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EXECUTIVE SUMMARY

D. C. Cook, Units 1 and 2
NRC Inspection Report 50-315/99013(DRS); 50-316/99013(DRS)

This was a special inspection to review the Discovery Phase of the Programmatic and Functional Area Restart Readiness Assessment process. Specifically, this inspection focused on: (1) Corrective Action, Design Engineering, Plant Engineering, Operations and Maintenance functional area assessments; and (2) Assessments of programs within these functional areas. Overall the assessments were considered sound in identifying potential restart issues.

- Functional area assessments in the areas of operations, maintenance and engineering and the assessment of the Corrective Action Program were successful in identifying potential restart issues and engineering process deficiencies. However, the inspectors did identify some weaknesses in the implementation of the assessment process, specifically related to documentation and process deficiencies. The documentation weaknesses were most apparent in engineering assessment reports which were not stand-alone documents and did not meet the expectations established by the System Readiness Review Board (Sections 07.3, 07.5, M7.1, E7.1, and E7.2)

- Several process weaknesses were identified which could impact the effectiveness of the assessment efforts: the assessment procedures did not explicitly require a review to ensure past process performance problems were eliminated; the assessment methodology relied principally on interviews of departmental staff; the programmatic assessment procedure did not require review or approval of programmatic assessments by the System Readiness Review Board; the silo approach used for programmatic assessments appeared likely to produce inconsistencies; the Cross Functional Review Team was not fully effective in identification of programs in need of a detailed self assessment; and an informal word-of-mouth training process was used for personnel involved in programmatic area self-assessments. (Section 07.1).

- The Systems Readiness Review Board members performed their charter functions and effectively challenged internal assessments and conclusions. The Systems Readiness Review Board process was an essential element in establishing quality expectations for the functional area assessment process (Section 07.2).

- Programmatic assessments were of varied quality: while the operations-related assessments were of good quality, the Contractor Control and Material Condition program reviews were considered vague and lacking in detail. The Plant Fuse Control Program documentation was not sufficient to support the conclusion that adequate guidance existed; however, the Electrical Load Control Program assessment identified substantive program issues (Sections 07.4, M7.2, and E7.2).

- The preventive maintenance program had been ineffectively implemented resulting in inadequate equipment maintenance and a large backlog of overdue preventive maintenance tasks. The failure to initiate prompt corrective actions (condition reports or deferrals) for approximately 150 overdue preventative maintenance tasks, and to determine if the operability of Unit 1 and Unit 2 safety related equipment had been affected was considered a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion XVI. The licensee was taking appropriate corrective actions including the formation of a cross-discipline review team to address the causes of the overdue maintenance and the performance of operability determinations to assess the impact on affected safety related equipment (Section E7.2.3).

Report Details

O7 Quality Assurance in Operations

O7.1 Functional and Programmatic Area Restart Readiness Processes

a. Inspection Scope (40500)

The inspectors reviewed assessment procedures, historical audits, assessment plans, assessment reports, and interviewed licensee staff involved in the functional and programmatic assessment process. Unless stated otherwise, the following observations apply to both the programmatic and functional area assessment processes.

b. Observations and Findings

The functional area restart readiness assessment process was described in plant managers procedure (PMP) 7200.RST.010, "Functional Area Restart Readiness," and the programmatic area restart readiness assessment process was described in procedure PMP 7200.RST.009, "Programmatic Restart Readiness." Each of these procedures invoked PMP 7034.SAP.001, "Conduct of Non Regulatory Self-Assessments," to implement the detailed self assessment process. Both assessment processes shared the same goal: to identify restart issues, that when resolved, would ensure departmental programs and processes were adequate to support safe and reliable restart and continued plant operation. The assessment process was divided into two phases: Phase 1 (Discovery) and Phase 2 (Implementation and Verification). At the conclusion of the inspection, this process had not progressed beyond the Discovery Phase. The inspectors considered these assessment processes, as described in the implementing procedures, to represent a structured approach to accomplish the assessment goals.

On May 10, 1999, the Cross Functional Review Team (CFRT) completed their review of the collected program baseline assessment surveys on 125 programs (such as Appendix R and Fuse Control). This team was responsible for resolving potential organizational conflicts and for verifying that all major specific programs were identified and were in place to support plant restart. The CFRT review identified 106 plant programs as necessary to support plant restart. The CFRT team was comprised primarily of contract personnel representing licensee organizations such as operations, maintenance and engineering. The CFRT's findings were subsequently reviewed by the System Readiness Review Board (SRRB) on May 26, 1999.

The programs identified by the CFRT had an identified owner who was responsible for evaluating the program's effectiveness. The program owner reported to a functional area manager, who had the overall responsibility to certify the programmatic assessment findings and to implement those actions necessary for restart. Each program owner reviewed previous station and industry assessments, station procedures, and NRC inspection report findings. The scope of the review was generally limited to activities performed since 1997. Each program was surveyed using the nine screening criteria defined in the Restart Readiness Procedure. These criteria included consistency of program ownership; implementation of program procedures; adequacy of performance

indicators; and effectiveness of program implementation. Based on the survey screenings filled out by the program owners, the CFRT determined if a program required a detailed assessment, management attention, or had reasonable confidence for program performance. However, as discussed below, this process was not fully effective in determining which programs required a detailed self assessment.

b.1 Self-Assessment Process Weaknesses

Conflicts existed between the CFRT and the program owners regarding which programs needed a detailed assessment. For example, the CFRT determined that detailed assessments were unnecessary for the Appendix R, Cable Aging and Monitoring, Equipment Classification, Procedures, Emergency Operating Procedures, Operability Determinations, and Operator Workarounds programs. However, this was contrary to the conclusions made by the respective program owners during their review. The conflicts arose from the CFRT screening process, which was limited to a subjective review of the data sheet surveys, provided by the program owners, without considering objective findings from other sources. For example, generic issues with the high energy line break, preventative maintenance and configuration management programs, which were identified through the Expanded System Readiness Reviews (ESRR), were not reviewed by the CFRT, but were considered by the program owners. Because of the extent of the conflicts, the licensee expanded the number of detailed assessments.

During their review, the CFRT identified action items that were considered necessary to certify specific programs as being ready for restart. These items were listed in Appendix B to the CFRT report. However, the inspectors identified that the programmatic assessment teams were unaware of how to address these findings. Specifically, some teams were unsure if these findings constituted restart issues that should be included in the functional and programmatic assessments. Consequently, licensee management intended to provide additional guidance to the staff.

The intent of the self-assessment processes, as implemented, was to focus on discovery of new issues and not to verify that past process performance problems had been eliminated. For example, the design engineering functional area assessment did not attempt to verify that the 23 design control bypass mechanisms previously identified in the Engineering Issues Review Group Report had been eliminated in the newly revised design control procedures and programs. This was also evident in the engineering assessment review plans, which did not encompass a review of NRC enforcement actions related to engineering such as, the safety evaluation process, or maintenance of the plant design basis. As a consequence of the assessment focus, licensee's responses to NRC enforcement actions were typically not reviewed which included root causes for past process deficiencies. Knowledge of these root causes may have strengthened the existing assessment process.

The assessments and assessment plans relied principally on interviews of department staff without sampling of work products produced by the department or program. This methodology was potentially less effective at producing an objective performance based assessment. The licensee considered that other processes such as department performance indicators would be adequate to determine the performance.

The governing programmatic assessment procedure PMP 7200.RST.009 did not require review or approval of programmatic assessments by the SRRB. Nevertheless, licensee program owners had elected to send selected engineering programs through the SRRB for review and approval as delineated in the Engineering Leadership Plan. However, the basis for selecting these programs was not defined, possibly resulting in inconsistent quality standards being applied for program assessments not subject to SRRB review.

The programmatic team reviews were conducted in an isolated "silo" manner, without direct or routine interaction with other program reviews or functional area reviews. Potential conflicts or generic issues were typically discussed ad hoc between the teams. This approach allowed inconsistencies in the programmatic assessments to go undetected. This was in direct contrast to the functional review teams for which all team leaders interacted frequently at scheduled meetings to resolve common issues.

The licensee acknowledged the inspectors' observations and was developing corrective actions.

b.2 Self assessment Procedure/Training Weaknesses

The functional area managers and assessment team leaders received two days of formal classroom training administered by a contractor on the procedures and detailed guidance for the conduct of assessments. The balance of the full time functional assessment team members received a single day of training on the conduct of self-assessments. This training familiarized team members with the procedures and management expectations for the conduct of self-assessments, team member roles and responsibilities, and guidance for restart readiness.

The program managers/owners did not receive formal classroom training on the self-assessment process. Instead the functional area managers who attended the formal training were responsible for training the program owners on the assessment process. The program owners were then responsible to train team members on the self-assessment process. This type of informal word-of-mouth training process represented a process weakness. The inspectors noted program owners who were confused about what constituted a program and in some instances demonstrated a limited knowledge of the programmatic assessment process.

The inspectors identified three examples discussed below where training/guidance provided to the assessment teams was not fully effective:

- Step 3.5.4 of PMP 7034.SAP.001, "Conduct of Non Regulatory Self-Assessments," Revision 0, stated that "one of the principle methods used to evaluate performance is observation of work in progress with support from event history, when available." This step included collection of "objective evidence." For example to accomplish this step, the plant engineering functional assessment team reviewed "a few" operability evaluations and safety evaluation screenings, and the design engineering team reviewed five recent modifications, supporting calculations and safety evaluations. In both cases, the extent of review of objective evidence (e.g., department generated work products) was limited. The

lack of clear guidance and expectations for the extent of review of work products indicated a lapse in training/guidance for the conduct of the assessment process.

- Step 3.5.5 of PMP 7034.SAP.001 stated "An important attribute of the assessment process is problem identification; however, the questions of why the problem exists and how it has continued uncorrected need to be evaluated." The assessment team leaders did not have a clear consistent interpretation or plan on how to accomplish this step. For example, the team leaders were considering addressing these questions on applicable findings within their reports or leaving the findings in the corrective action system and allowing the corrective action process to address these questions. The inspectors noted that the corrective action system would not address these types of questions unless the condition reports were classified at a level 3 or higher which required a formal root cause analysis. This meant that many current reports classified at a level 4, would not address these questions. The inspectors' questions prompted the licensee staff to evaluate and issued a revision to PMP 7034.SAP.001 to clarify this procedural step.

An additional example was Step 3.2 of procedure PMP 7034.SAP.001, which stated that potential areas for self-assessment may be identified by reviewing NRC inspection reports, INPO (Institute of Nuclear Power Operations) evaluations, performance monitoring reports, and other evaluation reports. However, no guidance was provided on what time frames to consider in selecting audits nor when this review should occur. The inspectors noted that this selection and review occurred after the assessment plans had been completed through the conduct of staff interviews. This was a nonconservative sequence, in that past performance assurance audit insights were not incorporated into the originally planned assessment focus or scope. For example, in SURV 99-010, "Calculation Revalidation Plan Surveillance Summary Report," dated February 1, 1999, a commitment was made for the scope of the plant engineering functional area review. This report stated "The strategy Project Plan indicated that the expanded review of the significant functional calculations associated with the 21 risk significant systems will not be included in the Calculation Restart Database, since it will be covered in the plant engineering functional area assessment." However, these calculations were not included in the assessment. Additionally this step did not require, nor did the teams perform, a review of NRC enforcement actions which had been issued in October 1998, on areas related to the functional areas under review. Inspectors considered this example to indicate an additional weakness in the training/guidance for the conduct of the functional area assessment process. Licensee management agreed with this observation and provided additional guidance to the assessment teams.

c. Conclusions

A structured approach to conducting functional and programmatic area assessments had been developed to achieve the assessment goal of identification of issues impacting programmatic and functional area performance for plant restart and continued operation.

The inspectors identified several process weaknesses which could impact the effectiveness of the assessment efforts: the assessment procedures did not explicitly require a review to ensure past process performance problems had been eliminated in

newly revised processes; the assessment methodology relied principally on interviews of departmental staff; the programmatic assessment procedure did not require review/approval of programmatic assessments by the SRRB; the silo approach used for programmatic assessments appeared likely to produce more inconsistencies; and the CFRT process was not fully effective in identification of programs in need of a detailed self assessment.

The functional area review training was adequate, with three minor exceptions. The informal word-of-mouth training process used to train personnel involved in programmatic area self assessments was considered a process weakness.

O7.2 System Readiness Review Board Assessment Presentation

a. Inspection Scope (40500)

The inspectors attended the SRRB presentation of the Nuclear Fuel, Safety and Analysis Department Functional Area (NFSAFA) Assessment Report held on June 8, 1999 and interviewed SRRB members.

b. Observations and Findings

The SRRB was responsible for performing functions related to assuring proper dispositioning of programmatic and functional area readiness discrepancies. Specifically, these functions were defined in the SRRB charter, which was Attachment 1 to the ESRR implementing procedure (PMP 7200.RST.004).

During the SRRB meeting, the inspectors observed a report summary and discussion of findings presented by the NFSAFA assessment team leader. This presentation demonstrated the team leader's understanding of the assessment areas under review and of the relative significance of the team's findings and assessments. Some of the more significant assessment findings identified by the team included: a need to evaluate the Westinghouse justification for continued operation related to the use of a revised analysis code for determining the internal pressure of fuel rods, a need for physical work or licensing actions to resolve analysis deficiencies related to the spray additive tank, and the need for an effective department work control process.

The inspectors also observed that a proper SRRB membership quorum was established in accordance with the SRRB charter. Additionally, the SRRB members effectively met their charter functions in challenging the assessment findings and conclusions. Specifically the SRRB members challenged program interfaces, work in progress observed by the team, post restart issues (3 were changed to restart), assessment areas with no findings, lack of discussion of performance indicators, and the basis for the conclusions on each attribute assessed. Through these challenges the SRRB set an expectation for the assessment report quality. The inspectors considered this an essential element for an effective assessment process.

c. Conclusions

The Nuclear Fuel, Safety and Analysis Department assessment report presentation to the SRRB demonstrated the team leader's understanding of the assessment areas under review and of the relative significance of the team's findings and assessments. The Board members performed their charter functions and effectively challenged the team's assessment and conclusions. The inspectors considered the SRRB process to be an essential element in establishing quality expectations for the functional area assessment process.

O7.3 Operations Functional Area Assessment

a. Inspection Scope (40500)

The inspectors reviewed the Operations Department Functional Area Assessment Plan, and the preliminary findings documented in RST-1999-001-OPS, Operations Functional Area Assessment Report. The inspectors also interviewed members of the operations department and licensee management regarding the operations functional area assessment.

b. Observations and Findings

The assessment plan followed PMP 7200.RST.010, "Functional Area Restart Readiness," with respect to the attributes incorporated into the assessment. The assessment team was successful in identifying potential restart issues. However, the inspectors identified the following weaknesses which could potentially impact the effectiveness of the functional area assessment:

- The assessment plan did not list objective criteria on which to base attribute assessment conclusions.

- Although the assessment report identified performance criteria under each attribute, discussion of the performance against these criteria was not documented in all cases. Summary statements in the draft report did not give a clear assessment of the health of each attribute.

- The inspectors determined that some attributes were not fully assessed. The assessment team leader indicated that, in some cases an attribute had enough significant findings to consider the attribute was broken, and the assessment process was stopped without evaluating the remaining sub-attributes. The inspectors concluded that discontinuing the assessment process without fully examining an assessment attribute, could potentially impact the effectiveness in identification of restart issues.

c. Conclusions

Although some weaknesses were identified with the process, the inspectors concluded that the operations functional area assessments were successful in identifying potential restart issues.

O7.4 Operations Programmatic Area Assessments

a. Inspection Scope (40500)

The inspectors reviewed Operability Determinations, Shutdown Risk, Infrequently Performed Evolutions, Reactivity Management, Clearance Permits, and Sealed and Locked Valves program assessments. The inspectors also interviewed members of the operations department and licensee management regarding the operations programmatic area assessment.

b. Observations and Findings

The CFRT had determined that the Shutdown Risk program needed a detailed assessment. However, the operations department had delayed the implementation of this detailed assessment to allow the implementation of a new risk assessment tool. The operations department managers had determined that the existing shutdown risk management program was acceptable until the new tool was ready and the detailed assessment could be performed (approximately 5 months by the current schedule). The inspectors considered the decision to delay this assessment not prudent, with respect to identification of issues in a program needed for the current shutdown mode.

The CFRT determined that the Infrequently Performed Evolutions program did not require a detailed assessment, nor was it in need of management attention. Based on the baseline assessment results for this program, the inspectors agreed with the CFRT and had no further concerns.

The inspectors reviewed the Reactivity Management, Clearance Permits, and Sealed and Locked Valves program assessments. The assessment reports for Clearance Permit and Sealed and Locked Valves had been combined into one report for Operational Configuration Control. The inspectors determined that these assessments were successful in identification of potential restart issues such as; a lack of guidance within procedures as to how many steps control rods can be continuously withdrawn while at power, and that corrective actions for previously identified problems with sealed and locked valves had not been adequately implemented. These assessment reports were generally of good quality and were completed in accordance with licensee self-assessment procedures, with one exception. Specifically, these assessments did not appear to consider or incorporate the INPO performance objectives and criteria as required by step 3.2.5 of PMP 7034.SAP.001 "Conduct of Non Regulatory Self-Assessments." Based on the report content, the inspectors could not confirm wether this issue was a weakness in documentation, or a lack of additional assessment attributes related to the INPO performance criteria. The licensee planned to review this issue and develop appropriate corrective actions.

c. Conclusions

The operations related programmatic area assessments reviewed were of generally good quality and were successful in identification of potential restart issues. However,

the inspectors could not confirm if the INPO performance objectives and criteria had been adequately considered in these assessments.

O7.5 Corrective Action Program Functional Assessment

a. Inspection Scope (40500)

The inspectors reviewed assessment procedures, historical audits, the functional area assessment plan, assessment findings and the Functional Area Assessment Report associated with the Corrective Action Program (CAP). These reports had not yet been approved by the SRRB at the conclusion of this inspection.

b. Observations and Findings

The scope of the CAP assessment effort was defined in the assessment plan documented in Data Sheet 1 of PMP 7200.RST.010. This plan included a review of previous assessments, audits, and inspection data, review of department backlogs, personnel training, and conducting interviews. This plan was reviewed and accepted by the SRRB on April 24, 1999.

This assessment focused on sixteen attributes that were developed by the licensee from INPO performance objectives and criterion. These attributes included such items as department staffing, contractor control, training and qualifications, procedure quality, safety culture, and use of industry experience. Because the CAP was recently revised, the primary purpose of the assessment was to evaluate how well the new program addressed the previous shortcomings.

The assessment was conducted by a team of five station and contract personnel having industry experience with corrective action and self-assessment programs. This team concluded that past implementation of the CAP was not effective, was not well understood by the staff, and was not supported by management. The licensee identified eight primary issues that needed resolution prior to having an effective CAP. These issues were documented in the Leadership Plan (Revision 0) and included, in part, that condition report threshold, timeliness and content were inconsistent; that root and apparent cause analyses were not timely and failed to identify and correct the true root causes; and that CAP oversight was complacent without strong management oversight or intrusive audits. These findings were consistent with those identified in previous station, NRC and other third party audits. The inspectors concluded that the assessment was successful in identifying potential restart issues impacting CAP processes.

This assessment primarily relied on interviews of personnel working within or associated with the CAP. A standard set of questions was developed by the team and used to obtain information on each of the sixteen attributes. The questions were limited in number and of general scope, but were sufficient to adequately assess the CAP. The inspectors reviewed selected responses to these questionnaires, and observed team members interviewing selected staff and attending CAP functional meetings, such as the Event Screening Committee. Additionally, the inspectors attended some biweekly meetings between the various functional assessment team leaders to observe how

cross-functional issues were addressed. Overall, the conduct of the team's activities were consistent with assessment procedures and the functional area review plan.

The Functional Area Assessment Report of the CAP, RST-1999-001-CAP had been approved by the team leader, but not by the functional area manager or the SRRB. This assessment clearly addressed each of the sixteen attributes defined in the review plan. Specific findings documented in the report were in the process of being evaluated against the licensee's restart criteria. However, the inspectors identified the following problems with the documentation quality of the assessment:

- Findings and conclusions were not always supported by the text. One example was the weakness associated with the Operating Experience program (p. 21 of the report), which was not discussed in the supporting text.

- The assessment report did not discuss how the new program addressed the previous shortcomings. In most cases, there were no previous deficiencies identified for the specific attributes.

- Only three findings were identified in the report, but several weaknesses were listed. Unlike "findings" the term "weakness" was not explicitly defined by PMP-7200.RST.010. The inspectors considered that some "weaknesses" should have been considered "findings."

- Reference and source material listed did not include: NRC inspection reports for D.C. Cook, NRC enforcement actions and associated licensee responses. Therefore, the inspectors could not confirm whether such material was used during the review.

Overall, the inspectors concluded that the quality of the assessment report documentation did not adequately support the team's conclusions. Consequently, the team planned to improve the report quality in subsequent revisions.

The inspectors identified a CAP process weakness. The CAP team had established a Corrective Actions Review Board responsible for reviewing root and apparent cause investigations. However, this function was not discussed in the CAP implementing procedure (PMI 7030). Additionally, some CAP team members believed that it was only a temporary action. However, CAP management stated to the inspectors that the Corrective Actions Review Board was intended to be a permanent measure. The licensee planned to address this item in subsequent revisions to the Leadership Plan and/or procedure.

c. Conclusions

Overall, the functional area assessment for the CAP was successful in identifying potential restart issues impacting CAP processes. However, the inspectors identified several weaknesses in the report documentation and considered the overall quality of the documentation inadequate to support the assessment conclusions.

II. Maintenance

M7 Quality Assurance in Maintenance Activities

M7.1 Maintenance Functional Area Assessment

a. Inspection Scope (40500)

The inspectors reviewed, the Maintenance Department Functional Area Assessment Plan and the preliminary findings documented in RST-1999-001-MT, the Maintenance Area Functional Assessment Report. The inspectors also interviewed members of the maintenance department and licensee management regarding the maintenance functional area assessment.

b. Observations and Findings

The assessment plan followed the assessment procedure, PMP-7200.RST.010, with regard to the attributes which needed to be addressed in the assessment. The assessment team was successful in identifying potential restart issues. However, the inspectors identified the following potential assessment report weaknesses which could impact the effectiveness of the functional area assessment:

- The assessment report did not clearly document how the health of a functional area attribute was assessed, did not define the objective criteria to which a functional area attribute was being compared, and did not clearly show how the assessment team used the reference documentation in reaching conclusions.
- The assessment team did not review the individual attribute findings for aggregate impact on the maintenance functional area restart readiness.

The team agreed with the inspectors' observations and planned to address them during subsequent revisions to the report.

c. Conclusions

The maintenance functional area assessment team was successful in identifying potential restart issues. However, the inspectors identified potential weaknesses which could impact the effectiveness of the maintenance functional area assessment. For example, the timing of the functional area assessment did not allow incorporation of performance insights on eight new programs under development within the maintenance organization.

M7.2 Maintenance Programmatic Assessments

a. Inspection Scope (40500)

The inspectors reviewed Programmatic Assessment Reports for Technical Specification Surveillances, Scaffolding, Maintenance and Testing Equipment, and Foreign Material

Exclusion. For two programs, Contractor Control and Material Condition, the inspectors reviewed the time-lines for the program development and implementation.

b. Observations and Findings

For 8 of the 11 programs owned by maintenance, the licensee was in the process of performing a program re-baseline effort prior to performing a detailed assessment. In the development plans/time-lines for the Contractor Control and Material Condition programs, the licensee included requirements to identify commitments, perform industry bench marking and establish performance indicators. However, these requirements were vague and lacked detail. For example, the requirement to perform industry bench marking did not include the need to establish what items should be bench marked, how many bench markings should occur, or which companies should be bench marked. In addition, the program development plans did not contain requirements to perform sampling of the work performed in the field.

The Scaffolding, Maintenance and Testing Equipment, and Foreign Material Exclusion program detailed assessment reports were accomplished in accordance with licensee self-assessment procedures, with one exception. These assessments did not appear to consider or incorporate INPO performance objectives and criteria as required by step 3.2.5 of PMP 7034.SAP.001, "Conduct of Non Regulatory Self Assessments." The program owners indicated that INPO performance criteria did not exist for every program. Based on the report content, the inspectors could not confirm whether this issue was a weakness in documentation, or a lack of additional assessment attributes related to INPO performance criteria.

The CFRT categorized the Technical Specification (TS) surveillance program in the management attention recommended category. The program owner had relied on a third party assessment in completing the CFRT survey forms. The inspectors reviewed the third party assessment and found that the assessment documented detailed findings which supported the assessment conclusions. However, the inspectors noted that this assessment had not considered the potential impact of TS clarifications on the surveillance program performance.

c. Conclusions

The detailed assessments of the Scaffolding, Maintenance and Testing Equipment, and Foreign Material Exclusion programs were generally consistent with the licensee self-assessment procedure. However, the inspectors could not confirm if INPO performance objectives and criteria had been adequately considered in these assessments. The inspector considered the development plans/time-lines for the Contractor Control and Material Condition programs vague and lacking in detail.

III. Engineering

E7 Quality Assurance in Engineering Activities

E7.1 Engineering Functional Area Restart Readiness Assessments

a. Inspection Scope (40500)

The inspectors reviewed assessment procedures, historical audits, functional area assessment plans, assessment findings and the functional area assessment reports associated with the plant and design engineering functional areas. These assessment reports had not yet been approved by the SRRB at the conclusion of this inspection.

b. Observations and Findings

b.1 Design Engineering Restart Readiness Assessment

The scope of the design engineering assessment effort was defined in the assessment plan documented in Data Sheet 1 of PMP 7200.RST.010 and included a review of previous assessments, audits, and inspection data, review of department backlogs, personnel training, and conducting interviews. This plan was reviewed and accepted by the SRRB on April 20, 1999, and was consistent with procedure requirements. The assessment plan included nineteen attributes that were developed from the INPO performance objectives and criteria. These attributes included items such as; department staffing levels, contractor control, training qualifications, procedure quality, safety culture and standards.

The design engineering assessment team consisted of seven experienced engineers with a mix of contractors and licensee engineering staff and was supplemented by an additional three part time engineering staff. This team identified in excess of eighty issues documented in condition reports which included: lack of a integrated work control process for design engineering; lack of a schedule for condition report resolution; design control managers were not aware of, nor trained on, contractor control procedures; lack of a process for assessing the quality of contractor products; lack of position specific qualifications and department training matrix; lack of systems and accident analysis training; microfilmed controlled drawings and superseded drawings in the same file cabinet; and lack of design engineering personnel knowledge of the risk significant systems, structures and components as described in the plant probability risk assessment; Five of the issues identified were considered significant enough to be screened at a level 3 or above on a condition report, which required consideration for a formal root cause investigation. Based on the number and types of findings, the inspectors considered the assessment effort successful in identification of design engineering process deficiencies.

The assessment relied principally on interviews of plant personnel within and outside the plant engineering department. The team developed a standard set of questions for these interviews. The quantity of prepared interview questions typically varied between seven and twelve questions for each of the nineteen attribute areas reviewed. The team also reviewed five recently completed safety related modification packages with

supporting calculations and safety evaluations. The review of these modifications represented a potential strength for the assessment, because it provided objective material on which to base conclusions.

The Design Engineering Functional Area Assessment Report (RST-1999-002-ENG) had been approved through the team leader and had not yet been reviewed by the functional area manager nor the SRRB. This assessment addressed each of the nineteen attributes defined in the review plan and documentation of each attribute was generally sufficient to understand the findings and conclusions without additional explanation. In this assessment, the team documented 85 findings, 65 of which were considered restart issues. The restart criterion used by the assessment team were based on the approved restart criteria documented in Attachment 8 of PMP 7200.RST.004, "Expanded System Readiness Review Program," Revision 5. The inspectors considered the overall documentation quality of this assessment to be consistent with the SRRB standards as discussed in Section O7.2.

b.2 Plant Engineering Restart Readiness Assessment

The scope of the plant engineering assessment effort was defined in the assessment plan documented in Data Sheet 1 of PMP 7200.RST.010 and included the same functional activity set as that used for the design engineering assessment plan, but focused on: Systems, Production Reactor, Reliability Programs, Engineering Programs, and Modification Installation Testing functional groups within plant engineering. This plan was reviewed and accepted by the SRRB on April 23, 1999, and was consistent with procedure requirements. The assessment plan included nineteen attributes that were developed from the INPO performance objectives and criteria. These attributes were similar to those evaluated during the design engineering assessment.

The plant engineering assessment team consisted of seven experienced engineers with a mix of contractors and licensee engineering staff. This team identified 28 issues documented in condition reports, which included: minor procedural conflicts, poor understanding of probability risk assessment and its use by the plant engineering staff, lack of a procedural requirement for awareness of procedures applicable to job functions, lack of process for prioritization and management of procedure upgrades, long working hours impacting human error rate, house keeping deficiencies within engineering spaces, inconsistent electronic condition report system data entry and retrieval, and organizational interfaces with plant engineering are not widely understood or effectively communicated. Additionally, this team had reviewed 39 existing recent condition reports (most were initiated in 1999) which included issues on contractor control, training, corrective action, staffing, management oversight, department backlogs, engineering work management and 50.59 quality.

The assessment team relied principally on interviews of plant personnel within and outside the plant engineering department. The team also reviewed to a limited extent plant engineering evaluations in support of action requests and operability determinations. The team developed a standard set of questions for these interviews. The inspectors noted that the questions were general in nature and relatively limited in number. However, the number of questions asked was substantially lower than the

number of design engineering interview questions. This potentially offered less information for the assessment of plant engineering attributes.

At the completion of this inspection, the Plant Engineering Functional Area Self-Assessment report (RST-1999-001-ENP, Revision 2) had been approved by the functional area manager, but had not been reviewed by the SRRB. The inspectors reviewed this report and noted the following:

- In some instances this report had insufficient documentation to determine the extent of review. For example, the extent of the assessment reviews could not be determined for procedures, open NRC commitments, operability determinations, qualification database, and engineering evaluations supporting action requests.

- Each of the nineteen attributes defined in the review plan was addressed, but there was insufficient documentation to understand the conclusion basis for each attribute.

- The report section discussing the summary of program assessments did not identify the programs owned by plant engineering, did not discuss the current status of those assessments, identify the programs undergoing a detailed self-assessment, or describe the interface of the program assessments with the functional area reviewed.

Overall, the inspectors concluded that this report was not a stand alone document and did not meet the expectations established by the SRRB (Section O7.2).

c. Conclusions

Overall, the inspectors considered the engineering functional area assessments successful at identification of engineering process deficiencies that impacted engineering department performance. However, the inspectors identified several weaknesses with the assessment report documentation and concluded that it was not a stand alone document and did not meet the expectations established by the SRRB.

E7.2 Engineering Programmatic Area Restart Readiness Assessments

E7.2.1 Electrical Coordination and Protection Program

a. Inspection Scope (40500)

The inspectors interviewed engineering personnel and documentation associated with the licensee efforts to conduct programmatic readiness reviews of the Electrical Protection Coordination program.

b. Observation and Findings

Based on a historical review of recent condition reports and past audits, the inspectors noted several deficiencies in the fuse control program and a lack of fuse/breaker coordination calculations. Examples included fuses installed that did not match the fuses specified in the vendor manual, voltage ratings of installed fuses, AC fuses improperly used in DC applications and failure to update fuse information in the Facility Data Base. Additionally, recent ESRR efforts concluded that the fuse control program was inadequate and only provided data for fuse replacement and criteria for resolving fuse discrepancies. Nevertheless, the licensee's assessment dated March 11, 1999, concluded that the Plant Fuse Control program (an element of the Electrical Coordination and Protection program) provided adequate guidance for blown fuses and for removal of fuses for plant equipment electrical isolation. The supporting documentation for this assessment was not of sufficient quality to independently confirm the assessment conclusions.

On May 10, 1999, the CFRT concluded that the Electrical Protection and Coordination program required a detailed assessment. Subsequently, Action Plan #99-180, "Electrical Protection Program," was issued May 14, 1999, to perform a programmatic assessment in the areas of relay/breakers setpoints, thermal overload setpoints and fuse control. This plan contained the detailed action items to be assessed, assigned individuals and an estimated completion date.

c. Conclusions

A recently completed assessment concluded that the Plant Fuse Control Program (an element of the Electrical Coordination and Protection program) provided adequate guidance. However, the supporting documentation was not of sufficient quality to independently reach this conclusion. The licensee subsequently developed an action plan which included performing a detailed self assessment of the Electrical Coordination and Protection program.

E7.2.2 Load Control Program

a. Inspection Scope (40500)

The inspectors interviewed plant personnel and review documentation associated with the licensee efforts to conduct programmatic readiness reviews of the Electrical Load Control program.

b. Observation and Findings

On March 11, 1999, the licensee completed an assessment of the Electrical Load Control Program in accordance with the Engineering Leadership Plan. This assessment did not follow the programmatic assessment procedure, as it was issued after this effort had started. This assessment was one of several ongoing related efforts (e.g., Calculation Reconstitution Effort) being performed by the licensee.

These efforts were successful in identifying several substantive program issues. These included: that the current Electrical Load Control program was not sufficiently maintained to provide reliable output with respect to system loading short circuit currents and available voltages at the various equipment; that the level of detail contained in the station electrical system calculations did not provide reasonable assurance that the electrical design basis had been maintained and, specifically, that the inputs to the software programs reflected actual design and field configurations; that the data used for load flow, voltage drop, short circuit, ampacity and coordinations needed to be verified; and that the associated calculations and design change procedures needed to be revised to ensure that any load changes are evaluated prior to implementation. Licensee managers were actively involved in resolving these assessment findings and planned to assess and reconstitute most design related products.

c. Conclusions

The Electrical Load Control program assessment was successful in identifying substantive program issues. Licensee management was actively involved in resolving the assessment findings.

E7.2.3 Preventive Maintenance Program

a. Inspection Scope (40500)

The inspectors interviewed plant personnel and reviewed documentation associated with the Licensee efforts to conduct programmatic readiness reviews of the Preventive Maintenance (PM) program.

b. Observation and Findings

The CFRT categorized the Preventive Maintenance (PM) program as requiring management attention, vice a detailed assessment. This decision was based in part on the team's review of a self assessment of the PM program completed in 1998. However, this assessment, did not appear to be effective as no significant issues were identified and (based on condition reports) PM problems still persisted. Further, the inspectors noted a history of past engineering and performance assurance department assessments, dating back to 1998, with several findings pertaining to missed and overdue PM tasks, indicative of an ineffective process. Subsequently, the Licensee decided that a detailed assessment of the PM program was required.

Following NRC discussions with the maintenance engineering staff regarding the overdue PMs and their potential operability impact on the plant, the licensee concluded that there was a programmatic breakdown of the PM program. Specifically, the licensee determined that the program had been ineffectively implemented resulting in inadequate equipment maintenance, ineffective resource utilization, and a large backlog of overdue PM tasks. This finding was documented by the licensee as a Level 1 (e.g., significant condition adverse to quality) condition report (No. 99-13697) on May 26, 1999.

In response, the licensee developed a cross-discipline review team comprising staff from the Work Control, Maintenance, Operations and Reliability Engineering groups. This team subsequently identified in excess of 150 overdue safety related PM tasks for Unit 1 and Unit 2. Thirty five of these tasks were further identified as impacting equipment required in Mode 5 (cold shutdown) or in all plant operating modes. A portion of the overdue PM tasks identified were also associated with safety related instruments which had either not been included in the PM program or had overdue required calibrations. The licensee stated that those overdue tasks required for the current mode, would be elevated in priority and appropriately resolved in accordance with plant procedure PMP 5030.001.003. Additionally, the licensee had initiated operability determinations for the safety related equipment impacted by the overdue PMs. These systems included: the emergency diesel generator, auxiliary feedwater, refueling water storage tank and reactor vessel level indication.

The licensee stated that several PM tasks went overdue each week due to several factors including a failure to plan the work in a timely manner, a failure to reschedule the work, inadequate resources to perform the required activities, and competing priorities of other work. However, the continued failure to perform the required PM's on equipment at the recommended frequency challenge the long term reliability of the equipment and associated systems.

10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires that measures shall be established to assure that conditions adverse to quality, such as deficiencies and nonconformance are promptly identified and corrected.

Contrary to the above, as of May 26, 1999, the licensee failed to initiate prompt corrective actions for approximately 150 overdue PM tasks (identified in the Attachment), to determine if the operability of Unit 1 and Unit 2 safety related equipment was affected. The failure to initiate the prompt corrective actions for the overdue PMs on safety-related equipment is considered a Severity Level Violation of 10 CFR Part 50, Appendix B, Criterion XVI. Appendix C of the Enforcement Policy requires that for Severity Level IV violations to be dispositioned as Non-cited Violations (NCVs) they be appropriately placed in a licensee corrective action program. Implicit in that requirement is that the corrective action program be fully acceptable. The adequacy of D.C. Cook's Corrective Action Program is of concern to both the NRC and Indiana Michigan Power. Because improving the corrective action program to a satisfactory status is an integral part of Indiana Michigan Power's "Restart Plan" and is under the formal oversight of the NRC through the NRC Manual Chapter 0350 Process, "Staff Guidelines for Restart Approval," this issue will be dispositioned as an NCV (NCV 50-315/99013-01(DRS); NCV 50-316/99013-01(DRS)).

c. Conclusions

The licensee determined that the preventive maintenance program had been ineffectively implemented resulting in inadequate equipment maintenance and a large backlog of overdue preventive maintenance tasks.

The licensee identified a failure to initiate prompt corrective actions (condition reports or deferrals) for approximately overdue 150 PM tasks and to determine if the operability of

Unit 1 and Unit 2 safety-related equipment had been effected. This issue was considered a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion XVI. The licensee was taking proper corrective actions including the formation of a cross-discipline review team to address the causes of the overdue PM tasks and the performance of operability determinations to assess the impact on affected safety related equipment. The overdue PM tasks are of concern as the continued failure to perform the required PM's on equipment at the recommended frequency challenge the long term reliability of the equipment and associated systems. This issue demonstrated poor management attention and support for the PM process.

E7.2.4 Plant Engineering Programmatic Area Assessment Plans

a. Inspection Scope (40500)

The inspectors reviewed assessment plans for four programs owned by the plant engineering department: American Society of Mechanical Engineers (ASME) Section XI Pressure Test Program, Safety and Relief Valve Program, ASME Section XI Repair/Replacement Program, and 10 CFR Part 50 Appendix J Program.

b. Observations and Findings

The inspection plans evaluated selected appropriate technical areas for review. However, the depth of material to be reviewed and the INPO performance objectives and criteria considered (as required by the licensee's self-assessment procedure) could not be determined. The engineering program owners indicated that applicable INPO performance criterion for these particular program areas did not exist. Inspectors considered these issues to indicate a lapse in documentation quality.

c. Conclusions

The plans for four plant engineering program assessments selected appropriate technical areas for review. However, lapses in documentation quality were identified pertaining to the depth of materials reviewed and the lack of INPO performance objectives and performance criteria considered.

V. Management Meetings

X1 Exit Meeting Summary

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on June 11, 1999. The licensee acknowledged the inspection conclusions presented and did not identify any potential report material as proprietary.

Attachment: List of Overdue Preventive Maintenance Tasks

PARTIAL LIST OF PERSONS CONTACTED

Licensee

G. Arent, Regulatory Affairs
J. Arias, Compliance Manager
C. Bakken, Site Vice President
P. Barrett, Performance Assurance
S. Blosser, Self Assessment Program Coordinator
M. Danford, Corrective Action Program Manager
M. Finissi, Director of Restart Engineering
D. Garner, Director Plant Engineer
S. Greenlee, Director Design Engineering
B. Kalinowski, Performance Assurance
W. McLane, Restart Manager
T. Noonan, Plant Manager
R. Powers, Senior Vice President
M. Rencheck, Vice President of Engineering
T. Taylor, Licensing
L. Thornsberry, Engineering Restart

US NRC

J. Jacobson, Chief Mechanical Engineering Branch

INSPECTION PROCEDURES USED

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

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-315/99013-01(DRS); 50-316/99013-01(DRS)	NCV	Failure implement prompt corrective actions for overdue preventative maintenance tasks on safety related equipment (Section E.7.2.3).

Closed

50-315/99013-01(DRS); 50-316/99013-01(DRS)	NCV	Failure implement prompt corrective actions for overdue preventative maintenance tasks on safety related equipment (Section E.7.2.3).

Discussed

None

LIST OF ACRONYMS USED

ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CFRT	Cross Functional Review Team
CR	Condition Report
DRS	Division of Reactor Safety
ESRR	Expanded Systems Readiness Review
INPO	Institute of Nuclear Power Operations
NCV	Non Cited Violation
NFSAFA	Nuclear Fuel, Safety and Analysis Department Functional Area
NRC	Nuclear Regulatory Commission
PA	Performance Assurance
PM	Preventive Maintenance
PMP	Plant managers procedure
PDR	Public Document Room
SRRB	System Readiness Review Board

PARTIAL LIST OF DOCUMENTS REVIEWED

Procedures:
PMP 7200.RST.010 "Functional Area Restart Readiness," Revision 1.
PMP 7200.RST.009 "Programmatic Restart Readiness," Revision 0a.
PMI-7034 "Self Assessment Program," Revision 0.
PMP 7034.SAP.001 "Conduct of Non Regulatory Self Assessments," Revision 0.
PMP 7200.RST.004 "Expanded System Readiness Review Program,"Revision 5.
PMI 7030, "Corrective Action Program," Revision 27.
PMP 2090.001, "Leadership Plans," Revision 0.
PMP 5030.001.003 "Preventive Maintenance," Revision 0.
PMP 6065.FUS.001 "Fuse Program" controls and requirements," Revision 0.
PMP 7030.INV.003 "Apparent Cause Evaluation and Condition Resolution," Revision 3.
PMP 7030.INV.001 "Rood Cause Investigation and Approvals," Revision 4.

Cook Nuclear Plant, "Restart Plan," Revision 5.

Functional & Programmatic Area Assessment Plans:
RST-1999-001-OPS, "Operations Department Functional Area Assessment Plan," Revision 0.
RST-1999-01-MT, "Maintenance Department Functional Area Assessment Plan,"Revision 0.
RST-1999-001-ENP, "Functional Area Assessment Plan, Plant Engineering," Revision 0.
RST-1999-002-ENG, "Functional Area Assessment Plan, Design Engineering," Revision 2.
SA-1999-007-ENP, "ASME Section XI Pressure Test Program Self Assessment Outline."
SA-1999-008-ENP, "10CFR50 Appendix J Program Self Assessment Outline."
SA-1999-006-ENP, "ASME Section XI Repair/Replacement Program."
Corrective Action Program, "Functional Area Assessment Plan," dated April 24, 1999.

Functional Area and Programmatic Assessment Reports:
RST-1999-002-MNT, Foreign Material Exclusion
RST-1999-003-MNT, Maintenance and Testing Equipment
RST-1999-004-MNT, Scaffolding
RST-1999-002-OPS, Reactivity Management Program
RST-1999-003-OPS, Operational Configuration Control (Clearance Permit and Sealed and Locked Valves)
RST-1999-001-ENP, "Plant Engineering Functional Area Self assessment," Draft Revision 2
RST-1999-002-ENG, "Functional Area Assessment Report of Design Engineering," Draft
RST-1999-001-OP, "Operations Department Functional Area Assessment Report," Draft
RST-1999-001-MT, "Maintenance Department Functional Area Assessment Report," Draft
"Report on Baseline Assessments Reviews, " dated May 10, 1999.
Corrective Action Program, "Functional Area Assessment Report," dated June 7, 1999

Condition Report Nos:

99-11475	ESO.004 conflicts with nuclear engineering organization and PMI-5080.
99-10088	PRA and its use is not understood by plant engineering personnel.
99-11316	Procedure 227000-POL-2000-04, Continued Awareness of American Electric Power Policies and Directives was canceled March 26, 1999, to an inappropriate superceding procedure which does not address the intent.
99-11981	Plant engineering does not have a common process for prioritization and management of engineering procedure upgrade needs.
99-11947	Months of long hours causing concern for personal and family lives, possibly increasing human errors.
99-11032	Numerous housekeeping/safety problems identified in plant engineering office areas.
99-11409	Electronic Corrective Action Process ... data entry/search results inconsistent
99-11951	Organizational interfaces with plant engineering are not widely understood or effectively communicated.
99-1562	Design engineering has not completed development and integration of a work control process which prioritizes, plans and schedules design engineering work at all levels of the organization.
99-10572	Design engineering management personnel work 12 or more hours daily and therefore some of them appear tired.
99-10448	The design engineering department managers and supervisors have not been trained on, and are not aware of the existence of the cook plant contractor control procedures.
99-09987	Design engineering department has not developed position specific qualifications based on the recently issued roles and responsibilities, and has not developed a departmental training matrix.
99-09964	Training is lacking in several areas within design engineering.
99-11791	Controlled microfilm copies of drawings, stamped as "Checked", are filed in the same cabinet with superceded microfilms.
99-11792	Drawings used as working copies in design engineering at Buchanan are not stamped, dated, and verified as required by procedure PMI-2030.
99-11353	Design engineering has not revised the safety evaluations of partially implemented modifications.

99-11271	Design engineering has no process or procedure in place to control the review, evaluation, and dissemination of industry documents such as NRC letters, bulletins, ...and other significant industry operation experiences.
97-3360	Adverse trend has resulted from continued deficiencies in Corrective Action Program.
99-08819	Program owners are having difficulty identifying commitments related to their programs.
99-10965	Condition Report generation threshold, timeliness, and content are inconsistent
99-10966	Condition Report screening and evaluations for operability are not timely and do not highlight important issues.
99-10967	Condition report resolutions and root cause analyses are not timely and fail to identify and correct true root causes.
99-10970	Corrective actions taken have not prevented event recurrence.
99-10975	Trending and reporting processes do not highlight significant issues, degrading conditions and precursors to events.
99-10978	Corrective Action Program oversight is complacent without strong management ownership or intrusive audits.
99-10980	Corrective Action Program infrastructure is weak, and Program tools do not support condition report resolution.
99-10981	Self assessment efforts fail to proactively identify problems or generate effective remedial actions.
99-11071	Clarification regarding the definition of a "program."
99-4618	PM Program performance expectations, roles and responsibilities not clearly defined or understood.
99-8045	PM Program does not pro-actively identify, determine cause, or solve issues in a timely manner.
99-5701	PM Program processes and procedures are ineffective. PM program backlog is not maintained at acceptable level.
99-8050	PM performance is not a management priority.
99-6864	PM program interfaces between departments is inadequate. AR's and JO's are not processed in a timely manner, PM's exceed their drop dead due dates. without evaluation or proper deferral. Changes to the PM program are poorly documented.
99-11763	Adverse performance trends were noted by the ESRR teams in the areas of vendor recommended preventive maintenance.
99-13697	Programmatic breakdown of the PM program.
99-13680	There are numerous instruments associated with the 2AB Diesel that are not in the PM program.
99-10149	The Electrical Coordination Protection program requires a detailed assessment.
99-07396	Weaknesses identified in the Fuse Control Program.

<u>Audits and Surveillance Reports</u>

NQPE 99-01, "NQPE Self-evaluation Design Change Process," dated February 2, 1999.
PA 97-08, "Design Change Control Program," dated May 30, 1997.
PA 97-02, "System Engineer Program," dated January 15, 1997.
SURV 99-001 "Design/Licensing Basis Strategy Surveillance Summary Report," dated February 1, 1999.
SURV 99-010, "Calculation Revalidation Plan Surveillance Summary Report," dated February 1, 1999.

"Design Engineering Assessment Report," dated December 17, 1998.
"Design Engineering Functional Area Assessment Report," dated July 2, 1998.
"Engineering Issues Review Group Final Report," dated December 19, 1998.
"Cook Nuclear Plant Engineering Self Assessment," dated May 23, 1997.
Corrective Action Program Restart Strategy, dated September 1998.
Corrective Action Program Assessment (MNCA-98-04), dated January 1999.
Station Audit report of Corrective Action Program assessment (PA-98-29/NSDRC 261) conducted from October 5 to December 21, 1998.
Summary station audit report of Corrective Action Program (PA-98-10/NSDRC 253) dated May 22, 1998.

NRC docketed correspondence:
DC Cook response to Notice of Violation dated October 13, 1998, dated March 19, 1999
NRC Notice of Violation to DC Cook dated October 13, 1998

Other:
Presentation slides for Self assessment training conducted on March 29 - April 1, 1999
Corrective Action Department Functional Assessment survey questionnaires
Cross Functional Review Team, "Report on Baseline Assessment Reviews," dated May 10, 1999
Meeting minutes for April 14, 1999, SRRB meeting regarding Corrective Action Department Functional Assessment plan
Meeting minutes for May 26, 1999, SRRB meeting regarding results of the Cross Functional Team baseline assessment review
Data Sheet 1 (PMP 7200.RST.009) for the Corrective Action and Self assessment Programs dated March 29, 1999, respectively
Data Sheets 2 (PMP 7200.RST.009) for the Corrective Action and Self assessment Programs dated April 1 and 5, 1999, respectively
Data Sheets 3 (PMP 7200.RST.009) for the Corrective Action and Self assessment Programs dated April 10, 1999, respectively
Cross Functional Review Team worksheets for the Corrective Action and Self Assessment Programs dated April 21, 1999, respectively
Corrective Actions Process, "Leadership Plan," dated May 17, 1999
Corrective Action Program, "Monthly Performance Indicators," dated April 1999
Engineering Action Plan #99-135, Revision 1, issued on May 10, 1999
Action Plan #99-180 "Electrical Protection Program" issued May 14, 1999
"Engineering Leadership Plan" dated March 18, 1999
Electrical Load Control Program assessment dated March 11, 1999
December, 1988 Impel conducted a protection device coordination assessment/technical review at DC Cook
Programmatic Restart Readiness Cross-Functional Review final report, dated May 10, 1999
Engineering Action Plan Process review #MISC-99-144, dated April 15, 1999
Program Baseline Assessments, "Electrical Protection Coordination"
Program Baseline Assessments, "Electrical Load Control"
Programmatic Restart Readiness Cross Functional Review Team Report on Baseline Assessments Reviews, dated May 10, 1999
Cook Nuclear Plant Restart Plan, Revision 5

JO NUMBER	RT NUMBER	COMPONENT	DESCRIPTION		FREQ	NEXT REQUIRED DATE	LAST PERF DATE	DROP DEAD DATE			STATUS	MODE REQUIRED
R0011008	00001358	1-TR11D	PERFORM PM TASK 4 PER SECTION 2.0.	C	1.R	97/01/23	92/07/21	01/01/01	FO1	C	PLNNED	7
R0008858	00001745	2-QT-507	FUNCTIONAL TEST MECHANICAL & ELECTRONIC OV	C	1.R	97/09/08	96/05/04	01/01/01	RO2	A	PLNNED	123
R0012881	00002249	2-AIRLOCK-C650	PERFORM STEPS 4.0,4.1,4.2,4.3 & 4.4 OF PM	C	3.R	97/09/19	92/05/30	01/01/01	RO2	C	ASIGND	1234
R0090909	00021100	2-T21D3	REFURBISH BKR 2-T21D3	C	6.R	98/03/14	01/01/01	01/01/01	RO2	A	PLNNED	1234
R0074227	00020573	2-T21D5	PERFORM IR INSPECTION ON 2-T21D5	C	72.W	98/06/07	01/01/01	01/01/01	RO2	C	PLNNED	1234
R0049647	00005479	1-CRID-3-INV	PERFORM PARTS REPLMNT PER E-PM CARD 1*CRID	C	2.R	98/08/20	95/08/31	01/01/01	RO1	C	PLNNED	7
R0049718	00005480	1-CRID-4-INV	PERFORM PARTS RPLMNT IAW E-PM CARD 1*CRID(	C	2.R	98/08/20	95/09/02	01/01/01	RO1	C	PLNNED	7
R0050072	00002889	1-NLS-121	CALIBRATE HYDRAULIC ISOLATOR LEVEL SW. 1-N	C	2.R	98/08/20	95/08/27	01/01/01	RO1	C	PLNNED	1234
R0051632	00002753	1-PP-45-1	1-PP-45-1 INSPECT RCP SEALS PER PM TASK 8	C	2.R	98/08/20	95/10/18	01/01/01	FO1	C	PLNNED	1234
R0029301	00001214	1-NMO-153	PERFORM PM REQUIREMENTS @ 1-NMO-153	I	1.R	98/08/28	94/03/22	01/01/01	FO1	A	PLNNED	1234
R0048878	00001210	1-MMO-230	PERFORM PM REQUIREMENTS @ 1-MMO-230	I	1.R	98/08/28	95/08/09	01/01/01	FO1	A	PLNNED	1234
R0030853	00008972	1-QPI-170	PERFORM 1HP6030.IMP.394 (1-QPI-170)	I	2.R	98/08/28	94/03/09	01/01/01	RO1	A	PLNNED	7
R0035158	00016618	1-CRV-412	1-CRV-412 REFURBISH VALVE AND ACTUATOR	I	54.M	98/08/28	01/01/01	01/01/01	FO1	A	PLNNED	1234
R0072752	00019710	1-OME-25	1-OME-25, PRE-OUTAGE EXAM. OF RX HEAD LIFT	I	72.W	98/09/19	01/01/01	01/01/01	RO1	C	PLNNED	6
R0049502	00003000	1-NLS-130	CALIBRATE HYDRAULIC ISOLATOR LEVEL SW. 1-N	C	2.R	98/09/20	95/08/27	01/01/01	RO1	C	PLNNED	1234
R0049503	00003001	1-NLS-131	CALIBRATE HYDRAULIC ISOLATOR LEVEL SW. 1-N	C	2.R	98/09/20	95/08/27	01/01/01	RO1	C	PLNNED	1234
R0049504	00002977	1-NLS-110	CALIBRATE HYDRAULIC ISOLATOR LEVEL SW. 1-N	C	2.R	98/09/20	95/08/27	01/01/01	RO1	C	PLNNED	1234
R0049505	00002978	1-NLS-111	CALIBRATE HYDRAULIC ISOLATOR LEVEL SW. 1-N	C	2.R	98/09/20	95/08/27	01/01/01	RO1	C	PLNNED	1234
R0049506	00002979	1-NLS-120	CALIBRATE HYDRAULIC ISOLATOR LEVEL SW. 1-N	C	2.R	98/09/20	95/08/27	01/01/01	RO1	C	PLNNED	1234
R0051799	00002994	1-QDA-31	CALIBRATE DIFF. PRESSURE ALARM SWITCH 1-QD	C	2.R	98/09/20	95/10/18	01/01/01	RO1	C	PLNNED	7
R0051800	00002992	1-QDA-21	CALIBRATE DIFFERENTIAL ALARM SWITCH 1-QDA-	C	2.R	98/09/20	95/10/19	01/01/01	RO1	C	PLNNED	7
R0051801	00002992	1-QDA-11	CALIBRATE DIFF. PRESSURE ALARM SWITCH 1-QD	C	2.R	98/09/20	95/10/19	01/01/01	RO1	C	PLNNED	7
R0051802	00002996	1-QDA-41	CALIBRATE DIFF. PRESSURE ALARM SWITCH 1-QD	C	2.R	98/09/20	95/10/19	01/01/01	RO1	C	PLNNED	7
R0030002	00008987	1-XSO-928	REPLACE ASCO SOLENOID VALVE 1-XSO-928.	I	3.R	98/10/14	94/04/11	01/01/01	RO1	C	PLNNED	1234
R0015536	00001568	1-PP-50E	CLADDING INSPECTION.	C	2.R	98/10/14	92/10/09	01/01/01	FO1	C	PLNNED	1234
R0034517	00007761	1-IMO-362	1-IMO-362 REFURBISH MOV ACTUATOR	C	648.W	98/11/30	01/01/01	01/01/01	FO1	A	ASIGND	123
R0076779	00020568	2-T21A1	PERFORM IR INSPECTION ON 2-T21A1	C	72.W	99/01/04	97/08/21	01/01/01	NOO	C	PLNNED	1234
R0033666	00007143	2-IMO-315	PERFORM MOV PREVENTIVE MAINTENANCE ON 2-IM	I	3.R	99/02/01	01/01/01	01/01/01	RO2	A	PLNNED	123
R0026711	00011524	2-DRV-342	REFURB VALVE ACTUATOR AND INTERNALS FOR 2-	I	54.M	99/02/28	01/01/01	01/01/01	RO2	C	PLNNED	12345
R0057953	00001246	2-MMO-210	PERFORM PREVENTIVE MAINTENANCE @ 2-MMO-210	I	1.R	99/03/19	96/04/05	01/01/01	RO2	A	PLNNED	123
R0060563	00001247	2-MCM-231	PERFORM PREVENTIVE MAINTENANCE @ 2-MCM-231	C	1.R	99/03/19	96/06/05	01/01/01	RO2	A	PLNNED	123
R0038914	00009096	2-QPI-170	CALIBRATE PRESSURE LOOP 2-QPI-170	I	2.R	99/03/19	94/10/13	01/01/01	RO2	C	PLNNED	7
R0037164	00007114	2-ICM-129	PERFORM MOV PREVENTIVE MAINTENANCE ON 2-IC	I	3.R	99/03/29	94/09/24	01/01/01	RO2	A	PLNNED	1234
R0036055	00007135	2-IMO-261	PERFORM MOV PREVENTIVE MAINTENANCE ON 2-IM	I	3.R	99/03/30	94/09/25	01/01/01	RO2	A	PLNNED	123
R0036341	00007164	2-IMO-390	PERFORM MOV PREVENTIVE MAINTENANCE ON 2-IM	I	3.R	99/03/30	94/09/25	01/01/01	RO2	A	PLNNED	123
R0036865	00007113	2-ICM-111	PERFORM MOV PREVENTIVE MAINTENANCE ON 2-IC	I	3.R	99/04/03	94/09/29	01/01/01	RO2	A	PLNNED	1234
R0017060	00007409	1-PP-7W-MTR	REMOVE,REFURB,REINSTALL MOTOR PER PM TASK	C	3.R	99/04/05	92/10/13	01/01/01	FO1	C	PLNNED	1234
R0094403	00021094	2-T21C1	REFURBISH BREAKER 2-T21C1	I	6.R	99/04/09	01/01/01	01/01/01	RO2	C	PLNNED	1234
R0003160	00001282	2-IMO-110	PERFORM PM REQUIREMENTS PER PROCEDURE.	C	3.R	99/04/10	01/01/01	01/01/01	RO2	C	PLNNED	123
R0036366	00007528	2-QMO-452	PERFORM MOV PREVENTIVE MAINTENANCE ON 2-QM	I	3.R	99/04/10	94/10/06	01/01/01	RO2	A	PLNNED	56
R0037372	00007246	2-QMO-200	PERFORM MOV PREVENTIVE MAINTENANCE ON 2-QM	I	3.R	99/04/14	94/10/10	01/01/01	RO2	A	PLNNED	56
R0037504	00007247	2-QMO-201	PERFORM MOV PREVENTIVE MAINTENANCE ON 2-QM	I	3.R	99/04/14	94/10/10	01/01/01	RO2	A	PLNNED	56
R0034271	00004171	2-MMO-220	2-MMO-220 REFURBISH MOV ACTUATOR	I	9.R	99/04/25	01/01/01	01/01/01	RO2	A	PLNNED	123
R0036922	00007122	2-IMO-128	PERFORM PREVENTIVE MAINTENANCE ON 2-IMO-12	I	3.R	99/04/30	94/09/27	01/01/01	RO2	A	PLNNED	4

Attachment

JO NUMBER	RT NUMBER	COMPONENT	DESCRIPTION		FREQ	NEXT REQUIRED DATE	LAST PERF DATE	DROP DEAD DATE			STATUS	MODE REQUIRED
R0092843	00017602	2-QT-502-CD	2-QT-502-CD, DISASSEMBLE, INSPECT AND REFU	I	6.R	98/05/16	01/01/01	01/01/01	RO2	C	PLNNED	7
R0047277	00001176	1-FMO-242	PERFORM PREVENTIVE MAINTENANCE AT 1-FMO-24	C	72.W	99/03/29	95/08/28	96/09/16	FO1	B	PLNNED	1234
R0047278	00001185	1-FMO-212	PERFORM PREVENTIVE MAINTENANCE @ 1-FMO-212	C	72.W	99/03/29	95/08/28	96/09/16	FO1	B	PLNNED	123
R0049091	00000344	1-CTS-101E	INSPECT & LUBE REACHROD VLV OP PER PM TASK	C	72.W	97/02/14	95/08/15	97/07/01	RO1	A	PLNNED	1234
R0074658	00015940	2-FFI-240	REPLACE 2-FFI-240.	C	768.W	98/12/14	01/01/01	97/07/28	RO2	B	PLNNED	123
R0055761	00000375	1-RH-104E	INSPECT AND LUBE REACHROD VALVE OP PER PM	C	72.W	98/02/23	96/01/31	98/02/23	NOO	A	PLNNED	123
R0059156	00002250	2-AIRLOCK-C612	2-AIRLOCK-C612/C650, AIRLOCK PM TASK 24 (1	C	1.R	97/09/08	96/05/03	98/03/20	RO2	A	ASIGND	1234
R0060514	00009251	2-HR1-WM	PERFORM TRAIN B H2 RECOMBINER CALIBRATION	C	72.W	98/04/06	96/05/03	98/04/20	NOO	A	PLNNED	12
R0081522	00016935	2-HV-CEQ-2	2-HV-CEQ-2 CONTAINMENT HYD. SKIMMER VENT.	C	12.W	98/09/06	98/01/21	98/05/08	NOO	A	PLNNED	1234
R0083252	00016931	1-HV-CEQ-2	1-HV-CEQ-2 CONTAINMENT HYD. SKIMMER VENT.	C	12.W	98/06/15	98/03/23	98/07/08	NOO	A	PLNNED	1234
R0083276	00016930	1-HV-CEQ-1	1-HV-CEQ-1 CONTAINMENT HYD. SKIMMER VENT.	C	12.W	98/10/20	98/03/24	98/07/07	NOO	A	PLNNED	1234
R0083464	00016934	2-HV-CEQ-1	2-HV-CEQ-1 CONTAINMENT HYD. SKIMMER VENT.	C	12.W	99/01/11	98/03/30	98/07/13	NOO	A	PLNNED	1234
R0081403	00003214	1-AIRLOCK-C612	1-AIRLOCK-C612, AIRLOCK PM TASK 24 (6 MONT	C	24.W	98/06/22	98/01/18	98/08/16	NOI	A	ASIGND	7
R0081688	00002239	1-AIRLOCK-C650	1-AIRLOCK-C650, AIRLOCK PM TASK 24 (6 MONT	I	24.W	98/07/14	98/01/27	98/08/25	NOI	A	PLNNED	7
R0085118	00015881	2-XJ-54E	2-XJ-54E REPLACE EXPANSION JOINT IN ACCOR	I	6.R	98/08/30	01/01/01	98/08/30	RO2	A	PLNNED	7
R0052443	00002908	1-QT-506	ADJUST TRIP & THROTTLE VALVE PER PM TASK 3	C	72.W	98/09/04	95/11/06	98/09/04	FO1	A	ASIGND	1234
R0033645	00006588	1-IMO-326	PERFORM MOV PREVENTIVE MAINTENANCE ON 1-IM	I	3.R	98/09/12	01/01/01	98/09/12	FO1	B	ASIGND	123
R0030944	00004982	1-ICM-265	PERFORM MOV PREVENTIVE MAINTENANCE ON 1-IC	I	3.R	98/09/19	94/03/14	98/09/18	FO1	B	PLNNED	1234
R0034444	00004980	1-ICM-251	PERFORM MOV PREVENTIVE MAINTENANCE ON 1-IC	I	3.R	98/09/21	01/01/01	98/09/21	FO1	B	PLNNED	1234
R0081475	00018719	1-QRV-171	1-QRV-171 REFURBISH VALVE AND ACTUATOR	I	54.M	98/09/27	01/01/01	98/09/27	FO1	A	PLNNED	12345
R0066577	00020075	1-T11D5	PERFORM IR INSPECTION ON 1-T11D5 BREAKER C	C	72.W	98/09/07	96/11/15	98/10/13	NOI	A	PLNNED	123
R0033646	00006670	1-IMO-51	PERFORM MOV PREVENTIVE MAINTENANCE ON 1-IM	I	3.R	98/09/05	01/01/01	98/10/21	FO1	A	PLNNED	123
R0033117	00004979	1-ICM-250	PERFORM MOV PREVENTIVE MAINTENANCE ON 1-IC	I	3.R	98/08/28	94/06/13	98/12/16	FO1	B	PLNNED	1234
R0033518	00006545	1-IMO-255	PERFORM MOV PREVENTIVE MAINTENANCE ON 1-IM	I	3.R	98/04/01	94/06/13	98/12/16	FO1	B	PLNNED	123
R0072767	00016021	1-CPN-71	INSTALL & REMOVE CONTAINMENT SERVICES COVE	C	1.R	98/08/17	97/04/30	99/01/01	RO1	A	PLNNED	56
R0085189	00020890	1-DG-153A	1-DG-153A DISASSEMBLE, INSPECT & REPAIR AS	I	2.R	98/09/14	01/01/01	99/01/06	FO1	A	PLNNED	1234
R0091118	00021103	2-T21D6	REFURBISH BREAKER 2-T21D6	C	6.R	99/01/18	01/01/01	99/01/18	NOO	A	PLNNED	1234
R0071290	00000944	1-52-RTB	CLEAN/INSPECT/TEST BKR 1-52-RTB	I	1.R	98/09/07	97/03/07	99/01/22	RO1	A	PLNNED	12
R0072434	00002974	1-NFA-220	CALIBRATE LOW FLOW ALARM SWITCH 1-NFA-220	I	1.R	98/09/09	97/03/09	99/01/24	RO1	A	PLNNED	1234
R0072435	00002976	1-NFA-240	CALIBRATE LOW FLOW ALARM SWITCH 1-NFA-240	I	1.R	98/09/09	97/03/09	99/01/24	RO1	A	PLNNED	1234
R0072436	00002973	1-NFA-210	CALIBRATE LOW FLOW ALARM SWITCH 1-NFA-210	I	1.R	98/09/09	97/03/09	99/01/24	FO1	A	PLNNED	1234
R0072437	00002975	1-NFA-230	CALIBRATE LOW FLOW ALARM SWITCH 1-NFA-230.	I	1.R	98/09/10	97/03/10	99/01/25	RO1	A	PLNNED	1234
R0072265	00000940	1-52-BYB	CLEAN/INSPECT/TEST BKR 1-52-BYB	I	1.R	98/09/13	97/03/13	99/01/28	RO1	A	PLNNED	12
R0072715	00008115	1-NRV-153	1-NRV-153 REPLACE ACTUATOR DIAPHRAGM	I	1.R	98/09/13	97/03/13	99/01/28	RO1	A	PLNNED	123
R0070877	00003252	1-AFW	CLEAN/INSPECT/TEST PANEL 1-AFW & BKRS	I	1.R	98/09/15	97/03/15	99/01/30	RO1	A	PLNNED	1234
R0070891	00003250	1-CRID-1	INSPECT/TEST/CLEAN PANEL 1-CRID-I & BKRS	I	1.R	98/09/15	97/03/15	99/01/30	RO1	A	PLNNED	1234
R0070918	00003249	1-CRID-2	CLEAN/INSPECT/TEST 1-CRID-2 BKRS & PANEL	I	1.R	98/09/16	97/03/16	99/01/31	FO1	A	PLNNED	1234
R0070902	00005486	1-CRID-1-INV	PERFORM PM TASKS ON 1-CRID-1-INV.	I	1.R	98/09/16	97/03/16	99/01/31	FO1	A	PLNNED	1234
R0092729	00021089	2-T21A7	REFURBISH BREAKER 2-T21A7	C	6.R	99/01/31	01/01/01	99/01/31	RO2	A	PLNNED	1234
R0094277	00021081	2-T21A1	REFURBISH BREAKER 2-T21A1	C	6.R	99/01/31	01/01/01	99/01/31	RO2	A	PLNNED	1234
R0094328	00021087	2-T21A5	REFURBISH BREAKER 2-T21A5	C	6.R	99/01/31	01/01/01	99/01/31	RO2	A	PLNNED	1234
R0073178	00000376	1-RH-104W	INSPECT AND LUBE REACHROD VALVE OP PER PM	C	72.W	98/09/21	97/05/12	99/02/01	NOO	A	PLNNED	123
R0070997	00000376	1-EZC-A	INSPECT/TEST/CLEAN MCC 1-EZC-A & BKRS	I	1.R	98/09/18	97/03/18	99/02/02	RO1	A	PLNNED	123
R0071002	00000792	1-EZC-A1	INSPECT/TEST/CLEAN MCC 1-EZC-A1 & BKRS	I	1.R	98/09/18	97/03/18	99/02/02	RO1	A	PLNNED	1234

Attachment

JO NUMBER	RT NUMBER	COMPONENT	DESCRIPTION		FREQ	NEXT REQUIRED DATE	LAST PERF DATE	DROP DEAD DATE			STATUS	MODE REQUIRED
R0071013	00004977	1-ICM-111	PERFORM MOV PREVENTIVE MAINTENANCE ON 1-IC	I	3.R	98/09/18	97/03/18	99/02/02	FO1	A	PLNNED	1234
R0071040	00003251	1-ELSC	INSPECT/CLEAN/TEST 1-ELSC & BKRS	I	1.R	98/09/19	97/03/19	99/02/03	RO1	A	PLNNED	1234
R0071107	00000722	1-ABD-B	CLEAN/INSPECT/TEST MCC 1-ABD-B AND BREAKER	I	1.R	98/09/19	97/03/19	99/02/03	RO1	A	PLNNED	1234
R0071289	00000943	1-52-RTA	CLEAN/INSPECT/TEST BKR 1-52-RTA	I	1.R	98/09/19	97/03/19	99/02/03	RO1	A	PLNNED	12
R0071078	00000794	1-AM-A	INSPECT/CLEAN/TEST MCC 1-AM-A	I	1.R	98/09/20	97/03/20	99/02/04	RO1	A	ASIGND	1234
R0071404	00009124	1-HE-15W	1-HE-15W, INSPECT AND CLEAN AS REQUIRED	I	1.R	98/09/20	97/03/20	99/02/04	RO1	A	ASIGND	1234
R0071098	00003246	1-CRID-4	INSPECT/TEST/CLEAN PANEL 1-CRID-IV & BKRS	I	1.R	98/09/20	97/03/20	99/02/04	FO1	A	PLNNED	1234
R0071128	00003247	1-CRID-3	INSPECT/TEST/CLEAN PANEL 1-CRID-III & BKRS	I	1.R	98/09/21	97/03/21	99/02/05	FO1	A	PLNNED	1234
R0071708	00005488	1-CRID-3-INV	PERFORM PM INSPECTION/CLEANING ON 1-CRID-3	I	1.R	98/09/22	97/03/22	99/02/06	FO1	A	ASIGND	1234
R0071189	00000712	1-EZC-B	INSPECT/TEST/CLEAN MCC 1-EZC-B & BKRS	I	1.R	98/09/23	97/03/23	99/02/07	RO1	A	PLNNED	123456
R0072264	00000939	1-52-BYA	CLEAN/INSPECT/TEST BKR 1-52-BYA	I	1.R	98/09/23	97/03/23	99/02/07	RO1	A	PLNNED	12
R0071207	00000719	1-ABV-A	INSPECT/TEST/CLEAN VCC 1-ABV-A & BKRS	I	1.R	98/09/24	97/03/24	99/02/08	RO1	A	PLNNED	123
R0071208	00000790	1-AB-A	INSPECT/TEST/CLEAN MCC 1-AB-A & BKRS	I	1.R	98/09/24	97/03/24	99/02/08	RO1	A	PLNNED	1234
R0071226	00000720	1-AZV-A	INSPECT/TEST/CLEAN MCC 1-AZV-A & BKRS	I	1.R	98/09/24	97/03/24	99/02/08	RO1	A	PLNNED	1234
R0070887	00004924	1-62-1-T11D	CALIBRATE AGASTAT TIME DELAY RELAY 1-62-1-	C	18.M	98/09/18	97/03/15	99/02/11	RO1	A	PLNNED	7
R0071019	00007284	1-62-1-T11A	CALIBRATE TIME DELAY RELAY 1-62-1-T11A.	I	18.M	98/09/28	97/03/19	99/02/14	RO1	A	PLNNED	7
R0086612	00020627	2-QC-107S	2-QC-107S CHANGE THE RCP SOUTH SEAL WATER	I	549.D	98/12/07	01/01/01	99/02/17	NOO		ASIGND	1234
R0048879	00001209	1-MMO-220	PERFORM PM REQUIREMENTS @ 1-MMO-220.	I	1.R	98/08/28	95/08/09	99/02/18	FO1	A	PLNNED	1234
R0048819	00001211	1-MMO-240	PERFORM PM REQUIREMENTS @ 1-MMO-240	I	1.R	98/08/28	95/08/07	99/02/18	FO1	A	PLNNED	1234
R0075851	00000995	1-OME-4	MEGGER U-1 PRESSURIZER HEATERS	I	1.R	98/10/05	97/04/04	99/02/19	RO1	A	PLNNED	123
R0073913	00020079	1-T11A2	PERFORM IR INSPECTION ON 1-T11A2 BREAKER C	C	72.W	98/10/12	97/05/30	99/02/19	NOI	A	PLNNED	12345
R0048818	00001208	1-MMO-210	PERFORM PM REQUIREMENTS @ 1-MMO-210	I	1.R	98/08/28	95/08/07	99/02/20	FO1	A	PLNNED	1234
R0080594	00004375	2-PP-7E-MTR	LUBE AND CLEAN 2-PP-7E-MTR	C	48.W	99/02/14	97/12/27	99/02/20	NOO	A	PLNNED	1234
R0094475	00021097	2-T21D11	REFURBISH BREAKER 2-T21D11	C	6.R	99/02/21	01/01/01	99/02/21	NOO	A	PLNNED	123
R0093075	00006900	12-QM-3E	12-QM-3E, PERFORM MONTHLY CRANE INSPECTION	C	4.W	99/02/16	98/01/27	99/02/23	NOO	A	PLNNED	123456
R0074181	00020078	1-T11A1	PERFORM IR INSPECTION ON 1-T11A1	C	72.W	98/10/19	97/06/05	99/02/25	NOI	A	PLNNED	12345
R0071621	00007167	2-IMO-53	PERFORM MOV PREVENTIVE MAINTENANCE ON 2-IM	I	3.R	99/03/01	01/01/01	99/03/01	RO2	A	PLNNED	123
R0071622	00007168	2-IMO-54	PERFORM MOV PREVENTIVE MAINTENANCE ON 2-IM	I	3.R	99/03/01	01/01/01	99/03/01	RO2	A	PLNNED	123
R0092423	00021098	2-T21D12	REFURBISH BREAKER 2-T21D12	C	6.R	99/03/01	01/01/01	99/03/01	RO2	A	PLNNED	1234
R0051771	00001207	1-MCM-231	PERFORM PREVENTIVE MAINTENANCE @ 1-MCM-231	I	1.R	98/09/19	95/10/19	99/03/07	FO1	A	PLNNED	1234
R0079447	00004772	2-PP-46-4	2-PP-46-4, DRAIN & REFILL PUMP OIL RESERVO	C	48.W	99/03/07	97/11/19	99/03/07	NOO	A	ASIGND	56
R0072389	00001529	1-QT-507	TEST MECHANICAL & ELECTRONIC OVERSPEED TRI	I	1.R	98/10/22	97/04/21	99/03/08	FO1	A	PLNNED	1234
R0072444	00001206	1-MCM-221	PERFORM PREVENTIVE MAINTENANCE @ 1-MCM-221	I	1.R	98/09/18	97/04/22	99/03/09	FO1	A	PLNNED	1234
R0066754	00012593	1-IPI-321	CALIBRATE PRESSURE INDICATOR 1-IPI-321	C	96.W	98/09/21	96/11/21	99/03/11	NOI	A	PLNNED	456
R0033595	00007606	2-WMO-704	PERFORM PREVENTIVE MAINTENANCE ON 2-WMO-70	C	216.W	99/01/04	01/01/01	99/03/12	RO2	A	PLNNED	1234
R0081452	00003922	2-PP-10E-MTR	LUBE AND CLEAN 2-PP-10E-MTR	C	48.W	98/12/21	98/01/19	99/03/15	NOO	A	PLNNED	1234
R0087496	00004481	2-PP-10W	2-PP-10W, CHANGE OIL IN BEARING RESERVOIR'	C	24.W	99/02/01	98/08/19	99/03/15	RO2	A	PLNNED	1234
R0094469	00021104	2-T21D7	REFURBISH BREAKER 2-T21D7	C	6.R	99/03/15	01/01/01	99/03/15	NOO	A	PLNNED	1234
R0094383	00020906	2-2C7	REFURBISH BKR 2-2C7	C	6.R	99/03/15	01/01/01	99/03/15	RO2	A	PLNNED	7
R0081538	00003924	2-PP-10E	2-PP-10E DISASSEMBLE,REPACK,REASSEMBLE CO	C	48.W	99/03/15	98/01/22	99/03/18	NOO	A	PLNNED	1234
R0092651	00021046	1-T11D3	REFURBISH BREAKER 1-T11D3	C	6.R	99/03/22	01/01/01	99/03/22	FO1	A	PLNNED	7
R0093227	00022145	2-ILA-250	CALIBRATE AND FUNCTIONALLY TEST 2-ILA-250	C	172.W	99/03/22	01/01/01	99/03/22	RO2	A	PLNNED	7
R0051365	00000840	1-T11A2	INSPECT AND CLEAN BREAKER 1-T11A2.	C	144.W	99/01/04	95/10/11	99/03/24	NOO	A	PLNNED	1234
R0038206	00007136	2-IMO-262	PERFORM MOV PREVENTIVE MAINTENANCE ON 2-IM	I	3.R	99/03/24	94/09/19	99/03/24	RO2	A	PLNNED	123

Attachment

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R0046466	00002927	1-BC-AB2-DC-VM	CALIBRATE DC OUTPUT METER 1-BC-AB2-DC-VM.	C	144.W	98/08/23	95/06/07	99/04/02	NOO	A	PLNNED	7
R0036221	00007118	2-ICM-260	PERFORM MOV PREVENTIVE MAINTENANCE ON 2-IC	I	3.R	99/04/04	94/09/30	99/04/04	RO2	A	PLNNED	1234
R0039429	00007119	2-ICM-265	PERFORM MOV PREVENTIVE MAINTENANCE ON 2-IC	I	3.R	99/04/09	94/10/05	99/04/04	RO2	A	PLNNED	1234
R0079665	00009544	2-51-T21D-1	CALIBRATE PROTECTIVE RELAYS FOR TRANSFORME	C	72.W	98/11/30	97/11/25	99/04/05	RO2	A	PLNNED	7
R0091141	00008063	1-QT-100-CD	1-QT-100-CD, PERFORM 12 WK LUBE & FUNCTION	C	12.W	99/03/15	98/12/15	99/04/05	NOI	A	ASIGND	7
R0092963	00021030	1-T11A5	REFURBISH BREAKER 1-T11A5 PER 12IHP5021.EM	C	6.R	99/04/05	01/01/01	99/04/05	FO1	A	PLNNED	7
R0045489	00001246	2-FMO-242	PERFORM 2-FMO-242 PREVENTIVE MAINTENANCE	C	72.W	99/04/05	95/05/12	99/04/05	NOO	A	PLNNED	123
R0077695	00005489	1-CRID-4-INV	PERFORM PM REQUIREMENTS ON 1-CRID-4-INV	I	1.R	98/11/23	97/05/23	99/04/09	FO1	A	PLNNED	1234
R0077696	00005487	1-CRID-2-INV	PERFORM PM REQUIREMENTS FOR 1-CRID-2-INV	I	1.R	98/11/23	97/05/23	99/04/09	FO1	A	PLNNED	1234
R0075386	00019207	1-STN-218-AB1	1-STN-218-AB1, CLEAN JACKET WATER STRAINER	C	72.W	98/11/09	97/07/10	99/04/15	NOO	A	PLNNED	7
R0047240	00006335	2-VRS-2100	REPLACE BACKUP BATTERY PER E-PM CARD 2"SAD	I	36.M	98/11/30	95/06/23	99/04/18	NOO	A	PLNNED	7
R0078661	00009592	2-NRI-21	PERFORM 2IHP6030.IMP.448 (GAMMAMETRICS CAL	I	1.R	99/04/25	97/10/23	99/04/25	RO2	A	PLNNED	12345B
R0081846	00004482	2-PP-10W	2-PP-10W DISASSEMBLE,REPACK,REASSEMBLE CO	C	48.W	99/02/01	98/02/01	99/04/26	RO2	A	PLNNED	1234
R0076343	00008060	1-DGCD-GND-RES	CLEAN & CHECK 1-DGCD-GND-RES	C	72.W	99/03/14	97/08/07	99/04/26	NOO	A	ASIGND	1234
R0068830	00017786	1-HV-SGR-MD-3	INSPECT 1-HV-SGR-MD-3 PER PM TASK 69	C	96.W	98/11/09	97/01/08	99/04/28	NOO	A	PLNNED	7
R0068705	00017790	1-HV-SGR-MD-5	INSPECT 1-HV-SGR-MD-5 PER PM TASK 69	C	96.W	98/11/09	97/01/10	99/04/30	NOO	A	PLNNED	7
R0078804	00009036	2-IFI-52-CRI	PERFORM **2IHP6030.IMP.481 (2-IFI-52)	I	1.R	99/04/30	97/10/28	99/04/30	RO2	A	PLNNED	7
R0078805	00009037	2-IFI-53-CRI	PERFORM **2IHP6030.IMP.482 (2-IFI-53)	I	1.R	99/04/30	97/10/28	99/04/30	RO2	A	PLNNED	7
R0078806	00009039	2-IFI-54-CRI	PERFORM **2IHP6030.IMP.483 (2-IFI-54)	I	1.R	99/04/30	97/10/28	99/04/30	RO2	A	PLNNED	7
R0078807	00009035	2-IFI-51-CRI	PERFORM **2IHP6030.IMP.480 FOR 2-IFI-51 LO	I	1.R	99/04/30	97/10/28	99/04/30	RO2	A	PLNNED	7
R0072492	00010436	1-MRV-242	1-MRV-242 REFURBISH ACTUATOR & VALVE & QEV	I	2.R	99/05/02	01/01/01	99/05/02	FO1	x	PLNNED	123
R0082837	00003569	12-PP-10	LUBE AND CLEAN 12-PP-10-MTR	C	48.W	99/02/08	98/03/08	99/05/03	RO2	A	PLNNED	1234
R0088953	00006907	12-QM-3E	12-QM-3E, 24WK/SEMI-ANNUAL CRANE PM	C	24.W	99/03/22	98/10/04	99/05/03	NOO	A	PLNNED	123456
R0093427	00021092	2-T21B1	REFURB BREAKER 2-T21B1	I	6.R	99/05/03	01/01/01	99/05/03	RO2	A	PLNNED	1234
R0068839	00017788	1-HV-SGR-MD-4	INSPECT 1-HV-SGR-MD-4 PER PM TASK 69	C	96.W	98/11/09	97/01/14	99/05/04	NOO	A	PLNNED	7
R0082948	00019469	1-T11A7	PERFORM IR INSPECTION ON BKR. CUBICLE T11A	I	48.W	99/02/11	98/03/12	99/05/06	FO1	A	PLNNED	12345
R0082722	00001272	2-NMO-151	PERFORM 2-NMO-151 PREVENTIVE MAINTENANCE	I	1.R	99/05/07	97/11/04	99/05/07	RO2	A	PLNNED	123
R0080284	00001274	2-NMO-153	PERFORM 2-NMO-153 PREVENTIVE MAINTENANCE	I	1.R	99/05/08	97/11/05	99/05/08	RO2	A	PLNNED	123
R0080301	00001273	2-NMO-152	PERFORM PREVENTIVE MAINTENANCE @ 2-NMO-152	I	1.R	99/05/08	97/11/05	99/05/08	RO2	A	PLNNED	123
R0094474	00021096	2-T21D10	REFURBISH BREAKER 2-T21D10	C	6.R	99/05/09	01/01/01	99/05/09	NOO	A	PLNNED	1234
R0094448	00021102	2-T21D5	REFURBISH BREAKER 2-T21D5	C	6.R	99/05/10	01/01/01	99/05/10	NOO	A	PLNNED	1234
R0094318	00002098	12-QM-3E	12-QM-3E,PERFORM WEEKLY (STP.015) ON "E" A	I	7.D	99/05/10	99/05/03	99/05/11	NOI	A	ASIGND	123456
R0080010	00011791	1-CFA-423	CALIBRATE ALARM SWITCH 1-CFA-423	C	48.M	98/10/19	94/04/08	99/05/12	FO1	A	PLNNED	7
R0083374	00016880	2-QM-85	2-QM-85, INSPECT AND LUBRICATE CRANE	C	48.W	99/01/18	98/03/27	99/05/13	NOO	A	ASIGND	7
R0076724	00019204	1-QT-502-CD	1-QT-502-CD, CHANGE OIL IN TURBOCHARGER	C	72.W	98/03/14	97/08/19	99/05/15	NOO	A	ASIGND	1234
R0049057	00000891	1-11B5	CLEAN/INSPECT/TEST BKR 1-11B5	I	2.R	98/08/17	95/08/15	99/05/18	FO1	A	PLNNED	7
R0053512	00000520	2-T21D8	CLEAN/INSPECT BKR 2-T21D8	C	144.W	98/02/21	95/12/08	99/05/18	RO2	A	PLNNED	1234
R0053513	00000528	2-T21C3	INSPECT AND CLEAN BREAKER 2-T21C3	C	144.W	98/02/21	95/12/08	99/05/18	RO2	A	PLNNED	1234
R0049223	00000888	1-11AC	INSPECT & CLEAN BKR 1-11AC	I	2.R	98/08/19	95/08/17	99/05/20	FO1	A	PLNNED	7
R0079847	00009073	2-QFR-20	PERFORM **2IHP6030.IMP.472 (2-QFR-20, 2-QF	C	72.W	99/01/18	97/12/01	99/05/24	RO2	A	PLNNED	
R0049413	00000874	1-11A3	INSPECT AND CLEAN BREAKER 1-11A3	I	2.R	98/08/24	95/08/22	99/05/25	RO1	A	PLNNED	
R0077132	00006280	2-HR2-PS	PERFORM PM INSTRUCTIONS FOR 2-HR2-PS	C	48.W	99/01/18	97/09/02	99/05/25	NOO	A	PLNNED	
R0069648	00012617	2-IPI-321	CALIBRATE PRESSURE INDICATOR 2-IPI-321	C	96.W	99/02/28	97/02/05	99/05/26	NOI	A	PLNNED	
R0049443	00000727	1-PS-A	INSPECT/TEST/CLEAN MCC 1-PS-A	I	2.R	98/08/26	95/08/24	99/05/27	FO1	A	PLNNED	

Attachment

JO NUMBER	RT NUMBER	COMPONENT	DESCRIPTION		FREQ	NEXT REQUIRED DATE	LAST PERF DATE	DROP DEAD DATE			STATUS	MODE REQUIRED
R0049741	00000687	1-11B1	CLEAN/INSPECT/TEST BKR 1-11B1	I	2R	98/08/27	95/08/25	99/05/28	FO1	A	PLNNED	
R0049788	00000676	1-11A2	CLEAN/INSPECT/TEST BKR 1-11A2	I	2R	98/08/27	95/08/25	99/05/28	FO1	A	PLNNED	

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50-315/316
12/21/98
99-23

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December 21, 1999

Mr. R. P. Powers
Senior Vice President
Nuclear Generation Group
American Electric Power Company
500 Circle Drive
Buchanan, MI 49107-1395

SUBJECT: NRC INSPECTION REPORT 50-315/99023(DRS); 50-316/99023(DRS)

Dear Mr. Powers:

On October 28, 1999, the NRC completed an inspection at your D. C. Cook Units 1 and 2 reactor facilities. The inspection addressed Case Specific Checklist Items No. 4A, "Failure to Perform Safety Evaluations or Screenings", and No. 4B, "Inadequate Safety Evaluations", which were established through NRC's Manual Chapter 0350, "Staff Guidelines for Restart Approval". This inspection assessed corrective actions to address significant deficiencies identified relative to your I0 CFR 50.59 safety evaluation program and its implementation. The enclosed report documents the results of the inspection.

Based on the results of this inspection, major improvements were noted regarding the implementation of the 10 CFR 50.59 safety evaluation program at D. C. Cook. We observed that process improvements, close management oversight, and good quality training contributed to the performance improvements. As a result, the NRC concluded that corrective actions for Case Specific Checklist Restart Item No. 4A, "Failure to Perform Safety Evaluations or Screenings", were adequate to support closure of this item. We also understand that you will continue with personnel training, oversite and assessments of this area after restart to ensure sustained improvements.

Regarding Case-Specific Checklist Item No. 4B, "Inadequate Safety Evaluations", our review confirmed that safety evaluations and screenings have been adequately completed. The adequacy of these work products has been dependent on the involvement of the Nuclear Safety Assessment Team (NSAT) in-line review function. We understand that the NSAT review function will remain in place through plant restart until your staff demonstrates consistently the ability to produce quality safety screenings and evaluations. Based on the effectiveness of your programs and processes to produce adequate safety evaluations and screenings, we consider your actions to address Case Specific Checklist Item No. 4A adequate to support closure of this item.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice", a copy of this letter, the enclosure, and your response to this letter, if you choose to provide one, will be placed in the NRC Public Document Room.

IE01

DNL ADOCK 05000315

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

Sincerely,

Original signed by John A. Grobe

John A. Grobe, Director
Division of Reactor Safety

Docket Nos. 50-315; 50-316
License Nos. DPR-58; DPR-74

Enclosure: Inspection Report 50-315/99023(DRS); 50-316/99023(DRS)

cc w/encl:
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REGION III

Docket Nos:	50-315; 50-316
License Nos:	DPR-58; DPR-74
Report No:	50-315/99023(DRS); 50-316/99023(DRS)
Licensee:	Indiana Michigan Power Company
Facility:	Donald C. Cook Nuclear Generating Plant
Location:	1 Cook Place Bridgman, MI 49106
Dates:	September 13 - October 28, 1999
Inspectors:	Z. Falevits, Reactor Engineer, Team Leader D. Jones, Reactor Engineer R. Langstaff, Reactor Engineer D. Schrum, Reactor Engineer T. Tella, Reactor Engineer
Approved by:	Gary L. Shear, Chief, Plant Support Branch Division of Reactor Safety

9912200050

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EXECUTIVE SUMMARY

D. C. Cook, Units 1 and 2
NRC Inspection Report 50-315/99023(DRS); 50-316/99023(DRS)

By NRC letter dated September 17, 1999, the NRC transmitted the updated Case Specific Checklist (CSC) for the Donald C. Cook Nuclear Power Plant which identified specific issues requiring resolution prior to restart of the Cook Plant.

This special inspection focused on licensee corrective actions for resolution of CSC items 4A, "Failure to Perform Safety Evaluations or Screenings", and No. 4B, "Inadequate Safety Evaluations". The standard applied to evaluate the acceptability for resolution of these CSC items was that described in paragraphs C.1.1 "Root Cause Determination", C.1.2 "Corrective Action Development", and C.1.3 "Corrective Action Plan Implementation and Effectiveness", as described in the enclosures of the NRC letter transmitting the CSC. Based on this inspection CSC Item No. 4A, "Failure to Perform Safety Evaluations or Screenings", and CSC No. 4B, "Inadequate Safety Evaluations", will be closed.

Open items identified in NRC inspection reports and Licensee Event Reports requiring resolution prior to restart of the Cook Plant have been identified in the Restart Action Matrix (RAM) approved by the NRC Manual Chapter 0350 Oversight Panel. In the RAM, open items were identified with a higher inspection priority. The higher inspection priority issues and a sample of lower priority inspection issues received a more in-depth review during this inspection. Based on adequate corrective actions for resolution of items selected for more in-depth review, reasonable assurance exists that corrective actions for similar lower priority inspection issues are adequate. The intent of selecting a sample of items for more in-depth review was to improve the efficiency of the NRC in assessing the restart readiness of D. C. Cook and to ensure appropriate focus on the issues most important from a safety and probabilistic risk perspective.

Engineering

- 10 CFR 50.59 Safety Screenings and Safety Evaluations were thorough and appropriate for the plant changes reviewed. Changes requiring 10 CFR 50.59 Safety Evaluations were appropriately identified. Determinations for whether changes represented Unreviewed Safety Questions were correct with appropriate justification. (Section E1.1)

- The team concluded that the actions taken by the licensee to address 10 CFR 50.59 bypass mechanisms were appropriate. (Section E1.2)

- The licensee's corrective actions to improve the quality of safety instructions have not been fully effective. Nuclear Safety Assessment Team review of 40 condition reports identified a significant number of 10 CFR 50.59 Safety Evaluations that were inadequate or failed to identify Unreviewed Safety Questions. The licensee had not consistently used the Nuclear Safety Assessment Team results to identify where additional 10 CFR 50.59 training and program improvements were needed. (Section E1.3)

- The team concluded that the Nuclear Safety Assessment Team process was a significant factor in improving the quality of the 10 CFR 50.59 Safety Screenings and Safety Evaluations. The Nuclear Safety Assessment Team members were broadly experienced and qualified. (Section E1.4)

- The team concluded that most corrective actions to address the sixteen corrective action items listed in the Restart Action Plan have been completed satisfactorily. The licensee stated that the remaining Restart Action Plan corrective items will be completed prior to plant restart. (Section E1.5)

- The team noted that aggressive measures have been implemented to identify and correct significant 10 CFR 50.59 safety evaluation process related deficiencies. Major improvements have been made in the last six months in the area of 10 CFR 50.59 safety evaluation program and training. (Section E.1.6)

- The team determined that continued improvement in the quality of 50.59 safety screenings and evaluations performed by the licensee's 10 CFR 50.59 qualified preparers and reviewers is needed. (Section E1.6)

- The team concluded that licensee efforts to address NRC concerns regarding Case-Specific Checklist Item No. 4A, "Failure to Perform Safety Evaluations or Screenings", and Case-Specific Checklist Item No. 4B, "Inadequate Safety Evaluations", and the related corrective actions proposed and completed had been effective and these items will be closed. (Section E.1.6)

- The 10 CFR 50.59 training, including the practical session, presently provided to plant personnel was considered much improved. (Section E5.1)

- 10 CFR 50.59 safety evaluation related audits and self assessments performed prior to 1999 were not sufficiently critical and did not identify many problems. Major improvement could be seen in audits and assessments performed in 1999. (Section E7.1)

Report Details

Background

NRC inspections and licensee audits and self assessments conducted in 1998 and 1999, identified significant concerns regarding the adequacy of the licensee's 10 CFR 50.59 program and its implementation. Specifically, the NRC identified that Safety Evaluations (SEs) were inadequate or not performed when needed resulting in the failure to identify a number of unreviewed safety questions. In addition, the program allowed changes to be implemented without 10 CFR 50.59 reviews. This represented a programmatic breakdown of D. C. Cook's ability to perform SEs to adequately assess the consequences of changes and ensure the plant was maintained as designed and as specified in the licensing basis.

As a result of these concerns, the licensee conducted self-assessments and root cause investigations to identify 10 CFR 50.59 related problems and their root causes. Some of the root causes identified included the lack of clear procedural guidance, lack of personnel understanding of "change" and "design licensing basis", and low management expectations regarding the acceptability of 10 CFR 50.59 reviews.

To address the deficiencies identified in the 10 CFR 50.59 program and processes, the licensee initiated a 10 CFR 50.59 Restart Action Plan to address the problems noted and to prevent recurrence. Corrective actions included: complete rewrite of the 10 CFR 50.59 procedure; establishment of an in-line review of safety screenings (SSs) and SEs using industry experts (Nuclear Safety Assessment Team (NSAT)), use of performance indicators to measure and trend the quality of 10 CFR 50.59 products; reviews to identify and eliminate 10 CFR 50.59 bypass mechanisms; development of Cook-specific 10 CFR 50.59 training modules; implementation of 10 CFR 50.59 training to appropriate personnel; review of previously performed SEs to identify potential unreviewed safety questions (USQs) and performance of an independent assessment of the upgraded 10 CFR 50.59 program and its implementation.

Restart Action Plan No. 004, dated September 20, 1999, was issued to provide actions to correct deficiencies identified relative to 10 CFR 50.59 programs and processes and to address Manual Chapter (MC) 0350 case specific checklist items 4A and 4B. The plan specified root cause acceptance criteria and corrective action items and effectiveness measures to address the 10 CFR 50.59 programmatic deficiencies identified by the NRC and by licensee audits and self assessments.

The team reviewed the upgraded 10 CFR 50.59 program for adequacy and assessed the effectiveness of its implementation. The team examined the licensee's actions to identify the related root causes, the restart acceptance criteria, and the corrective actions initiated and completed to resolve the identified concerns and to prevent recurrence. Inspection results indicated that the licensee performed a comprehensive root cause investigation to identify 10 CFR 50.59 related deficiencies, established reasonable restart acceptance criteria and initiated appropriate corrective actions. At the end of the inspection the majority of the fourteen restart action items delineated in the Leadership Plan to address the identified 10 CFR 50.59 related concerns had been completed.

III. Engineering

E1 Conduct of Engineering

E1.1 10 CFR 50.59 Safety Screenings and Evaluation:

a. Inspection Scope

The team evaluated the licensee's program for 10 CFR 50.59 SSs and SEs. The team reviewed approximately 50 approved 10 CFR 50.59 SSs and SEs for adequacy. The review emphasized the adequacy of controls and compliance with regulatory requirements.

b. Findings and Observations

The SSs and SEs reviewed by the team were generally of good technical quality, appropriate for the plant changes reviewed, and clearly described the proposed design changes. The SEs appropriately addressed the 10 CFR 50.59 review questions. The team determined that approved 10 CFR 50.59 SSs properly classified changes as to whether a 10 CFR 50.59 SE was required. The team determined that approved 10 CFR 50.59 SEs properly determined whether the changes represented an USQ with appropriate justification. The team did not identify any unreviewed safety questions.

The team reviewed 10 CFR 50.59 SS and SE documentation provided by the licensee for a sample of five procedure revisions. The team determined that 10 CFR 50.59 SSs had been performed for three of the procedure revisions and that a 10 CFR 50.59 SE had been performed for one procedure revision (procedure 2IHP5040.EMP.002). A screening had been initiated for the fifth procedure change (procedure 12MHP5021.019.003) but had not yet been formally reviewed and approved. Additionally, the team reviewed the approved screenings and the approved evaluation and determined that they were acceptable.

The team also reviewed sixteen 10 CFR 50.59 SSs and two 10 CFR 50.59 SEs in the Electrical and Instrument and Control (I&C) areas. The NSAT members also reviewed these 10 CFR 50.59 documents and generated comments that were satisfactorily resolved. The team considered the final 10 CFR 50.59 SSs and SEs to be sufficiently thorough.

The team noted that the NSAT comments on draft SSs and SEs had identified substantive issues regarding the quality of many SSs and SEs proposed by the licensee's staff. The team noted that, in some cases, determinations that a USQ did not exist were not fully supported by draft 10 CFR 50.59 SEs prepared by the staff. The deficiencies indicated a heavy dependence on the NSAT review to ensure acceptable quality for SSs and SEs. Deficiencies associated with proposed SSs and SEs were addressed prior to approval.

c. Conclusions

The team concluded that the 10 CFR Part 50.59 SSs and SEs were thorough and appropriate for the plant changes reviewed. Changes requiring 10 CFR 50.59 SEs were appropriately identified and addressed. 10 CFR 50.59 applicability was appropriately addressed for procedure revisions. Determinations for whether changes represented unreviewed safety questions were correct with appropriate justification. However, the team determined that the adequacy of the SEs was significantly dependent upon the in-line reviews performed by the licensee's NSAT. The 10 CFR 50.59 SEs issued after NSAT in-line reviews were considered acceptable.

E1.2 10 CFR 50.59 Process Bypass Mechanisms

a. Inspection Scope

The team reviewed the licensee's corrective actions to eliminate potential 10 CFR 50.59 bypass mechanisms in the identified work processes. This corrective action addresses the licensee's NRC Commitment No. 7316 in reply to the NRC's Notice of Violation dated October 13, 1998.

b. Observations and Findings

Bypass mechanisms have the potential to allow changes to be introduced without requiring 10 CFR 50.59 SSs and SEs. The licensee initially identified 29 work processes with potential bypass mechanisms and 13 additional processes were subsequently identified during the inspection by an audit conducted by the licensee. Action items for the 29 work processes were closed and the 13 additional items were assigned condition reports. The condition reports were initiated to document the deficiencies, and track corrective actions.

The team reviewed the 10 CFR 50.59 bypasses identified by the licensee to determine if the licensee correctly identified the bypasses and if corrective actions to address this issue and to prevent recurrence were in place. The team reviewed the licensee's corrective actions taken to eliminate potential 10 CFR 50.59 bypass mechanisms in the identified work processes. In addition, the team verified that the licensee had in-place a mechanism to identify future potential bypasses, and to correct the potential bypasses once they were identified. The licensee conducted 10 CFR 50.59 bypass training for first line supervisors. Based on interviews with eight SE preparers/evaluators, the inspectors determined that the individuals interviewed were adequately trained to recognize potential 10 CFR 50.59 bypasses.

c. Conclusions

The team concluded that the corrective actions taken by the licensee to address 10 CFR 50.59 bypass mechanisms were appropriate. In addition, the licensee provided training to selected engineering personnel to enhance their knowledge of the 10 CFR 50.59 process and improve their ability to recognize potential 10 CFR 50.59 bypass mechanisms.

E1.3 10 CFR 50.59 Safety Evaluation Related Condition Reports

a. Inspection Scope

The team reviewed the licensee's corrective action reports issued for inadequate 10 CFR 50.59 SSs and SEs to evaluate adequacy of corrective actions.

b. Observations and Findings

The licensee had established the NSAT as a final barrier to ensure that 10 CFR 50.59 SSs and SEs were acceptable prior to issuance. NSAT issued a condition report (CR) for each SS and SE identified as being unsatisfactory. The team determined that NSAT had done a thorough job of identifying 10 CFR 50.59 SS and SE problems.

The team reviewed approximately 40 CRs, issued during the last 4 months, related to SSs and SEs. The condition reports indicated that NSAT identified a significant number of inadequate SSs and SEs during their reviews of Design Change Packages (DCPs). Some of these were safety significant. However, NSAT had not identified the significance of the problems and did not identify most of these problems as potential USQs. The team determined that approximately 15 CRs were potential USQs. The potential USQs appeared to indicate that the training and qualification programs were not fully effective in improving the performance of some licensee staff. The licensee stated that they intended to identify, evaluate, and track the potential USQs identified by NSAT and the team, and provide systems training to their staff.

The team noted that some NSAT observations from March 1999 had not been resolved as of the dates of this inspection. The team determined that the licensees implementation of corrective actions to correct the deficiencies identified by NSAT was not timely. In some cases the reviewed work was canceled after NSAT comments. NSAT members stated that there wasn't adequate time to track these issues and mentor the staff. This did not meet the licensee's start up plan objective to mentor and train the engineering staff to improve their performance. In addition, NSAT had not used the lessons learned results of the 10 CFR 50.59 in-line reviews to identify where additional improvements were needed regarding training and the 10 CFR 50.59 program.

Based on the licensee rating system for engineering work products, 10 CFR 50.59 product quality had not improved. The licensee stated that the quality of engineering was not improving because newly qualified people had been added to the 10 CFR 50.59 review process and they still required experience with writing SSs and SEs.

During review of canceled and rejected 10 CFR 50.59 reviews, the inspectors noted that several CRs have been closed without completing and documenting the required corrective actions. For example, CR 99-10743 documented incorrect disposition of CR 98-4650 and was closed without further action. Also, corrective action for CR 99-18155 written by NSAT on July 11, 1999, for an inadequate procedure change were not timely. The CR was issued to document potential use of a faulty curve in the procedure used to calculate load limits for lifting weights over the spent fuel. Use of this curve could have

resulted in violation of Technical Specification Section 3.9.7. The reportability review was due November 15, 1999, while the engineering evaluation was due March 13, 2000.

The team also reviewed a sample of electrical and I&C related 10 CFR 50.59 related condition reports and found that the CRs adequately described the problems identified. Corrective actions taken were generally well documented prior to final closure. However, the team identified another example where CR No. P-99-01355 had been closed prior to documenting the completed corrective actions. This CR was issued because an unqualified person performed twenty-seven 10 CFR 50.59 screenings during the period of August 1998 through January 1999. This Category 3 condition report, closed on June 18, 1999, did not identify whether any similar instances of SSs and SEs performed by non-qualified personnel were identified or whether any corrective actions were taken to prevent recurrence of similar issues.

c. Conclusions

The licensee's corrective actions to improve the quality of engineering work have not been fully effective or timely. A review of 40 CRs indicated that a significant number of 10 CFR 50.59 SEs were inadequate or failed to identify USQs prior to NSAT review. The licensee had not consistently used the NSAT results to identify where additional improvements were needed with training and with the 10 CFR 50.59 program.

E1.4 Nuclear Safety Assessment Team In-Line Reviews

a. Inspection Scope

The team reviewed the 10 CFR 50.59 SE in-line review process, performed by the NSAT, which was initiated in February 1999.

b. Observations and Findings

The team reviewed procedure No. EHI 1040.SES.001, (Rev. 2), "Nuclear Safety Assessment Team 10 CFR 50.59 Review Process", dated June 10, 1999. This procedure provided the requirements for the NSAT team and the NSAT Manager. The team discussed the NSAT process with the Manager and interviewed four members of the team. The team concluded that the members of the NSAT were well qualified in the 10 CFR 50.59 process and had extensive nuclear power plant experience.

Procedure No. EHI 1040.SES.001 required that the NSAT Manager track and trend the results of the NSAT reviews. While the NSAT Manager issued a weekly report indicating the graded quality of the 10 CFR 50.59 SSs and SEs for each department, this report did not include the issues identified by the NSAT members, any root causes for the noted deficiencies, or any suggested corrective actions required by each of the departments. The team also noted that NSAT was not performing reviews to determine common causes and corrective actions to address deficiencies identified by NSAT during reviews of 10 CFR 50.59 products.

The team determined that 10 CFR 50.59 SSs and SEs issued after February 1999 have been thoroughly reviewed by experienced NSAT members. The team considered the

final approved 10 CFR 50.59 SSs and SEs to be of good quality. However, without NSAT in-line reviews, a number of the 10 CFR 50.59 products submitted for review would not have been acceptable from a regulatory standpoint as previously discussed in Section E1.3 of this report.

c. Conclusions

The team concluded that the NSAT process was a significant factor in improving the quality of 10 CFR 50.59 SSs and SEs. The NSAT members were broadly experienced and qualified for reviewing 10 CFR 50.59 SSs and SEs.

E1.5 Follow up on Restart Action Plan Corrective Action Items

a. Inspection Scope

The team reviewed the licensee's corrective actions to address 10 CFR 50.59 Safety Evaluation program weaknesses. The inspectors reviewed a sample of applicable Corrective Action Items which were documented in the licensees Restart Action Plan 004.

b. Observations and Findings

The team reviewed the following Corrective Action Items initiated to address 10 CFR 50.59 related deficiencies.

Corrective Action Item No. 4: Perform reviews of D. C. Cook work processes for mechanisms that may potentially allow changes to be introduced without performing 10 CFR 50.59 safety screens/evaluations (bypasses).

Licensee Corrective Actions: The licensee identified 29 work processes with potential 10 CFR 50.59 bypass mechanisms. Thirteen additional mechanisms were subsequently identified during the inspection by an audit conducted by the licensee. Action items for the 29 work processes were closed and the 13 additional items were assigned condition reports. The inspectors considered the licensee actions to be acceptable.

Corrective Action Item No. 5: Address the mechanisms that may potentially allow changes to be introduced without performing 10 CFR 50.59 safety screens/evaluations (bypasses) in the identified work processes.

Licensee Corrective Actions: The inspectors verified that actions were taken to eliminate potential bypasses and that the actions were completed on the identified items. In addition, the inspectors verified that the licensee had in-place a mechanism to identify potential 10 CFR 50.59 bypasses, and to correct the potential bypasses once they were identified. The inspectors concluded that the actions taken by the licensee to address 10 CFR 50.59 bypass mechanisms were appropriate.

Corrective Action Item No. 6: Identify and implement the proper training approach (including identifying the target plant population) to address a knowledge gap in recognizing when a configuration/design change is introduced and in recognizing that

changes to the facility and procedures and the performance of tests and experiments must be 10 CFR 50.59 screened/evaluated.

Licensee Corrective Actions: The licensee identified the training approaches needed for 10 CFR 50.59 training and the target plant personnel who needed the training. Training lesson plans were developed and training was initiated. This training initiative was in progress during this inspection. Based on interviews of engineering personnel, the inspectors determined that the licensee training appeared effective in increasing awareness in this engineering performance area.

Corrective Action Item No. 7: Establish an in-line review of work process procedures and instructions by a qualified technical reviewer to identify and prevent the introduction of mechanisms that may potentially allow changes to be introduced without performing SSs and SEs.

Licensee Corrective Actions: The procedure for this action item had been prepared but not approved during the inspection. Personnel had not been trained yet for the use of the new procedure. This action item remains open.

Corrective Action Item No. 8: Develop Cook-specific 10 CFR 50.59 training modules by industry experts.

Licensee Corrective Actions: The licensee contracted a group of engineering training specialists to develop a training course and provide instructions to support 10 CFR 50.59 activities at Cook Nuclear Plant. Training modules TS-C-CS44 and TS-O-0003 were developed for this training. The lesson plans will be revised based on the feedback from the previous training sessions. The team reviewed these training modules and considered them to be acceptable.

Corrective Action Item No. 9: Perform 10 CFR 50.59 training utilizing the new initial 10 CFR 50.59 training for personnel performing and reviewing SSs and SEs.

Licensee Corrective Actions: A new 10 CFR 50.59 training course was developed and pilot training was conducted during the April 27 - 29, 1999 time period. The regular three day training sessions were started on May 11, 1999, and are expected to continue through November 1999. While several contractors were trained in the recent training sessions, about half of the D. C. Cook plant personnel needing the 10 CFR 50.59 training have not yet been trained. Pending completion of training for all the required plant personnel, this action item remains open.

Corrective Action Item No. 15: Establish a controlled electronic Updated Final Safety Analysis Report (UFSAR).

Licensee Corrective Actions: Actions had not been completed on this item at the close of the inspection. The licensee had installed an electronic copy of the UFSAR and obtained the services of a contractor to independently verify the electronic version with the hard copy. However, actions were being taken to reconcile the page numbering of the electronic version with that of the hard copies. This item remains open.

Restart Action Plan Corrective Action Item No. 16: Perform future periodic monitoring of the 10 CFR 50.59 program and its implementation in accordance with PMP 7034.SAP.001.

Licensee Corrective Actions: This item was complete. Quarterly Assessments were performed and are planned to be performed in the future.

c. Conclusions

The team noted that the licensee has taken aggressive measures to identify and correct 10 CFR 50.59 safety evaluation process related deficiencies. The team concluded that most corrective actions required to address the sixteen corrective action items listed in the licensees Restart Action Plan have been completed satisfactorily. The licensee stated that the remaining restart action items will be completed prior to plant restart. The team is satisfied that the progress made on these actions and the plans for completing remaining actions will adequately address these issues.

E1.6 Safety Evaluation Process Conclusions

Based on findings from Sections E1.1 through E1.5, the team noted that aggressive measures have been implemented to identify and correct significant 10 CFR 50.59 safety evaluation process related deficiencies. Major improvements have been made in the last six months in the area of 10 CFR 50.59 safety evaluation program development, implementation and training. However, not all concerns have been resolved and continued improvement, mainly in the quality of 10 CFR 50.59 safety screenings and evaluations performed by the licensee's 10 CFR 50.59 qualified preparers and reviewers, appears warranted.

The team concluded that licensee efforts to address NRC concerns regarding Case-Specific Checklist Item No. 4A, "Failure to Perform Safety Evaluations of Screenings", and Case-Specific Checklist Item No. 4B, "Inadequate Safety Evaluations", and the related corrective actions proposed and completed had been effective and these items will be closed.

E3 Engineering Procedures and Documentation

E3.1 10 CFR 50.59 Safety Evaluation Procedures

a. Inspection Scope

The team reviewed procedure PMP-1040.SES.001, "Safety Screenings/Evaluations", for adequacy. The team also reviewed other procedures for determining whether existing conditions which were not consistent with the Updated Safety Analysis Report (USAR) description would receive appropriate evaluation under 10 CFR 50.59.

b. Observations and Findings

The team determined that revision 7a of procedure PMP-1040.SES.001, "Safety Screenings/Evaluations", correctly reflected the requirements of 10 CFR 50.59. The

procedure provided sufficient guidance such that a trained and experienced person following the procedure could correctly determine whether a 10 CFR 50.59 safety evaluation was required and, if so, understand what was required for writing an adequate evaluation. The team noted that, in comparison to revision 4, revision 7a required more consideration for 10 CFR 50.59 applicability and better justification for determinations that an unreviewed safety question did not exist. The team noted that the revised procedure required NSAT review and approval for the majority of SEs and screenings. Based on discussions with licensee management, the team determined that the licensee intended to retain the NSAT in-line reviews of 10 CFR 50.59 SSs and SEs until its staff had become more experienced with the revised process and had demonstrated their proficiency.

The team noted that some of the definitions and the scope of the procedure, while legally accurate, did not elaborate on some of the NRC applicable interpretations of 10 CFR 50.59. For example, neither the scope of the procedure nor the definition for "Changes in the Facility as Described in the Safety Analysis Report", mentioned that retaining existing conditions which were contrary to the USAR description required a 10 CFR 50.59 safety evaluation. Additionally, the definition for "Changes in Procedures as Described in the Safety Analysis Report", did not discuss that changes to actions described in the USAR are considered changes in procedures as described in the safety analysis report thereby requiring a 10 CFR 50.59 safety evaluation. The body of the procedure provided additional discussion of 10 CFR 50.59 requirements beyond what was outlined in the definitions section and addressed the weaknesses noted above for some of the definitions. However, the team was concerned that an untrained individual may draw erroneous conclusions from a cursory review of the procedure regarding what activities or conditions would require a 10 CFR 50.59 safety evaluation.

For consideration of existing conditions which were not consistent with the USAR, the team confirmed that procedure PMP-7030.CAP.001, "Corrective Action Program (CAP) Process Flow", required that issues which were inconsistent with requirements be documented and processed as part of the condition report process. Procedure PMP-7300.UFSAR.001, "UFSAR Update Process", specifically required that a condition report be initiated to address discrepancies between the facility, procedures, or analyses and the USAR description. Depending upon the significance of the issue, PMP-7030.CAP.001, "Corrective Action Program (CAP) Process Flow", required that the issue be addressed using either PMP-7030.INV.001, "Root Cause Investigations And Approvals", or PMP-7030.INV.002, "Apparent Cause Evaluation and Condition Resolution". Both procedure PMP-7030.INV.001 and PMP-7030.INV.002 required that accepting conditions "use-as-is" be evaluated for operability and that the condition be addressed via the design change process or an appropriate change process. The team verified that the design change process, outlined in procedure 12 EHP 5040.MOD.006, "Design Change Packages", required that a 10 CFR 50.59 screening or evaluation be performed using the 10 CFR 50.59 screening or evaluation procedure. Additionally, procedure 12 EHP 5043 EDC.001, "Evaluation of Discrepant Conditions", required that a 10 CFR 50.59 safety screening or evaluation be performed for "use-as-is" determinations. The team also verified that procedure PMP-7300.UFSAR.001, "UFSAR Update Process", required that changes to the USAR be evaluated using procedure PMP-1040.SES.001, "Safety Screenings/Evaluations".

c. Conclusions

The revised 10 CFR 50.59 safety evaluation procedure was conservative and inspectors considered it acceptable. Licensee procedures appropriately required that existing conditions which were inconsistent with the USAR be screened or evaluated under the 10 CFR 50.59 process.

E4 Engineering Staff Knowledge and Performance

E4.1 10 CFR 50.59 Safety Evaluation Staff Knowledge and Performance

a. Inspection Scope

The team interviewed selected individuals qualified to perform 10 CFR 50.59 SSs and/or SEs.

b. Observations and Findings

The individuals interviewed considered the 10 CFR 50.59 process workable. The individuals acknowledged that although they received the training, additional practice was needed to gain practical experience using the new process. Individuals interviewed demonstrated adequate training and knowledge of the 10 CFR 50.59 process.

c. Conclusions

The inspectors determined that the individuals interviewed appeared adequately trained and knowledgeable of the 10 CFR 50.59 process.

E5 Engineering Staff Training and Qualification

E5.1 10 CFR 50.59 Safety Evaluation Training and Qualification

a. Inspection Scope

The team reviewed the current 10 CFR 50.59 training provided to plant personnel.

b. Observations and Findings

The team reviewed the scope of the current 10 CFR 50.59 training plan and implementation. A contractor was selected during February 1999 to develop 10 CFR 50.59 training and lesson plans. Three day training sessions were implemented in February 1999 and were scheduled to continue until the middle of November 1999. Prior to this rigorous three day training, several D. C. Cook employees and contractors had been qualified to perform 10 CFR 50.59 SSs and SEs after a one day training. All the 10 CFR 50.59 SSs and SEs issued after February 1999 were reviewed by the NSAT members.

Team members attended portions of 10 CFR 50.59 training sessions and considered the quality of the training very good. The team noted that the classes included several

examples of 10 CFR 50.59 SEs and noted good interactions between the instructor and the students. There was a written test at the end of the third day with a score of 80 percent or above considered passing. The training conducted on the week of September 14 to 17, 1999, included a practical session on the 4th day. This Position Specific Guidance training qualifies the students as full fledged 10 CFR 50.59 screeners/evaluators. However, specific training to familiarize the staff on the 10 CFR 50.59 Cook specific procedure was not included in this training program.

The team determined that training to 10 CFR 50.59 safety evaluation preparers and reviewers on the upgraded 10 CFR 50.59 procedure was not included in the upgraded training. Also, Plant Systems Integrated training and Accident Analysis (UFSAR Chapter 14) training was not yet provided to the qualified 10 CFR 50.59 safety evaluation preparers and reviewers.

The team noted that the majority of D. C. Cook's 10 CFR 50.59 certified evaluators were contractors. The licensee stated that more plant personnel would be included in the future training sessions. The team noted that many licensee employees had completed the three day 10 CFR 50.59 training course but were not yet certified to perform SEs, as they did not complete the position specific guidance training needed for qualification. The team interviewed a few engineers in this category and noted that the additional training would not be completed soon because the engineers had other urgent work assigned to them.

c. Conclusions

The 10 CFR 50.59 training, including the practical session, presently provided to plant personnel was considered much improved.

E7 Quality Assurance in Engineering Activities

E7.1 10 CFR 50.59 Safety Evaluation Related Audits and Assessments

a. Inspection Scope

The team reviewed selected 10 CFR 50.59 program related audits and assessments.

b. Observations and Findings

The team noted that audits and self assessments performed prior to 1999 were not critical and did not identify many 10 CFR 50.59 program related problems. Major improvement could be seen in the conduct and results of audits and assessments performed in 1999. For example, Performance Assurance audit PA 99-S08 "50.59 Restart Action Plan", dated September 21, 1999, was self critical and effective in identifying important "gaps" that needed to be addressed prior to restart. In addition, Self Assessment SA-1999-002-RCL, dated September 30, 1999, "10 CFR 50.59 Program" was also very detailed and self critical. Results indicated that at least 13 new mechanisms that may potentially allow changes without a safety screening and evaluation still existed, 10 CFR 50.59 procedure distribution requirements were not being consistently followed and that plant personnel knowledge and ability to recognize

when a change is introduced and the need to perform a safety evaluation needed improvement. A questionnaire was circulated to plant personnel to determine their ability to recognize when a change is introduced and the need to perform a safety evaluation. The following results were recorded: Operations department personnel scored 79 percent, maintenance 71 percent, work control 63 percent and engineering 60 percent.

c. Conclusions

The team noted that audits and self assessments performed prior to 1999 were not very critical and did not identify many of the 10 CFR 50.59 program related problems. Major improvement could be seen in the conduct and results of audits and assessments performed in 1999.

E8 Miscellaneous Engineering Issues

E8.1 Previously Identified Items

E8.1.1 (Closed) Violation 50-315/98152-01282; 50-316/98152-01282: Sump roof vent hole design basis. The licensee failed to translate the design basis for containment recirculation sump roof vent holes into specifications, drawings, procedures, and instructions. The team reviewed condition report (CR) 1998-0345 which was associated with this item. The team determined that the licensee had performed a design change (Design Change Package 12-DCP-859) to translate the containment sump design basis into appropriate design documents and plant procedures. The licensee performed a 10 CFR 50.59 safety screening which demonstrated that the changes to the sump design did not represent a change to the plant as described in the updated safety analysis report (USAR). Additionally, procedure 12 EHP 5040.MOD.006, "Design Change Packages", was modified to specify that field changes only applied to changes which could be made within the bounds of approved 10 CFR 50.59 SS/SEs. The team considered the licensee's corrective actions acceptable to preclude recurrence. This item was previously identified as Escalated Enforcement Item 50-315;316/98004-01, failure to perform a safety evaluation for re-drilling sump roof vent holes, and was originally discussed in section E1.1.1.2(E)(1) of Inspection Report 50-315/97201; 50-316/97201. This violation is closed.

E8.1.2 (Closed) Violation 50-315/98152-01292; 50-316/98152-01292: Inadequate safety evaluation review for containment recirculation sump inlet screen modification. During the implementation of a design change to the containment recirculation sump inlet grating, changes to the facility that had not been evaluated in accordance with 10 CFR 50.59 occurred. These changes included welding of the grating with fine mesh screening material sandwiched in between rather than using stainless steel fasteners (original design), and reducing the individual sump screen "section" size.

The team reviewed the licensee's corrective actions addressed in letter Number AEP: NRC: 1260GH, dated March 19, 1999. Corrective actions included the following: revision to procedure PMP 1040 to include a multi-discipline team review of shutdown risk assessments, and to ensure that outage schedules do not include high-risk evolutions, an evaluation for a dual-train Component Cooling Water (CCW) outage on

the refueling unit with the other unit at power was performed. The team concluded that the licensee's corrective actions were acceptable. This item was previously identified as EEI Item 50-315/98004-05; 50-316/98004-05. This item is closed.

E8.1.3 (Closed) Violation 50-315/98152-01312; 50-316/98152-01312: Unit 2 dual train CCW and Emergency Service Water (ESW) outage. During the Unit 2 full core off-load outage in 1996 and with Unit 1 at 100% power, both Unit 2 CCW and ESW trains were taken out-of-service on August 7 through 8, 1996, leaving one Unit 1 CCW train available to supply spent fuel pool (SFP) cooling. The 10 CFR 50.59 SEs performed for the core off-load did not recognize that the Unit 1 CCW system could not perform its safety function under the design basis assumptions described in the USAR.

The team reviewed the licensee's corrective actions addressed in letter Number AEP: NRC: 1260GH dated March 19, 1999. Corrective actions included the following: revision to procedure PMP. 1040, to include a multi-discipline team review of shutdown risk assessments, and to ensure that outage schedules do not include high-risk evolutions, an evaluation for a dual-train CCW outage on the refueling unit with the other unit at power was performed. The team concluded that the licensee's corrective actions were acceptable. This item was previously identified as EEI Item 50-315/98009-29; 50-316/98009-29. This item is closed.

E8.1.4 (Closed) EEI 50-315/98004-02(DRS)): An SE had not been performed for a missing nut on the Unit 1 containment recirculation sump screen support bracket. The licensee did not recognize that this was a change to the plant design. In addition, the existing 3/4 anchor was bent downward to permit installation of ½ inch bolts for fastening the screen into position. The licensee issued CR 98-0392 and an SE was performed. Procedure 227400-STG-2400-02 was revised to include guidance when a 10 CFR 50.59 screening was appropriate. A self-assessment was performed to review a sample of Action Requests (ARs) to determine if any changes should have required a 10 CFR 50.59 review. Training sessions for the SE program were provided. This item is closed.

E8.1.5 (Closed) EEI 50-315/98004-04(DRS); 50-316/98004-04(DRS)): An SE had not been performed to address a change in plant design for using stainless steel screening material to replace galvanized steel for the recirculation sump screens. The licensee's corrective actions included an SE for the new sump screen design. To enhance proper verification of the screen installation, procedure 12-MHP 4030.STP.008 was revised. This item is closed.

E8.1.6 (Closed) EEI 50-315/98004-11(DRS); 50-316/98004-11(DRS)): An SE had not been performed until April 1997 for a filter media micron size and composition change that was implemented in July 1996. An SS was performed for minor modification No.12 MM 078 to change the type of filters used in the Reactor Coolant System (RCS), seal water injection, and seal water return filters to allow the use of more than one micron size filter media. The SS evaluated filter media size ratings between 0.25 to 0.45 microns and answered "NO" to all of the screening questions. The licensee did not recognize that the change in filter media size was an implied change to the plant requiring a SE.

The licensee's corrective actions included writing CR 96-1672 and, in part, CR 98-0343 to address this issue. An SE was performed for the micron filter change. Self-

evaluations and assessments were performed to assess programmatic concerns with the 10 CFR 50.59 program. In addition, Procedure PMP 1040.SES.001 was revised to incorporate various administrative changes, assessment conclusions, and lessons learned in the SS and SE process. This item is closed.

V. Management Meetings

X1 Exit Meeting Summary

The team presented the inspection results to members of licensee management at the conclusion of the inspection on October 28, 1999. The licensee acknowledged the inspection conclusions presented and did not identify any potential report material as proprietary.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Casteel, Engineering 50.59 Coordinator
M. Finissi, Plant Engineering Director
D. Garner, Director Plant Engineer
R. Gaston, Compliance Manager
L. Gibson, NSAT (Contractor)
R. Godley, Director, Regulatory Affairs
S. Greenlee, Director Design Engineering
T. Noonan, Plant Manager
R. Powers, Senior Vice President
T. Quaka, Nuclear Safety Assessment
M. Rencheck, Vice President of Engineering
D. Richardson, NSAT (Contractor)
D. Robinson, NSAT Manager
T. Taylor, Licensing
K. VanDyne, Regulatory Compliance

US NRC

B. Bartlett, Senior Resident Inspector
J. Grobe, Director, Division of Reactor Safety
J. Jacobson, Chief, Mechanical Engineering Branch

INSPECTION PROCEDURES USED

IP 37001:	10 CFR 50.59 Safety Evaluation Program
IP 40500:	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 92903	Follow up-Engineering

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

50-315;316/98004-02	EEI	Failure to perform a safety evaluation screening
50-315;316/98004-04	EEI	Inadequate safety evaluation review for containment recirculation sump inlet screen modification
50-315;316/98004-11	EEI	Inadequate safety evaluation review
50-315;316/98152-01282 (50-315;316/98004-01)	VIO	Sump roof vent hole design basis.
50-315;316/98152-01312 (50-315;316/98009-29)	VIO	Unit 2 dual train CCW and ESW outage
50-315;316/98152-01292 (50-315;316/98004-05)	VIO	Inadequate safety evaluation review for containment recirculation sump inlet screen modification

Discussed

None

LIST OF ACRONYMS USED

AEP	American Electric Power
ARs	Action Requests
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CR	Condition Report
DCP	Design Change Package
DRS	Division of Reactor Safety
EEI	Escalated Enforcement Item
ESRR	Expanded Systems Readiness Review
ESW	Essential Service Water
FSAR	Final Safety Analysis Report
I&C	Instrumentation and Controls
NRC	Nuclear Regulatory Commission
NSAT	Nuclear Safety Assessment Team
PA	Performance Assurance
PMP	Plant managers procedure
PSG	Position Specific Guidance
RCS	Reactor Coolant System
SE	Safety Evaluation
SFP	Spent Fuel Pool
SS	Safety Screening
SRRB	System Readiness Review Board
UFSAR	Updated Final Safety Analysis Report
USQ	Unreviewed Safety Question
VIO	Violation

PARTIAL LIST OF DOCUMENTS REVIEWED

Condition Reports

CR No. P-99-01355 - "Unqualified Personnel Performing Safety Evaluations"
CR No. P-99-01500 - "No Safety Evaluations Performed"
CR No. P-99-09876 - "Safety Evaluation on Switchgear Design Modification Does Not Exist"
CR No. P-99-13955 - "Emergency Diesel Generator 2CD Fuses Replaced Without a 10 CFR 50.59 screening/evaluation".
CR No. P-99-15125 - "Solenoid was Replaced Without a Design Change"
CR No. P-99-18128 - "Removing Control Room Annunciators Without a Safety Evaluation".
CR 98-0345, "Effective Measures for Design Control Were Not Taken in the Case of the Recent Modifications to the Recirc Sump Screens and the Recirc Sump Vent Holes," dated January 28, 1998.
CR P-99-02343, "Operability Determination for CR-96-1496 Indicated RHR is Operable After Wrong Type of Vent Valve Was Installed Under DC-819 But No 50.59 Screening Was Done to Justify Valve Remaining In System," dated February 10, 1999.
CR P-99-06584, "A Number of Potential 10 CFR 50.59 Bypass Processes Exist," dated March 24, 1999.
CR P-99-07932, "Radiation Monitor Setpoint Calculation Process Is a Possible 10 CFR 50.59 Evaluation Bypass Candidate," dated April 8, 1999.
CR P-99-01630, "Evaluation per 10 CFR 50.59 Was Not Performed for Compensatory Measures Established for an Operable but Degraded Condition of Valve Leak-by in the CCW System," dated January 28, 1999.
CR P-99-10575, "A015696-2 Accepted Unqualified Coating As-Is Without 50.59," dated May 4, 1999.
CR P-99-01484, Control Room Doors Taken from Normally Open to Normally Closed via an E-mail, dated January 26, 1999.
CR P-99-10179 Safety Screening (1999-0361-00) for a Temporary Installation of Test Equipment on the 1CD Diesel Failed to Identify That a Full 10 CFR 50.59 Safety Evaluation was Required.
CR P-99-10364 Impact of Control Air Compressor Modification on the Diesel Generator Loading was not Included in the Safety Evaluation Portion of the 10 CFR 50.59 Determination.
CR P-99-10371 Safety Screen was Unsatisfactory for Not Identifying That Removal of Limit on Load Limit for the ATWS Mitigating System Actuation Circuitry was a Change to the Facility.
CR P-99-10376 Safety Evaluation was Unsatisfactory for Modification DCP-0855 Which Recommended That the UFSAR be Revised for Parameter Values for CCW Flow Because of the Increased Design Temperature From 95 to 120 Degrees Fahrenheit.
CR P-99-10378 The 10 CFR 50.59 Safety Evaluation for UFSAR Change 98 UFSAR-556.was Determined to be Unsatisfactory Based on NSAT Review of the UFSAR Change Package.
CR P-99-10644 Component Equivalency was written to Replace 12 DG Wattmeters. Safety Screening Indicated That a Change in Design Existed. Procedure 227200-STG-5400-01 Does Not Allow CE if Change in Design Results.
CR P-99-10720 NSAT Review Identified an Inadequate Safety Screening for a Procedure Change.
CR P-99-11317 Safety Screening and Safety Evaluation Questions Regarding Post LOCA Hot Leg Switch Over and Potential Recriticality Were Incomplete and/or Incorrect.

CR P-99-11481 The 10 CFR 50.59 Safety Evaluation for the UFSAR Change 98 UFSAR-0229 was Determined to be Unsatisfactory Based on a Recent NSAT Review of the UFSAR Change Package.
CR P-99-11487 The Safety Evaluation for the UFSAR Change 98 UFSAR-0286 was Determined to be Unsatisfactory Based on a Recent NSAT Review of the UFSAR Change Package.
CR P-99-11490 The 50.59 Safety Evaluation for the UFSAR Change 98 UFSAR-0514 was Determined to be Unsatisfactory Based on a Recent NSAT Review of the UFSAR Change Package.
CR P-99-11493 The 10 CFR 50.59 Safety Evaluation for the UFSAR Change98 UFSAR-0663 was Determined to be Unsatisfactory Based on a Recent NSAT Review of the UFSAR Change Package.
CR P-99-12833 Inadequate Safety Screening as a Result of an Incorrect Procedure Change for Reducing Batching Tank Boron Concentration.
CR P-99-12873 Safety Screening and Evaluation for 12 DCP-283, Which Added Two Compressed Air Bottles to the PORV Backup Air Supply, Failed to Change Technical Specifications and Assess NRC SERs, and Used Improper Calculational Methods/Assumptions.
CR P-99-14764 Safety Screening/Evaluation 1999-0408-00 for UCR 0219 and 0220 was Unsatisfactory in that it Failed to Identify a Related NRC SER as the Acceptance Basis for a UFSAR Change.
CR P-99-14780 SS#1999-0459-00 as Submitted to NSAT was Unsatisfactory in that it Failed to Consider a LER Related NRC Commitment and the Acceptance Criteria Established in the SBO SER.
CR P-99-16064 NSAT Identified an Inadequate Safety Screening/Evaluation Validation and Supporting Safety Evaluation For a Procedure Revision (02-OHP 4023.028.001, Revision 6).
CR P-99-16930 NSAT Identified an Inadequate Safety Screening/Evaluation and Questionable UFSAR Change (UCR 98-UFSAR-0156)
CR P-99-17406 NSAT Review of Safety Screening an UFSAR Change UCR No. 98-UFSAR-0334 Found Significant Issues of Non-compliance With the Safety Evaluation Procedure PMP-1040.SES.001.
CR P-99-17435 Safety Evaluation Concerning Charging Pump Head/Capacity Resulted in Inappropriate Change to the UFSAR.
CR P-99-18157 The Initial Review Conducted by NSAT Considered the Safety Screening of Changes to Procedure 12PMP 4050.CHL.001, Rev.0, do not Meet the Requirements of PMP 1040.SES.001, Revision 7 and the SS was deemed Unsatisfactory.
CR P-99-18579 Proposed UFSAR Change to Delete Letdown Line Flow Alarm is Insufficiently Justified in the Safety Screening and Evaluation.
CR P-99-18872 Valve Stroke Timing Changed Without Safety Screening Being Marked as Change to SAR and Change to the Facility.
CR P-99-18925 The Lack of Adequate Guidance in the New Configuration Determination Procedure May Have Resulted in a Bypass of the Design Change Process and the 10 CFR 50.59 Process.
CR P-99-19557 Safety Screening for Containment Purge and Exhaust Isolation System Operability Test, Block E.1 (Change to Facility), Should be Marked "Yes" and a Safety Evaluation Should Have Been Prepared.
CR P-99-19564 NSAT Identified an Inadequate Safety Screening for a Procedure Change (revision to PMP 2291.PMT.001).
CR P-99-19739 NSAT Identified an Inadequate Safety Screening That Did Not Identify That a Commitment Change Was Required.

CR P-99-19788 Review of Safety Screening for the Ice Condenser Procedure Change Found a Discrepancy Between the Technical Specifications and the UFSAR/Design Basis.
CR P-99-19987 During the Preparation of 10 CFR 50.59 Safety Screening/Evaluation for EOP, a USQ was Identified in the Safety Screening Without Performing a Full Safety Evaluation.
CR P-99-20711 Site Protection Planned to Replace the Security Access Metal Detectors in the North Security Access Building With Newer Models Without Apparently Following Existing CNP Processes for Configuration Control.
CR P-99-20984 During Preparation of Safety Evaluation, for Implementation of PTM 2-IHP 5040.EMP.001, the Loss of Power to 2S Spent Fuel Pool Pump Was Not Considered.
CR P-99-21531 The Current Method of Issuing Motor Operator Actuator Torque/Thrust Setpoints has a Bypass of the 10 CFR 50.59 Review Requirements.
CR P-99-21636 Bypasses of the Configuration Control/Design Processes are Occurring That Indicate an Apparent Adverse Trend.
CR P-99-22143 NSAT Identified an Inadequate Safety Screening/Safety Evaluation for Proposed UFSAR Changes Regarding Containment Hydrogen Analysis.
CR P-99-22685 The ESW and CCW Surveillance Requirements Currently Address Pump Flow and Valve Alignment Rather Than Heat Transfer Capability.
CR P-99-23593 License Amendment Request to Allow Credit for RCCA Negative Reactivity Following a Cold Leg LBLOCA Failed to Identity that Crediting RCCA reactivity Involved an Unreviewed Safety Question.

Procedures

2IHP5040.EMP.002, Revision 0, "Installation and Removal of Temporary Power to Required Loads on 600V Bus 2-21e"
2IHP4030.STP.509, Revision 1, "Residual Heat Removal Suction Valve Interlock Bistable Functional Test"
2IHP4030.SMP.206, Revision 2, "ΔT/Tavg Protection Set III Functional Test and Calibration"
2EHP4030.STP.259, Revision 0, "DG2AB Start & Load Rejections"
12MHP5021.019.003, Revision 0, "Essential Service Water Strainer Maintenance"
12 EHP 5040.MOD.006, "Design Change Packages," Revision 1a.
PMP-7300.UFSAR.001, "UFSAR Update Process," Revision 2.
PMP-7030.CAP.001, "Corrective Action Program (CAP) Process Flow," Revision 2.
PMI-7030, "Corrective Action Program," Revision 27.
PMP-7030.INV.001, "Root Cause Investigation And Approvals," Revision 4.
PMP-7030.INV.002, "Apparent Cause Evaluation And Condition Resolution," Revision 3.
PMP-1040.SES.001, "Safety Screenings/Evaluations," Revision 7a.
PMP-1040.SES,001, "Safety Screenings/Evaluations," Revision 4.
12 EHP 5043.EDC.001, "Evaluation of Discrepant Conditions," Revision 0.

Safety Evaluations

NSAT # 1999-0476-00 (2-DCP 604), "ABB 4 KV Circuit Breaker Refurbishment".
NSAT # 1999-0854-00 (UCR 99-UFSAR-0837), "Change Requirements in UFSAR Associated with Electrical Cable Tray Separation/Loading".
SE 1999-0401-00, "Compensatory Action for ODE-91-18-NESD-0034 Revision 1; Temporary Modification 12-99-0006," dated May 13, 1999

SE 1999-0044-00, "Procedure 12-OHP.4022.018.001, Revision 4, Change 1, Loss of Spent Fuel Pit Cooling," dated February 23, 1999
SE 1999-0339-00, "Procedure 1 EHP SP.103, Revision 0, U1 Control Room Tracer Gas Testing," dated April 19, 1999
SE 1999-0875-00, "Installation and Removal of Temporary Power to Required Loads on 600V Bus 2-21e," dated September 3, 1999
SS/SE#1999-0137-00 CCW Heat Exchanger (1HE-15W) Tube Plugging and Removal
SS/SE#1999-0456-00 Intake Tunnel Molluscide Treatment
SS/SE#1999-0467-00 Allow Non-Staggering of Reinforcing Steel Splices During Restoration of Steam Generator Enclosures for Unit 1 SGRP.
SE 1999-0701-00 Unit 1 Reactor Side Upender Winch Assembly Support Modification
SE 1999-0787-00 NESW Pump-Revise Impeller Material to Stainless Steel
SE 1999-0880-00 Replace CVCS Cross-Tie Valves
SE 1999-0131-00 EDG Starting Air Compressor Control Switch Replacement
SE 1999-0131-01 EDG Starting Air Compressor Control Switch Replacement
SE 1999-0869-00 Replacement of Diesel Generator Aftercoolers
SE 1999-0597-00 Replace Idler Wheel Assemblies on New and Spent Fuel Handling Crane
SE 1999-0597-01 Replace Idler Wheel Assemblies on New and Spent Fuel Handling Crane

Safety Screenings

NSAT # 1999-0107-00 "O1 MHP 2291. PMT.HFAICD, Rev. 2) "PMT for HFA Relay Contact Changes on U1 EDG Controls".
NSAT #1999-0188-00 (121 HP 6030-IMP.014 R08C16) "Protective Relay Calibration".
NSAT # 1999-0191-00 (121 HP 6030-IMP.355, Rev. 0, Change 3) "Check of 7.5 KVA Inverter Prior to Switching to Normal Source".
NSAT # 1999-0193-00 (ICP-00193) "Setpoint Change to 12-VTA-310 for the High Temperature Alarm".
NSAT # 1999-0209-00 (PMP-7030.OPR.001, Rev. 2, Change 1) "Operability Determination Procedure Changes".
NSAT # 1999-0218-00 (PMI-2070, Rev. 14, Change 0) "Training and Qualification Procedure".
NSAT # 1999-0235-00 (PMP-2070.600, Rev. 0, Change 0) "Training Administration and Qualification".
NSAT #1999 0277-00 (PMP 1040.SES.001, Rev. 6) "Safety Screenings/Evaluation Procedure Changes".
NSAT # 1999-0289-00 (12 IHP 6030.IMP 077, Rev. 0, Change 0) "Emergency Diesel Generator Watt Meter Calibration".
NSAT # 1999-0539-00 (1 IHP 4030.SMP 129, Rev. 0, Change 8) "Source Range Nuclear Instrumentation Functional Test and Calibration".
NSAT # 1999-0593-00 (ICP-00232, Rev. 0) "Setpoint Change for Differential Pressure Switch 2-LDA-155".
NSAT # 1999-0676-00 (12-DCP-316) "Supplemental AC Power System".
NSAT # 1999-0692-00 (PMI-2294, Rev. 0) "Post Maintenance Test Program".
NSAT # 1999-0755-00 (ICP-00237) "Instrument Change Package for 17-Ton CO2 Tank Pressure Switches".
NSAT # 1999-0833-00 (2 IHP 6030.IMP 247, Rev. 10) "Reactor Coolant System Wide Range Pressure Protection Set II Calibration (Cold Over Pressurization)".

NSAT # 1999-0927-00 (12 IHP 6030 IMP 073, Rev. 0, Change 2) "Time Delay Relay Calibration".
NSAT # 1999-01515-00 (2EHP SP.109, Rev. 0) "Post Maintenance Testing of HFA Relays on Unit 2 CD Diesel Generator Controls".
SS 1999-0641-00, "2IHP4030.STP.189, Revision 4, Change 3, Pressurizer Power Operated Relief Valve Cold Overpressurization Bistable Air Pressure System Functional Test," dated July 8, 1999.
SS 1999-0052-00, "12 THP 6020 CHM.110, Rev 4, Chg 2, RCS Chemistry - Shutdown/ Refueling," dated February 11, 1999.
SS 1999-0262-00, "12 EHP 4030 STP.308, Revision 2, Change 0, Boron Curve Update," dated March 27, 1999.
SS 1999-0259-00, "Editorial change to FSAR Section 5.3 (line item #97)," dated March 26, 1999.
SS 1999-0132-00, "(2 Docs) PRZ Relief Valve Testing & Plant Cooldown from Hot Standby to Cld. Shtdn.," dated February 26, 1999.
SS 1999-0604-00, "MHI 5080 - Control of Contractors, Revision 0," dated July 2, 1999.
SS 1999-0892-00, "Safety Classification Determination," dated August 30, 1999.
SS 1999-0811-00, "Revision 1 to 2IHP4030.STP.509, Residual Heat Removal Suction Valve Interlock Bistable Functional Test," dated August 11, 1999.
SS applicable to 2IHP4030.SMP.206, Revision 2, "ΔT/Tavg Protection Set III Functional Test and Calibration," dated January 14, 1999.
SS 1999-0695-00, "DG2AB Start & Load Rejections," dated July 28, 1999.
SS#1999-0161-02 Potential USQ Related to RHR Vibration Induced Piping Crack.
SS#1999-0165-00 Substitution of Loctite 262 for Loctite Stud-Locke.
SS#1999-0824-00 Removal of Power to the South Spent Fuel Pool Pump Due to Installation of Temporary Modification.
SS#1999-0580-01 Operation of Containment Supplemental Cooling Systems.
SS#1999-0067-00 Containment Spray Additive Tank.
SS#1999-0904-00 Emergency Diesel Fuel Oil.
SS#1999-0198-00 Manual Mechanical Tube Plug Installation and Removal Procedure.
SS#1999-0166-00 Valve Replacement for 1-WDS-701-v2.
SS#1999-0260-00 Plugging of Existing Holes into the Unit 1 Containment Rear Access Doors.
SS#1999-0087-00 Addition of Belleville Washers to Actuators.
SS#1999-0106-00 Instrument Tubing for Root Shutoff Valve.
SS#1999-0112-00 Control Air Malfunction.
SS#1999-0821-00 Diesel Jacket Cooling Water.
SS#1999-0789-01 Starting Large Rotating Plant Equipment.
SS#1999-0789-00 Starting Large Rotating Plant Equipment.
SS#1999-0723-00 Servicing EDG Heat Exchanger Thermal Bypass Valves.
SS#1999-0379-00 Plant Air Compressor Maintenance.
SS#1999-0867-00 Periodic Performance Test.
SS#1999-0492-00 Bill of Material Procedure.

Audits and Self Assessments

Audit PA 99-S08 10 CFR 50.59 Restart Action Plan, September 21, 1999
Self-Assessment 10 CFR 50.59 Program, September 30, 1999
Engineering Issues Review Group Report, December 19, 1998
Self-Assessment 10 CFR 50.59 Program, August 11, 1999
Self-Assessment SA-1999-002-NFG, Engineering Dept. 10 CFR 50.59 Products, May 19, 1999
Self-Evaluation, Operability and Evaluations Report NQPE-98-01
Self-Evaluation, 10 CFR 50.59 Screening and Safety Evaluations Report NQPE-97-06

50-315/316
3/17/2000
99-22

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

March 17, 2000

Mr. R. P. Powers
Senior Vice President
Nuclear Generation Group
American Electric Power Company
1 Cook Place
Bridgman, MI 49106

SUBJECT: D. C. COOK INSPECTION REPORT 50-315/99022(DRP); 50-316/99022(DRP)

Dear Mr. Powers:

This refers to the inspection conducted on January 14, 2000, through February 25, 2000, at the D. C. Cook Units 1 and 2 reactor facilities. The inspection was an examination of activities conducted under your license as they relate to compliance with the Commission rules and regulations and with the conditions of your license. Areas reviewed included Operations, Maintenance, Engineering, and Plant Support. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress. The inspectors also reviewed observations and findings as they related to the NRC Manual Chapter 0350 Case Specific Checklist for D. C. Cook. The enclosed report presents the results of that inspection.

During this inspection period, we noted that you continued to make progress towards completing activities required to support plant restart. For example, Unit 2 ice loading activities were nearing completion and testing activities on the emergency core cooling systems were in progress. Of particular importance, the inspectors observed that these critical activities were being conducted in a methodical, and conservative manner. We also observed portions of the residual heat removal system turnover to operations, and noted that the system managers and senior reactor operators were knowledgeable, appropriately communicated significant system issues, and were effectively implementing the process. Additionally, we concluded that your System Indexed Database System (SIDS) was appropriately being used to track and disposition potential restart related items. The inspectors reviewed a sample of SIDS items which were being deferred for post restart resolution, and determined these items were being adequately controlled, evaluated and documented by your staff.

The enclosed report also documents the closure of the following NRC Manual Chapter 0350 Guidelines for Restart Approval items: C.2.1.a: "Effectiveness of Quality Assurance Program," C.2.1.d: "Effectiveness of Deficiency Reporting System," C.3.1.a: "Demonstrated Commitment to Achieving Improved Performance Through the Results of the Programmatic Readiness Assessment (Staff)," C.3.2.a: "Demonstrated Commitment to Achieving Improved Performance

Through the Results of the Programmatic Readiness Assessment (Corporate Support)," and C.5.e: "Confirmatory Action Letter Conditions Have Been Satisfied." The NRC Manual Chapter 0350 panel determined that you had taken adequate corrective actions to address the above items.

However, we identified a number of equipment configuration control deficiencies during the inspection period. The specific circumstances relating to these issues are detailed in the enclosed inspection report. In some cases, we noted that there were adequate procedures in place to control equipment configuration; however, these procedural requirements were not followed. In other cases, plant procedures did not ensure that plant configurations were consistent with Final Safety Analysis Report or Technical Specification requirements. We noted that these configuration control deficiencies were often associated with operation during infrequently used equipment lineups or unusual plant conditions. Because of the current defueled plant condition, we concluded that these configuration control deficiencies had minimal safety significance. However, as the plant progresses through core reload and mode ascension, additional systems will be returned to service and required to be operable. These anticipated changes in system status will bring more complexity and greater safety significance to equipment configuration control issues.

Based on the results of this inspection, the NRC has determined that one violation of NRC requirements occurred involving the control of an auxiliary building pressure boundary door. This was considered a failure to meet the requirements of Technical Specification 6.8.1, "Procedures and Programs."

This violation is being treated as a Non-Cited Violation (NCV), consistent with Section VII.B.1.a of the Enforcement Policy. This NCV is described in the subject inspection report. If you contest the violation or severity level of this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to the Regional Administrator, Region III; and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if you choose to provide one, will be placed in the NRC Public Document Room.

Sincerely,

John A. Grobe, Director
Division of Reactor Safety

Docket Nos. 50-315; 50-316
License Nos. DPR-58; DPR-74

cc w/encl: A. C. Bakken III, Site Vice President
J. Pollock, Plant Manager
M. Rencheck, Vice President, Nuclear Engineering
R. Whale, Michigan Public Service Commission
Michigan Department of Environmental Quality
Emergency Management Division
MI Department of State Police
D. Lochbaum, Union of Concerned Scientists

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if you choose to provide one, will be placed in the NRC Public Document Room.

Sincerely,

/s/ J. Grobe

John A. Grobe, Director
Division of Reactor Safety

Docket Nos. 50-315; 50-316
License Nos. DPR-58; DPR-74

cc w/encl: A. C. Bakken III, Site Vice President
J. Pollock, Plant Manager
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REGION III

Docket Nos:	50-315; 50-316
License Nos:	DPR-58; DPR-74
Report No:	50-315/99022(DRP); 50-316/99022(DRP)
Licensee:	American Electric Power Company 1 Cook Place Bridgman, MI 49106
Facility:	D. C. Cook Nuclear Generating Plant
Location:	1 Cook Place Bridgman, MI 49106
Dates:	January 14, 2000, through February 25, 2000
Inspectors:	B. L. Bartlett, Senior Resident Inspector K. A. Coyne, Resident Inspector R. G. Krsek, Resident Inspector - Palisades J. D. Maynen, Resident Inspector
Approved by:	A. Vegel, Chief Reactor Projects Branch 6 Division of Reactor Projects

EXECUTIVE SUMMARY

D. C. Cook Units 1 and 2
NRC Inspection Report 50-315/99022(DRP); 50-316/99022(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

- During a routine plant tour, the inspectors identified that the licensee had inappropriately blocked open an auxiliary building pressure boundary door. The door serves as a barrier which is designed to mitigate the potential for an unfiltered release. The auxiliary building pressure door was blocked open to allow a drain hose to be routed through the door, but contrary to plant procedures, the blocked open door was not continuously monitored. The inspectors concluded that the licensee's failure to maintain configuration control of the auxiliary building pressure boundary in accordance with plant managers procedure PMP 4030.001.002 constituted a non-cited violation of TS 6.8.1. (Section O1.2)

- The inspectors identified that the licensee failed to maintain adequate configuration control over the manual operation of a motor operated recirculation sump isolation valve after a Type C containment leak rate test failure. Because the reactor was defueled at the time of the occurrence and containment integrity was not required, the failure to adequately implement configuration control procedural requirements was of minimal safety significance and constituted a minor violation. (Section O1.3)

- The operators responded appropriately to indications of air binding in the Non-Essential Service Water (NESW) system. However, during the recovery of plant air which followed the loss of NESW, the licensee identified that the operators installed a temporary bypass jumper around an air header isolation valve without performing the appropriate reviews as required by the licensee's temporary modifications procedure. A minor violation was identified. (Section O1.4)

- The inspectors identified that control power was not removed from the residual heat removal (RHR) suction motor operated valves to preclude the potential loss of RHR system flow, contrary to the Final Safety Analysis Report Section 9.3.2 requirements. The licensee had previously identified that the procedure controlling operation of the RHR suction valves did not provide adequate instructions to remove control power, but failed to take prompt corrective action for this deficiency. Because the reactor was defueled at the time of this event, this failure had minimal safety significance and constituted a minor violation. (Section O3.1)

- The inspectors reviewed a selection of items which were originally characterized as having to be completed prior to the Unit 2 restart and subsequently deferred to be completed post Unit 2 restart. The inspectors noted that, except for one minor discrepancy, the deferrals were adequately justified. The approved scope deferrals were reviewed and approved by a system manager, the outage scope management team, and a senior reactor operator. (Section O7.1)

Maintenance

- The licensee established an integrated team to oversee open vessel testing. (Open vessel testing was a series of tests designed to exercise infrequently used ECCS piping and determine injection flow balance.) The inspectors concluded that the licensee was conducting the open vessel testing of the Unit 2 ECCS in a methodical, conservative manner. (Section M1.1)

- The licensee revised a plan to install a temporary suction strainer on the Unit 2 East Centrifugal Charging Pump to allow the work control process to control the installation rather than a procedure. The inspectors determined that the licensee's revised plan would have bypassed the procedure's 10 CFR 50.59 safety evaluation for installation of the temporary strainer. Subsequently, the licensee took corrective actions to ensure that the installation of the strainer was evaluated through the 10 CFR 50.59 evaluation process. (Section M1.2)

- Engineering support to resolve known configuration control weaknesses in a spent fuel pool ventilation system surveillance procedure was weak. The inspectors identified that the procedure did not control or limit the operation of other interfacing ventilation systems. System engineering personnel knew about the weaknesses in the surveillance procedure, but action had not yet been taken to address these weaknesses. The inspectors also noted that engineering had not informed operations about the configuration control weaknesses. (Section M3.1)

Engineering

- Modification work of structural door restraints on maintenance access doors for the component cooling water pumps was performed in accordance with the plant procedures and the design change package. The modification reinforced three maintenance doors to ensure the postulated effects of a high energy line break would not adversely impact the Unit 2 component cooling water pumps. (Section M1.1)

- The inspectors determined that the system return to operations process effectively evaluated and resolved issues associated with the residual heat removal system. The system managers and senior reactor operators were knowledgeable, appropriately communicated significant systems issues, and were effectively implementing the process. (Section E2.2)

- The inspectors determined that the licensee's implementation of maintenance rule performance criteria for residual heat removal system shutdown cooling function were not comprehensive. The licensee documented this issue in their corrective action system for evaluation and resolution. (Section E2.2)

Report Details

Summary of Plant Status

Unit 1 remained defueled throughout the inspection period. The licensee continued work in support of the Unit 1 steam generator replacement project, including removal and installation of portions of the steam generators.

Unit 2 also remained defueled throughout the inspection period. The licensee continued to make progress on activities leading toward restart. For example, system turnover activities and open vessel testing of the emergency core cooling systems were in progress. Additionally, the licensee had nearly completed the loading of the Unit 2 ice condenser ice baskets by the end of the inspection period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments

The inspectors conducted frequent observations of control room activities and equipment operation during the extended outage of both reactor units. Overall, plant operations were performed using approved operating procedures and reflected good operating practices. Noteworthy observations and findings are detailed in the report sections which follow.

O1.2 Failure to Consider Ventilation Boundary Requirements Prior to Blocking Open an Auxiliary Building Pressure Boundary Door

a. Inspection Scope (71707, C.4.d)

During a routine plant tour on February 2, 2000, the inspectors observed auxiliary building pressure boundary door 1-DR-AUX-391 blocked open and unattended. Door 1-DR-AUX-391 was the primary access door to the auxiliary building from the turbine building and had been blocked open to allow a drain hose to be routed to the auxiliary building sump. The inspectors informed control room personnel and questioned the effect of the blocked door on auxiliary building ventilation.

The inspectors assessed the observations and findings developed during this review as they related to the Manual Chapter 0350, Guidelines for Restart Approval, Item C.4.d, "Adequacy of System Lineups."

b. Observations and Findings

Control room personnel determined that the door being blocked open affected the negative pressure requirements of Technical Specification (TS) 3.7.6.1, Engineered Safety Features Ventilation System. Because door 1-DR-AUX-391 was part of the auxiliary building pressure boundary, it was required by procedure to be attended at all times when blocked open. Additionally, door 1-DR-AUX-391 was a fire door and a High Energy Line Break (HELB) separation door and appropriate compensatory measures for

these functions had been implemented. Licensee personnel determined that when the door was blocked open the ventilation requirements were overlooked even though the door was labeled as a ventilation barrier. After the inspectors identified the blocked open door, the licensee wrote Condition Report (CR) 00-1987 to document the issue. The operators removed the drain hose running through the doorway and closed the door.

Technical Specification 6.8.1 requires, in part, that written procedures shall be established, implemented and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide (RG) 1.33, Revision 2, February 1978. Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Revision 2, February 1978, Appendix A, recommended, in part, that procedures be written to cover operation of auxiliary building ventilation. Plant Managers Procedure (PMP) 4030.001.002, Revision 1, "Administrative Requirements for Ventilation Boundary and High Energy Line Break Barriers," addressed the administrative requirements for blocking open ventilation boundary door 1-DR-AUX-391. Step 4.7 of PMP 4030.001.002, allowed an auxiliary building pressure boundary barrier to be blocked open provided that the open barrier was continuously monitored. Contrary to the above, on February 2, 2000, the inspectors identified there was inadequate configuration control in that auxiliary building pressure boundary barrier 1-DR-AUX-391 was blocked open and was not monitored as required by procedure. The inspectors determined that the failure to follow plant procedural requirements was a Violation of Technical Specification 6.8.1. This Severity Level IV violation is being treated as a Non-Cited Violation (NCV), consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as CR 00-1987 (NCV 50-315/316/99022-01).

The inspectors questioned licensee personnel as to whether the door being blocked open affected the TS 4.9.12.d.4 requirement to maintain the spent fuel pool area at a negative 1/8-inch water gauge pressure. The licensee was unable to demonstrate that the spent fuel pool area would be unaffected by the open auxiliary building door. The spent fuel pool area was observed to be at a negative pressure with respect to the outside atmosphere, but the absolute magnitude of the negative pressure was unknown. The action statement for TS 3.9.12 required, in part, that with the spent fuel pool ventilation system inoperable, movement of fuel with the spent fuel pool be suspended and crane operation of loads over the pool also be suspended. Although there was movement of steam generator heavy loads around the spent fuel pool during the time that the door was blocked open, no fuel movements were performed. The inspectors assessed the licensee's procedure for performing the TS surveillance test which verified the spent fuel pool area negative pressure requirements. This assessment is discussed in Section M3.1, below.

There was no TS requirement for the auxiliary building to be at a specific negative pressure. However, procedure PMP 4030.001.002 required that a blocked open pressure boundary door be immediately closed if air flow out of the auxiliary building was identified. The inspectors and the licensee determined that while the door was blocked open the auxiliary building was at a negative pressure with respect to the turbine building.

c. Conclusions

During a routine plant tour, the inspectors identified that the licensee had inappropriately blocked open an auxiliary building pressure boundary door. The auxiliary building pressure door was blocked open to allow a drain hose to be routed through the door, but contrary to plant procedures, the blocked open door was not continuously monitored. The inspectors concluded that the licensee's failure to maintain configuration control of the auxiliary building pressure boundary in accordance with procedure PMP 4030.001.002 constituted a non-cited violation of TS 6.8.1.

The inspectors assessed this event as it related to NRC Restart Action Plan 0350 Item C.4.d, "Adequacy of System Lineups." The inspectors noted that, although the licensee had failed to maintain adequate configuration control of an auxiliary building pressure boundary door, the safety significance of this event was minimal. The licensee's immediate corrective actions to address this issue were prompt and reasonable. In addition, a CR was initiated to document the issue and track and trend corrective actions.

O1.3 Failure to Maintain Adequate Configuration Control of Recirculation Sump Isolation Motor Operated Valve (Unit 2)

a. Inspection Scope (71707, C.4.d)

On January 24, 2000, 2-ICM-305, the "A" Train containment recirculation sump isolation motor operated valve failed an Appendix J, Type C local leak rate test. The licensee conducted an investigation and determined that the test failure was due to 2-ICM-305 not being closed with the motor operator prior to the start of the test. The inspectors assessed the circumstances surrounding this event. The inspectors also assessed the event as it related to NRC Restart Action Plan 0350 Item C.4.d, "Adequacy of System Lineups."

b. Observations and Findings

Type C testing of 2-ICM-305 was performed in accordance with 2-Engineering Head Procedure (EHP) Surveillance Test Procedure (STP).203, "Type B and C Leak Rate Test." The test valve lineup in 2-EHP STP.203 required 2-ICM-305 to be initially opened to drain the sump suction piping and then shut using the motor operator prior to the test. Because the sump suction had been drained prior to performance of the test, the test engineer modified this valve lineup as allowed by Step 4.21 of the test procedure. Consequently, the test engineer did not require 2-ICM-305 to be opened and shut using the motor operator, but instead verified that 2-ICM-305 was closed using control board valve position indication lights.

Prior to the start of the Type C test on January 24, 2000, 2-ICM-305 was manually operated in the shut direction to facilitate removal of the valve enclosure. Although the intent of this manual operation was not to close and seat the valve, the valve operation was sufficient to close the valve position shut limit switch and illuminate the control room shut indication for 2-ICM-305. Because 2-ICM-305 was not fully seated using the normal motor operator, the measured leak rate during the subsequent type C test was approximately 21,000 standard cubic centimeters per minute (sccm). Although this leak rate was above the acceptance criteria of 2,700 sccm, the total combined leak rate for

type B and C tested penetrations remained less than 60 percent of the maximum allowable leak rate specified in TS 3.6.1.2, "Containment Leakage." At the time the test was performed, primary containment integrity was not required. The licensee initiated CR 00-1331 and Action Request (AR) A196964 to document the test failure. The licensee concluded that the test failure was due to 2-ICM-305 not being fully shut by the prior manual operation. Operations personnel subsequently shut 2-ICM-305 using the motor operator and satisfactorily retested the valve on January 28, 2000.

Procedure PMP 4043.APC.001, "Abnormal Position Control," Revision 0, Step 3.1.8 required, in part, that all components placed in an abnormal position be caution tagged to maintain configuration control. Similarly, PMP 4043.VLU.001, "Valve Lineups and Position Control," Revision 0, stated that "if a motor operated valve is placed on the backseat, or is manually operated, then PMP 4043.APC.001, Abnormal Position Control, requires that a caution tag is placed on the valve control switch denoting that an operability concern may exist. Contrary to these requirements, a caution tag was not placed on 2-ICM-305 following its manual operation and therefore adequate configuration control of the valve position was not maintained. On February 17, 2000, the licensee initiated CR 00-2858 to document the failure to maintain adequate configuration control of 2-ICM-305. Because manual operation of motor operated valves could degrade either their seat leak tightness or the ability of the motor operator to move the valve, adequate configuration control of these valves is required to ensure that operability concerns are identified and evaluated. In this case, because the reactor was defueled, containment integrity was not required, and the valve was subsequently retested satisfactorily, the safety significance associated with the failure to maintain configuration control over 2-ICM-305 was minimal. Consequently, this failure constituted a violation of minor significance and is not subject to formal enforcement action.

c. Conclusions

The inspectors identified that the licensee failed to maintain adequate configuration control over the manual operation of a motor operated recirculation sump isolation valve after a Type C containment leak rate test failure. Because the reactor was defueled at the time of the occurrence and containment integrity was not required, the failure to adequately implement configuration control procedural requirements was of minimal safety significance and constituted a minor violation.

The inspectors assessed this event as it related to NRC Restart Action Plan 0350 Item C.4.d, "Adequacy of System Lineups." The inspectors noted that, although the licensee had failed to maintain adequate configuration control of a motor operated valve, the safety significance of the event was minimal. Licensee immediate corrective actions to address this issue were prompt and reasonable. In addition, a CR was initiated to document the issue, and to track and trend corrective actions.

O1.4 Installation of Unauthorized Temporary Modification After Loss of All Non-Essential Service Water

a. Inspection Scope (71707)

On January 21, 2000, operations personnel shut down the Unit 1 circulating water system due to weather conditions conducive to the formation of frazil ice. On

January 23, 2000, shortly after re-establishing circulating water flow, the Unit 1 North Non-Essential Service Water (NESW) pump became air bound. The inspectors followed the licensee's response to this event.

b. Observations and Findings

b.1 Loss of NESW

On January 21, 2000, as part of the circulating water shutdown procedure, the NESW pump suction supply was swapped from the normal supply to the to the alternate supply. The Unit 1 NESW pump was supplying flow for both units. On January 23, 2000, the licensee started a circulating water pump and throttled the circulating water flow to establish the desired discharge pressure of 9 psig. About 41 minutes after starting the circulating water pump, the Unit 1 north NESW pump discharge pressure and motor amps decreased, indicating air binding of the pump suction. Shortly after that, the Unit 1 south NESW pump automatically started on low header pressure and displayed the same symptoms of air binding. The operators manually shut off both pumps. Due to the loss of NESW cooling, the operators also stopped all of the operating air compressors. Fifteen minutes after stopping NESW, the operators returned the NESW suction lineup to the normal supply and restarted the Unit 1 north NESW pump. The operators verified that NESW flow and pressure were restored and started the Unit 1 plant air compressor and both units' control air compressors. The Unit 2 plant air compressor was not started due to low lubricating oil temperature.

The licensee established a rapid event response team to evaluate the cause of the loss of NESW. The licensee's team concluded that air, which was released out of solution downstream of the circulating water throttling valve, was entrained in the NESW alternate suction line. The licensee's team also identified that the corrective actions for an earlier air binding event in 1999 were not fully effective. Following the 1999 event, 01-Operating Head Procedure (OHP) 4021.057.001, "Circulating Water System Operation," was revised to include a note which stated, "It is preferred to shift NESW suction to the intake tunnel after Circulating Water is placed in service to prevent air entrainment into the NESW header." The licensee's team concluded that the placement and wording of the note were not effective in preventing the second air binding event. Condition Report 00-1269 was written to document this event.

On February 11, 2000, the licensee issued a revision to 01-OHP 4021.057.001 which strengthened the wording of the note and emphasized the time sensitivity of shifting the NESW suction supply after circulating water was started. The inspectors reviewed the rapid event response team findings and corrective actions and determined that the actions appeared appropriate to prevent recurrence.

b.2 Installation of Plant Air Header Bypass Jumper

On January 23, 2000, as a result of the loss of NESW, the operators stopped the Unit 1 plant and control air compressors. Due to lowering plant air pressure, the plant air crosstie valves, 2-PRV-20 and 2-PRV-21 automatically closed. These valves were intended to isolate the Unit 1 plant air header from the Unit 2 plant air header in the event of a rupture in one unit's plant air system. After NESW flow was restored, the operators started the Unit 1 plant air compressor and both units' control air compressors. The operators restored the Unit 2 plant air pressure by installing a bypass

jumper around plant air crosstie valve 2-PRV-20 and slowly bleeding air from the Unit 1 plant air header. After both air headers were equalized in pressure, the bypass jumper was removed.

After the recovery of NESW, operations personnel reviewed the control room logs and wrote CR 00-1275 to document that the installation of the bypass jumper represented an unauthorized temporary modification. Final Safety Analysis Report (FSAR) Section 9.8.2, "Compressed Air Systems," documented that the function of the air-operated isolation valves was, in part, to completely isolate either unit's plant air system. Procedure EHP 5040.MOD.001, "Temporary Modifications," provided guidance for making changes to the plant which could affect equipment function as described in the FSAR. Contrary to the above, the licensee identified that the operators had failed to follow EHP 5040.MOD.001 when installing the bypass jumper to equalize plant air header pressure between the units. The bypass jumper prevented the automatic isolation of the plant air headers while it was installed. Because both reactors were defueled, there was minimal safety significance associated with the inability to isolate the plant air headers. Consequently, the inspectors determined that the failure to follow EHP 5040.MOD.001 to install the bypass jumper constituted a violation of minor significance and is not subject to formal enforcement action.

c. Conclusions

The operators responded appropriately to indications of air binding in the Non-Essential Service Water (NESW) system. However, during the recovery of plant air which followed the loss of NESW, the licensee identified that the operators installed a temporary bypass jumper around an air header isolation valve without performing the appropriate reviews as required by the licensee's temporary modifications procedure. A minor violation was identified.

O3 Operations Procedures and Documentation

O3.1 Inadequate Corrective Action for Identified Procedure Deficiency Results in Violation of FSAR Requirements (Unit 2)

a. Inspection Scope (71707, C.2.1.d, C.4.d)

On February 14, 2000, the inspectors identified that control power was supplied to the residual heat removal system (RHR) hot leg suction valves contrary to FSAR requirements. The inspectors assessed the circumstances surrounding this event. The inspectors also assessed the event as it related to NRC Restart Action Plan 0350 Item C.2.1.d, "Effectiveness of Deficiency Reporting System," and C.4.d, "Adequacy of System Lineups."

b. Observations and Findings

On February 3, 2000, plant operators began restoration from Reactor Coolant System (RCS) draindown in accordance with Procedure 02-OHP 4021.002.012, "Restoration from RCS Draindown," Revision 1. The objective of this procedure was to fill the RCS and reactor cavity with the core offloaded and to align the RHR system for shutdown cooling. On February 5, 2000, with RCS restoration from draindown still in progress, a member of the licensee's plant engineering testing group identified that

Procedure 02-OHP 4021.002.012 conflicted with the FSAR and initiated CR 00-2149. Specifically, FSAR Section 9.3.2 stated that when the RCS was open to atmosphere, power to both RHR motor operated suction isolation valves (IMO-128 and ICM-129) would be locked out to preclude inadvertent closure of the valves. Spurious closure of either of the RHR suction valves could result in a loss of net positive suction head to an operating RHR pump and subsequent loss of RHR system flow. Condition Report 00-2149 identified that Step 4.20 of 02-OHP 4021.002.012, which aligned RHR system suction from the refueling water storage tank to the loop 2 hot leg, did not provide procedure steps to control the connection and disconnection of power to the RHR suction valve motor operators.

The shift technical advisor (STA) conducted an operations review of CR 00-2149 on February 5, 2000, but failed to recognize that an RHR pump would be in operation during performance of Step 4.20. Consequently, the STA incorrectly concluded that the procedure complied with FSAR requirements and the identified deficiencies in Procedure 02-OHP 4021.002.012 were not promptly corrected. On February 6, 2000, plant operators aligned the RHR suction to the loop 2 hot leg in accordance with Procedure 02-OHP 4021.002.012 Step 4.20. The procedure did not provide specific steps to disconnect control power from these suction valves, and the operators failed to lock out control power to 2-IMO-128 and 2-ICM-129. Following completion of Procedure 02-OHP 4021.002.012 on February 7, 2000, operations personnel transitioned the control of RHR system operation to the normal RHR system operation Procedure 02-OHP 4021.017.001, "Operation of the Residual Heat Removal System." The inspectors reviewed the RHR normal operating Procedure 02-OHP 4021.017.001, and determined that the procedure lacked steps that would have removed control power from the RHR suction valves prior to core reload. Procedural steps for the connection, disconnection, and lock out of control power to 2-IMO-128 and 2-ICM-129 were contained in Procedure 02-OHP 4021.017.002, "Placing in Service the Residual Heat Removal System," which addresses startup of the RHR system during RCS cooldown from Mode 4 (T_{avg} between 200°F and 350°F).

10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," stated, in part, that measures shall be established that conditions adverse to quality are promptly identified and corrected. Contrary to this requirement, the procedural deficiencies identified in CR 00-2149 were not promptly corrected prior to operations personnel performing the affected procedure steps. Because the reactor was defueled at the time of this occurrence, the safety significance of this event was minimal. Therefore, this failure constituted a violation of minor significance and is not subject to formal enforcement action.

After the inspectors questioned the failure to lock out control power to 2-IMO-128 and 2-ICM-129, the licensee removed and locked out control power to the valves and initiated CR 00-2708. Condition Report 00-2708 also identified several other procedures that required revision to appropriately address the lock out of control power to 2-IMO-128 and 2-ICM-129. Procedure 02-OHP 4021.002.012 was placed in administrative hold pending resolution of the discrepancy between the procedure and FSAR requirements. Additionally, the operations department evaluation of CR 00-2149 was reopened for further review.

c. Conclusions

The inspectors identified that control power was not removed from the residual heat removal (RHR) suction motor operated valves to preclude the potential loss of RHR system flow, contrary to the Final Safety Analysis Report Section 9.3.2 requirements. The licensee had previously identified that the procedure controlling operation of the RHR suction valves did not provide adequate instructions to remove control power, but failed to take prompt corrective action for this deficiency. Because the reactor was defueled at the time of this event, this failure had minimal safety significance and constituted a minor violation.

The inspectors assessed this event as it related to NRC Restart Action Plan 0350 Item C.2.1.d, "Effectiveness of Deficiency Reporting System," and C.4.d, "Adequacy of System Lineups." Although the safety significance of the failure to comply with FSAR requirements was minimal, the licensee failed to take prompt corrective action for an identified procedural deficiency associated with control of system configuration.

O7 Quality Assurance in Operations

O7.1 Deferral of Restart Activities (Unit 2)

a. Inspection Scope (61726, C.4.e, C.4.i)

The System Indexed Database System (SIDS) was used by the licensee to track issues that potentially needed to be addressed prior to restart, including issues identified by the Expanded System Readiness Reviews. The inspectors reviewed items in the program originally designated as required for Unit 2 restart and subsequently deferred as items allowed to be completed after the Unit 2 restart. Attachment 11 to Plant Manager's Procedure (PMP) 7200.RST.004, "Expanded System Readiness Review Program," Revision 10b, provided criteria and instructions for removing a SIDS open item from the restart work scope. The inspection consisted of a review of applicable documentation for deferred items and interviews with appropriate licensee personnel. Additionally, the inspectors reviewed the deferred items as they related to NRC Restart Action Plan 0350 Items C.4.e, "Adequacy of Surveillance Tests and Test Program," and C.4.i, "Maintenance Backlog Managed and Impact on Operations Assessed."

b. Observations and Findings

The inspectors reviewed the PMP 7200.RST.004 Attachment 11 forms for approximately 100 SIDS items out of a total population of approximately 2000 SIDS items which had been deferred. An additional 40 SIDS items were sampled as part of the Residual Heat Removal system turnover review documented in Section E2.2 below. The inspectors noted that the Attachment 11 forms for the deferred item in both samples were completed in accordance with the procedure and reviewed by the appropriate personnel.

During the review, the inspectors identified one Attachment 11 form (tracking number 000107002) which included both preventive maintenance (PM) activities and Technical Specification (TS) surveillances. The justification for the deferral documented on the Attachment 11 stated that, "These items have PM frequencies of 1R and 2R and the Unit has not been in service since the last calibration. Based on this, the frequency

has been met and the PM activities are not needed at this time." The inspectors reviewed the activities from Attachment 11 number 000107002 in the licensee's database system and noted that the deferred activities all had required periodicities of 1R or 2R. For a preventive maintenance item, the licensee identified a periodicity of 1R as once per refueling outage. However, for a TS surveillance, the Technical Specifications defined "R" as once per 549 days.

The inspectors discussed this issue with the system manager who verified that some of the deferred activities were TS required surveillances. The system manager also confirmed that some of the deferred TS surveillances were required to be completed prior to restart, contrary to the approved scope change of the Attachment 11. The system manager recognized "R" as an event-based refueling frequency rather than a period of time defined by the Technical Specifications. In addition, the action requests and job orders on the Attachment 11 were interpreted by the system manager to be PM activities rather than as TS surveillances. The system manager wrote (CR) 00-2065 to document the discrepancies in interpretation between PM activities and TS surveillances.

The inspectors also discussed the issue of deferred TS surveillances with the licensee's work control surveillance group supervisor. The surveillance group supervisor stated that the surveillance group had begun its own investigation into deferred TS surveillances and had previously written CR 00-2114 to document their findings. Condition Report 00-2114 documented seven inappropriately deferred TS surveillances. The surveillance group supervisor stated that the group's review of deferred items was ongoing and that they had identified approximately 12 additional TS surveillances which were inappropriately deferred in the SIDS to be completed after Unit 2 restart. In addition, the surveillance group supervisor noted that TS surveillance due date requirements were tracked using the Surveillance Requirements Database (SRDB) which was independent of SIDS. The SRDB identified all TS surveillance requirements due in the current mode and all TS surveillances which were required prior to entering a new mode. The inspectors verified that the deferred TS surveillances were scheduled to be completed in the SRDB; therefore, the inspectors concluded that the deferred TS surveillances would have been properly scheduled.

The inspectors reviewed the deferred items as they related to NRC 0350 Case Specific Checklist Items C.4.e, "Adequacy of Surveillance Tests and Test Program," and C.4.i, "Maintenance Backlog Managed and Impact on Operations Assessed." The inspectors determined that the licensee's efforts to review SIDS items and defer item until after the Unit 2 restart were consistent with managing the backlog. In addition, the work control surveillance group's review of the deferred items demonstrated that the licensee's surveillance test program was ensuring that TS surveillance requirements would be properly scheduled.

c. Conclusions

The inspectors reviewed a selection of items which were originally characterized as having to be completed prior to the Unit 2 restart and subsequently deferred to be completed post Unit 2 restart. The inspectors noted that, except for one minor discrepancy, the deferrals were adequately justified. The approved scope deferrals were reviewed and approved by a system manager, the outage scope management team, and a senior reactor operator.

The minor discrepancy identified by the inspectors involved an inappropriate deferral for several TS surveillances. The inspectors concluded that the TS surveillances would have been properly scheduled because the licensee's work control surveillance group maintained an independent Surveillance Requirements Database which was used to schedule TS surveillances.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (62707)

The inspectors observed all or portions of the following maintenance activities and reviewed associated documentation:

- 02-EHP 4030.STP.203.001, "Unit 2 ECCS [Emergency Core Cooling System] Flow Balance - Boron Injection System," Revision 0.
- 02-EHP 4030.STP.208.001, "ECCS Flow Balance - Safety Injection System," Revision 0.
- Job Order (JO) C45952, Unit 2 ice basket filling and loading
- JO C53940, Fabricate material for Design Change Package DCP-4258
- JO R36402, Perform motor operated valve preventive maintenance on 2-ICM-251

The inspectors assessed the observations and findings developed during this review as they related to the Manual Chapter 0350, Guidelines for Restart Approval, Item C.1.2.e, "Corrective Actions Include Restoring Systems and Equipment to Service," C.4.a, "Operability of TS systems," and C.4.f, "Significant Hardware Issues Resolved."

b.1 Open Vessel Testing

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. Work items were appropriately scheduled in the plan of the day. Noteworthy observations and findings are detailed below and in the report sections which follow.

On February 1, 2000, the licensee began open vessel testing on Unit 2. Open vessel testing consisted of a series of tests on the emergency core cooling systems (ECCS) which were conducted with the reactor vessel head removed. The tests were designed to determine the performance characteristics of the ECCS pumps, establish flow balances for safety injection, and exercise portions of the systems which were not routinely tested. The inspectors observed portions of the open vessel testing, attended test meetings, and discussed the testing with licensee personnel. The inspectors noted

that the licensee had formed an integrated open vessel testing oversight team which included members from all of the involved departments. The team met frequently to discuss the open vessel testing schedule, issues, and problems. The inspectors observed that several of the ECCS pump performance and flow balancing tests were repeated after the oversight team reviewed the initial data and questioned the accuracy of the test results. Additionally, the inspectors noted that the licensee's Performance Assurance department was providing oversight of open vessel testing.

b.2 Installation of High Energy Line Break Modification

The licensee documented in CR 98-2383, CR 99-9572, and CR 99-9815 that requirements to protect safe shutdown equipment from the effects of an assumed design basis break in high energy lines were not being met. In Unit 2, two main steam lines and one main feedwater line are routed near the CCW pumps. The high energy lines are separated from the CCW pumps by a substantial concrete wall; however, there were three maintenance access doors penetrating the wall. The licensee could not find calculations or analysis that ensured the doors could withstand the effects of a postulated HELB.

Design change package (DCP) 2-DCP-4258 was issued on January 17, 2000, to modify the doors to withstand the loading from a postulated HELB in the vicinity of the doors. The field implementation of the DCP was performed under Action Request (AR) A194572 and Job Orders (JO) C53940, C53942, and C53943. The inspectors reviewed the DCP, ARs, and JOs, and observe a portion of the field installation of DCP-4258. The DCP installed quarter inch steel plate over the doors and straps to hold the doors in place.

The inspectors determined that the work was performed in accordance with procedures and required concrete drilling and welding permits were obtained prior to any field work being performed. When reinforcing bars were encountered during the concrete drilling, the workers requested the appropriate documentation prior to performing additional drilling.

c. Conclusions

The licensee established an integrated team to oversee open vessel testing. Open vessel testing was a series of tests designed to exercise infrequently used ECCS piping and determine injection flow balance. The inspectors concluded that the licensee was conducting the open vessel testing of the Unit 2 ECCS in a methodical, conservative manner.

The inspectors performed routine assessment of design change package 4258, structural door restraints. The modification reinforced three maintenance doors to ensure the postulated effects of a high energy line break would not adversely impact the Unit 2 component cooling water pumps. The work was performed in accordance with the plant procedures and the design change package.

M1.2. Potential 10 CFR 50.59 Bypass For Temporary Strainer Installation (Unit 2)

a. Inspection Scope (62707)

On February 22, 2000, the inspectors attended a daily licensee meeting regarding the status of open vessel testing. One of the items discussed was a change to the licensee's plan to install a temporary suction strainer on the Unit 2 East ("A" Train) Centrifugal Charging Pump (CCP). The original plan was to install the strainer as directed by the recirculation leakage test procedure, but the revised plan appeared to use the work control process to control the installation. The licensee's revised plan to use the work control process to control the strainer installation in lieu of a procedure appeared to bypass the 10 CFR 50.59 safety evaluation which had been completed for the procedure. The inspectors interviewed licensee personnel and reviewed the licensee's procedures regarding temporary modifications.

b. Observations and Findings

The licensee planned to install a suction strainer on the Unit 2 East CCP to support the performance of procedure 2 EHP SP.126, "ECCS [Emergency Core Cooling System] Recirculation Leakage Test." The recirculation leakage test was being performed, in part, to establish flow through portions of ECCS piping which had not been tested since initial plant construction. The Unit 2 east CCP suction strainer was being installed to protect the CCP from foreign material which might have been present in the ECCS piping. Once the test was complete, the licensee planned to remove the strainer and restore the charging system to its design configuration.

The licensee had originally planned to control the CCP strainer installation and removal as part of the recirculation test procedure, and the recirculation test procedure had received appropriate reviews and a safety screening to ensure that the installation of the strainer would be acceptable. However, Operations had delayed implementing the recirculation test procedure in order to incorporate comments which were received after practicing the test on the simulator. As a result, the licensee planned to install the Unit 2 east CCP suction strainer and issue a shift manager's clearance to prevent the use of the Unit 2 east charging train until the recirculation test procedure changes were approved.

The inspectors questioned the use of the work control process to control the installation of the suction strainer. In the licensee's original plan, the Unit 2 east CCP suction strainer was to be installed as directed by a procedure which had received a safety evaluation in accordance with 10 CFR 50.59. The licensee's revised plan to use the work control process to control the strainer installation in lieu of the recirculation test procedure appeared to bypass the 10 CFR 50.59 safety evaluation which had been completed for the test procedure. The inspectors discussed this question with several attendees of the status meeting. The licensee personnel believed that, in accordance with Section 3.5.3 of EHP 5040.MOD.001, "Temporary Modifications," the strainer installation could be considered a "temporary condition" and the clearance permit system and work control process provided adequate control over the strainer installation. The licensee stated that system control would be maintained by not allowing the clearance tags to be removed until the step in the recirculation test procedure was reached which placed the strainer in service.

Procedure EHP 5040.MOD.001defined a "temporary condition" as, "an alteration to a structure, system, or component that is to remain out of service or be declared inoperable while maintenance is in progress. The inspectors determined that the definition of "temporary condition" applied to maintenance activities, not test activities; therefore, the strainer installation required a 10 CFR 50.59 safety evaluation. The inspectors noted that, because Unit 2 was defueled and the Unit 2 charging system was not required to be operable, the installation of the temporary suction strainer without a 10 CFR 50.59 safety evaluation would have been of negligible safety significance. After discussing the issue with the inspectors, the licensee changed the plan to install the temporary strainer to ensure that a 10 CFR 50.59 safety evaluation was completed prior to the installation.

c. Conclusions

The licensee revised a plan to install a temporary suction strainer on the Unit 2 East Centrifugal Charging Pump to allow the work control process to control the installation rather than a procedure. The inspectors concluded that the licensee's revised plan would have bypassed the procedure's 10 CFR 50.59 safety evaluation for installation of the temporary strainer. Subsequently, the licensee took corrective actions to ensure that the installation of the strainer was evaluated through the 10 CFR 50.59 evaluation process.

M3 Maintenance Procedures and Documentation

M3.1 Weak Configuration Control During TS Surveillance Test

a. Inspection Scope (61726)

In Section O1.2, above the inspectors discussed the follow-up to finding door 1-DR-AUX-391 blocked open. The inspectors performed additional follow-up on the licensee's procedure which verified compliance with TS surveillance requirement 4.9.12.d.4. Technical Specification surveillance 4.9.12.d.4 required that the spent fuel pool area be maintained at 1/8 inch water gauge negative pressure with respect to the outside atmosphere whenever the spent fuel pool ventilation was in operation. The inspectors evaluated the adequacy of configuration controls of the surveillance test boundary.

The inspectors assessed the observations and findings developed during this review as they related to the Manual Chapter 0350, Guidelines for Restart Approval, Item C.4.a, "Operability of TS Systems" and Item C.4.e, "Adequacy of Surveillance Tests/Test Program."

b. Observations and Findings

The inspectors reviewed 12-EHP 4030.STP.230, "Spent Fuel Storage Pool Exhaust Ventilation Tests," Revision 0, to evaluate the adequacy of the test boundary configuration controls. The inspectors determined that the surveillance procedure controlled the position of pressure boundary doors in the immediate vicinity of the spent fuel pool, but the procedure did not control the position of other auxiliary building pressure boundary doors. In addition, the inspectors determined that the surveillance procedure did not control or limit the operation of other interfacing and potentially

interfacing ventilation systems. After questioning system engineering personnel about the above configuration control weaknesses, the inspectors determined that the licensee's engineering department knew about the above weaknesses; however, plans to evaluate the effect of the positions of the auxiliary building pressure doors on the spent fuel pool ventilation were not being implemented.

Some of the auxiliary building pressure boundary doors that could affect the spent fuel pool area were several floors below the spent fuel pool area and were only open to the spent fuel pool area through three stairwells. The licensee believed that the effect these doors would have on the auxiliary building pressure boundary would be minimal. The inspectors requested the results of any tests or analyses which verified that the auxiliary building pressure boundary doors and interfacing ventilation systems would not adversely impact the TS 4.9.12.d.4 requirement. The licensee informed the inspectors that the requested information was not available and wrote CR 00-2032 to document the potential impact of the surveillance configuration control weaknesses on the spent fuel pool ventilation TS requirement. Due to both reactors being defueled, no fuel movement in progress, and no heavy loads moved over the spent fuel pool, the inspectors determined that the licensee had complied with the action statement requirements of TS 3.9.12.

The inspectors verified that the licensee's corrective actions to install and maintain configuration control of the auxiliary building pressure boundary doors and interfacing systems were scheduled to be implemented in a timely fashion. However, the inspectors noted that engineering support to resolve known configuration control weaknesses in a surveillance procedure was weak. Until the inspectors questioned system engineering, operations personnel had not been informed of the potential operability questions resulting from the configuration control weaknesses of the surveillance procedure.

c. Conclusions

Engineering support to resolve known configuration control weaknesses in a spent fuel pool ventilation system surveillance procedure was weak. The inspectors identified that the procedure did not control or limit the operation of other interfacing ventilation systems. System engineering personnel knew about the weaknesses in the surveillance procedure, but action had not yet been taken to address these weaknesses. The inspectors also noted that engineering had not informed operations about the configuration control weaknesses.

III. Engineering

E2 Engineering Support of Facilities and Equipment

E2.1 Cross Unit Dependancies of Control Room Ventilation Systems

a. Inspection Scope

On February 16, 2000, the inspectors questioned the impact of Unit 2 restart on Unit 1 control room habitability. The inspectors discussed this issue with systems engineering and operations personnel.

b. Observations and Findings

During the Expanded System Readiness Reviews (ESRR) performed in 1999, the licensee had determined there was a need to:

- Install redundant normal (in series) air intake isolation dampers to resolve single failure issues;
- Install redundant emergency (in parallel) air intake dampers to resolve single failure issues;
- Eliminate minor leakage paths;
- Perform other minor modifications and TS revisions to resolve control room ventilation questions.

The performance of the modifications ensured that the control room envelopes would remain habitable following a postulated design basis accident.

The licensee had scheduled the completion of the Unit 2 modifications to be completed prior to the reloading of fuel into the reactor vessel (Mode 6). In response to the inspectors questions, system engineering personnel stated that the modifications to the separate Unit 1 control room envelope would not be completed prior to Unit 2's entry into Mode 6 but would be completed prior to Unit 1's entry into Mode 6. The inspectors questioned the system engineering personnel as to the controls that would be in place during the time frame following Unit 2's entry into Mode 6 and until the modifications to Unit 1 were completed.

System engineering personnel stated that administrative controls were not planned because radiation protection personnel would perform surveys and inform the Unit 1 control room operators if there was a need to evacuate the control room. System engineering personnel stated because there was no fuel in the Unit 1 reactor vessel there was no TS requirement to maintain operators in the Unit 1 control room and this planned action was appropriate.

The inspectors determined that in the event of a postulated accident in Unit 2, dose rates in the unmodified Unit 1 control room envelope could be expected to exceed regulatory requirements (depending upon the accident and environmental conditions) and that the following issues had not been considered by the licensee:

- Unit 1 control room operator assistance to the Unit 2 control room,
- Notification of the control room operators regarding radiological conditions and control of a normally available doorway between the control rooms,
- Control of Unit 1 equipment that may be required to mitigate an accident on Unit 2. For example, NRC Inspection Report 50-315/316/99021 discussed a possible cross-unit dependency of the ESW system.

The licensee conducted an evaluation of the potential cross unit dependancies and initiated a focus team to identify and assess other potential cross unit dependancy issues.

c. Conclusions

The licensee had not fully examined the effects of a postulated radiological release on operators in the Unit 1 control room created by modifying only the Unit 2 control room pressure envelope. The licensee had initiated a focus team to identify and resolve potential cross unit dependancy issues.

E2.2 Review of Residual Heat Removal System Return to Operations

a. Inspection Scope (37751, 71707, C.4.f, C.4.j)

The inspectors reviewed the turnover of the residual heat removal system from engineering to operations. The system turnover process was being conducted as part of the expanded system readiness reviews (ESRR). At the time of the inspection, the RHR system turnover was in progress and had not been completed. The inspectors reviewed system turnover procedures, reviewed items contained in SIDS for proper scoping and disposition, attended various engineering meetings, and interviewed engineering and operations department personnel. The inspectors also conducted a walkdown of portions of the Unit 2 RHR system.

The inspectors also assessed the event as it related to NRC Restart Action Plan 0350 Item C.4.f, "Significant hardware issues resolved (i.e., equipment with poor material condition, equipment aging, modifications)," and C.4.j, "Adequacy of plant housekeeping and equipment storage."

b. Observations and Findings

The ESRR system turnover process was controlled by Procedures PMP 7200.RST.003, "System Turnover to Operations," and PMP 7200.RST.004. System turnover to operations was included within phase three of the ESRR program which included: review of the system work completion, disposition of incomplete work items, review of post restart and deferred work, and development of system performance monitoring program. In addition to the normally assigned system manager, each system was also assigned a system senior reactor operator (SRO) to support the implementation of the ESRR program.

The RHR system was divided into two functional areas: RHR/emergency core cooling and RHR/shutdown cooling. A system manager and a system SRO were assigned to each RHR functional area. The inspectors determined that the system managers and SRO were knowledgeable about issues affecting the return of the RHR system to an operational status, effectively communicated significant issues among themselves and to other departments within the licensee's organization, and fully participated in the ESRR program. The inspector concluded that the system managers and system SROs were effectively implementing the ESRR program.

The inspector sampled approximately forty SIDS items to determine if items were appropriately scoped, work item completion was adequately documented, post restart

items were appropriately deferred, and emergent items were appropriately evaluated and entered into the system. The inspectors identified no additional discrepancies during this review. Additional observations and findings regarding the review of the SIDS database are discussed above in Section O7.1.

The inspectors performed an independent walkdown of portions of the Unit 2 RHR system, including the RHR pumps, heat exchangers, and control valves. The inspectors identified no deficient conditions that were not previously identified by the licensee. At the time of the walkdown, the East RHR pump was in service and no excessive system vibrations or abnormal flow noise were identified. Housekeeping conditions and area lighting were adequate. The inspectors did not identify any improperly stored transient combustibles.

During the evaluation of RHR system turnover, the inspectors reviewed a number of technical issues associated with the RHR system, including system vibration during shutdown cooling operation and Maintenance Rule monitoring criteria for the system. The inspectors attended various engineering meetings associated with these issues. The inspectors determined that the level of meeting discussions were appropriate and effective, and meeting participants were knowledgeable and actively participated in meeting discussions. Notable observations and findings of this review are detailed below.

b.1 Resolution of RHR System Vibration

Prior to this inspection period, the RHR system has experienced periods of excessive vibration. This issue has been discussed in NRC Inspection Report No. 50-315/99001(DRP), 50-316/99001(DRP) and was being tracked under Inspector Followup Item (IFI) 50-315/99001-01. The licensee submitted Licensee Event Report (LER) 50-315/1999008-00 on April 9, 1999 to report the incidence of excessive RHR system vibration. Event Report 50-315/1999008 was included in the NRC restart action matrix (RAM) as Item R.1.26. Although the LER remained open at the time of the inspection pending the submittal of a supplemental LER, RAM Item R.1.26 had been closed during a previous NRC inspection. Section E8.4 of NRC Inspection Report No. 50-315, 50-316/1999-029 documented the closure of RAM Item R.1.26 based upon incorporation of the issue within the corrective action system with appropriate corrective action specified and tracked.

The licensee believed that the piping vibration was due to flow cavitation caused by high differential pressure across the RHR system flow control valves (IRV-310, IRV-311, and IRV-320). The flow cavitation has been associated with RHR system operation during conditions of low heat load (resulting in reduced heat exchanger flow rates and increased potential for flow cavitation at IRV-310 and IRV-320) and low RCS pressure (which reduces backpressure on the system flow control valves). Additionally, the licensee has determined that use of the normal RHR cooldown line exacerbated the conditions leading to flow cavitation. The licensee believed that the lower pressure drop associated with the normal cooldown line created favorable conditions for flow cavitation. To mitigate system vibration, the licensee used either of the two emergency core cooling injection lines as an alternate cooldown path. The licensee has also identified that cross train feeding though the RH-128E and RH-128W downstream of the RHR heat exchangers results in flow oscillations on the RHR flow instrumentation.

The inspectors identified a minor discrepancy between the FSAR and the RHR operating procedures associated with the use of the alternate ECCS injection lines. Specifically, Table 9.3-3, "Residual Heat Removal System Malfunction Analysis," Item 6 stated that in the event of the failure of the normal RHR discharge line, the low head safety injection lines may be opened to direct flow to the reactor coolant system cold legs, but a reactor coolant pump must be operated. This FSAR requirement was not reflected in the RHR system operating procedures. The licensee initiated CR 00-2695 to document and evaluate this FSAR discrepancy. The system manager stated that this issue did not represent a significant safety concern during Mode 5 and 6 operation.

The licensee has completed an operability determination for RHR system operation during Mode 5 (T_{avg} less than or equal to 200°F) and Mode 6 (refueling) operation. The licensee documented this evaluation in operability determination Nos. 91-18-ODE-060 and 91-18-ODE-355 and concluded that the RHR system was operable but degraded for Mode 5 and 6 operation. The specified compensatory actions for the RHR system included restrictions on the use of the normal cooldown path and procedural precautions to balance system flow rates to minimize system cavitation. At the time of the inspection, the licensee was performing an operability evaluation for RHR system operation during plant conditions other than Modes 5 and 6. Additionally, the licensee was evaluating the long term effects of RHR system vibration. The inspectors will continue to follow the licensees resolution of these issues under IFI 50-315/99001-01.

b.2 System Performance Monitoring

Step 1.4.3 of PMP 7200.RST.004 required development of performance monitoring baseline for system performance and trending. The licensee's system engineering manager informed the inspectors that guidance for the system performance monitoring program was under of the development at the time of the inspection. However, the licensee's Maintenance Rule program, required by 10 CFR 50.65, was anticipated to contribute system performance information into the monitoring program. Therefore; the inspectors reviewed the Maintenance Rule performance criteria established for the RHR system. The licensee was evaluating other system monitoring methods, in addition to Maintenance Rule monitoring, for selected systems.

The RHR system was divided into two Maintenance Rule risk significant system boundaries: emergency core cooling and shutdown cooling. At the time of the inspection, performance criteria for emergency core cooling functions were under development and were unavailable for review. The licensee wrote CR 99-23971 to track the development of performance criteria for the ECCS functions of RHR. The inspectors reviewed Maintenance Rule performance criteria for the RHR shutdown cooling functions, which had been approved by the licensee's Maintenance Rule expert panel, and interviewed the licensee's Maintenance Rule coordinator. Significant findings and observations are detailed below:

- The licensee had intended to scope the ECCS functions of the RHR system into the Maintenance Rule as applicable in operating Modes 1 through 3 (T_{avg} greater than or equal to 350°F). Similarly, the actions associated with CR 99-23971 were identified in SIDS as a Mode 3 constraint. After the inspector questioned the need for an operable residual heat removal pump and heat exchanger in Mode 4 per TS 3.5.2, "ECCS Subsystems - T_{avg} < 350°F," the licensee rescoped the applicable CR actions to a Mode 4 constraint.

- The identified shutdown RHR system functions did not include mitigation of boron dilution accident. Technical Specification 3.1.1.3 and 3.9.8.1 required the RHR system to provide minimum reactor coolant circulation for decay heat removal, to minimize the effects of a boron dilution accident and to prevent boron stratification. The Maintenance Rule functions for RHR shutdown cooling included decay heat removal for shutdown but did not include a specific reference to boron dilution and stratification concerns.

- The Maintenance Rule coordinator informed the inspectors that the RHR shutdown cooling performance criteria would be monitored on a per unit basis. Specifically, a functional failure of shutdown cooling would only occur if both RHR trains failed to provide shutdown cooling. Contrary to this, Engineering Head Instruction (EHI) 5035, "Maintenance Rule Program Administration," Revision 5, Step 3.7.3, stated that systems that are more risk significant must be monitored at the train level. The purpose of monitoring at a train level was to ensure that a good performing train would not mask the performance of a poorly performing train. The current shutdown cooling performance criteria identified that several shutdown cooling RHR functions were risk significant. The inspectors questioned the consistency of the guidance contained in EHI 5035 with the licensee plans to monitor shutdown cooling on a per unit basis.

- In some cases, the performance criteria associated with an identified function did not bound the Maintenance Rule function. For example, the performance criteria for the "decay heat removal during shutdown" function listed specific criteria for flow control valves and motor operated valves but did not include criteria for system flow, RHR pump performance, or heat exchanger performance. Furthermore, the specified motor operated valves did not include the motor operated valves used to align the alternate ECCS injection lines which had been used to minimize RHR system vibration (see Section E2.2.b.1 above).

The inspectors determined that the performance criteria for the RHR shutdown cooling function were not comprehensive. The licensee added a corrective action in CR 98-3495 to resolve these discrepancies. The licensee intended to reconvene the Maintenance Rule expert panel and re-evaluate the functional boundaries and performance criteria established for the RHR system.

c. Conclusions

The inspectors determined that the system return to operations process effectively evaluated and resolved issues associated with the RHR system. The system managers and SROs were knowledgeable, appropriately communicated significant systems issues, and were effectively implementing the process.

The inspectors determined that the licensee's implementation of maintenance rule performance criteria for residual heat removal system shutdown cooling function were not comprehensive. The licensee documented this issue in their corrective action system for evaluation and resolution.

The inspectors also assessed the RHR system return to operations process as it related to NRC Restart Action Plan 0350 Item C.4.f, "Significant hardware issues resolved (i.e., equipment with poor material condition, equipment aging, modifications," and C.4.j,

"Adequacy of plant housekeeping and equipment storage." The ESRR program and the system return to operations process effectively addressed significant hardware issues and tracked corrective actions for completion. During a walkdown of the RHR system, the inspectors concluded that housekeeping and equipment storage were adequate.

E8 Miscellaneous Engineering Issues

E8.1 Inspectors Review of Restart Action Matrix Items

In a letter dated July 30, 1998, the NRC informed the licensee that an oversight panel had been established in accordance with NRC Manual Chapter (MC) 0350, and a checklist was enclosed which specified activities which the NRC considered necessary to be addressed prior to restart. In accordance with MC 0350, an inspection plan was developed to evaluate the effectiveness of the licensee's actions to correct the items listed on the Case Specific Checklist.

In addition to the Case Specific Checklist, on November 22, 1999, the NRC MC 0350 oversight panel developed a Restart Action Matrix (RAM) to track the completion of NRC and licensee activities which were determined necessary for plant restart. The NRC MC 0350 oversight panel assessed the RAM items on the basis of importance, from "risk significant" to "little or no risk significance" and established criteria for inspection of the RAM items based on the relative risk. For low-risk significant items, the panel criteria required that: (1) the licensee had written a condition report to track the issue addressed by the RAM item, and (2) the licensee appropriately tracked the item as required for restart. The inspectors reviewed the following low-risk items and concluded that the licensee's actions met the requirements of the MC 0350 oversight panel restart criteria; therefore, the following items are discussed.

- (Closed) RAM Item R.2.2.2, IFI 50-315/316/96006-14: Slowed implementation of procedural improvements. The licensee has implemented an operations procedure upgrade program which was documented in CR 99-12799. This item is closed.

- (Closed) RAM Item R.2.3.1, IFI 50-315/316/96006-10: Technical operating guidance was promulgated to shift supervisors without indication that it had operations management approval for implementation. In 1998, a licensee self assessment identified that Technical Direction Memoranda were implementing changes without ensuring that a 10 CFR 50.59 review was performed.

  In response to the self assessment finding, the licensee revised the process for issuing technical direction. The technical direction procedure was superceded by procedure 12 EHP 5040.DES.001, "Control of Design Input." This procedure created a formal method for transmitting technical information through the use of a Design Input Transmittal and eliminated the use of Technical Direction Memoranda. Plant Mangers Instruction (PMI) 2260, "Standing Orders," required that all standing orders received a 10 CFR 50.59 review performed prior to being issued. The licensee documented this item in CR 98-0285. This item is closed.

- (Closed) RAM Item R.2.13.1, LER 50-316/99001-00: Degraded component cooling water flow to containment main steam line penetrations. The licensee completed an evaluation of the containment concrete and concluded that the

integrity of the containment boundary formed by the main steam line penetrations was maintained. The licensee documented this evaluation in CR 99-3641. A second evaluation of potential high temperature effects on the main steam penetration line sleeves, liners, and welds was being tracked as a corrective action item under CR 98-6832. The licensee planned to submit a supplement to the LER 50-316/99001-00 to include the results of the evaluations.

Licensee Event Report 50-316/99001-00 will remain open pending the inspectors' review of the LER supplement. Restart Action Matrix Item 2.13.1 is closed.

E8.2 (Closed) Restart Action Matrix Item 2.10.1: Debris of Unknown Origin Found in Containment Spray Header. In 1998, the licensee found foreign material resembling sludge and numerous pieces of solid debris during a boroscopic examination of the Unit 1 west containment spray system (CTS) lower ring header. The licensee documented this finding in CR 98-1905. During a subsequent investigation of the Unit 2 west CTS heat exchanger, a small amount of addition foreign material was found. Condition Report 99-8199 was written to document the additional material found in Unit 2, and the evaluation for the earlier Unit 1 CR was expanded to include the Unit 2 CR.

Based on the evaluation of the debris found in the Unit 1 west CTS lower ring header, the licensee determined that four corrective actions were necessary.

- Inspect and clean the Unit 2 CTS ring headers. The Unit 2 headers were cleaned on October 6, 1999 under Job Order (JO) C52585.

- Implement Design Change 12-DCP-221 for Unit 2 to remove 1-inch test lines which had never been used. The licensee determined that the isolation valves for the 1-inch test lines leaked during CTS pump testing, resulting in borated water entering the lower CTS ring headers. The Unit 2 1-inch test lines were cut and capped per 12-DCP-221 on November 22, 1998.

- Evaluate Unit 2 CTS/RHR as found piping internal material condition. The licensee's evaluation of the Unit 2 CTS cleaning was continuing; however, the action to clean and inspect the CTS ring headers had been completed. The licensee planned to include the results of the Unit 2 evaluation in a supplement to LER 50-315/98027.

- Develop an inspection program to identify any future degraded condition. The licensee planned to develop a program to periodically inspect the CTS ring headers for foreign material and boric acid deposits. This action was categorized as post-restart because the CTS ring headers had been recently flushed and inspected.

The inspectors reviewed the corrective actions and noted that not all of the licensee-identified restart action items for the Unit 1 CTS lower ring header debris were completed. However, the inspectors noted that the physical work required to clean the CTS ring headers was complete, that action had been taken to identify and correct the source of borated water leakage into the headers, and that the licensee planned to

develop a periodic inspection plan to identify any foreign material or boric acid deposits inside the CTS ring headers.

Licensee Event Report 50-315/98027-00 will remain open pending the inspectors' review of the LER supplement. The licensee planned to issue the supplement on February 29, 2000. Restart Action Matrix Item 2.10.1 is closed.

E8.3 Inspectors Review of NRC Manual Chapter 0350 Case Specific Checklist Items

In a letter dated July 30, 1998, the NRC informed the licensee that an oversight panel had been established in accordance with NRC Manual Chapter (MC) 0350, and a checklist was enclosed which specified activities which the NRC considered necessary to be addressed prior to restart. In accordance with MC 0350, an inspection plan was developed to evaluate the effectiveness of the licensee's actions to correct the items listed on the Case Specific Checklist. The inspectors reviewed the following Case Specific Checklist and concluded that the licensee's actions met the requirements of the MC 0350 oversight panel restart criteria; therefore, the following items are closed:

- (Closed) Case Specific Checklist Item C.2.1.a: Effectiveness of Quality Assurance Program. Case Specific Checklist Item C.2.1.a was closed based upon the inspectors' assessments of the licensee's quality assurance program as documented in NRC Inspection Reports 50-315/316/99021,024, 025, 026, 029, 032, 033, and 034. In assessing the effectiveness of the Quality Assurance Program the inspectors primarily considered two aspects of the program, the vitality of the site Corrective Action Program, and the effectiveness of the Performance Assurance organization. As documented in NRC Inspection Report 50-315/316/99021 an inspection team concluded that the D. C. Cook Corrective Action Program was capable of acceptably resolving identified conditions adverse to quality in a manner sufficient to support the plant's return to operation. This conclusion was based on a sample of the adequacy of licensee corrective actions to resolve programmatic deficiencies that were addressed by Restart Action Plans, technical issues that were identified in the Confirmatory Action Letter and the Restart Action Matrix, and a randomly selected sample of sixty closed, recent vintage condition reports for acceptable problem resolution. Regarding the effectiveness of the Performance Assurance group, inspectors have noted increased and effective involvement by the Performance Assurance group in providing independent oversight of activities. Specific examples include effective assessments of motor operated valve work activities documented in NRC Inspection Report 50-315/316/99021, and critical evaluations of issues regarding the hydrogen mitigation system documented in NRC Inspection Reports 50-315/316/99029.

  Overall, NRC inspection results concluded that the licensee's Quality Assurance program and processes were adequate to support the restart of the plant. This item is closed.

- (Closed) Case Specific Checklist Item C.2.1.d: Effectiveness of Deficiency Reporting System. Case Specific Checklist Item C.2.1.d was closed based upon the inspectors' assessments of the licensee's deficiency reporting system as documented in NRC Inspection Reports 50-315/316/99024, and 029. The inspectors' determined that corrective actions associated with implementation of

the new corrective action program were effective and had been properly implemented. The new program was rigorous and contained sufficient checks and balances to ensure that corrective actions were completed and their effectiveness was subsequently assessed. The inspectors also noted that the licensee's staff had continually monitored the program's effectiveness and adjusted it as needed to address problem areas. Consequently, the inspectors concluded that the D. C. Cook deficiency reporting system was capable of supporting the effective resolution of identified conditions adverse to quality in a manner sufficient to support the plant's return to operation. This item is closed.

- (Closed) Case Specific Checklist Item C.3.1.a: Demonstrated Commitment to Achieving Improved Performance Through the Results of the Programmatic Readiness Assessment (Staff). Case Specific Checklist Item C.3.1.a was closed based upon the inspectors' assessments of the licensee's demonstrated commitment to achieving improved performance as documented in NRC Inspection Reports 50-315/316/99001, 002, 003, 006, 007, 009, 013, 021, 024, and 029. The licensee's assessment teams consisted of licensee staff members across all organizational boundaries. The teams conducted the programmatic readiness assessment reviews using a structured approach and were successful in identifying issues potentially impacting department or program performance. This item is closed.

- (Closed) Case Specific Checklist Item C.3.2.a: Demonstrated Commitment to Achieving Improved Performance Through the Results of the Programmatic Readiness Assessment (Corporate Support). Case Specific Checklist Item C.3.2.a was closed based upon the inspectors' assessments of the licensee's demonstrated commitment to achieving improved performance as documented in NRC Inspection Reports 50-315/316/99001, 002, 003, 006, 007, 009, 013, 021, 024, and 029. The licensee's assessment teams conducted the programmatic readiness assessment reviews using a structured approach and were successful in identifying issues potentially impacting department or program performance. Further, the System Readiness Review Board, which was primarily a system support function established high expectations for the assessment process. In addition, functional area assessments in the areas of operations, maintenance and engineering and the assessment of the Corrective Action Program were successful in identifying potential restart issues and engineering process deficiencies. This item is closed.

- (Closed) Case Specific Checklist Item C.5.e: Confirmatory Action Letter conditions have been satisfied. This Case Specific Checklist item was closed based on inspector assessments of licensee corrective actions related to the specific issues identified in Confirmatory Action Letter RIII-97-011, dated September 19, 1997. NRC actions regarding the Confirmatory Action Letter were documented in a letter from the Regional Administrator to the licensee dated February 2, 2000. This item is closed.

E8.4 (Closed) Licensee Event Report 50-316/97003-03: Performance of Dual Unit Component Cooling Water Outage During Unit 2 1996 Refueling Outage Resulted in Condition Outside Plant's Design Basis. During the Unit 2 full core off-load outage in 1996 and with Unit 1 at 100 percent power, both Unit 2 CCW and ESW trains were taken out-of-service on August 7 through 8, 1996, leaving one Unit 1 CCW train

available to supply spent fuel pool cooling. The 10 CFR 50.59 SEs performed for the core off-load did not recognize that the Unit 1 CCW system could not perform its safety function under the design basis assumptions described in the USAR. This LER was related to violation 50-315/316/98152-01312 which was closed in NRC Inspection Report 50-315/316/99023. The LER did not reveal any new issues; therefore, this LER is closed.

E8.5 (Closed) Licensee Event Report 50-315/99028-00: ESF [Engineered Safety Features] Actuation and Start of Emergency Diesel Generator 1 CD During Transformer Maintenance. On December 16, 1999, workers performing corrective maintenance on the Unit 2 "A" Train reserve feed transformer (2-TR201CD), inadvertently caused an actuation of the sudden pressure relay. The relay actuation resulted in the loss of both units' reserve feed transformers and a consequent loss of spent fuel pool cooling. This event was discussed in Inspection Report 50-315/316/99021. The LER did not identify any additional issues; therefore this LER is closed.

IV. Plant Support

R1 Radiation Protection and Chemistry Controls (71750)

During normal resident inspection activities, routine observations were conducted in the area of radiation 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 February 25, 2000. 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.

X2 Summary of MC 0350 Restart Action Matrix Items

The inspectors reviewed selected items from the NRC Inspection Manual Chapter 0350 Case Specific Checklist (CSC) and the Restart Action Matrix (RAM). The following list indicates NRC CSC and RAM Items which are discussed in the report:

- CSC Item C.2.1.a, "Effectiveness of Quality Assurance Program," is discussed in Section E8.1. This item is closed.
- CSC Item C.2.1.d, "Effectiveness of Deficiency Reporting System," is discussed in Section E8.1. This item is closed.
- CSC Item C.3.1.a, "Demonstrated Commitment to Achieving Improved Performance Through the Results of the Programmatic Readiness Assessment," is discussed in Section E8.1. This item is closed.
- CSC Item C.3.2.a, "Demonstrated Commitment to Achieving Improved Performance Through the Results of the Programmatic Readiness Assessment (Corporate Support)," is discussed in Section E8.1. This item is closed.
- CSC Item C.5.e, "Confirmatory Action Letter Conditions Have Been Satisfied," is discussed in Section E8.1. This item is closed.
- RAM Item R.2.2.2, "Slowed Implementation of Procedural Improvements," is discussed in Section E8.2. This item is closed.
- RAM Item R.2.3.1, "Technical Operating Guidance Was Promulgated to Shift Supervisors Without Indication That It Had Operations Management Approval for Implementation," is discussed in Section E8.2. This item is closed.
- RAM Item R.2.10.1, "Debris of Unknown Origin Found in Containment Spray Header," is discussed in Section E8.4. This item is closed.
- RAM Item R.2.13.1, "Degraded Component Cooling Water Flow to Containment Main Steam Line Penetrations," is discussed in Section E8.2. This item is closed.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

#R. Crane, Regulatory Affairs Supervisor
#D. Garner, Director, Nuclear Fuel Safety and Analysis
#S. Greenlee, Director, Design Engineering
#R. Godley, Director, Regulatory Affairs
#R. Huey, Performance Assurance
#I. Jackiw, Regulatory Affairs
#J. Long, Chemistry, Radiation Protection, and Environmental Supervisor
#M. Marano, Director, Business Services
#J. Molden, Director, Maintenance
#T. Mountain, Regulatory Affairs
#D. Naughton, System Engineering
#E. Nelson, Nuclear Documentation Management
#S. Partin, Operations
#J. Pollack, Plant Manager
#R. Powers, Senior Vice President
#M. Rencheck, Vice President, Nuclear Engineering
#C. Vanderzwaag, Engineering

# Denotes those present at the February 25, 2000, exit meeting.

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 61726:	Surveillance Observations
IP 62707:	Maintenance Observation
IP 71707:	Plant Operations
IP 71750:	Plant Support Activities
IP 92700:	Onsite Follow-up of Written Reports of Nonroutine Events at Power Reactor Facilities

NRC MANUAL CHAPTER 0350 ITEMS DISCUSSED

- Item C.1.2.e, "Corrective Actions Include Restoring Systems and Equipment to Service."
- Item C.4.a, "Operability of TS systems."
- Item C.4.d, "Adequacy of System Lineups."
- Item C.4.e, "Adequacy of Surveillance Tests and Test Program."
- Item C.4.f, "Significant Hardware Issues Resolved."
- Item C.4.i, "Maintenance Backlog Managed and Impact on Operations Assessed."
- Item C.4.j, "Adequacy of plant housekeeping and equipment storage."

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-315/99022-01 50-316/99022-01	NCV	Inadequate configuration control in that auxiliary building pressure boundary barrier 1-DR-AUX-391

Closed

50-315/96006-10 50-316/96006-10	IFI	Technical operating guidance was promulgated to shift supervisors without indication that it had operations management approval for implementation
50-315/96006-14 50-316/96006-14	IFI	Slowed implementation of procedural improvements
50-316/97003-03	LER	Performance of dual unit component cooling water outage during Unit 2 1996 refueling outage resulted in condition outside plant's design basis
50-315/99022-01 50-316/99022-01	NCV	Inadequate configuration control in that auxiliary building pressure boundary barrier 1-DR-AUX-391

Discussed

50-315/98027-00	LER	Debris of unknown origin found in containment spray header
50-316/99001-00	LER	Degraded component cooling water flow to containment main steam line penetrations
50-315/99001-01	IFI	Residual heat removal system vibration

LIST OF ACRONYMS

AR	Action Request
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CR	Condition Report
D/G	Diesel Generator
DHSO	Department Head Standing Order
DRP	Division of Reactor Projects
ESRR	Expanded System Readiness Review
ESW	Essential Service Water
IHP	Instrument Head Procedure
IMP	Instrument Maintenance Procedure
IST	In-Service Test
JO	Job Order
MC	Manual Chapter
MCCB	Molded Case Circuit Breaker
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
OSO	Operations Standing Order
PA	Performance Assurance
PMI	Plant Manager's Instruction
PMP	Plant Manager's Procedure
PMSO	Plant Manager's Standing Order
PMT	Post Maintenance Testing
PDR	Public Document Room
RCS	Reactor Coolant System
RHR	Residual Heat Removal
SRO	Senior Reactor Operator
STP	Surveillance Test Procedure
SWO	Stop Work Order
TS	Technical Specification
VIO	Violation

50-315
2/4/2000
99-21

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Docket: 05000315
Docket: 05000316

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

February 04, 2000

Mr. R. P. Powers
Senior Vice President
Nuclear Generation Group
American Electric Power Company
1 Cook Place
Bridgman, MI 49106

SUBJECT: D. C. COOK INSPECTION REPORT 50-315/99021(DRP); 50-316/99021(DRP)

Dear Mr. Powers:

This refers to the inspection conducted from November 19, 1999, through January 13, 2000, at the D. C. Cook Units 1 and 2 reactor facilities. The inspection was an examination of activities conducted under your license as they relate to compliance with the Commission rules and regulations and with the conditions of your license. Areas reviewed included Operations, Maintenance, Engineering, and Plant Support. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress. The inspectors also reviewed observations and findings as they related to the NRC Manual Chapter 0350 Case Specific Checklist for D. C. Cook. The enclosed report presents the results of that inspection.

We noted that you continued to make progress in resolving items in accordance with your Restart Plan. For example, you demonstrated a commitment to improving material condition during your recent electrical train maintenance outages. Additionally, management's willingness to stop work, including critical path work, to correct problems showed a self-critical approach to problem solving. The Performance Assurance Department's expansion of management's initial assessments added a proactive element to your understanding of the root causes and extent of condition.

We have observed that progress is being made in the completion of physical work to support plant restart. In observing your staff performing post-modification testing, we identified several weaknesses related to the evaluation of test results and test acceptance criteria. Although these weaknesses did not result in a significant safety impact, the inadequate implementation of test acceptance criteria and less than rigorous reviews of test results could lead to returning inoperable equipment to service. Your continued vigilance and focus and the thorough and rigorous implementation of post-maintenance and post-modification testing appears warranted.

Based on the results of this inspection, the NRC has determined that one violation of NRC requirements occurred involving the In-Service Testing Program. Specifically, low action limits for the Unit 2 West Essential Service Water pump were found to be set below the safety analysis minimum operability requirement. This was considered a failure to meet the requirements of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control."

Template RGN-002

0037100085

This violation is being treated as a Non-Cited Violation (NCV), consistent with Section VII.B.1.a of the Enforcement Policy. This NCV is described in the subject inspection report. If you contest the violation or severity level of this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to the Regional Administrator, Region III; and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if you choose to provide one, will be placed in the NRC Public Document Room.

Sincerely,

John A. Grobe, Director
Division of Reactor Safety

Docket Nos. 50-315; 50-316
License Nos. DPR-58; DPR-74

Enclosure: Inspection Report 50-315/99021(DRP);
50-316/99021(DRP)

cc w/encl: A. C. Bakken III, Site Vice President
J. Pollack, Plant Manager
M. Rencheck, Vice President, Nuclear Engineering
R. Whale, Michigan Public Service Commission
Michigan Department of Environmental Quality
Emergency Management Division
MI Department of State Police
D. Lochbaum, Union of Concerned Scientists

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-315; 50-316
License Nos:	DPR-58; DPR-74
Report No:	50-315/99021(DRP); 50-316/99021(DRP)
Licensee:	American Electric Power Company 1 Cook Place Bridgman, MI 49106
Facility:	D. C. Cook Nuclear Generating Plant
Location:	1 Cook Place Bridgman, MI 49106
Dates:	November 19, 1999, through January 13, 2000
Inspectors:	B. L. Bartlett, Senior Resident Inspector K. A. Coyne, Resident Inspector J. D. Maynen, Resident Inspector
Approved by:	A. Vegel, Chief Reactor Projects Branch 6 Division of Reactor Projects

EXECUTIVE SUMMARY

D. C. Cook Units 1 and 2
NRC Inspection Report 50-315/99021(DRP); 50-316/99021(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

- Operators responded promptly and effectively to a partial loss of offsite power on Unit 1. Operators used their knowledge of the low heat load in the spent fuel pool, and did not start the Unit 2 spent fuel pool cooling pump until they verified that Unit 2 was not affected by the loss of power. Operators continually monitored spent fuel pool temperature during the short time that the spent fuel pool cooling system was not operating. (Section O1.2)

- The inspectors identified an error in the Outage Risk Assessment and Management logic model associated with the electrical power supply to the spent fuel pool cooling system. It was possible to calculate an acceptable risk condition with no emergency diesel generators available to support spent fuel pool cooling. Also, the licensee identified a failure to perform an Outage Risk Assessment and Management evaluation of a scheduled work activity affecting offsite power availability. Because spent fuel pool cooling requirements were met during this period, these deficiencies did not result in a significant risk impact. The licensee had implemented adequate interim compensatory measures pending long term resolution of these identified deficiencies. (Section O1.3)

Maintenance

- On December 16, 1999, a maintenance error in the switchyard by the St. Joseph Division of American Electric Power resulted in the partial loss of off-site power to Unit 1. The St. Joseph Division personnel were non-nuclear trained American Electric Power employees who were responsible for performing maintenance in the switchyard. Although the St. Joseph Division personnel were not technically contractors, the problems associated with this event were similar to previous contractor control problems. A recent NRC inspection determined that the licensee made satisfactory improvements to the contractor control program. The licensee incorporated St. Joseph Division personnel into the contractor control program. (Section M1.2)

- The inspectors identified a weakness in the licensee's process for testing molded case circuit breakers. Specifically, the applicable test procedure did not require initial overcurrent test failures to be evaluated prior to performing a second test 20 minutes later. The inspectors did not identify any actual failures of the first test which would have affected the operability of specific in-service breakers. (Section M2.1)

- The licensee effectively implemented immediate corrective actions for performance problems. In addition, the use of the stop work orders demonstrated the licensee's willingness to stop work on critical path activities to ensure that problems are corrected prior to resuming work. (Section M7.1)

- The licensee's actions to issue a stop work order and quarantine the motor-operated valve refurbishment trailer after they discovered that safety grade fastener may have been improperly stored was appropriate. The licensee's Performance Assurance department expanded the scope of the investigation and identified fastener storage problems with other onsite work groups. The widened investigation by the Performance Assurance department was appropriate and thorough. The failure to properly control safety grade fasteners did not affect the safety function of any equipment. (Section M7.2)

Engineering

- The licensee determined that the failures of several new emergency diesel generator high pressure fuel oil injection lines were due to manufacturing defects. Due to the difficulty in performing non-destructive testing of the lines, the licensee developed an alternate testing method to verify that any installed lines did not have any manufacturing defects which would lead to premature failure. The licensee conservatively declared three emergency diesel generators inoperable until susceptible lines could be verified operable using the alternate testing method. The licensee's efforts to resolve the high pressure fuel injection line leak issues were aggressive and thorough. (Section E1.1)

- The inspectors identified that the 2W Essential Service Water Pump In-Service Testing low action limit was set such that the pump could have degraded to a performance level below the required operability limit. Further, the In-Service Testing action limits established for the 1E and 2W Essential Service Water Pumps when both pumps were last required to be operable were inconsistent with the safety analysis. This constituted a failure to meet the requirements of 10 CFR Part 50, Appendix B, Criterion XI, and was identified as a non-cited violation. Also, the licensee did not consider the impact of instrument uncertainty when establishing In-Service Testing low action limits. This may have allowed pumps with operability limits more restrictive than the code allowable degradation to degrade to a level such that safety analysis requirements would not be met. (Section E2.1)

- Technical Specification 3.7.4.1 requirements may not reflect design basis assumptions concerning the operability of the opposite unit's essential service water pumps. Specifically, essential service water pumps in both units may be required to support essential service water system operability. This issue was identified as an Unresolved Item. (Section E2.1)

Report Details

Summary of Plant Status

Both Units remained defueled throughout the inspection period. The licensee began physical work in support of the Unit 1 steam generator replacement project, including installation of temporary rigging equipment and removal of portions of the steam generator enclosures. The licensee continued loading ice into the Unit 2 ice condenser and had loaded approximately half of the 1944 ice baskets by the end of the inspection period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments

The inspectors conducted frequent observations of control room activities and equipment operation during the extended outage of both reactor units. Overall, plant operations were performed using approved operating procedures and reflected good operating practices. Noteworthy observations and findings are detailed in the report sections which follow. The inspectors were onsite monitoring plant activities during the Year 2000 rollover. No significant problems or abnormalities were observed.

O1.2 Partial Loss of Offsite Power Due to Maintenance Error

a. Inspection Scope (71707, C.3.1.a)

The inspectors reviewed the licensee's response to a loss of Unit 1 Train A Electrical Busses and spent fuel pool cooling. The maintenance aspects of this event are discussed in more detail in Section M1.2 of this report.

b.1 Observations and Findings

On December 16, 1999, workers performing corrective maintenance on the Unit 2 "A" Train reserve feed transformer (2-TR201CD), inadvertently caused an actuation of the sudden pressure relay. The sudden pressure relay provided protection for the transformer in case of a rapid pressure rise inside the transformer casing. The actuation of the 2-TR201CD sudden pressure relay resulted in the tripping of the high voltage supply breaker. The high voltage supply breaker also supplied the Unit 1 "A" Train reserve feed transformer. Unit 1 was being supplied by the reserve feed transformer; therefore, Unit 1 lost off-site power to the "A" Train electrical busses. Unit 2 was being supplied by backfeed through the main transformer; therefore, Unit 2 was not affected by the maintenance error. The loss of off-site power resulted in the loss of spent fuel pool cooling for 38 minutes.

The loss of power resulted in the automatic start of the Unit 1 CD emergency diesel generator (D/G) and load shedding of nonsafety-related Unit 1 "A" Train electrical loads

and the operating spent fuel pool cooling pump. The operating crew responded to the event using the appropriate abnormal operating procedure, 01-Operations Head Procedure (OHP) 4022.001.005, "Loss of Offsite Power With the Reactor Shutdown."

The licensee established a rapid event response team to determine the cause of the event. The team concluded that the cause was a maintenance error by American Electric Power personnel not normally assigned to D.C. Cook. The inspectors concluded that the licensee had responded promptly and effectively to the event. Additionally, the use of a rapid event response team to determine the cause of the event demonstrated the licensee's commitment to achieving improved operator performance.

The inspectors reviewed the operating logs and interviewed operations personnel about the response to the event. The inspectors had the following observations:

- The operating crew response was appropriate to the event and demonstrated a knowledge of the plant conditions.

- One Unit 1 breaker, 1-11D3 (a feeder to a nonsafety-related containment lighting transformer), failed to load shed on the loss of voltage. The failure of this breaker to trip did not significantly affect the 1 CD D/G due to low loading on the D/G. The 1-11D3 breaker spuriously tripped about four hours after the loss of voltage. The licensee wrote Condition Report 99-29272 to document the 1-11D3 breaker failure.

- The shift manager dispatched the fire brigade after the control room received a smoke detector alarm and report of smoke in the auxiliary building. The fire brigade did not detect any fires; the alarm and smoke were due to the D/G exhaust being drawn into the auxiliary building ventilation system.

- The plant lost spent fuel pool cooling for a period of 38 minutes. Cooling was restored when the operators started the Unit 2 spent fuel pool cooling pump. There was no measurable temperature rise in the spent fuel pool, which remained at 85°F. The licensee had previously calculated a spent fuel time to boil of 40 hours from 90°F.

The Unit Supervisor stated that the operating crew knew that no spent fuel pool cooling pumps were running; however, the operating crew was also aware of the low heat load in the spent fuel pool. The Unit Supervisor stated that the operating crew monitored spent fuel pool temperature while they determined that only Unit 1 was affected by the loss of off-site power. Once the operating crew had verified that Unit 2 was not affected, the Unit 2 spent fuel pool cooling pump was started and spent fuel pool cooling was restored. Off-site power was restored approximately four hours after the event, and the Unit 1 CD D/G was shut down and aligned for standby operation.

c. Conclusions

Operators responded promptly and effectively to a partial loss of offsite power on Unit 1. Operators used their knowledge of the low heat load in the spent fuel pool, and did not start the Unit 2 spent fuel pool cooling pump until they verified that Unit 2 was not affected by the loss of power. Operators continually monitored spent fuel pool temperature during the short time that the spent fuel pool cooling system was not operating.

O1.3 Problems Implementing Revised Shutdown Risk Assessment Program

a. Inspection Scope (71707, 62707)

On November 30, 1999, the licensee issued Revision 3 to PMP-4100.SDR.001, "Plant Shutdown Safety and Risk Management." This revision incorporated the use of the Outage Risk Assessment and Management (ORAM) computer program for shutdown risk management. The inspectors reviewed the implementation of the Outage Risk Assessment and Management (ORAM) system. The inspectors also reviewed ORAM logic models related to spent fuel pool cooling and electrical power safety functions.

b. Observations and Findings

The ORAM computer program used component number identifiers obtained from the work scheduling system to evaluate the shutdown risk profile. This included use of logic models to integrate component and system status to determine plant risk for eight-key safety functions, including spent fuel pool cooling and electric power availability. The ORAM program provided a more detailed and comprehensive evaluation of risk compared to the previous shutdown risk program. The revision to PMP-4100.SDR.001 also defined a new shutdown condition for the defueled condition with low spent fuel pool heat load (i.e., shutdown for greater than 1 year). The addition of this shutdown condition allowed greater operational flexibility in the defueled mode.

The inspectors identified an error in the ORAM logic model and followed up on a licensee identified problem regarding the interface between the work scheduling system and the ORAM program. These findings are discussed below:

- The detailed logic model descriptions for the ORAM computer model were contained in the "ORAM Desktop Guide." Using the Desktop Guide descriptions, the inspectors evaluated the impact of the loss of the D/Gs on the spent fuel pool cooling safety function. Section 2.6 of the ORAM Desktop Guide stated that the minimum level of defense requirements for spent fuel pool cooling under current conditions were one spent fuel pool cooling train supported by one D/G and one off-site power source.

  The inspectors noted that the associated power source safety function logic tree was inconsistent with the minimum level of defense requirements. Specifically, the electric power availability logic model may not have evaluated the number of available of D/Gs if a single offsite power supply was supporting the spent fuel cooling trains. Thus, it was possible for ORAM to calculate an acceptable risk

the minimum level of defense requirements. The licensee initiated CR 99-28422 to document and evaluate this condition. Because the spent fuel pool cooling and emergency power source safety functions satisfied the minimum level of defense requirements during this period, there was no actual risk impact associated with this logic error.

- On January 5, 2000, the licensee removed the "B" Train 4 kV electric busses and the 69 kV Emergency Power (EP) power source from service to support planned maintenance. Although, the maintenance was scheduled in the licensee's work scheduling program, the component number listed on the associated job order and clearance activities did not match a component number specifically modeled within the ORAM program. Consequently, the maintenance was not included in the ORAM input data file and the risk impact of the work activity was not initially evaluated with ORAM.

  Prior to removal of the 4 kV busses from service, the shift technical advisor (STA) manually evaluated the risk impact, and initiated CR 00-00201 to document the failure of ORAM to recognize the work activity. Because the STA was not aware of the planned loss of the EP power source during the maintenance, the risk associated by loss of EP was not evaluated. The next day, an STA identified the failure to perform a risk evaluation for the loss of the EP power source and initiated CR 00-00231. The actual risk associated with the loss of the 4 kV busses and the EP power source was later evaluated by the licensee and found to be insignificant. During the inspectors' followup to this event, the STAs and scheduling personnel informed the inspectors that only one component identifier can be associated with a clearance or job order activity. Therefore, the full risk impact of activities that affect multiple components, such as clearances, might not have been automatically evaluated by the ORAM program.

As an interim compensatory measure for these identified deficiencies, operations management stated that an outage technical advisor (OTA) would perform an additional risk evaluation prior to removal of any required safety system from service. An OTA was an individual qualified as an STA or who has held a senior reactor operators license. The licensee was evaluating additional corrective actions for the shutdown risk program as part of the resolution of the associated condition reports.

c. Conclusions

The inspectors identified an error in the Outage Risk Assessment and Management logic model associated with the electrical power supply to spent fuel pool cooling. It was possible to calculate an acceptable risk condition with no emergency diesel generators available to support spent fuel pool cooling. Also, the licensee identified a failure to perform an Outage Risk Assessment and Management evaluation of a scheduled work activity affecting offsite power availability. Because spent fuel pool cooling requirements were met during this period, these deficiencies did not result in a significant risk impact. The licensee had implemented adequate interim compensatory measures pending long term resolution of these identified deficiencies.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (62707)

The inspectors observed all or portions of the following maintenance activities and reviewed associated documentation:

- 01-OHP 4030.STP.027AB, "AB Diesel Generator Operability Test (Train B)," Revision 14
- 12-OHP 4030,STP.039, "Security Diesel Generator Operability Test," Revision 0
- Job Order (JO) C45952, Unit 2 ice basket filling and loading
- JO C49136, Recirculation sump inspection
- JO C52753, Check and correct source of security diesel fuel oil transfer pump cavitation
- JO C87362, Perform insulation testing on Unit 2 reserve feed transformer
- JO R96272, Perform tank inspection on Unit 2 component cooling water surge tank

b. Observations and Findings

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. Work items were appropriately scheduled in the plan of the day.

M1.2 Improper Work Control Practices by Non-Nuclear AEP Employees

a. Inspection Scope (62707, C.4.b)

On December 16, 1999, workers performing corrective maintenance on the Unit 2 Train A reserve feed transformer (2-TR201CD), inadvertently caused a partial loss of off-site power. The inspectors interviewed members of the rapid event response team and reviewed the team's report findings. The inspectors also assessed the event as it related to NRC Restart Action Plan 0350 Item C.4.b, "Operability of Required Secondary and Support Systems." The operations aspects of this event are discussed in more detail in Section O1.2 above.

b.1 Observations and Findings

During the week of December 10, 1999, routine insulation testing was being performed by St. Joseph Division personnel on the Unit 2 "A" Train reserve feed transformer (2-TR201CD) under Job Order R87362. The St. Joseph Division personnel were non-nuclear trained American Electric Power (AEP) employees who were responsible for performing maintenance in the switchyard. Because the St. Joseph Division were AEP employees who did similar switchyard work at non-nuclear facilities, the licensee did not provide direct oversight to the work group.

During the testing, the St. Joseph Division personnel identified a damaged bushing, and the licensee expanded the scope of Job Order (JO) R87362 to add the repair. Two separate repair activities were added to JO R87362 to be performed by different work groups. However, these two activities needed to be coordinated to ensure that the sudden pressure relay was defeated prior to repairing the transformer. On December 16, 1999, only one of the two activities, repairing the transformer, was scheduled. The St. Joseph Division personnel erroneously believed that the sudden pressure relay was defeated, and began repairing the transformer. During the addition of nitrogen to the transformer, the sudden pressure relay actuated, causing the loss of "A" Train reserve feed to both units.

The licensee wrote CR 99-29277 to document the event and established a rapid event response team to investigate the event. The licensee's rapid event response team found that:

- The transformer repair work was not adequately coordinated between licensee personnel and the St. Joseph Division personnel, the maintenance was being performed without direct licensee oversight and the St. Joseph Division personnel had not been trained on the licensee's work control process.

- The corrective maintenance was added to a routine JO instead of creating a corrective maintenance JO. Therefore, the licensee did not recognize that the activity to defeat the sudden pressure relay was on hold and never scheduled.

- There was no formal maintenance procedure for performing maintenance on the transformer. The maintenance was being performed using instructions provided in JO R87362.

Following the event, the maintenance department issued a Shop Work Order (SWO) (CR 99-29312) for all activities which may impact essential off-site power supplies. The SWO required direct licensee oversight of work by the St. Joseph Division during all work activities which could impact off-site power.

The inspectors noted that this event was similar to other recent contractor control issues. The inspectors discussed this observation with senior licensee management who agreed that, although the St. Joseph Division personnel are not technically contractors, the role of the St. Joseph Division is similar to that of contract maintenance personnel. The licensee planned to implement the existing contractor control processes to work performed by the St. Joseph Division. (A recent NRC inspection determined

that the licensee made satisfactory improvements to the contractor control program.) . The inspectors agreed that the licensee's action was adequate for preventing similar maintenance errors.

b.2 Review of Switchyard Maintenance Error for Restart

The inspectors assessed this event as it related to NRC Restart Action Plan 0350 Item C.4.b, "Operability of Required Secondary and Support Systems." The "A" Train reserve feed transformer provides one source of off-site power to both units' spent fuel pool cooling pumps. The inspectors concluded that the licensee's testing of the switchyard components to verify equipment performance and identify problems was being appropriately used to verify the operability of required support systems.

c. Conclusions

On December 16, 1999, a maintenance error in the switchyard by the St. Joseph Division of American Electric Power resulted in the partial loss of off-site power to Unit 1. The St. Joseph Division personnel were non-nuclear trained American Electric Power employees who were responsible for performing maintenance in the switchyard. Although the St. Joseph Division personnel were not technically contractors, the problems associated with this event were similar to previous contractor control problems. A recent NRC inspection determined that the licensee made satisfactory improvements to the contractor control program. The licensee incorporated St. Joseph Division personnel into the contractor control program.

The inspectors assessed this event as it related to NRC Restart Action Plan 0350 Item C.4.b, "Operability of Required Secondary and Support Systems." The inspectors concluded that the licensee's testing of the switchyard components to verify equipment performance and identify problems was appropriate to verify the operability of required support systems.

M2 Maintenance Procedures and Documentation

M2.1 (Closed) Inspection Followup Item 50-315/316/99020-03 (DRP): molded case circuit breaker testing.

a. Inspection Scope (62707, C.4.f)

On November 8, 1999, the inspectors observed portions of JO R84549, Clean and Inspect Motor Control Center 2-EZC-BS. Part of the JO required the licensee to test the molded case circuit breakers (MCCBs). The inspectors questioned the MCCB testing procedure methodology for performing 300 percent overcurrent tests on MCCBs. An inspection followup item was opened pending the inspectors' review. The inspectors also assessed the event as it related to NRC Restart Action Plan 0350 Item C.4.f, "Significant Hardware Issues Resolved."

b.1 Observations and Findings

The licensee's procedure for performing overcurrent tests on MCCBs, 12 IHP 5030.EMP.006, "MCCB/TOLR [Thermal Overload Relay] Testing and Electrical Enclosure Maintenance," allowed a MCCB to remain in service following a failed test provided it passed a retest 20 minutes later. However, the procedure did not require the initial test failure to be evaluated. The inspectors reviewed documentation from previous MCCB tests and found one example, a test on a spare MCCB, where the MCCB failed the first test, but passed the second test. The inspectors did not identify any instances of an in-service breaker which failed an initial overcurrent test but remained in service after it passed a second test.

10 CFR Part 50, Appendix B, Criterion XI, required, in part, that test results be documented and evaluated to assure that test requirements have been satisfied. The licensee's procedure, 12 IHP 5030.EMP.006, "MCCB/TOLR Testing and Electrical Enclosure Maintenance," was inconsistent with Criterion XI in that after comparing the test results with the acceptance criteria, Step 7.2.6 of the test procedure stated that if the test results were not satisfactory, then the MCCB could be retested 20 minutes later without evaluating the initial test failure. The procedure directed the MCCB to be removed from service only if it failed the second test. However, all of the MCCBs in service in the plant had passed their initial overcurrent tests; therefore, the inspectors concluded that the licensee had complied with 10 CFR Part 50, Appendix B, Criterion XI, in this case because there were no initial test failures which needed to be evaluated.

The inspectors discussed these observations with members of the licensee's engineering department. The licensee wrote Condition Report 99-27129 to document the inspectors' questions, and placed the MCCB test procedure on hold pending a revision to remove the allowance for a retest without evaluating an initial test failure.

b.2 Review of MCCB Testing for Restart

The inspectors assessed this event as it related to NRC Restart Action Plan 0350 Item C.4.f, "Significant Hardware Issues Resolved." The inspectors noted that the MCCB testing was being done as part of a larger licensee project to clean and inspect all of the motor control centers. The motor control center cleaning project was being conducted to identify and correct longstanding material condition issues in the plant's electrical distribution systems.

c. Conclusions

The inspectors identified a weakness in the licensee's process for testing molded case circuit breakers. Specifically, the applicable test procedure did not require initial overcurrent test failures to be evaluated prior to performing a second test 20 minutes later. The inspectors did not identify any actual failures of the first test which would have possibly affected the operability of specific in-service breakers.

The inspectors assessed this event as it related to NRC Restart Action Plan 0350 Item C.4.f, "Significant Hardware Issues Resolved." The inspectors noted that the molded case circuit breaker testing was being done as part of a larger licensee project

to clean and inspect all of the motor control centers. The inspectors concluded that the motor control center cleaning project demonstrated the licensee's commitment to resolving significant hardware issues with the electrical distribution systems in the plant.

M7 Quality Assurance in Maintenance Activities

M7.1 Licensee Stop Work Orders

a. Inspection Scope (62707, C.3.1.a, C.4.f)

During this inspection period, several stop work orders (SWOs) were issued to various work groups in order to correct performance issues. The inspectors assessed the licensee's actions regarding the stop work orders. Additionally, the inspectors evaluated the individual SWOs as they related to NRC Restart Action Plan 0350 Item C.3.1.a, "Demonstrated Commitment to Achieving Improved Performance Through the Results of the Programmatic Readiness Assessment," and NRC Restart Action Plan 0350 Item C.4.f, "Significant Hardware Issues Resolved."

b.1 Observations and Findings

During this inspection period, the following SWOs were issued:

- On December 2, 1999, the Operations department issued a SWO on critical path ice condenser loading activities after problems were identified with foreign material control and ice chemistry. The SWO was documented in CR 99-28313.

- On December 17, 1999, the Maintenance department issued a SWO for all work activities which may impact essential off-site power supplied to the plant after a maintenance error resulted in a partial loss of off-site power. This issue is discussed in additional detail in Sections O1.2 and M1.2 of this report. The SWO was documented in CR 99-29312.

- On December 18, 1999, the Engineering department issued a SWO on critical path motor operated valve (MOV) refurbishments after deficiencies in the control of safety grade material were identified. This issue is discussed in additional detail below. The SWO was documented in CR 99-29471.

- On January 11, 2000, the Maintenance department issued a SWO on the questionable use of parts from plant equipment. The SWO was documented in CR 00-0673.

The inspectors determined that the licensee was appropriately using SWOs to implement corrective actions. Each SWO required a specific action plan to be completed in order to lift the SWO and allow work to resume. In addition, the inspectors noted that the licensee demonstrated a willingness to stop critical path work in order to address problems. The SWO on MOV refurbishments was particularly noteworthy in that the licensee's Performance Assurance (PA) department expanded the scope of the investigation to include other work groups.

b.2 Review of Stop Work Orders for Restart

The inspectors assessed the use of SWOs as they related to NRC Restart Action Plan 0350 Item C.3.1.a, "Demonstrated Commitment to Achieving Improved Performance Through the Results of the Programmatic Readiness Assessment." The inspectors noted that both the licensee's willingness to stop critical path work with a SWO and the establishment of action plans to lift each SWO demonstrated a commitment to improving work performance.

The inspectors also assessed the MOV refurbishment project as it related to NRC Restart Action Plan 0350 Item C.4.f, "Significant Hardware Issues Resolved." The inspectors noted that the MOV refurbishment project was part of a larger project intended to correct deficiencies in the maintenance and material condition of MOVs. The MOV project demonstrated the licensee's commitment to resolving longstanding hardware issues.

c. Conclusions

The licensee effectively implemented immediate corrective actions for performance problems. In addition, the use of the stop work orders demonstrated the licensee's willingness to stop work on critical path activities to ensure that the problems are corrected prior to resuming work.

The inspectors assessed the use of SWOs as they related to NRC Restart Action Plan 0350 Item C.3.1.a, "Demonstrated Commitment to Achieving Improved Performance Through the Results of the Programmatic Readiness Assessment." The inspectors noted that both the licensee's willingness to stop critical path work with a SWO and the establishment of action plans to lift each SWO demonstrated a commitment to improving work performance.

The inspectors assessed the MOV refurbishment project as it related to NRC Restart Action Plan 0350 Item C.4.f, "Significant Hardware Issues Resolved." The inspectors noted that the MOV refurbishment project was part of a larger project intended to correct deficiencies in the maintenance and material condition of MOVs. The MOV project demonstrated the licensee's commitment to resolving longstanding hardware issues.

M7.2 Performance Assurance Involvement in MOV Refurbishment Stop Work Order

a. Inspection Scope (62707)

On December 18, 1999, the Engineering department issued a SWO on critical path MOV refurbishments after deficiencies in the control of safety grade material were identified. The licensee's Performance Assurance (PA) department investigated the circumstances surrounding the issuance of the SWO. The inspectors followed up on the stop work order and the PA investigation.

b. Observations and Findings

On December 18, 1999, the licensee's maintenance department quarantined the MOV refurbishment trailer after they discovered that safety grade fasteners may have been improperly stored. The trailer had been used by a contractor work group for refurbishing MOV actuators. The licensee evaluated the use of the safety grade fasteners in the MOVs and determined that only safety grade fasteners were installed in safety-related MOVs. However, the licensee could not determine which specific safety grade fasteners were installed in which specific MOVs.

The licensee later determined that the non-traceable fasteners did not result in a loss of any MOV functionality. The licensee amended the work packages to include an engineering evaluation of the installed fasteners. In December 1999, the SWO was incrementally lifted after the action plan to train the MOV workers in the proper control of safety grade parts was completed.

After the original SWO was issued to the MOV refurbishment group, the licensee's PA organization widened the root cause investigation to include other on-site organizations. The PA department identified safety grade material control deficiencies with the air-operated valve project team and the licensee's instrumentation and controls shop. However, similar to the MOV findings discussed above, the licensee determined that the improperly controlled safety grade parts did not affect the safety function of any equipment. These groups were also trained on the procedural requirements for safety grade parts control. The inspectors noted that the licensee's PA department had appropriately expanded the inspection scope in order to identify and correct a wider problem than the safety grade fasteners storage problem in the MOV refurbishment trailer.

c. Conclusions

The licensee's actions to issue a stop work order and quarantine the motor-operated valve refurbishment trailer after they discovered that safety grade fasteners may have been improperly stored was appropriate. The licensee's Performance Assurance department expanded the scope of the investigation and identified other on-site work groups with similar problems. The widened investigation by the Performance Assurance department was appropriate and thorough. The failure to properly control safety grade fasteners did not affect the safety function of any equipment.

III. Engineering

E1 Conduct of Engineering

E1.1 High Pressure Fuel Injection Line Failures on Emergency Diesel Generators

a. Inspection Scope (37551, C.4.f)

In November 1999, the Unit 2 AB D/G experienced a number of high pressure fuel injection line failures. The inspectors followed up on the licensee's response to the fuel line failures. The inspectors also assessed the failures as they related to NRC Restart Action Plan 0350 Item C.4.f, "Significant Hardware Issues Resolved."

b.1 Observations and Findings

In mid-1997, the licensee replaced the Unit 2 AB D/G carbon steel high pressure fuel oil injection lines with stainless steel lines due to concerns about line failures. The stainless steel lines had a larger inner diameter than the original carbon steel lines, but the D/G drawings indicated that the larger diameter lines were acceptable. The line replacement decreased the engine performance and increased the fuel oil consumption. The high pressure fuel injection line changes were discussed in a previous NRC Inspection Report 50-315/316/97024.

In order to reduce fuel oil consumption and restore engine performance, the licensee decided to restore the fuel injection system to the original configuration. On November 1, 1999, the licensee replaced the stainless steel lines with new carbon steel lines of the original inner diameter as part of a scheduled maintenance overhaul of the Unit 2 AB D/G. Several attempted post-maintenance tests of the Unit 2 AB D/G were stopped after the new high pressure fuel injection lines developed through wall leaks. After each attempted test, the failed line was replaced with another new carbon steel line. The licensee analyzed the leak failures and determined that the through-wall leaks were caused by fatigue failures which propagated from existing flaws on the inner bore surface. The licensee also determined that the flaws on the new lines were most likely due to manufacturing defects.

The nature of the carbon steel line manufacturing process increased the likelihood of flaws to appear on the inner bore surface. The licensee developed an alternate testing method due to the difficulty in performing non-destructive testing of the lines. The licensee performed the alternate testing method to verify that any installed lines did not have any manufacturing defects which would lead to premature failure.

After reviewing the high pressure fuel injection line failure analysis, the licensee determined that any manufacturing flaws would result in a through-wall leak within 1 million cycles (approximately 65 hours of run time). The licensee evaluated the other D/G fuel lines and found that two of the three D/Gs each had a replacement high pressure fuel injection line with less than 65 hours of run time. Based on this

information, the operators declared the Unit 2 D/Gs and the Unit 1 AB D/G inoperable until all of the high pressure fuel injection lines could accumulate at least 65 hours of run time.

Originally, the licensee intended to run the three affected D/Gs for 72 hours to ensure that all of the high pressure fuel injection lines had greater than 65 hours of run time. However, senior licensee management determined that the safety-related D/Gs should not be run simply to accumulate run time on the fuel lines. The licensee contracted with an off-site testing facility to replicate the high pressure fuel injection line service conditions and run each of the new lines for 72 hours. Once each D/G's susceptible lines had been tested satisfactorily and re-installed, the D/Gs were declared operable.

b.2 Review of High Pressure Fuel Injection Line Failures for Restart

The inspectors assessed this event as it related to NRC Restart Action Plan 0350 Item C.4.f, "Significant Hardware Issues Resolved." The inspectors noted that the licensee's efforts to identify and correct the cause of the D/G high pressure fuel injection lines were thorough. Because the manufacturing defects cannot be easily identified through non-destructive testing methods, the licensee developed a test methodology to identify defective lines and replace them.

c. Conclusions

The licensee determined that the failures of several new emergency diesel generator high pressure fuel oil injection lines were due to manufacturing defects. Due to the difficulty in performing non-destructive testing of the lines, the licensee developed an alternate testing method to verify that any installed lines did not have any manufacturing defects which would lead to premature failure. The licensee conservatively declared three emergency diesel generators inoperable until susceptible lines could be verified operable using the alternate testing method. The inspectors concluded that the licensee's efforts to resolve the high pressure fuel injection line leak issues were aggressive and thorough.

The inspectors assessed this event as it related to NRC Restart Action Plan 0350 Item C.4.f, "Significant Hardware Issues Resolved." The inspectors concluded that the resolution of the D/G high pressure fuel injection line demonstrated the licensee's commitment to resolving significant hardware issues with the emergency electrical distribution systems in the plant.

E2.1 Review of Post Modification Testing of Essential Service Water Pump

a. Inspection Scope (61726, 37551, C.4.a, C.4.e)

In November 1999, the inspectors observed the post modification testing (PMT) of the 2 West (2W) ESW pump following completion of DCP-666, "Replace Pump Bowl (Casing) Assembly." The PMT was conducted in accordance with Procedure 2-Engineering Head Procedure (EHP) SP.DCP.666, "Essential Service Water Pump Performance Test." The test acceptance criteria used pump performance curves obtained from engineering Procedure 12-EHP 5070 ISI.017R, "Section XI

Centrifugal Pump Performance Verification," which was also used in the licensee's In-Service Testing (IST) program for safety-related centrifugal pumps. Because the licensee confirmed ESW pump operability through periodic IST, the inspectors also reviewed the basis for the quarterly IST acceptance criteria. Additionally, the inspectors reviewed Technical Specification (TS) 3.7.4.1, "Essential Service Water System," for consistency with design basis calculations.

The inspectors assessed the observations and findings developed during this review as they related to the Manual Chapter 0350, Guidelines for Restart Approval, Item C.4.a, "Operability of TS Systems" and Item C.4.e, "Adequacy of Surveillance Tests/Test Program."

b. Observations and Findings

The inspectors reviewed various aspects of the IST program associated with the ESW pumps. This review included pump minimum operability requirements, treatment of instrument uncertainty, surveillance procedure adequacy, design basis assumptions, and TS requirements. Significant observations and findings related to this review are detailed below.

b.1. IST Pump Action Limit Set Below Minimum Operability Limit

The inspectors compared ESW pump acceptance criteria to the associated safety analysis to verify that periodic pump testing ensured that operability assumptions were met. Technical Specification 4.0.5.a requires, in part, that In-Service Testing of American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 pumps be done in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable addenda. For the third 10-year interval, the licensee committed to perform In-Service Testing in accordance with Part 6 of OMa-1988, "In-Service Testing of Pumps in Light-Water Reactor Power Plants." Procedure 1[2]-OHP 4030.STP.022E[W], "Essential Service Water System Test," was used demonstrate the operability of the ESW system.

Calculation NEMP940921AF, "CCW Hx [heat exchanger] Flow Multiplier," Revision 1, established the minimum design basis operability limit for the ESW pumps. Based on this calculation, the minimum operability for the 1 East (1E) and 2 West (2W) ESW pumps at their specified IST reference flows were 69.5 and 61.8 pounds-force per square inch differential (psid), respectively. The low action limit for 2W ESW pump was established at 60.7 psid, or 1.1 psid below the minimum operability limit. Therefore, the 2W ESW pump low action limit could have allowed the pump to degrade to a performance level below the minimum operability limit required by the ESW system safety analysis. At the time of the inspection, both units were in a defueled condition and ESW pump TS operability was not required. However, the ESW pumps provided support for spent fuel pool cooling. Based on a review of recent surveillance data, the inspectors determined that all ESW pumps were performing at a level above the minimum operability limit.

The ESW pumps were last required to be operable per the TSs prior to the dual unit shutdown of September 1997. The inspectors reviewed surveillance data obtained prior

to the shutdown to determine if appropriate low action IST limits had been established at that time. The inspectors identified the following examples of non-conservative low action limits:

- The low action limit acceptance criteria for the July 18, 1997, performance of 01 OHP 4030.STP.022E for the 1E ESW pump was 69.2 psid. The minimum operability limit at the associated reference flowrate was 69.5 psid.

- The low action limit acceptance criteria for the August 19, 1997, performance of 02 OHP 4030.STP.022W for the 2W ESW pump was 69.1 psid. The minimum operability limit at the 2W ESW pump IST reference flow was 69.5 psid. The reference flow for the 2W pump was later increased and the low action limit was lowered to 60.7 psid following a pump rebuild.

10 CFR Part 50, Appendix B, Criterion XI, "Test Control," requires, in part, that a test program be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents. Contrary to Criterion XI, the acceptance limits established for the 1E ESW pump in 01 OHP 4030.STP.022E and the 2W ESW pump in 02 OHP 4030.STP.022W did not incorporate the operability limits of the associated design calculation. This Severity Level IV violation is being treated as a Non-Cited Violation (NCV), consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as CR 99-21087 and CR 99-29349 (NCV 50-315/316/99021-01).

The licensee had previously identified the failure to appropriately set the low action limit for the 1E ESW pump in CR 99-01635 on January 27, 1999. However, this CR identified that only the 1E ESW had a low action limit set below the minimum operability requirement. Prior to the initiation of this CR, the reference flow and low action limit for the 2W pump had been revised. The condition evaluation for this CR failed to identify that the revised low action limit for the 2W ESW pump was also established below the minimum operability limit. The corrective action for this CR included a revision to the Unit 1 technical data book to increase the 1E ESW pump low action limit to 70.0 psid.

As discussed in Section E2.1.b.4, the licensee initiated CR 99-21087 to identify that there was no programmatic method to compare minimum pump operability limits to IST testing acceptance criteria. Although CR 99-21087 did not identify any specific cases where a pump low action limit was set below the minimum operability limit, it did document that there was a potential to allow a pump to degrade to a level allowed by the ASME code but below the minimum operability limit in the associated system safety analysis. The corrective actions for the CR included evaluation of every pump tested in the IST program to determine if design requirements were satisfied. During discussions with the inspectors, members of licensee engineering management stated that the failure to appropriately establish the IST low action limit for the 2W ESW pump would have been identified during this review.

The requirement to establish action limits consistent with design requirements has been promulgated by the NRC in a number of publications available to the licensee.

Discussions of the application of minimum pump operability limits to the IST program were contained in the following documents:

- NUREG-1482, published in April 1995, provided guidelines and recommendations for developing and implementing IST programs. NUREG-1482, Section 5.6, "Operability Limits of Pumps," stated that operability limits of pumps "must always meet, or be consistent with, licensing assumptions in a plant's safety analysis." Section 9.8.3.4 of the Updated Final Safety Analysis Report (UFSAR) stated that the ESW pumps are tested in accordance with ASME OM standards and NUREG-1482, "Guidelines for In-Service Testing at Nuclear Power Plants."

- On December 30, 1997, the NRC issued Information Notice 97-90, "Use of Non-Conservative Acceptance Criteria in Safety-Related Pump Surveillance Tests." This notice discussed the use of In-Service Testing acceptance criteria that might have allowed safety-related pumps to degrade below the performance assumed in the accident analysis. Specifically, the notice stated that if the minimum design performance stated in design-basis documentation is more restrictive than the ASME code acceptance criteria, then the test acceptance criteria must be adjusted to avoid actual pump performance being allowed to degrade below the minimum acceptable design performance. This Information Notice also referred to a previous violation (50-315/96013-02(DRS); 50-316/96013-02(DRS)) at D.C. Cook where the IST low action limits for the centrifugal charging pumps were established below the minimum operability limit.

Although this issue had been disseminated to the industry, the failure of the licensee to be responsive to industry information was identified by the licensee's expanded system readiness reviews and has been discussed in earlier NRC inspection reports (See NRC Inspection Reports 50-315/316/99001 and /99003). Additionally, the plant corrective action system had been judged to be inadequate and has been the focus of significant licensee attention to improve the program.

b.2 Failure to Account for Instrument Uncertainty During Operability Tests

The inspectors reviewed the ESW pump low action limits to determine if instrument uncertainties were appropriately considered. Although the adjustment of IST acceptance limits for instrument uncertainty was not required by the ASME code, periodic IST was used to verify pump operability. Therefore, the IST acceptance criteria must be set to the more restrictive of either: (1) the allowable ASME code degradation from the reference differential pressure or (2) the minimum safety analysis operability limit including consideration for test instrument uncertainty. If pump minimum operability limits were more restrictive than the allowable ASME code degradation (i.e., the pump was design limited), instrument uncertainty must have been considered to ensure that the pump actually performed above the minimum operability limit. This issue was further discussed in NUREG-1482, Section 5.10, "Adjustments for Instrument Inaccuracies."

The ESW pump surveillance procedure acceptance criteria did not account for instrument inaccuracies for design limited pumps. Because the 2W ESW pump had a

minimum operability limit more restrictive than the full code allowable degradation limit, it was a design limited pump. Therefore, the acceptance criteria for the 2W ESW pump surveillance test was required to account for instrument uncertainty to ensure minimum operability requirements were met.

Case Specific Checklist Item 3C, "Failure to Consider Instrument Uncertainties, Setpoints, and/or other Instrument Biases," will be addressed in NRC Inspection Report 50-315/316/99032. However, the application of instrument uncertainty within the licensee's IST program was outside the scope of NRC Inspection Report 50-315/316/99032. In responding to the Case Specific Checklist item, the licensee reviewed the ESW quarterly IST surveillance procedure, 01[02]-OHP 4030.STP.022E[W]. The inspector reviewed the licensee's instrument uncertainty evaluation of the ESW pump test procedure. The licensee's review was limited to ensuring that test instruments were identified for the critical parameter list and that instruments met ASME code requirements for IST. This review did not evaluate the impact of instrument uncertainty on test acceptance criteria when the minimum pump operability requirements were more limiting than the ASME code allowable degradation.

The licensee documented the failure to account for the effect of instrument uncertainty on minimum pump operability requirements in CR 99-21087 and CR 99-29349. During their initial review of the CR 99-21087, the inspectors concluded that the failure to account for instrument uncertainty in the IST program was only generally addressed. The licensee subsequently revised the corrective actions in the CR to include specific actions to add instrument uncertainty margin to pump low action limits as required.

b.3 Surveillance Test Procedure Inadequacies

During a review of completed IST surveillance procedures for the ESW pumps, the inspectors identified the inappropriate use of a test reference flow band and a minor calculation error associated with the computation of total pump head. These observations are detailed below:

- The inspectors identified that during a performance of 02-OHP 4030.STP.022W for the 2W ESW pump on August 19, 1997, the inappropriate use of the reference flow band could have potentially masked pump degradation. The surveillance test acceptance criteria was based on a reference flow of 7000 gallons per minute (gpm) and the procedure specified a flow rate band of 6900 gpm to 7100 gpm. The purpose of providing the flow band around the reference flow was to provide an allowance for expected instrument variation during the test. The operators initially performed the test at a flow rate of 7100 gpm and obtained a pump differential pressure between the IST alert level and the low action level. The operators then repeated the test at 6900 gpm and obtained an acceptable differential pressure. After the inspector identified this condition, the licensee initiated CR 99-29359 to document the inappropriate use of the test control flow band. Subsequent to this test, the 2W pump was rebuilt and the pump differential pressure was determined to be above the minimum operability limit during later inservice tests.

- The inspectors identified a minor error in the pump differential pressure calculation in Procedure 01[02]-OHP 4030.STP.022E[W]. After establishing the reference pump flow, the operators determined the ESW pump differential pressure based on pump discharge pressure and forebay level. The elevation difference between the pump discharge pressure gage and the forebay level represented additional pump head that was added to the pump discharge pressure to obtain the total pump developed head. The inspector measured the gage elevations and concluded that the gages (1-WPI-711, 1-WPI-712, 2-WPI-713, and 2-WPI-714) were located 1 foot below the elevation stated in the procedure. This elevation error introduced a non-conservativism of approximately 0.4 psid in the calculation of ESW pump differential pressure. The licensee reviewed past ESW pump data and determined that the 0.4 psid reduction in developed pump differential pressure would not have made an ESW pump inoperable. The licensee documented this condition in CR 00-00458.

  10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that procedures include appropriate quantitative acceptance criteria. Contrary to Criterion V, the ESW In-Service Testing Procedure, 01[02]-OHP 4030.STP.022E[W], did not provide appropriate acceptance criteria in that the calculation used to determine total pump differential pressure used an incorrect value for the elevation pump discharge pressure. Because the condition did not result in the inoperability of an ESW pump, the safety significance of the failure to provide appropriate acceptance criteria was minimal. Therefore, this failure constituted a violation of minor significance and is not subject to formal enforcement action.

b.4 Minimum Operability Limits Not Appropriately Reflected in IST Acceptance Criteria

Attachment 2 to 12-EHP 5070 ISI.017R provided a collection of head and flow performance curves for centrifugal pumps tested by the In-Service Testing program. The purpose of this procedure was to ensure that pump design limits were considered when pump reference values and acceptance criteria were changed. Step 7.3.1 of 12-EHP 5070 ISI.017R stated that pump IST low action limits must not be less than the minimum required net total head for the system as shown in Attachment 2 pump performance curves. In August 1999, the licensee identified that the minimum operability limits in Attachment 2 were not programmatically required to be updated when design assumptions changed. The licensee documented this concern in CR 99-21087.

In addition to a graphical representation of the minimum required pump total head, Attachment 2 provided a quadratic curve fitting equation for each performance curve. The inspectors noted that pump performance requirements derived from the use of the curve fitting equation did not bound design calculation assumptions or established IST action limits. During discussions with the inspectors, licensee management stated that the use of curve fitting equations for the minimum pump operability limits was inappropriate and the placement of the equations on the performance curve was misleading. On January 6, 2000, the licensee placed the 12-EHP 5070.ISI.017R, Attachment 2, performance curves on administrative hold pending validation of the

operability limits. The licensee planned to complete this evaluation as part of the corrective action for CR 99-21087.

b.5 Evaluation of the Effect of Degraded Voltage and Frequency on ESW Pump Operability

Although IST pump testing generally has been run at nominal bus voltage and frequency conditions, under accident conditions, the electrical power supply to the ESW pump motors may become degraded. For example, TS 4.8.1.1.2 for emergency diesel generator surveillance testing allowed a frequency band of 60+/- 1.2 Hz and a voltage range of 4160+/- 420 volts. Less than nominal voltage and frequency conditions for the ESW pump motor may have resulted in a reduced ESW pump speed. Therefore, the power supply to the ESW pump motors under worst case conditions could have resulted in a reduced ESW pump head and flow capability. Licensee engineering management stated that this effect was not considered when establishing operability limits for the ESW pumps. The licensee also stated that they believed that the reduction in motor speed associated with degraded voltage conditions would be a minor effect (e.g., approximately 2 - 4 RPM or less than a 1 percent degradation in total head) and would not significantly alter the ESW pump operability limit. The licensee has documented this concern in CR 99-29349 and stated they will also evaluate the effect of degraded voltage and frequency conditions during the closure of CR 99-21087.

b.6 Review of TS Operability Requirements for ESW System

During a review of the ESW system safety analysis calculation, NEMP940921AF, the inspectors noted that the ESW system was modeled with two ESW pumps supplying cooling water to a single cross connected system header. Based on this configuration, an ESW pump located in the opposite unit would be required to meet the design basis safety analysis. This configuration is consistent with Section 9.8.3.2 of the UFSAR, which stated that two ESW pumps are sufficient to supply all service water requirements for unit operation, shutdown, refueling, or post accident operation. Technical Specification 3.7.4.1.a required at least two independent ESW loops to be operable, but was not specific about what constituted an operable ESW loop. The inspectors questioned if the flowpath from the opposite unit ESW pumps was required to be operable to support ESW system operability. Although TS 3.7.4.1.b required at least one essential service water flow path from the opposite unit to be available for 10 CFR Part 50, Appendix R considerations, the requirements TS 3.7.4.1.a may not have been consistent with design basis assumptions. Based on the inspectors' questions, the licensee initiated CR 00-00641 on January 13, 2000. After additional review, the licensee identified two additional CRs related to this issue:

- CR 99-08588, initiated on April 17, 1999, which identified that UFSAR Table 9.8-6 may have had a conflict concerning the number of required ESW pumps for a design basis accident.

- CR 99-17580, initiated on July 1, 1999, which identified an industry issue related to TS requirements for a multi-unit site with a shared service water system.

Pending further review of the ESW system licensing basis and operational requirements, this issue is identified as Unresolved Item (URI) 50-315/316/99021-02 (DRP).

b.7 Review of Inspection Findings and Physical Readiness of Plant for Restart

The inspectors assessed the observations and findings developed during this review as they relate to the Manual Chapter 0350, Guidelines for Restart Approval, Item C.4.a, "Operability of TS Systems" and Item C.4.e, "Adequacy of surveillance tests/test program." Although the inspectors determined that the IST surveillance low action limit for the 2W ESW was established less conservatively than the minimum operability limit, the licensee has planned on reverifying the action limits for all inservice tested centrifugal pumps prior to restart. This review should provide reasonable assurance that IST action limits have been established consistently with minimum operability requirements. The inspectors identified a minor calculation error associated with the ESW In-Service Testing surveillance procedure and the inappropriate execution of the surveillance with regard to the use of the specified flow range. These issues have been documented in the licensee's corrective action system.

c. Conclusions

The inspectors identified that the 2W Essential Service Water Pump In-Service Testing low action limit was set such that the pump could have degraded to a performance level below the required operability limit. Further, the In-Service Testing action limits established for the 1E and 2W Essential Service Water Pumps when both pumps were last required to be operable were inconsistent with the safety analysis. This constituted a failure to meet the requirements of 10 CFR Part 50, Appendix B, Criterion XI and was identified as a non-cited violation. Also, the licensee did not consider the impact of instrument uncertainty when establishing In-Service Testing low action limits. This may have allowed pumps with operability limits more restrictive than the code allowable degradation to degrade to a level such that safety analysis requirements would not be met.

In addition, TS 3.7.4.1 requirements may not reflect design basis assumptions concerning the operability of the opposite unit's essential service water pumps. Specifically, essential service water pumps in both units may be required to support essential service water system operability. This issue was identified as an Unresolved Item.

E8 Miscellaneous Engineering Issues

E8.1 Inspectors Review of Restart Action Matrix Items

In a letter dated July 30, 1998, the NRC informed the licensee that an oversight panel had been established in accordance with NRC Manual Chapter (MC) 0350, and a checklist was enclosed which specified activities which the NRC considered necessary to be addressed prior to restart. In accordance with MC 0350, an inspection plan was developed to evaluate the effectiveness of the licensee's actions to correct the items listed on the Case Specific Checklist. In addition, the NRC Inspection Manual 0350

Panel initiated a Restart Action Matrix to document all items that needed review prior to restart.

The NRC MC 0350 oversight panel assessed the RAM items on the basis of importance, from "risk significant" to "little or no risk significance" and established criteria for inspection of the RAM items based on the relative risk. For low-risk significant items, the panel criteria required that: (1) the licensee had written a condition report to track the issue addressed by the RAM item, and (2) the licensee appropriately tracked the item as required for restart. The inspectors reviewed the following low-risk items and concluded that the licensee's actions met the requirements of the MC 0350 oversight panel restart criteria.

- (Closed) RAM Item R.2.1.11, URI 50-315/316/98009-016: Performance testing of the D/G heat exchangers was not able to detect degradation, as required by the licensee's Generic Letter (GL) 89-13 testing program. The inspectors reviewed RAM closure item R.2.1.11 in accordance with the criteria discussed earlier in this section. The original unresolved item is quoted below:

  "Heat exchanger performance trending included the EDG [Emergency Diesel Generator] jacket water, lube oil and aftercoolers. ESW outlet temperatures were recorded and trends were charted over several tests. The trends indicated that the temperature profiles were relatively constant over the testing period. However, the AE team identified that the heat exchanger outlet temperature was automatically regulated by a flow control valve. Therefore, the trending data only indicated that the flow control valves were operating correctly."

  In response to this unresolved item the licensee opened condition reports, CR 97-2339, CR 97-3523, CR 98-5574, and CR 99-7866. The licensee corrective action review board split the issue into the specific question on the D/G heat exchangers and the programmatic issue on GL 89-13 testing in general.

  During the outage the licensee opened up, inspected, and cleaned all heat exchangers on the D/Gs, including those with service water as a cooling medium. Based upon the GL option of either testing or inspecting and cleaning, the licensee decided that rather than correct the GL 89-13 problems prior to restart that inspection and cleaning would ensure heat exchanger operability for restart. The CRs for both the specific D/G heat exchanger issue and the general 89-13 issue were moved to after restart.

  The inspectors reviewed the records documenting the inspection and cleaning of the heat exchangers and verified that the D/G heat exchangers had been cleaned. The inspectors determined that the licensee took appropriate corrective actions to ensure the operability of D/G heat exchangers cooled by service water. However, the GL 89-13 programmatic issues were in the process of being corrected by the licensee. Consequently, the inspectors concluded that sufficient corrective actions had been taken to support plant restart, but future

inspections need to be conducted to verify that long term corrective actions to resolve GL 89-13 programmatic weaknesses were adequate. This RAM item will be closed. The inspector's review of the licensee's long term corrective actions to resolve GL 89-13 weaknesses will be tracked as IFI 50-315/316/99021-03.

- (Closed) RAM Item R.2.3.32, Unresolved Item 50-315/316/98009-17: Inadequate justification to return the Unit 2 250 VDC battery Train CD to an operable status. The licensee documented this item in CR 97-3520. This item is closed.

- (Closed) RAM Item R.2.4.26, Violation 50-315/316/98152-01342: Change to CCW operating procedure was not recognized as a change to the intent of the procedure. This item had previously been identified as Escalated Enforcement Item 50-315/316/98009-32. The licensee documented this item in CR 97-2340 and included it in the root cause evaluation of CR 98-5339. This item is closed.

- (Closed) RAM Item R.2.9.4, Inspection Follow-up Item 50-315/316/98007-11: Unable to identify any NRC correspondence that specifically approved the licensee position. The licensee documented this item in CR 98-06369. This item is closed.

IV. Plant Support

R1 Radiation Protection and Chemistry Controls (71750)

During normal resident inspection activities, routine observations were conducted in the area of radiation 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 January 13, 2000. 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.

X2 Summary of MC 0350 Restart Action Matrix Items

The inspectors reviewed selected items from the NRC Inspection Manual Chapter 0350 Restart Action Matrix (RAM). The following list indicates NRC RAM Items which are discussed in the report:

- Item R.2.1.11, "Performance Testing of the D/G Heat Exchangers Was Not Able to Detect Degradation, As Required by the Licensee's GL 89-13 Testing Program," is discussed in Section E8.1. This item is closed.

- Item R.2.3.32, "Inadequate Justification to Return the Unit 2 250 VDC Battery Train CD to an Operable Status," is discussed in Section E8.1. This item is closed.

- Item R.2.4.26, "Change to CCW Operating Procedure Was Not Recognized as a Change to the Intent of the Procedure," is discussed in Section E8.1. This item is closed.

- Item R.2.9.4, "Unable to Identify Any NRC Correspondence That Specifically Approved the Licensee Position," is discussed in Section E8.1. This item is closed.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

#C. Bakken, Site Vice President
#L. Bush, Assistant Operations Manager
#R. Gaston, Compliance Manager
#S. Greenlee, Director, Design Engineering
#R. Godley, Director, Regulatory Affairs
#R. Kalinowski, Acting Manager, Engineering Programs
#W. Kropp, Director, Performance Assurance
#M. Marano, Director, Business Services
#T. Noonan, Restart Director
#T. O'Leary, Radiation Protection, Chemistry, and Environmental Manager
#J. Pollack, Plant Manager
#R. Powers, Senior Vice President
#T. Quaka, Nuclear Safety Assessment
#M. Rencheck, Vice President, Nuclear Engineering
#B. Wallace, Training Manager
#R. Womack, Engineering Supervisor

# Denotes those present at the January 13, 2000, exit meeting.

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 61726:	Surveillance Observations
IP 62707:	Maintenance Observation
IP 71707:	Plant Operations
IP 71750:	Plant Support Activities

NRC MANUAL CHAPTER 0350 ITEMS DISCUSSED

- Item C.3.1.a, "Demonstrated Commitment to Achieving Improved Performance Through the Results of the Programmatic Readiness Assessment"
- Item C.4.a, "Operability of TS Systems"
- Item C.4.b, "Operability of Required Secondary and Support Systems"
- Item C.4.e, "Adequacy of Surveillance Tests/Test Program"
- Item C.4.f, "Significant Hardware Issues Resolved"

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-315/316/99021-01	NCV	In-Service Testing low action limits set lower than minimum operability limit
50-315/316/99021-02	URI	Review of TS requirements for ESW operability during design basis accident
50-315/316/99021-03	IFI	Verify adequacy of long term corrective actions to resolve GL 89-13 programmatic weaknesses for performance testing of the D/G heat exchangers

Closed

50-315/316/98007-11	IFI	Unable to identify any NRC correspondence that specifically approved the licensee position
50-315/316/98009-17	URI	Inadequate justification to return the Unit 2 250 VDC battery train CD to an operable status
50-315/316/98152-01342 (50-315/316/98009-32)	VIO	Change to CCW operating procedure was not recognized as a change to the intent of the procedure
50-315/316/99020-01	IFI	Molded case circuit breaker overcurrent testing
50-315/316/99021-01	NCV	In-Service Testing low action limits set lower than minimum operability limit

Discussed

50-315/316/98009-16	URI	Performance testing of the D/G heat exchangers was not able to detect degradation, as required by the licensee's Generic Letter 89-13 testing program

LIST OF ACRONYMS

AR	Action Request
ASME	American Society of Mechanical Engineers
C	Clarence
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CR	Condition Report
D/G	Diesel Generator
DHSO	Department Head Standing Order
DRP	Division of Reactor Projects
EP	69kV Emergency Power
EMP	Electrical Maintenance Procedure
ESRR	Expanded System Readiness Review
ESW	Essential Service Water
IHP	Instrument Head Procedure
IMP	Instrument Maintenance Procedure
IST	In-Service Testing
JO	Job Order
MC	Manual Chapter
MCCB	Molded Case Circuit Breaker
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
ORAM	Outage Risk Assessment and Management
OSO	Operations Standing Order
OTA	Outage Technical Advisor
PA	Performance Assurance
PMI	Plant Manager's Instruction
PMP	Plant Manager's Procedure
PMSO	Plant Manager's Standing Order
PMT	Post Modification Testing
PDR	Public Document Room
RAM	Restart Action Matrix
RCS	Reactor Coolant System
RHR	Residual Heat Removal
SRO	Senior Reactor Operator
STA	Shift Technical Advisor
STP	Surveillance Test Procedure
SWO	Stop Work Order
TS	Technical Specification
VIO	Violation

50-315
12/17/99
99-20

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

December 17, 1999

Mr. R. P. Powers
Senior Vice President
Nuclear Generation Group
American Electric Power Company
500 Circle Drive
Buchanan, MI 49107-1395

SUBJECT: D. C. COOK INSPECTION REPORT 50-315/99020(DRP); 50-316/99020(DRP)

Dear Mr. Powers:

This refers to the inspection conducted on October 9 through November 19, 1999, at the D. C. Cook Units 1 and 2 reactor facilities. The inspection was an examination of activities conducted under your license as they relate to compliance with the Commission rules and regulations and with the conditions of your license. Areas reviewed included Operations, Maintenance, Engineering, and Plant Support. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress. The enclosed report presents the results of that inspection.

During this inspection period, we noted that your staff was making progress in resolving some of the issues which had contributed to the extended outage. For example, we observed that a significant milestone was met in the commencement of ice loading activities on the Unit 2 ice condenser. In the area of self-assessment effectiveness, your Performance Assurance group demonstrated a strong questioning attitude in identifying motor operated valve testing issues.

However, examples of inadequate procedure quality and adherence indicate that there are still some problems to be resolved in this area. Your staff identified one example where an Essential Service Water (ESW) system normal operating procedure was partially used without the appropriate reviews to ensure that the partial use did not result in a change of intent to the procedure. We considered the failure to properly review the proposed partial use of the ESW procedure constituted a Severity Level IV violation of 10 CFR Part 50, Appendix B, Criterion V. In addition, the inspectors identified that an Operations Standing Order was used in place of a procedure to provide complex, system-specific plant operating guidance. We concluded that the failure to provide appropriate operating guidance constituted a Severity Level IV violation of 10 CFR Part 50, Appendix B, Criterion V.

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These Severity Level IV violations are being treated as Non-Cited Violations (NCVs). Section VII.B.1.a of the Enforcement Policy requires that for Severity Level IV violations to be dispositioned as NCVs, they are appropriately placed in the licensee's corrective action program. Implicit in that requirement is that the corrective action program be fully acceptable. The plant corrective action program was not adequate and has been the focus of significant attention by your staff to improve the program. While your staff and the NRC have not yet concluded that the corrective action program is fully effective, the corrective action program improvement efforts are underway and captured in the Restart Plan which is under the formal oversight of the NRC through the NRC Manual Chapter 0350 Process, "Staff Guidelines for Restart Approval." Consequently, these issues will be dispositioned as NCVs.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be placed in the NRC Public Document Room.

Sincerely,

John A. Grobe, Director
Division of Reactor Safety

Docket Nos. 50-315; 50-316
License Nos. DPR-58; DPR-74

Enclosure: Inspection Report 50-315/99019(DRP);
50-316/99019(DRP)

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-315; 50-316
License Nos:	DPR-58; DPR-74
Report No:	50-315/99020(DRP); 50-316/99020(DRP)
Licensee:	American Electric Power Company 1 Cook Place Bridgman, MI 49106
Facility:	D. C. Cook Nuclear Generating Plant
Location:	1 Cook Place Bridgman, MI 49106
Dates:	October 9 through November 19, 1999
Inspectors:	B. L. Bartlett, Senior Resident Inspector J. D. Maynen, Resident Inspector K. A. Coyne, Resident Inspector
Approved by:	A. Vegel, Chief Reactor Projects Branch 6 Division of Reactor Projects

EXECUTIVE SUMMARY

D. C. Cook Units 1 and 2
NRC Inspection Report 50-315/99020(DRP); 50-316/99020(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 control room operators did not properly review partial use of the essential service water system normal operating procedure prior to switching the essential service water pumps. The failure to properly review partial use of the procedure resulted in the unintended chlorination of the Unit 2 ESW system. This was considered a non-cited violation of 10 CFR Part 50 Appendix B, Criterion V. (Section O1.2)

- The licensee failed to provide appropriate guidance for load control of the reserve auxiliary transformer following an offsite power supply transformer tap setting change. A standing order was used to provide complex guidance on loading restrictions rather than a formal procedure. This was considered a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V. (Section O3.1)

- The inspectors identified two minor examples of failures to comply with administrative procedure requirements involving: (1) use of expired department head standing orders, and (2) placing the emergency operating procedure for transfer to cold leg recirculation on administrative hold. (Section O3.2)

Maintenance

- The licensee did not have an integrated process for controlling plant winterization. As an interim measure until a winterization program could be developed, the licensee appointed a project leader to ensure winterization activities would be completed. The interim measures appeared to adequately prepare the plant for winter. Not all of the required actions had been completed at the end of this inspection period. The winterization program development was scheduled to be completed by the end of 1999. (Section M1.2)

- A licensee procedure for performing overcurrent tests on molded case circuit breakers (MCCBs) allowed a MCCB to remain in service following a failed overcurrent test provided it passed a retest 20 minutes later. The procedure did not require the initial test failure to be evaluated. This was identified as an Inspection Followup Item. (Section M1.3)

- The licensee's Performance Assurance (PA) department identified a poor performance trend in motor-operated valve testing and issued a stop work order until the problems were corrected. This followed failure by maintenance personnel to install an open limit switch on a motor-operated valve. Engineering and maintenance department personnel failed to self-identify the poor performance trend and later issued a joint stop work order which provided an action plan to correct the trend. The PA department maintained

appropriate oversight of the corrective actions until the stop work orders were lifted. (Section M7.1)

Plant Support

- The inspectors identified a vital area barrier breach caused by the partial removal of ice loading Temporary Modification 12-98-28. The breach had existed for several months. The licensee took prompt compensatory measures upon notification by the NRC inspectors. One Non-Cited Violation of the Modified Amended Security Plan was identified. (Section S2.1)

Report Details

Summary of Plant Status

Both units remained defueled throughout this inspection period. The licensee completed the Unit 2 "A" Train electrical bus work on November 17, 1999. The licensee subsequently started the second scheduled Unit 2 "B" Train outage to perform electrical bus cleaning and the scheduled 18-month preventive maintenance activity on the Unit 2 AB emergency diesel generator. Work on the Unit 2 "B" Train was continuing at the end of this inspection period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments

The inspectors conducted frequent observations of control room activities and equipment operation during the extended outage of both reactor units. Overall, plant operations were performed using approved operating procedures and reflected good operating practices. Noteworthy observations and findings are detailed below and in the report sections which follow.

- On November 10, 1999, the licensee began cooling the Unit 2 ice condenser in preparation for loading ice. The ice condenser chill was in progress at the end of the inspection period.

- During this inspection period, the licensee completed the emergency operating procedure validation and began the emergency operating procedure verification process in the simulator.

O1.2 Inappropriate Partial Use of Essential Service Water Operating Procedure

a. Inspection Scope (71707)

On October 31, 1999, after switching operating essential service water (ESW) pumps, the control room operators did not notify chemistry personnel. As a result, the licensee continued to add chlorine to the Unit 2 ESW system after the pump was turned off. The inspectors followed up on the operators' failure to notify chemistry personnel.

b. Observations and Findings

On October 31, 1999, both control rooms' operators coordinated with each other to start the Unit 1 West ESW pump and stop the Unit 2 East ESW pump. The pump switching evolution was done to support work on Unit 2. The following day, after reviewing the control room logs, chemistry personnel identified that they were not notified. A chemistry supervisor wrote Condition Report (CR) 99-26474 to document the missed notification. Chemistry personnel concluded that this excessive chlorination of the Unit 2 ESW system would not result in system damage; however, the Michigan state discharge limits could have been exceeded if the Unit 2 ESW system had been returned to service before the excess chlorine had dispersed.

On November 1, 1999, operations personnel investigated the CR. The investigation determined that the control room operators had used one of the attachments to the normal operating procedure for the ESW system, 12-Operations Head Procedure (OHP) 4021.019.001, "Operation of the Essential Service Water System," Revision 17. The normal operating procedure provided an attachment for stopping the Unit 2 East ESW pump and removing the Unit 2 East ESW header from service. The operators intended to stop the Unit 2 East ESW pump but leave the header in service. The operators determined that not all of the steps in the attachment were necessary to perform the pump switch. Plant Managers Procedure (PMP) 2010.PRC.003, "Procedure Use and Adherence," Revision 0, allowed the partial use of procedures provided certain criteria were met. In the case of the ESW normal operating procedure, the PMP required that the procedure be reviewed for change of intent, that the justification for the partial use of a procedure be documented, that a second technical review of the procedure be performed, and that a marked up copy of the procedure be used to perform the applicable steps.

The inspectors discussed the investigation with operations management. The licensee stated that the operators had not reviewed the intended partial use of the ESW normal operating procedure for change of intent. The inspectors agreed with the chemistry departments' assessment that in this case, the ESW system could not have been damaged by the excess chlorination. However, the inspectors discussed the potential for inadvertently changing the intent of a procedure if a proper review was not completed prior to using the procedure.

The licensee's investigators concluded that the failure to review the procedure in accordance with PMP 2010.PRC.003 resulted in the missed step to notify chemistry of the system status change. On November 4, 1999, operations management directed the Shift Managers to brief all of the Unit Supervisors on the requirements for partial use of procedures, and the operating crews were briefed on the potential to inadvertently change the intent of a procedure. The corrective actions were added to the original CR 99-26474.

10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," required, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, and drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above, on October 31, 1999, the licensee identified that an activity affecting quality, the partial use of the ESW normal operating Procedure 12 OHP-4021.019.001, was not accomplished in accordance with PMP 2010.PRC.003 in that the operators did not perform the required reviews of the proposed partial use. The inspectors considered the failure to properly review the proposed partial use to be a violation of 10 CFR Part 50, Appendix B, Criterion V. This Severity Level IV violation is being treated as an NCV.

Section VII.B.1.a of the Enforcement Policy requires 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 is 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. While the licensee and the NRC have not yet concluded that the corrective action program is fully effective, the corrective action program improvement efforts are underway and

captured in the D. C. Cook Plant Restart Plan which is under the formal oversight of the NRC through the NRC Manual Chapter 0350 process, "Staff Guidelines for Restart Approval." Consequently, this issue is being dispositioned as an NCV (50-315/99020-01(DRP)).

c. Conclusions

The control room operators did not properly review partial use of the essential service water (ESW) system normal operating procedure prior to switching ESW pumps. The failure to properly review partial use of the procedure resulted in the unintended chlorination of the Unit 2 ESW system. This was considered a non-cited violation of 10 CFR Part 50 Appendix B, Criterion V.

O3 Operations Procedures and Documentation

O3.1 Inappropriate Use of an Operations Standing Order

a. Inspection Scope (71707)

The inspectors reviewed standing order requirements associated with reserve auxiliary transformer loading restrictions. The inspectors also reviewed requirements associated with the use of standing orders to promulgate plant operation guidance.

b. Observations and Findings

On June 4, 1999, the licensee completed a tap change adjustment to transformer number 5 in order to reduce voltage on in-plant safety-related buses. At the time the tap change was completed, TS 3.8.1.2, "Electrical Power Systems - Shutdown," required one operable circuit between the offsite transmission network and the onsite Class 1E distribution. The TS 3.8.1.2 requirements were applicable until the offloads of both the Unit 1 and 2 cores were completed on August 8, 1999. To support the tap change and ensure operability of the offsite power supply, the licensee issued Operations Standing Order (OSO) 136, "Plant Loading Restrictions After Transformer 5 Tap Change," Revision 0.

The OSO limited the operation of certain plant equipment and required other equipment to be tagged out-of-service. Step 3 of the OSO required that no more than one of the three Unit 1 circulating water pumps be operating at the same time. Contrary to this step, on October 24, 1999, the inspectors observed two Unit 1 circulating water pumps operating. After the inspectors questioned if running two circulating pumps complied with the OSO requirements, a member of the operations department management stated this was an acceptable condition based on an "additional precaution" in the OSO. The additional precaution stated, "loading of equipment tagged out-of-service for this OSO may be accomplished as long as a piece of equipment of equal or greater load from the same RAT [reserve auxiliary transformer] is removed from service and made incapable of auto starting." The licensee stated that additional equipment was tagged out-of-service to compensate for the load imposed by operating a second circulating water pump. The inspectors determined that, because the circulating water pumps were not among the "tagged out-of-service" equipment listed in the OSO, this precaution did not apply. Following further questioning by the inspectors, the licensee recognized that the guidance in the OSO was not being followed and stopped the second Unit 1

circulating water pump. The licensee did not exceed loading restrictions on the Unit 1 RATs during the time that two circulating water pumps were in service.

Because of the complexity and potential for misinterpretation of the OSO.136 requirements, the inspectors reviewed the requirements for the use of Department Head Standing Orders (DHSO) contained in Operations Head Instruction (OHI) 2000, "Operations Department Guidance Policy," Revision 4, and Plant Manager Instruction (PMI) 2260, "Standing Orders," Revision 7. Procedure OHI-2000 stated that OSOs should be used for short-term generic equipment operation guidance. Long-term guidance affecting plant operation should be issued in a plant procedure. The PMI-2260 policy statement for DHSOs stated that standing orders shall not be used to provide long term direction for the conduct of operations or the performance of work. Furthermore, PMI-2260 stated that standing orders shall not be used in lieu of a required procedure, or to supersede a procedure or instruction. The inspectors concluded that the OSO provided relatively complex, system-specific guidance on limiting electrical load to the operators. Furthermore, that guidance was subject to inconsistent execution as evidenced by the misinterpretation of the circulating water pump operating requirements. The licensee wrote CR 99-26997 to document the issue.

10 CFR Part 50 Appendix B Criteria V, "Instructions, Procedures, and Drawings," stated, in part, that activities affecting quality shall be prescribed by instructions of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions. The inspectors concluded that the failure to provide appropriate procedural guidance for an activity affecting quality, electrical load limiting on the reserve auxiliary transformers, constituted a violation of 10 CFR Part 50, Appendix B, Criterion V, in that an OSO was not appropriate to the circumstances to provide complex, system-specific operating instructions. This Severity Level IV violation is being treated as an NCV.

Section VII.B.1.a of the Enforcement Policy requires 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 is 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. While the licensee and the NRC have not yet concluded that the corrective action program is fully effective, the corrective action program improvement efforts are underway and captured in the D. C. Cook Plant Restart Plan which is under the formal oversight of the NRC through the NRC Manual Chapter 0350 process, "Staff Guidelines for Restart Approval." Consequently, this issue is being dispositioned as an NCV (50-315/99020-02(DRP)).

c. Conclusions

The licensee failed to provide appropriate guidance for the control of reserve auxiliary transformer loading following an offsite power supply transformer tap setting change. A standing order was used to provide complex guidance on transformer loading restrictions rather than a formal procedure. This was considered a noncited violation of 10 CFR Part 50, Appendix B, Criterion V.

O3.2 Failure to Comply with Operation Head Instruction Requirements

a. Inspection Scope

The inspectors reviewed the implementation of OHI requirements related to the maintenance of OSOs and procedures. The inspectors also reviewed the licensee's corrective action system to determine if the licensee had identified problems related to these programs.

b. Observations and Findings

b.1. Failure to Revise Operations Standing Orders in a Timely Manner

The inspectors reviewed active OSOs for consistency with Operations Head Instruction (OHI) 2000, "Operations Department Guidance Policy," Revision 4, and Plant Manager Instruction (PMI) 2260, "Standing Orders," Revision 7, requirements. PMI-2260, Section 4.3.3 stated that all department head standing orders shall have an expiration date no later than one year from the approval date. At the time of the inspection, there were nine active operations standing orders in Unit 1. Of these nine, three standing orders were more than 1 year old. The oldest standing order, OSO.103, Revision 0, "Minimum Position Requirements for On-Shift Supervisory Personnel," was issued on June 1, 1992. OSO.076, "Control of Control Room Pressure Boundaries," Revision 11 was issued on July 10, 1998, and OSO.107, "Emergency Diesel Generator Incident Report," Revision 0, was issued on April 20, 1993. During the past year, the licensee had identified a number of related issues involving the compliance of department head standing orders with PMI-2260 requirements. The licensee has initiated the following condition reports relating to department head standing orders:

- CR 99-01529 (initiated on January 26, 1999) identified that twelve maintenance and operations department head standing orders did not comply with PMI-2260 expiration date requirements

- CR 99-11240 (initiated on May 8, 1999) identified that OSO.103 and OSO.107 did not comply with PMI-2260 expiration date requirements

- CR 99-12904 (initiated on May 26, 1999) identified that OSOs were not properly controlled and implemented. Specifically, CR 99-12904 noted that requirements contained in four OSOs should have been placed in an approved plant procedure instead of a department head standing order.

- CR 99-20607 (initiated on August 10, 1999) stated that 28 department head standing orders were not in accordance with PMI-2260 requirements.

At the time of this inspection, the corrective actions associated with the above CRs have not been completed. During a review of DHSOs, the inspectors concluded that the failure to revise standing orders in a timely fashion did not significantly impact plant safety. The failure to implement the expiration date requirements of PMI-2260 constitutes a violation of minor significance and is not subject to formal enforcement action.

b.2. Inappropriate Placement of an Emergency Operating Procedure on Administrative Hold

During the October 26, 1999, biennial emergency preparedness exercise (see NRC Inspection Report Nos. 50-315, 50-316/99-030), licensee participants in the technical support center and the control room simulator identified that copies of emergency operating procedure (EOP) 02-O.P. 4023.ES-1.3, Revision 5, "Transfer to Cold Leg Recirculating," had been placed in an administrative hold status. The administrative hold process is used to temporarily remove a procedure or a section of a procedure from use. Because the administrative hold process affected all controlled copies of this procedure, copies of ES-1.3 had also been removed from the Unit 1 and Unit 2 control rooms. The licensee placed ES-1.3 in a hold status on December 8, 1998, pending completion of an engineering analysis of the required containment water level necessary to initiate transfer to cold leg recirculating following a loss of coolant accident. This lack of a supporting analysis for ES-1.3 was documented in CR 97-02312 and was discussed in the NRC's Confirmatory Action Letter of September 19, 1997.

Operations Head Instruction 2010, "Operations Department Procedure Maintenance," Revision 7, Step 3.2.4 stated that Emergency Operating Procedures (4023 series) will not be placed on administrative hold. Although CR 99-08512, issued on April 16, 1999, identified that placing O.P. 4023.ES-1.3 in administrative hold was contrary to the guidance in OHI 2010, the administrative hold on ES-1.3 was not lifted until October 27, 1999. The initial corrective action for CR 99-08512 stated that the procedural requirements contained in OHI 2010 should be revised to allow placement of EOPs in administrative hold rather than removing ES-1.3 from a hold status. During discussions with the inspectors, operations department management stated that the corrective action specified for this CR was in error and will be re-evaluated. On November 10, 1999, the inspectors verified that controlled copies of ES-1.3 were present in the control room and the procedure was no longer in an administrative hold status. During the period that ES-1.3 was in administrative hold, both units were in either mode 5, mode 6 or refueled, therefore the EOP was not required for safe plant operation. Placing procedure O.P. 4023.ES-1.3 in an administrative hold status, contrary to the requirements of OHI 2010, Step 3.2.4, constitutes a violation of minor significance and is not subject to formal enforcement action.

c. Conclusion

The inspectors identified two minor examples of failures to comply with administrative procedure requirements involving: (1) use of expired department head standing orders, and (2) placing the emergency operating procedure for transfer to cold leg recirculation on administrative hold.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (62707)

The inspectors observed all or portions of the following maintenance activities and reviewed associated documentation:

- Job Order (JO) C46935, Flush Unit 2 1AB emergency diesel generator fuel oil system
- JO C52417, Install temporary ice blowing equipment
- JO C52585, Clean and inspect Unit 2 containment spray and residual heat removal spray headers
- JO R78934, Replace C2 capacitor bank in Unit 2 control room Instrumentation distribution panel 4 inverter
- JO R84549, Clean and inspect motor control center 2-EZC-BS
- JO R95230, Plant winterization
- 01-OHP-4030.STP.027AB, "AB Diesel Generator Operability Test (Train B)," Revision 14
- Unit 2 Engineering Head Procedure (EHP) 4030.STP.203, "Type B & C Leak Rate Test," Revision 3

b. Observations and Findings

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. Work items were appropriately scheduled in the Plan of the Day.

Noteworthy observations and findings are detailed below and in the report sections which follow.

- While reviewing JO C52417, the inspectors observed that there was minimal guidance for the installation of required temporary security compensatory measures. The inspectors' review of temporary modification (TM) 12-99-11, which authorized the installation of the temporary ice blowing equipment, determined that engineering personnel improperly concluded there was no impact upon security. This error significantly contributed to the weak security compensatory measures discussed in JO 52417. Additional detail on the engineering and security aspects of this JO are discussed in Section E3.1 and S2.1, below.

M1.2 Cold Weather Preparations

a. Inspection Scope (71714)

The inspectors reviewed the licensee's processes and procedures for preparing the plant for cold weather. In addition, the inspectors performed a walked down portions of the plant and reviewed the actions taken to correct identified deficiencies.

b. Observations and Findings

The inspectors reviewed Job Order R95230, Plant Winterization, which was written as a recurring task to prepare the plant for winter. This JO implemented Preventive Maintenance (PM) Task 30, "Plant Winterization and Dewinterization." The inspectors reviewed PM Task 30 and determined that PM Task 30 appeared to adequately prepare the plant for cold weather. However, the inspectors noted that the licensee did not have a process in place to ensure that the plant's winterized configuration would be maintained.

In addition, the licensee did not have a process for ensuring that the plant winter preparations were integrated across organizational boundaries. This was discussed in a previous NRC Inspection Report 50-315/316/98027. The lack of integration contributed to the inadequate preparation for cold weather, especially considering the lack of process heat in the buildings due to the current shutdown condition. Cold weather preparations were untimely and severe cold weather caused multiple challenges to the plant operators. The licensee stated that, as an interim measure until the process was developed, an individual would be selected to lead the plant winterization project for 1999.

The inspectors discussed plant winterization with the project leader and reviewed the following condition reports:

- CR 99-01516 (initiated on January 26, 1999), documented that the plant does not have adequate winterization policies or procedures to prevent outside tank vents or bladders from freezing.

- CR 99-05872 (initiated on March 17, 1999), documented that the plant does not have a winterization program in place to prepare the plant for winter.

- CR 99-24020 (initiated on September 27, 1999), documented that Condition Reports associated with cold weather and winterization are not being addressed in a timely manner.

- CR 99-27050 (initiated on November 9, 1999), documented that the winterization program walkdowns revealed many air intrusion issues and other discrepancies.

The inspectors determined that the individual discrepancies identified in the CRs listed above were being corrected. However, the inspectors noted that not all of the actions required by PM Task 30 were complete at the end of the inspection period. All of the PM Task 30 winterization activities were scheduled to be completed by the end of November 1999.

The inspectors reviewed the CR 66-05872 root cause analysis and discussed the findings with licensee management. The licensee stated that the root cause analysis and corrective actions for CR 99-05872 required a comprehensive plant winterization program, owned by the Operations department, to be implemented. The CR documented that the winterization program would be developed by the end of 1999 and used for the following winter. The inspectors identified no further concerns.

c. Conclusions

The licensee did not have an integrated process for controlling plant winterization. As an interim measure until a winterization program was developed, the licensee appointed a project leader to ensure winterization activities were completed. The inspectors concluded that the interim measures appeared to adequately prepare the plant for winter; however, not all of the required actions had been completed at the end of the inspection period. The winterization program development was scheduled to be completed by the end of 1999.

M1.3 Molded Case Circuit Breaker Testing

a. Inspection Scope (62707)

On November 8, 1999, the inspectors observed portions of JO R84549, Clean and inspect motor control center 2-EZC-BS. Part of the JO required the licensee to test the molded case circuit breakers (MCCBs). The inspectors questioned the MCCB testing procedure methodology for performing 300 percent overcurrent tests on MCCBs.

b. Observations and Findings

The inspectors reviewed the molded case circuit breaker (MCCB) testing, 12 Instrument Head Procedure (IHP) 5030.EMP.006, "MCCB/TOLR Testing and Electrical Enclosure Maintenance," Revision 4. The procedure provided instructions for performing a 300 percent overcurrent test of a MCCB. The 300 percent overcurrent test was performed to time how long a MCCB takes to trip on overcurrent and compared the measured time to a maximum allowable time.

Step 7.2.6 of 12-IHP 5030.EMP.006 stated that if the test results were unsatisfactory (the MCCB took too long to trip on overcurrent), then the MCCB should be retested after cooling for 20 minutes. The inspectors questioned the licensee about the second test. The licensee stated that if a MCCB passed the second test, then the MCCB would be left in service. The inspectors reviewed test history and found one example, a test on a spare MCCB, where the MCCB failed the first test, but passed the second test. The inspectors did not identify any instances of an in-service breaker which failed an initial overcurrent test but remained in service after it passed a second test.

The inspectors questioned the licensee about the potential of the first test to precondition the second test and the potential for leaving an inoperable breaker in service. The test procedure did not require an evaluation of a failed overcurrent test; it simply directed the test personnel to wait 20 minutes and then retest the MCCB. The licensee stated that the MCCBs which were tested using the procedure all required three separate tests to fully perform the overcurrent test on each breaker pole. Thus,

the first overcurrent test performed on any breaker pole would necessarily precondition all of the following tests. The licensee also stated that other utilities and an industry group were contacted regarding standard industry practices for performing overcurrent tests on MCCBs. However, the licensee had not received responses by the end of this inspection period. Engineering personnel wrote CR 99-27129 to document the inspectors' questions regarding the test procedure. The inspectors considered the quality of the licensee's procedure for performing overcurrent testing of MCCBs to be an Inspection Followup Item (IFI 50-316/99020-03 (DRP)) pending the review of standard industry practices for MCCB testing.

c. Conclusions

A licensee procedure for performing overcurrent tests on molded case circuit breakers (MCCBs) allowed a MCCB to remain in service following a failed overcurrent test provided it passed a retest 20 minutes later. The procedure did not require the initial test failure to be evaluated. This was identified as an Inspection Followup Item.

M7 Quality Assurance in Maintenance

M7.1 Performance Assurance Identification of Poor Trend on Motor Operated Valve Work

a. Inspection Scope (62707)

On October 19, 1999, during maintenance on a motor operated valve (MOV), several procedural steps were missed which resulted in the open limit switch not being installed. During the subsequent test, the MOV failed to stop opening as designed. The inspectors followed up on the licensee's response to this event.

b. Observations and Findings

After the failed MOV test, engineering personnel wrote CR 99-25635 to document the failure; however, the Performance Assurance department noted that the engineering CR did not document the incomplete maintenance. The PA department reviewed other CRs and identified a poor performance trend on MOV maintenance and testing. As a result of the identification of the poor performance, the licensee's Performance Assurance (PA) department issued Stop Work Order (SWO) PA-99-013 (CR 99-25678) on October19, 1999, which stopped all field work on MOVs

Subsequent to the PA SWO, on October 21, 1999, the licensee's engineering and maintenance departments jointly issued SWO MT-99-08 (CR 99-25825), which also stopped all field work on MOVs. Stop Work Order MT-99-08 provided an action plan which required a root cause analysis of the MOV errors, refresher training on procedure adherence, and a review of the MOV maintenance and testing procedures. The action plan also provided direction for work to resume in stages after action plan items were completed. The engineering and maintenance SWO required that the MOV maintenance and testing procedures be revised, and that the workers receive training on the revised procedures. The engineering and maintenance SWO also allowed an incremental lifting of the order as various portions of the action plan were completed. Performance Assurance department personnel reviewed the engineering and maintenance department SWO and stated in a revision to their SWO that if the action plan provisions of MT-99-08 were thoroughly implemented, the PA department concerns

regarding procedure adherence, work control practices, and supervisory field oversight would be adequately addressed.

Over the next several weeks, the SWO was incrementally lifted as provided by the engineering and maintenance action plan. Motor operated valve testing resumed in November 1999. The inspectors reviewed the SWOs and determined that the licensee had taken appropriate action to correct the poor performance trend.

c. Conclusions

The licensee's Performance Assurance (PA) department identified a poor performance trend in motor-operated valve testing and issued a stop work order until the problems were corrected. This followed failure by maintenance personnel to install an open limit switch on a motor-operated valve. Engineering and maintenance department personnel failed to self-identify the poor performance trend. These departments later issued a joint stop work order which provided an action plan to correct the trend. The PA department maintained appropriate oversight of the corrective actions until the both of the stop work orders were lifted.

III. Engineering

E3 Engineering Procedures and Documentation

E3.1 Incomplete Review of a Temporary Modification (37551, 71707)

The inspectors reviewed ice loading Temporary Modifications (TM) 12-99-11, and TM 12-98-28, following the inspectors' identification of a vital area barrier breach. The vital area barrier breach was caused by the implementation of the ice loading TMs and is discussed in additional detail in Section S2.1, below. The inspectors performed additional follow up to the failure of the licensee to follow the TM process that resulted in the violation of a vital area barrier.

Procedure 12 EHP 5040.MOD.009, Revision 1, "Design Change and Temporary Modification Package Reference guide," provided a summary of technical issues required to be evaluated in the development of design change packages or temporary modifications. Attachment 42 of the procedure addressed plant security and directed that the Plant Security Impact Checklist be completed in order to determine the impact of the TM on plant security. The checklist required a review of the proposed TM or design change for potential impact on security equipment or barriers. The inspectors requested a copy of the completed checklist, but the licensee was unable to comply with the request. The licensee informed the inspectors that an engineer had completed the checklist, determined that the TM would not impact upon security, and discarded the checklist. The licensee documented the incorrect conclusion that the TM did not have an impact upon a vital area barrier in CR 99-26772. As a result of the incomplete review, the licensee failed to implement adequate compensatory measures to support the TM installation.

After the inspectors identified the vital area barrier breach, the licensee took prompt corrective actions to address the degraded vital area barrier. In addition, engineering

personnel reviewed all 19 open TMs to determine if other similar conditions existed. Of the 19 TMs reviewed, only TM 12-99-11 was determined to have a security impact.

E8 Miscellaneous Engineering Issues

E8.1 Review of Licensee's Readiness for Year 2000

On October 28, 1999, the licensee updated its response to NRC Generic Letter 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants." The licensee reported that the meteorological information and dispersion assessment system (MIDAS) upgrade was completed on October 14, 1999, and that the MIDAS had been restored to operability on October 21, 1999.

On November 2, 1999, the inspectors discussed the design change package for the MIDAS upgrade and the Year 2000 testing with the test engineer and reviewed the test results in accordance with NRC Temporary Instruction 2515/141, "Review of Year 2000 Readiness of Computer Systems at Nuclear Power Plants," and Nuclear Energy Institute / Nuclear Utilities Software Management Group (NEI/NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness." Prior to installation, the MIDAS interface with the plant process computer (PPC) was tested on the licensee's development PPC to verify the accuracy of shared data. Additionally, the licensee tested high-risk rollover dates to verify that the MIDAS to PPC interface was not affected by date changes and that the appropriate dates were displayed on the PPC screens. Following installation, an integrated test was run on MIDAS to verify its interface with the PPC. The inspectors concluded that the MIDAS upgrade Y2K testing methodology met the data and integration testing recommendations of NEI/NUSMG 97-07, Appendix F.

IV. Plant Support

R1 Radiation Protection and Chemistry Controls (71750)

During normal resident inspection activities, routine observations were conducted in the area of radiation 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. Two discrepancies were noted. The first discrepancy involved the inspectors' identification of a missing temporary security barrier. The barrier separated two vital areas and was removed for construction activities. The barrier was not in place and uncontrolled personnel access between the two vital areas was possible. A review of the licensee's security plan determined that there was no security violation, but the security plan requirements for barriers between adjacent vital areas were ambiguous. The licensee stated that a revision of the security plan would soon be submitted to the NRC and the revision would resolve the ambiguity. Condition Report 99-25717 was written by the licensee to address the inspectors' observation. The inspectors had no further concerns. (The second discrepancy is discussed in Section S2 of this report.)

S2 Status of Security Facilities and Equipment

S2.1 Inadequate Compensatory Measure (71750)

a. Inspection Scope

During a routine tour, the inspectors identified a breach in a vital area barrier caused by the partial removal of a temporary modification for loading ice in the ice condenser. The inspectors promptly notified security personnel and followed up on this finding. Observations related to the process and procedures for the review of the TM which created the vital area barrier breach are documented in Section E3.1, above.

b. Observations and Findings

After identifying the vital area barrier breach, the inspectors informed security personnel. The licensee's security personnel compensated for the inadequate vital area barrier within procedurally required time limits. Security personnel measured the breach and confirmed the inspectors measurements of a 9" by 12" opening which exceeded the maximum opening allowed by the licensee's security plan. The licensee subsequently restored the vital area barrier to an acceptable status. Condition Report 99-25959 was initiated on October 24, 1999, by licensee personnel.

The inspectors' review of the records and interviews with personnel determined that the vital area barrier breach occurred when the TM was partially removed to support core offload in July 1999. Licensee personnel did not identify the vital area barrier breach during routine operator rounds and security patrols. The TM remained partially removed between July 1999, and October 26, 1999.

Modified Amended Security Plan (MASP) Section 5.2.1.1.f, and Figure 5.1-4 identified that the area near the temporary equipment installed for ice loading was a vital area. The MASP further identified the vital area barriers that protected the noted vital area. Contrary to the above, the licensee partially removed TM 12-98-28 without providing adequate compensatory measures for the degraded vital area barrier. This Severity Level IV violation is being treated as an NCV.

Section VII.B.1.a of the Enforcement Policy requires 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 is 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. While the licensee and the NRC have not yet concluded that the corrective action program is fully effective, the corrective action program improvement efforts are underway and captured in the D. C. Cook Plant Restart Plan which is under the formal oversight of the NRC through the NRC Manual Chapter 0350 process, "Staff Guidelines for Restart Approval." Consequently, this issue is being dispositioned as an NCV (50-316/99020-04(DRP)).

The inspectors performed additional reviews of licensee security plans and procedures and determined design guidance for the installation of temporary security barriers did not exist. The temporary barrier installed as part of the ice loading TMs was installed to comply with verbal requirements by licensee security personnel but did not have

procedural requirements. In response to this inspector observations licensee personnel stated that the security plan was already in the process of being revised and would include requirements for the compensation for degraded security barriers.

The inspectors review of the MASP also determined that the plan did not address temporary degradations of vital area or protected area barriers. The licensee stated that a revision of the security plan would soon be submitted to the NRC and the revision would add information concerning temporary security compensatory measures.

c. Conclusions

The inspectors identified a vital area barrier breach caused by the partial removal of ice loading Temporary Modification 12-98-28. The breach had existed for several months. The licensee took prompt compensatory measures upon notification by the NRC inspectors. One Non-Cited Violation of the Modified Amended Security Plan was identified.

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 November 19, 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
#J. Carlson, Radiation Protection, Environmental, and Chemistry
#R. Cook, Regulatory Affairs
#R. Crane, Regulatory Affairs
#R. Ebright, Plant Engineering
#M. Finissi, Director, Plant Engineering
#J. Pollack, Plant Manager
#A. Rodriguez, Site Protective Services
#B. Smalldridge, Assistant Operations Manager
#F. Timmons, Manager, Site Protective Services
#H. Torberg, Site Protective Services
#C. Vanderniet, Performance Assurance
#B. Wallace, Training
#L. Weber, Operations Manager

# Denotes those present at the November 19, 1999, exit meeting.

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 61726:	Surveillance Observations
IP 62707:	Maintenance Observation
IP 71707:	Plant Operations
IP 71714:	Cold Weather Preparations
IP 71750:	Plant Support Activities
TI 2515/141:	"Review of Year 2000 (Y2K) Readiness of Computer Systems at Nuclear Power Plants"

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-315/99020-01	NCV	Inappropriate partial use of procedure
50-315/99020-02	NCV	Inadequate guidance provided to operators
50-316/99020-03	IFI	Molded case circuit breaker overcurrent testing
50-315/99020-04	NCV	Unidentified vital area barrier breach caused by implementation of temporary modification

Closed

50-315/99020-01	NCV	Inappropriate partial use of procedure
50-315/99020-02	NCV	Inadequate guidance provided to operators
50-315/99020-04	NCV	Unidentified vital area barrier breach caused by implementation of temporary modification

Discussed

None

LIST OF ACRONYMS

AR	Action Request
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CR	Condition Report
D/G	Diesel Generator
DHSO	Department Head Standing Order
DRP	Division of Reactor Projects
EHP	Engineering Head Procedure
ESRR	Expanded System Readiness Review
ESW	Essential Service Water
IHP	Instrument Head Procedure
IMP	Instrument Maintenance Procedure
IST	In-Service Test
JO	Job Order
MASP	Modified Amended Security Plan
MC	Manual Chapter
MCCB	Molded Case Circuit Breaker
MHP	Maintenance Head Procedure
MIDAS	Meteorological Information and Dispersion Assessment System
MOV	Motor Operated Valve
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
OHI	Operations Head Instruction
OHP	Operations Head Procedure
OSO	Operations Standing Order
PA	Performance Assurance
PM	Preventive Maintenance
PMI	Plant Manager's Instruction
PMP	Plant Manager's Procedure
PMSO	Plant Manager's Standing Order
PMT	Post Maintenance Testing
PDR	Public Document Room
PPC	Plant Process Computer
RAT	Reserve Auxiliary Transformer
RCS	Reactor Coolant System
RHR	Residual Heat Removal
SRO	Senior Reactor Operator
STP	Surveillance Test Procedure
SWO	Stop Work Order
TM	Temporary Modification
TOLR	Thermal Overload Relay
TS	Technical Specification
VIO	Violation

50-315
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

November 03, 1999

Mr. R. P. Powers
Senior Vice President
Nuclear Generation Group
American Electric Power Company
1 Cook Place
Bridgman, MI 49106

SUBJECT: D. C. COOK INSPECTION REPORT 50-315/99019(DRP); 50-316/99019(DRP)

Dear Mr. Powers:

This refers to the inspection conducted on August 26 through October 8, 1999, at the D. C. Cook Units 1 and 2 reactor facilities. The inspection was an examination of activities conducted under your license as they relate to compliance with the Commission rules and regulations and with the conditions of your license. Areas reviewed included Operations, Maintenance, Engineering, and Plant Support. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress. The enclosed report presents the results of that inspection.

We noted during this inspection period examples of improved problem identification. For example, your staff appropriately expanded the scope of the root cause investigation on clearance order problems to include recent events which occurred after the root cause analysis was started. We also observed that after a fuse configuration problem was noted on a 600V breaker, your operations staff took prompt action to determine the extent of the condition, including verifying that the previously refurbished 600V breakers had properly installed fuses.

In the operations and maintenance areas, we identified three procedural deficiencies. Two examples were identified in the spent fuel pool cooling system abnormal operating procedures. These procedures had not been updated to reflect the currently installed plant equipment configuration. However, we determined that the procedures could have been performed and satisfactorily accomplished their objectives as written. The third procedural deficiency involved a procedure which was inadequate to the circumstances in that it did not provide guidance to your staff on controlling 600V breaker fuses which were removed as part of the breaker refurbishment process. We concluded that this procedural weakness constituted a Severity Level IV violation of 10 CFR Part 50, Appendix B, Criterion V.

This Severity Level IV violation is being treated as a Non-Cited Violation (NCV). Appendix C of the Enforcement Policy requires that for a Severity Level IV violation to be dispositioned as an NCV, it be appropriately placed in the licensee's corrective action program. Implicit in that requirement is that the corrective action program be fully acceptable. The plant corrective action program was not adequate and has been the focus of significant attention by your staff

to improve the program. While your staff and the NRC have not yet concluded that the corrective action program is fully effective, the corrective action program improvement efforts are underway and captured in the Restart Plan which is under the formal oversight of the NRC through the NRC Manual Chapter 0350 Process, "Staff Guidelines for Restart Approval." Consequently, these issues will be dispositioned as NCVs.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if you choose to provide one, will be placed in the NRC Public Document Room.

Sincerely,

/s/ J. A. Grobe

John A. Grobe, Director
Division of Reactor Safety

Docket Nos. 50-315; 50-316
License Nos. DPR-58; DPR-74

Enclosure: Inspection Report 50-315/99019(DRP);
50-316/99019(DRP)

cc w/encl: A. C. Bakken III, Site Vice President
T. Noonan, Plant Manager
M. Rencheck, Vice President, Nuclear Engineering
R. Whale, Michigan Public Service Commission
Michigan Department of Environmental Quality
Emergency Management Division
MI Department of State Police
D. Lochbaum, Union of Concerned Scientists

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-315; 50-316
License Nos:	DPR-58; DPR-74
Report No:	50-315/99019(DRP); 50-316/99019(DRP)
Licensee:	American Electric Power Company 1 Cook Place Bridgman, MI 49106
Facility:	D. C. Cook Nuclear Generating Plant
Location:	1 Cook Place Bridgman, MI 49106
Dates:	August 26 through October 8, 1999
Inspectors:	B. L. Bartlett, Senior Resident Inspector B. J. Fuller, Resident Inspector J. D. Maynen, Resident Inspector K. A. Coyne, Resident Inspector J. A. Lennartz, Senior Resident Inspector - Palisades
Approved by:	A. Vegel, Chief Reactor Projects Branch 6 Division of Reactor Projects

9932200 88

EXECUTIVE SUMMARY

D. C. Cook Units 1 and 2
NRC Inspection Report 50-315/99019(DRP); 50-316/99019(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

- On August 27, 1999, maintenance workers performing voltage checks on de-energized switchgear found voltage present. The licensee included the event in the scope of the proposed corrective actions for previously identified clearance order problems. The inspectors reviewed the licensee's short-term corrective actions and concluded that the licensee's corrective actions were reasonable. (Section O1.2)

- Two spent fuel pool (SFP) cooling system abnormal operating procedures were not revised after modifications were made to plant equipment. The annunciator response procedure for low level in the SFP directed the operators to check a section of piping which had been previously removed, and the abnormal operating procedure for loss of spent fuel pool cooling referenced a temporary modification which had been removed. (Section O2.1, b.2)

- The inspectors determined that the spent fuel pool cooling system was adequately performing its intended function. In addition, based on interviews of operations staff, the operators were knowledgeable of actions required to restore cooling in the event of lowering spent fuel pool water level. (Section O2.1)

- Senior Management Review Team and Nuclear Safety Design Review Committee meetings observed during this report period were conducted in a detailed, probing, and appropriate manner. Differing view points of the committee members were considered and resolved prior to dispositioning the presented information. Both committees appeared to be effective in the performance of their oversight role. (Section O7.1)

Maintenance

- The licensee did not have any preventive maintenance measure in place to ensure that spent fuel pool siphon breaker holes were not blocked. The inspectors observed that the siphon breaker holes were clear and concluded that the failure to have a preventive maintenance program on the holes did not affect system operation. (Section O2.1, b.1)

- The licensee was taking appropriate system operating data in accordance with their 10 CFR 50.65 (Maintenance Rule) paragraph (a)(1) monitoring plan for risk-significant systems. However, the inspectors identified that the system manager was not aware that the SFP cooling system was being monitored under licensee established Maintenance Rule goals. (Section O2.1, b.3)

- The licensee was adequately protecting plant equipment and ensuring personnel safety during the Unit 2 "A" Train breaker cleaning. 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. (Section M1.1)

- On September 17, 1999, an operator identified a fuse configuration error on a Unit 2 "A" Train 600V safety-related bus. The licensee's actions to verify the fuse configurations on the remaining 600V busses were prompt and thorough. (Section M1.2)

- The licensee's procedures for controlling fuse configuration during breaker refurbishment were not adequate. The inspectors identified that the procedures did not specify that the fuse configuration be checked when returning a breaker to service. The failure to provide adequate guidance to ensure that breaker fuse configuration was properly controlled was a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V. (Section M1.2)

Engineering

- The inspectors identified that the temporary modification (TM) process was not rigorously implemented for TM 12-96-07(refueling water cleanup system) as evidenced by several identified deficiencies. Signatures were not obtained to approve restoration and drawings were not revised. In addition, the safety analysis was not revised to evaluate the acceptability for extended partial restoration of the TM. No adverse safety consequences resulted from the identified deficiencies. (Section E1.1)

Report Details

Summary of Plant Status

Both units remained defueled throughout this inspection period. The licensee completed the Unit 2 "B" Train electrical bus outage on September 16, 1999. The licensee began the Unit 2 "A" Train electrical bus outage on September 17, 1999, in order to perform bus cleaning; the Unit 2 CD emergency diesel generator scheduled 18-month maintenance tear down; and other "A" Train electrical work. The Unit 2 "A" Train electrical bus outage was in progress at the end of this inspection period.

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 Licensee Response to Clearance Permit Error

a. Inspection Scope (71707)

On August 27, 1999, maintenance personnel performing voltage checks inside de-energized switchgear found voltage present. The unexpected voltage was the result of a clearance permit system error. The inspectors reviewed the circumstances and licensee corrective actions related to this occurrence. In addition, the inspectors interviewed operations and maintenance personnel, and reviewed applicable documentation.

b. Observations and Findings

On August 27, 1999, workers verifying that a Unit 2 600V "B" Train electrical bus was de-energized found voltage present where no voltage was expected. The maintenance workers wrote Condition Report (CR) 99-21638 to document the problem. In order to expeditiously prevent personnel injury or equipment damage, the Performance Assurance Department issued a stop work order on clearances the same day. This stop work order was documented in CR 99-21691. On August 28, 1999, the operating crew wrote CR 99-21682 to document that the operations management had also issued a stop work order to the department on clearances. The stop work orders were lifted after short-term corrective actions were completed which verified the clearance writers' qualifications and provided the Centralized Clearance Group a written checklist for developing clearances. Additionally, the licensee performed voltage checks and clearance verifications to ensure the adequacy of all switchgear isolation boundaries.

NRC Inspection Report 50-315/316/99015 and 50-315/316/99017 had previously discussed the clearance permit system issues. Inspection Report 50-315/316/99017 documented the following:

> "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."

The inspectors reviewed the draft root cause analysis for CR 99-17286 and noted that the two CRs written following the August 27, 1999, event (CR 99-21682 and CR 99-21691) had also been included in the scope of the proposed corrective actions for the adverse trend on clearances. The inspectors determined that the short-term corrective actions proposed in the root cause analysis had been implemented and were considered reasonable. On October 7, 1999, the licensee's Corrective Action Review Board approved the root cause analysis and preliminary long-term corrective actions.

c. Conclusions

On August 27, 1999, maintenance workers performing voltage checks on de-energized switchgear found voltage present. The licensee included the event in the scope of the proposed corrective actions for previously identified clearance order problems. The inspectors reviewed the licensee's short-term corrective actions and concluded that the licensee's corrective actions were reasonable.

O2 Operational Status of Facilities and Equipment

O2.1 Spent Fuel Pool Cooling System (62707, 71707)

a. Inspection Scope

On August 8, 1999, the licensee completed off-loading both cores into the spent fuel pool (SFP). During this inspection period, the inspectors walked down accessible portions of the SFP cooling system. In addition, the inspectors reviewed SFP cooling system documentation, including the following: procedures used for operating the system, portions of the maintenance history on selected system components, and the Expanded System Readiness Review (ESRR) findings on the SFP cooling system.

b. Observations and Findings

On September 14, 1999, the inspectors walked down accessible portions of the SFP cooling system. The inspectors observed that the system was operating within the normal ranges as identified in the normal operating procedure 12-Operations Head Procedure (OHP) 4021.018.002, "Placing In Service and Operating the Spent Fuel Pit Cooling System," and in the operations surveillance checklist, Attachment 10 to 01-OHP 5030.001.002, "Outage Risk Surveillance." In addition, the inspectors reviewed recently completed surveillances for SFP chemistry and SFP cooling pump performance and did not identify any deficiencies. The inspectors did not identify any equipment deficiencies in the SFP cooling pump room which had not already been marked with an action request (AR) tag. Additionally, the inspectors verified that each equipment

deficiency marked with an AR tag had been entered into the licensee's AR database. The licensee had concluded that the identified deficiencies did not prevent the SFP cooling system from performing its intended function. The inspectors reviewed the AR evaluations in the database and agreed with the licensee's conclusion. Comments on specific findings are detailed in the sections below.

b.1 Spent Fuel Pool Siphon Breaker Holes

Unit 1 Technical Specification (TS) 5.6.3 stated, "The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 629 feet 4 inches." During the SFP walkdown, the inspectors observed that the siphon breaker holes on the SFP cooling and skimmer systems were not obstructed. As shown on flow diagram OP-12-5136-21, "Spent Fuel Pit Cooling & Clean-Up," the SFP skimmer and cooling system discharge piping enter the SFP above the normal pool water level and terminate below the water level approximately 6 feet above the top of the stored fuel, at elevation 626 feet 1½ inches. The flow diagram also indicated that siphon breaker holes were incorporated into the design of each of these discharge lines. The siphon breaker holes, located near the normal pool water level, were intended to prevent siphoning of the SFP in the event of a skimmer or cooling system discharge pipe break. If the siphon breaker holes had become blocked, a break in the skimmer or cooling system discharge line could have inadvertently drained the SFP below elevation 629 feet 4 inches.

The inspectors questioned the SFP system manager about the maintenance of the siphon breaker holes. NRC Information Notice 88-65, "Inadvertent Drainages of Spent Fuel Pools," had previously documented that blocked or non-existent siphon protection of the SFP cooling system could lead to an inadvertent draining of the SFP. The SFP system manager informed the inspectors that there was no preventative maintenance program to ensure that the siphon breaker holes remain open. The SFP system manager wrote CR 99-23149 to evaluate the need for a preventative maintenance program to detect degradation of the SFP siphon breaker holes.

b.2 Loss of Spent Fuel Pool Cooling Abnormal Operating Procedures

The inspectors reviewed the loss of SFP cooling abnormal operating procedures and identified two SFP cooling system abnormal operating procedures which were not revised after modifications were made to plant equipment. However, the procedures could have been performed as written and satisfactorily accomplished their objectives.

Annunciator response procedure 12-OHP 4024.134, Drop 2, "Spent Fuel Pit Water Low," Subsequent Action Step 3.4 directed the operators to verify that the anti-siphon vent cap was removed on the SFP drain line. However, the SFP drain line had been cut and capped because it was used only during plant construction. The annunciator response procedure did not require the operators to verify that the siphon breaker holes on the SFP pump discharge lines and the skimmer pump discharge lines were not obstructed. The inspectors interviewed several operators about how Step 3.4 would be accomplished. The operators stated that they would check that the siphon breaker holes were open, but recognized after the inspectors' questioning that the step was incorrect as written. The licensee wrote CR 99-23774 to enter the procedure discrepancy into the corrective action program.

The inspectors identified that Abnormal Operating Procedure 12-OHP 4022.018.001, "Loss of Spent Fuel Pool Cooling, " Revision 4, contained an incorrect caution statement in Attachment A, "Spent Fuel Pool Makeup Alignment." The caution stated that the procedure attachment assumed the refueling water purification pump was aligned to purify either unit's refueling water storage tank via a temporary demineralizer. In March 1996, the licensee installed a temporary demineralizer under TM 12-96-07 for refueling water clean-up because the original demineralizer had broken resin retaining screens. In November 1996, licensee removed the temporary demineralizer and replaced the original demineralizer. Consequently, the assumption in the caution statement was no longer correct. However, the inspectors determined that the caution statement in the procedure attachment had no significant impact on the operators' ability to complete the procedure. Temporary Modification 12-96-07 is discussed in further detail in Section E1.1 below.

The inspectors determined that the plant had multiple sources available to add water to the SFP in the event of a low level alarm. Additionally, the inspectors verified that the plant equipment necessary to add water to the SFP was accessible and capable of accomplishing the task. Operations personnel indicated that, for a slowly lowering water level, hoses were available and could be obtained or fabricated to add water to the SFP. If an immediate source of water was needed, the fire water header was available.

b.3 Monitoring of the Spent Fuel Pool System

As part of the restart effort, the licensee had re-classified the SFP cooling system as risk significant from non-risk significant early in 1999. Because no system performance history had been previously developed, the licensee implemented a monitoring program under Maintenance Rule paragraph (a)(1) in order to collect system performance data. Before the classification as risk significant, the licensee had monitored performance of the SFP cooling system using only reliability criteria rather than using both reliability and availability criteria.

On September 14, 1999, the inspectors discussed the SFP cooling system with the system manager. During the discussions, the inspectors determined that the system manager was not aware that the SFP cooling system was being monitored under 10 CFR 50.65 (the Maintenance Rule) paragraph (a)(1). The system manager stated that he had only recently become the system manager of the SFP cooling system, and that prior to that, he had been participating in the licensee's ESRR effort at an offsite location. However, the licensee's Maintenance Rule coordinator explained that the SFP cooling system performance had been monitored using operations' department surveillance procedures; therefore, the system performance information had been retained. At the time of this inspection, no maintenance preventable functional failures of the system were recorded within the last two years, and the SFP cooling system had operated within the established performance goals. The licensee was finalizing SFP cooling unavailability and reliability performance criteria and intended to place the system under monitoring per Maintenance Rule paragraph (a)(2).

c. Conclusions

The inspectors concluded that the SFP cooling system was adequately performing its intended function. However, the licensee did not have any preventive maintenance measure in place to ensure that the siphon breaker holes were not blocked. The

inspectors observed that the siphon breaker holes were clear and concluded that the failure to have a preventive maintenance program on the holes did not affect system operation.

The inspectors concluded that two SFP cooling system abnormal operating procedures were not revised after modifications were made to plant equipment. The annunciator response procedure for low level in the SFP directed the operators to check a section of piping which had been previously removed, and the abnormal operating procedure for loss of spent fuel pool cooling referenced a temporary modification which had been removed. After interviewing several operators and reviewing the procedures, the inspectors concluded that the operators were aware of the proper actions to restore SFP cooling in the event of lowering SFP water level. The procedures could have been performed as written and satisfactorily accomplished their objectives.

The inspectors concluded that the licensee was taking appropriate system operating data in accordance with their 10 CFR 50.65 (Maintenance Rule) paragraph (a)(1) monitoring plan for a risk-significant system. However, the inspectors identified that the system manager was not aware that the SFP cooling system was being monitored under licensee established Maintenance Rule goals.

O7 Quality Assurance in Operations

O7.1 Case Specific Checklist Item 2 "Corrective Action Program Breakdown"

a. Inspection Scope (40500)

The inspectors observed the off-site Nuclear Safety Design Review Committee (NSDRC) and the on-site Senior Management Review Team (SMRT) activities in order to assess licensee oversight performance. The SMRT was not required by NRC regulations but was established as part of the licensee's Restart Plan to supplement the existing oversight committees.

b. Observations and Findings

The SMRT was responsible for the generation and approval of the restart criteria, approval of Restart Action Plans, and for the oversight of the associated restart processes. The inspectors observed SMRT meeting number 99-19, held on September 28, 1999, and SMRT meeting number 99-21, held on October 5, 1999. The primary purpose of the meetings was to review selected Restart Action Plans.

The inspectors verified that the committee members present were as stated in the licensee's Restart Plan, Revision 5. The inspectors also observed the performance of the SMRT and determined that the members appropriately questioned the Restart Action Plans being reviewed. In addition, the inspectors observed that the differing viewpoints of all of the committee members were considered. Any differences were resolved through professional discussions to the members satisfaction. The SMRT appeared to be effective in its oversight of the Restart Action Plans that were presented.

The inspectors observed meeting number 208 of the NSDRC, on September 28, 1999. The primary focus of the meeting was to review a proposed TS change and necessary license amendments regarding the containment recirculation sump design. The

inspectors observed that a quorum was present, that committee members questioned the presented information in a detailed, probing, and appropriate manner, and that differing viewpoints of the committee members were considered. The committee appeared to be effective in providing oversight for the proposed TS change.

c. Conclusions

The inspectors concluded that the Senior Management Review Team and Nuclear Safety Design Review Committee meetings were conducted in a detailed, probing, and appropriate manner. Differing viewpoints of the committee members were considered and resolved prior to dispositioning the presented information. Both committees appeared to be effective in the performance of their oversight role.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (62707)

The inspector reviewed or observed portions of the following activities:

- Job Order (JO) C47408, Repair various exhaust leaks on Unit 2 CD ("A" Train) emergency diesel generator
- JO C47614, Perform cold crankshaft deflection on Unit 2 CD emergency diesel generator
- JO C49563, Perform detailed bus cleaning of Unit 2 "A" Train 4kV bus 2C
- JO R10468, Unit 2 CD ("A" Train) battery 60-month battery and charger surveillance
- JO R80406, Open both ends of Unit 2 East component cooling water (CCW) heat exchanger for inspection
- JO R91359, Inspect and clean Unit 1 East CCW heat exchanger as required

b. Observations and Findings

The inspectors noted 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.

The inspectors walked down the "A" Train switchgear rooms to verify the precautions which had been taken to protect plant equipment and ensure safety. The inspectors noted that cleanliness and stowage of the work areas was acceptable. However, the inspectors noted that breakers removed from cubicles in switchgear rooms, which were awaiting maintenance, had been tied off with rope to the plant ground bus bar around

the perimeter of the room. The inspectors informed the work supervisor, and the licensee took action to secure the breakers to other structures in the room.

The inspectors also walked down the "B" Train switchgear rooms to verify the precautions taken to protect the opposite train equipment during the "A" Train outage. The inspectors identified that the licensee had placed warning placards on the 4kV breakers supplying power to the "B" Train essential service water pump and the "B" Train component cooling water pump. The inspectors noted that no warning placards had been placed on the feeder breakers which were supplying power to the "B" Train 4kV safety-related busses. However, the licensee had posted the Unit 2 "B" Train switchgear rooms as guarded areas to provide additional controls on performing work in the vicinity of the vital equipment.

c. Conclusions

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.

The inspectors concluded that the licensee was adequately protecting plant equipment and ensuring personnel safety during the Unit 2 "A" Train breaker cleaning. The inspectors noted that the licensee had tied removed breakers to the plant ground bar with rope; however, after the inspectors informed the licensee, this condition was promptly corrected.

M1.2 Loss of Configuration Control of 600V Breaker Fuses (Unit 2)

a. Inspection Scope (62707)

On September 17, 1999, an operator identified that 30 amp fuses were not installed in the Unit 2 south SFP cooling pump 600V supply breaker. The operator also noted that the breaker had two 10 amp fuses installed rather than one. After the operator contacted the control room, the licensee racked out the breaker and investigated the event. The inspectors reviewed the job order and interviewed members of the licensee's operations and maintenance departments.

b. Observations and Findings

After identifying the fuse configuration error, the operators de-energized the Unit 2 600V "A" Train bus 21C. The licensee identified two other breakers which had incorrect fuse configurations: the south screen wash pump 600V supply breaker, and the north non-essential service water pump 600V supply breaker. The operators also noted that for the three breakers with incorrect fuse configurations, no fuses were missing; the fuses were simply installed in the wrong locations. The operators wrote CR 99-23814 to document the finding.

The inspectors followed up on the operations department response to the finding. The operations shift verified that the "B" Train 600V breakers had the proper fuse configuration. The "B" Train 600V breakers had been previously refurbished as part of the "B" Train outage. The operators determined that the improper fuse configurations were isolated to the 21C bus and were most likely the result of the fuses being installed

improperly following breaker refurbishment. Therefore, the licensee concluded that the breakers on the "B" Train busses would have operated properly if needed. The inspectors noted that the licensee's actions to verify the fuse configurations on the other busses was prompt and thorough. The inspectors did not have any questions about the operability of the "B" Train breakers.

Two procedures were used to perform the breaker refurbishment on the 21C bus: Instrument Head Procedure 5030.EMP.006, "MCCB [molded case circuit breaker] /TOLR [thermal overload relay] Testing and Electrical Enclosure Maintenance," Revision 4, and Operations Head Procedure 4021.082.009, "Racking In and Out 4kV, 600V, and 480V Breakers," Revision 9. The inspectors reviewed these procedures and noted that neither procedure required the breaker fuse amperage rating or installation configuration to be verified correct prior to breaker operation. The failure to install the fuses in the proper configuration could have prevented the breaker from tripping if necessary; therefore, the safety-related load shedding function might not have worked properly. The inspectors determined that inadequate guidance was provided to the operations and maintenance personnel to ensure that the proper 600V breaker fuse configuration was maintained.

10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," required, in part, "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances . . . ." Contrary to the above, Operations Head Procedure 4021.082.009, "Racking In and Out 4kV, 600V, and 480V Breakers," Revision 9, was not appropriate to the circumstances in that it did not provide guidance to the operations and maintenance personnel to ensure that the proper 600V breaker fuse configuration was maintained. This Severity Level IV violation is being treated as an NCV.

Appendix C of the Enforcement Policy requires 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 is 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. While the licensee and the NRC have not yet concluded that the corrective action program is fully effective, the corrective action program improvement efforts are underway and captured in the D. C. Cook Plant Restart Plan which is under the formal oversight of the NRC through the NRC Manual Chapter 0350 process, "Staff Guidelines for Restart Approval." Consequently, this issue is being dispositioned as an NCV (50-316/99019-01(DRP)).

c. Conclusions

On September 17, 1999, an operator identified a fuse configuration error on a Unit 2 "A" Train 600V safety-related bus. The inspectors concluded that the licensee's actions to verify the fuse configurations on the remaining 600V busses were prompt and thorough. However, the inspectors also concluded that the licensee's procedures for controlling fuse configuration during breaker refurbishment were not adequate in that the procedures did not specify that the fuse configuration be checked when returning a breaker to service. The inspectors determined that the failure to provide adequate guidance to ensure that breaker fuse configuration was properly controlled was a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V.

III. Engineering

E1 Conduct of Engineering

E1.1 Review of Temporary Modification 12-96-07

a. Inspection Scope (37551, 71707)

The inspectors reviewed Temporary Modification (TM) 12-96-07, which was referenced in SFP cooling procedures as discussed previously in Section O2.1, b.2 of this inspection report. In addition, the inspectors discussed the TM process with engineering personnel and reviewed associated CRs.

b. Observations and Findings

In March 1996, TM 12-96-07 was installed to add a temporary demineralizer for refueling water clean-up. The system's original demineralizer was out-of-service because of broken resin retaining screens. The TM remained in place until November 6, 1996, at which time the original demineralizer was replaced and the temporary demineralizer was removed under JO C35337. The inspectors determined that a heat exchanger for the 15 gpm radioactive waste evaporator had been removed to install the TM. The heat exchanger was scrapped following removal; therefore, the 15 gpm evaporator system could not be restored to its original design, and the TM could not be closed out (i.e., paperwork complete). Engineering personnel indicated that the 15 gpm evaporator was not used and would be retired in place through a design change and that the TM could be closed out after the design change was completed. The inspectors determined that no adverse safety consequences resulted from the current status, partial restoration of the TM.

On July 22, 1999, licensee personnel identified that the approved extension for TM 12-96-07 had expired on December 31, 1998. The licensee had not fully restored the TM, and had not documented any further extensions. Licensee personnel wrote CR 99-19248 which was entered into the licensee's corrective action system. However, the CR was coded as post-restart and therefore, the discrepancy still existed. Following the inspectors' questions, engineering personnel reviewed the TM package and identified the following additional deficiencies:

- The required signature to approve restoration had not been obtained.
- The documented safety review only covered installation and was not revised to evaluate acceptability of partial restoration for an extended period.
- The marked up drawings were not available as required.

Engineering personnel wrote CR 99-23773 to enter the identified deficiencies into the licensee's corrective action program. The identified deficiencies demonstrated a lack of rigor regarding implementation of the TM process for TM 12-96-07. The inspectors determined that the failure to implement the TM process per plant procedures had no adverse safety consequences and therefore, constituted a violation of minor significance that was not subject to formal enforcement action.

c. Conclusions

The inspectors concluded that the temporary modification process was not rigorously implemented for TM 12-96-07 as evidenced by several identified deficiencies. Signatures were not obtained to approve restoration and drawings were not revised as required. In addition, the safety analysis was not revised to evaluate the acceptability for extended partial restoration of the temporary modification. No adverse safety consequences resulted from the identified deficiencies.

IV. Plant Support

R3 Radiological Protection and Chemistry Procedures and Documentation

R3.1 Radiation Survey Map Not Updated Following Dual Core Off-load

a. Inspection Scope (71750)

During routine plant tours, the inspectors compared posted survey maps to actual plant conditions and the most recent survey data. The following procedures were reviewed:

- 12 Technical Head Procedure 6010 RPP.401, "Performance of Radiation, Contamination and Airborne Radioactivity Surveys," Revision 7
- Radiation Protection Standing Order 004, "Routine Survey Schedule Frequency," Revision 10

b. Observations and Findings

On September 14, 1999, during a walkdown of the spent fuel cooling system, the inspectors noted that the Radiological Area Status Sheet for the Auxiliary Building 650' level SFP area was dated July 3, 1999. The licensee placed Unit 2 in Mode 6 on July 13, 1999, and both reactor cores were fully off-loaded to the SFP on August 8, 1999. Because the addition of fuel assemblies to the SFP could potentially change radiological conditions in the vicinity of the pool, the inspectors reviewed the licensee's requirements for the performance of periodic surveys near the SFP. In addition to detailed radiation and contamination surveys every quarter, Radiation Protection Standing Order 004 required weekly radiation checks and masslin mopping surveys of the SFP 650' level. The inspectors reviewed the results from recent weekly radiation checks and masslin mopping surveys. Although a detailed quarterly radiological survey of the SFP area was not completed following core off-load, based on the results of weekly surveys, the inspectors identified no significant changes in SFP area radiological conditions due to core off-load.

c. Conclusions

The inspectors concluded that, although a detailed quarterly radiological survey of the SFP area was not completed following the dual unit core off-load in July 1999, based on the results of weekly surveys, the inspectors identified no significant changes in SFP area radiological conditions.

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 October 8, 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
#M. Dixon, Reliability Engineering
#M. Finissi, Director, Plant Engineering
#R. Gaston, Compliance Manager
#R. Godley, Director, Regulatory Affairs
#W. McDaniel, Design Engineering
#T. Noonan, Plant Manager
#T. O'Leary, Manager, Radiation Protection and Chemistry
#J. Reed, Manager, Electrical Maintenance
#M. Stark, Maintenance
#F. Timmons, Manager, Site Protective Services
#G. VanBladeren, Reliability Engineering
#L. Weber, Operations Manager

# Denotes those present at the October 8, 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

316/99019-01	NCV	Procedure inappropriate to the circumstances in that it did not ensure that fuses in safety-related 600V bus were properly installed

Closed

316/99019-01	NCV	Procedure inappropriate to the circumstances in that it did not ensure that fuses in safety-related 600V bus were properly installed

Discussed

None

LIST OF ACRONYMS

AR	Action Request
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
JO	Job Order
MC	Manual Chapter
MHP	Maintenance Head Procedure
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
PPA	Plant Performance Assurance
PDR	Public Document Room
SFP	Spent Fuel Pool
SMRT	Senior Management Review Team
TM	Temporary Modification
TS	Technical Specification
VCT	Volume Control Tank
VIO	Violation