adjustment to the governor without informing the control room. The control room operators noted an unexpected frequency change and stopped the D/G. The licensee initiated Condition Report 99-20125 to document the unauthorized governor adjustment, and the licensee commenced an investigation.

The licensee's investigators concluded that there was inadequate control of the vendor technical representative. As discussed during the pre-job briefing, the vendor technical representative was to make recommendations to the I&C technicians, and the I&C technicians were expected to make any governor adjustments.

The inspectors discussed the troubleshooting effort with maintenance management. The maintenance manager stated that the licensee employees involved in the troubleshooting had deferred to the vendor technical representative's expertise. During the actual troubleshooting, the licensee employees had followed the vendor technical representative's recommendations for adjusting the Unit 2 CD D/G governor, but they had not developed a formal troubleshooting plan using the guidance provided in PMP 2291.TRS.001.

Corrective Actions for Previously Identified Weaknesses

The inspectors had recently discussed weaknesses in troubleshooting with maintenance management (see NRC Inspection Report 50-315/99015; 50-316/99015). The maintenance manager stated that requiring the use of PMP 2291.TRS.001 was not practical for all corrective maintenance JOs. For example, if an equipment failure was due to an obvious cause, a plan would be unnecessary. The licensee was developing guidelines for situations when the use of a formal troubleshooting plan would be required and situations when a formal plan would be optional. At the time of the Unit 2 CD D/G troubleshooting problems, the guidelines were still under development. However, the licensee stated that a formal troubleshooting plan should have been used to investigate the Unit 2 CD D/G governor problem.

As an interim corrective action to the weaknesses documented in NRC Inspection Report 50-315/99015; 50-316/99015, the licensee prepared a briefing package which provided management expectations regarding troubleshooting. Specifically, the briefing package provided a broad overview of PMP 2291.TRS.001. The package stated that troubleshooting must be conducted in a systematic manner, and the troubleshooting steps outlined in PMP 2291.TRS.001 were briefly discussed.

The inspectors determined that the briefing given to the licensee's staff was not effective at preventing troubleshooting problems similar to those identified in NRC Inspection Report 50-315/99015; 50-316/99015.

c. Conclusions

The inspectors concluded that troubleshooting activities were performed on the Unit 2 C/D D/G governor without a formal troubleshooting plan, contrary to management expectations. The licensee was still developing guidance for when use of the troubleshooting guidance would be required.

In addition, a vendor technical representative made an unauthorized adjustment to the on the Unit 2 CD emergency diesel generator engine governor during troubleshooting. Based the unexpected engine speed change, the operators tripped the diesel. The licensee investigated the event and concluded that, although roles and responsibilities had been discussed prior to beginning the troubleshooting, there was inadequate control of the vendor technical representative. Effective control of troubleshooting continues to be a weakness.

M7 Quality Assurance in Maintenance

M7.1 Case Specific Checklist Item 1, "Programmatic Breakdown in Surveillance Testing"

a. Inspection Scope (40500 and 61726)

The inspectors reviewed the licensee's Technical Specification (TS) surveillance program initiatives and interviewed the program's owner. The NRC identified the surveillance program as one that required oversight during the licensee's restart effort as described in NRC letters to the licensee dated July 30, 1998, and updated on October 13, 1998. Additional aspects of the TS surveillance program were discussed in NRC Inspection Report 50-315/99007; 50-316/99007.

b. Observations and Findings

The licensee initiated the following actions to improve the quality of surveillance procedure performance:

- A database was developed to provide cross reference of TS required surveillances to the plant procedures for meeting surveillance requirements. The licensee planned to use the database to track surveillance completion dates, identifying surveillance due dates and surveillances which are in the allowed grace period. To give more margin to the TS time limits, the licensee planned to schedule surveillance testing on a 28-day month and 84-day quarter basis.

- The licensee added a requirement for a senior reactor operator's (SRO) review of all surveillance procedures prior to sign off for completion of the surveillance. The surveillance program owner stated that the SRO review of all surveillance testing would improve operations department awareness of the operability of equipment. Previously, surveillance testing could be completed without notification to operations shift personnel.

- The licensee planned to perform in-depth reviews to ensure the technical adequacy of all surveillance procedures. The licensee had previously initiated CR 99-13901 to document that in-depth technical reviews of TS surveillance procedures had not been performed. Corrective action for this deficiency included establishment of a test review board to perform reviews of all TS procedures.

The surveillance program owner stated that the methodology for assessment would aggregate the results of previous assessments, along with new reviews, to give a single set of results which would present a consolidated picture of program health. The program owner planned to incorporate the results of the root cause analysis performed for a missed power-operated relief valve TS surveillance (CR 99-0930), an assessment performed by a third party (CR 99-8703), and a Performance Assurance audit performed in 1998 (CR 98-1181). A draft assessment plan was presented to the System Readiness Review Board for approval, and the licensee planned to complete the assessment in early fall 1999.

c. Conclusions

The licensee implemented several TS surveillance program initiatives to improve surveillance scheduling and review. Other planned improvements were in progress to provide a more effective method for ensuring compliance with TS requirements. Case Specific Checklist item 1 remained open at the end of the inspection period.

III. Engineering

E1 Conduct of Engineering

E1.1 Troubleshooting Efforts on the Unit 1 East Essential Service Water Pump

a. Inspection Scope (37551)

The inspectors reviewed the licensee's troubleshooting and repair efforts on the Unit 1 East ESW pump. On July 2, 1999, the inspectors identified that the operators had removed the Unit 1 East Essential Service Water (ESW) pump from service only hours after the Unit 1 West ESW pump had failed to meet its in-service test criteria (IST) for differential pressure. The inspectors determined the licensee was planning to enter Mode 6 on Unit 1 without evaluating the Unit 1 West ESW pump's capability of performing at design values. The inspectors reviewed CR 99-17678, which was written by operations personnel to document the IST test failure.

b. Observations and Findings

On July 29, 1999, the inspectors determined the licensee was planning to enter Mode 6 on Unit 1 without evaluating the Unit 1 West ESW pump's capability of performing at design values. In Mode 6, both trains of RHR were required to be operable, and ESW was a support system required to support the RHR operability. The inspectors had the following observations:

- The licensee was planning to enter Mode 6 in order to remove all fuel from the Unit 1 reactor vessel on August 5, 1999.
- The Unit 1 East ESW system was operable for shutdown requirements; however, the Unit 1 West ESW system remained inoperable due to the low differential pressure IST test results.
- While Unit 1 was in Mode 5, only one train of RHR was required by TS; however, when Unit 1 entered Mode 6, both trains of RHR would be required to be operable.
- Engineering had not been requested to verify that the Unit 1 West ESW pump was capable of supporting an operable RHR system even though the results of the IST surveillance demonstrated that the pump was developing less than the minimum design requirement differential pressure.

The inspectors interviewed operations and engineering personnel regarding the planned mode change and the Unit 1 West ESW pump's ability to support an operable RHR train. In response to the inspectors' questions, the licensee initiated Engineering Action Plan 99-219 to address the low developed differential pressure. The inspectors reviewed Engineering Action Plan 99-219 and determined that it was detailed, comprehensive, and thorough.

The Engineering Action Plan was focused on identifying and correcting the causes for the low developed head and laid out in a step-by-step plan the process by which the problems would be identified. The Plan contained a troubleshooting plan to identify the

cause of the low developed head. The inspectors determined the plan was well thought out and included contingencies, crew briefings, and other items required by licensee procedures. This was in contrast to the troubleshooting weaknesses documented above in Section M1.2 and in NRC Inspection Report 50-315/99015; 50-316/99015.

The licensee's troubleshooting of the Unit 1 West ESW Pump determined that workers had improperly installed the pump's strainer drain valve, 1-WRV-762 during maintenance performed on June 15, 1999. The result of the improper installation was that the valve would not fully close. The failure to close resulted in a diversion of about 1,000 gpm before the flow reached the pump's flow indicator. Because the actual flow through the pump was greater than the indicated flow, the pump differential pressure was lower than expected.

Workers repaired Valve 1-WRV-762, and successfully tested the Unit 1 West ESW pump on August 14, 1999. The results indicated that the pump had returned to its previous normal differential pressure readings. The licensee initiated CR 99-20474 to assess the cause for the failure of maintenance personnel to re-install valve 1-WRV-762 properly. The licensee concluded that:

- The low differential pressure readings of Unit 1 West ESW pump were not resolved in a timely manner.
- The IST program data indicated a problem, but the engineering staff was preparing to accept the pump's performance and re-baseline the acceptance criteria.
- The decision by operations to accept the Unit 1 West ESW pump as available (but inoperable) lacked definitive criteria, and the general philosophy used by the operations department for components that need to be assessed for availability needed further consideration.

Based upon the information above, the inspectors determined, and the licensee concurred, that operations personnel lacked a sensitivity to the information derived from the IST program. The licensee completed the valve repair and pump test prior to Unit 1 entering Mode 6, thereby complying with TS requirements.

c. Conclusions

The inspectors identified that the licensee had not performed an engineering evaluation to determine if the Unit 1 West Essential Service Water pump was capable of supporting the Unit 1 West Residual Heat Removal pump during de-fueling operations following the identification of low differential pressure. As a result of the inspectors' questions, the licensee resolved the cause of the low differential pressure condition and corrected it prior to beginning de-fueling operations. The licensee's actions to resolve the inspectors' concerns were conducted in a controlled and deliberate manner. The Engineering Action Plan to resolve the essential service water pump performance deficiencies was comprehensive and thorough.

IV. Plant Support

R1 Radiological Protection and Chemistry Controls (71750)

During normal resident inspection activities, routine observations were conducted in the area of radiological protection and chemistry controls using Inspection Procedure 71750. No uncontrolled releases of radioactive material were identified.

S1 Conduct of Security and Safeguards Activities (71750)

During normal resident inspection activities, routine observations were conducted in the area of security and safeguards activities using Inspection Procedure 71750. No discrepancies were noted.

F1 Control of Fire Protection Activities (71750)

During normal resident inspection activities, routine observations were conducted in the area of fire protection activities using Inspection Procedure 71750. No discrepancies were noted.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of the licensee management at the conclusion of the inspection on August 25, 1999. The licensee acknowledged the findings presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

#C. Bakken, Site Vice President
#R. Crane, Regulatory Affairs
#M. Danford, Correction Action Planning Manager
#R. Gaston, Compliance Manager
#K. Greene, Maintenance
#R. Godley, Director, Regulatory Affairs
#S. Lacey, Engineering Restart Director
#J. LaPlatney, Consultant
#R. Meister, Regulatory Affairs
#T. Noonan, Plant Manager
#J. Pollock, Director, Performance Assurance
#B. Smalldridge, Operations
#M. Stark, Maintenance
#R. Strasser, Assistant Operations Manager
#R. Tinkle, Maintenance
#C. Vanderniet, Performances Assurance
#A. Verteramo, Reactor Engineering Manager
#D. Walker, Operations
#L. Weber, Operations Manager

# Denotes those present at the August 25, 1999, exit meeting.

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 40500	Corrective Action
IP 61726:	Surveillance Observations
IP 62707:	Maintenance Observation
IP 71707:	Plant Operations
IP 71750:	Plant Support Activities
IP 92901:	Followup - Operations
IP 92902:	Followup - Maintenance

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-316/99017-01	VIO	Failure to restore compliance from a previous identified violation involving inadequate 10 CFR 50.59 evaluations

Closed

None

Discussed

None.

LIST OF ACRONYMS

AR	Action Request
CCP	Centrifugal Charging Pump
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CR	Condition Report
D/G	Diesel Generators
DRP	Division of Reactor Projects
ESRR	Expanded System Readiness Review
ESW	Essential Service Water
I & C	Instrumentation and Controls
IHP	Instrument Head Procedure
IMP	Instrument Maintenance Procedure
IST	In-Service Test
JO	Job Order
MC	Manual Chapter
MHP	Maintenance Head Procedure
MOV	Motor Operated Valve
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
OHI	Operations Head Instruction
OHP	Operations Head Procedure
PMI	Plant Manager's Instruction
PMP	Plant Manager's Procedure
PMSO	Plant Manager's Standing Order
PMT	Post Maintenance Testing
PPA	Plant Performance Assurance
PDR	Public Document Room
RCS	Reactor Coolant System
RHR	Residual Heat Removal
SRO	Senior Reactor Operator
STP	Surveillance Test Procedure
TS	Technical Specification
USQ	Unriewed Safety Question
VCT	Volume Control Tank
VIO	Violation