March 26, 1999

EA 99-044

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 50-315/99001(DRP); 50-316/99001(DRP)

Dear Mr. Powers:

On March 2, 1999, the NRC completed an inspection at your 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 you developed an Operations Department Leadership Plan and an Engineering Department Leadership Plan to establish a framework for performance improvements. We also noted that you established a Shift Operability Review Team which improved both the quality and the timeliness of operability determinations. In addition, we noted that following your identification of a missed Technical Specification surveillance requirement, associated with the power operated relief valves, you implemented comprehensive corrective actions which resulted in the identification of additional missed surveillance testing requirements. As a result, you appropriately broadened the scope of your investigation to include surveillance testing requirements in other modes of operation. The above initiatives and demonstrated aggressive corrective actions reflect positively on your commitment to identify and resolve safety issues.

In contrast to the above examples of improving performance, a non-licensed operator started the Unit 1 CD diesel generator starting air compressor and failed to monitor the system response. Consequently, the starting air receiver relief valve lifted on high pressure and an alarm was received in the control room. In addition, we identified that the control room operators observed, but did not question, abnormal indications on a residual heat removal flow instrument. Both of these occurrences indicated weaknesses with operator control and monitoring of plant systems and equipment. Your continued attention to effect improved performance in this area appears warranted.

Based on the results of this inspection, the NRC has determined that four violations of NRC requirements occurred. The first violation, which was identified by NRC inspectors pertained to a tagging procedure for plant equipment that did not contain instructions to place tags at all locations where out-of-service equipment may be operated. The second violation, which was identified by your staff, related to the failure to implement Technical Specification Action Requirements for missed surveillance testing associated with the power operated relief valves. The third violation, which was identified by your staff in 1994, involved the movement of fuel in the spent fuel pool area with the spent fuel pool exhaust ventilation system inoperable. The fourth violation, which was identified by your staff in 1997, pertained to inadequate maintenance instructions which permitted the installation of unqualified material in a safety-related system.

These Severity Level IV violations are being treated as Non-Cited Violations (NCVs). 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 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 D. C. Cook 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 and its enclosure will be placed in the NRC Public Document Room.

Sincerely,

/s/ A. Vegel (for)
John A. Grobe, Director
Division of Reactor Safety

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

Enclosure: Inspection Report 50-315/99001(DRP);
50-316/99001(DRP)

cc w/encl: A. C. Bakken III, Site Vice President
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REGION III

| | |
|---|---|
| Docket Nos: | 50-315; 50-316 |
| License Nos: | DPR-58; DPR-74 |
| Report No: | 50-315/99001(DRP); 50-316/99001(DRP) |
| Licensee: | Indiana and Michigan Power<br>500 Circle Drive<br>Buchanan, MI 49107-1395 |
| Facility: | Donald C. Cook Nuclear Generating Plant |
| Location: | 1 Cook Place<br>Bridgman, MI 49106 |
| Dates: | January 14, 1999, through March 2, 1999 |
| Inspectors: | B. L. Bartlett, Senior Resident Inspector<br>B. J. Fuller, Resident Inspector<br>J. D. Maynen, Resident Inspector |
| Approved by: | A. Vegel, Chief<br>Reactor Projects Branch 6<br>Division of Reactor Projects |

EXECUTIVE SUMMARY

D. C. Cook Units 1 and 2
NRC Inspection Report 50-315/99001(DRP); 50-316/99001(DRP)

This inspection included aspects of licensee operations, maintenance, engineering, and plant support. The report covers a 7-week period of resident inspection activities and includes follow-up to issues identified during previous inspection reports.

Operations

C Overall operator performance during this inspection report period was characterized by effective procedural compliance and conservative decision making. On two occasions operators stopped evolutions in progress until abnormal conditions could be resolved. (Section O1.1)

C One notable example of poor operator control and monitoring of plant equipment occurred. Specifically, a non-licensed operator failed to meet management expectations regarding operation of an emergency diesel generator starting air compressor. (Section O1.1)

C In response to weaknesses previously identified with the operability determination process by both licensee and NRC personnel, the licensee instituted a number of short and long-term corrective actions. The inspectors concluded that the licensee's corrective actions were timely and appeared to be effective in improving both the quality and the timeliness of operability determinations. (Section O1.2).

C The inspectors concluded that several contractors working for the licensing department exceeded the working hour limitations specified by Plant Manager's Instruction 4010, "Plant Operations Policy," Revision 12. No violations of regulatory requirements occurred since the contractors were performing nonsafety-related activities. (Section O1.3)

C Establishment of the core safety priorities list was a positive step taken by the licensee to focus attention on the issues that posed the greatest risk to core safety. (Section O1.4)

C Operators failed to recognize indications of cavitation in the residual heat removal system until prompted by the inspectors. The inspectors also noted that the residual heat removal system cavitation and vibration on both units appeared to be recurring, long-standing deficiencies. The licensee subsequently took prompt action to assess possible degradation of the system and formed a multi-disciplined project team to assess the operability of the system. (Section O2.1)

C The inspectors identified that the licensee's clearance permit procedures did not address the tagging of all locations where out-of-service equipment could be operated. As allowed by the procedures, the operations department practice was to tag only the control room and local hand switches for safety-related equipment. The inspectors concluded that the licensee's tagging procedures and practices did not ensure worker safety during work on out-of-service equipment. One Non-Cited Violation was issued for the failure to have a procedure appropriate to the circumstances. (Section O3.1)

- C Control room operators alertly identified a slow level increase in the Unit 1 volume control tank and took appropriate action to identify and correct the source of the in-leakage. In addition, the inspectors concurred with the licensee's conclusion that the volume control tank in-leakage resulted from the failure to fully close the residual heat removal to letdown isolation valve following the previous operation. (Section O4.1)

- C The Operations Department Leadership Plan established a framework for performance improvements, and if properly implemented, should result in the operations department being ready to support plant restart. (Section O6.1)

- C The Nuclear Safety and Design Review Committee (NSDRC) performed adequate oversight of the technical issues discussed. The inspectors also concurred with the licensee's conclusion that the NSDRC meetings were of mixed quality and not always effective. In addition, the inspectors concluded that the licensee's corrective actions following the NSDRC meeting 188 appeared to be effective in improving the quality of the subsequent NSDRC meeting. (Section O7.1)

Maintenance

- C Observed maintenance activities were performed in accordance with approved procedures. The inspectors noted that the maintenance personnel performing the work activities were knowledgeable of their assigned tasks and utilized appropriate radiation protection work practices. In addition, the inspectors observed frequent management oversight of work in progress. (Section M1.1)

- C Following the identification of a missed pressurizer power operated relief valve surveillance test, the licensee's review of scheduled and event-initiated surveillances identified that some required Mode 5 surveillances were not being performed. The licensee also identified several weaknesses in the tracking processes to ensure that Mode 5 surveillances were properly completed. The inspectors concluded that the licensee's efforts to identify missed surveillances were comprehensive and methodical. (Section M1.2)

- C The licensee conservatively declared all four emergency diesel generators inoperable due a question regarding the seismic qualification of the General Electric HFA safety-related relays installed in the emergency diesel generator circuits. (Section M2.1)

- C The procedure approval process was not effective in identifying technical errors in the post-maintenance testing procedure for the HFA relay work. (Section M2.1)

- C The Maintenance Proficiency Evaluation training program appeared to be thorough and focused on improving the performance of both the maintenance workers and supervisors. (Section M5.1)

Engineering

- C The inspectors concluded that the Engineering Department Leadership Plan established a framework for performance improvements, and if properly implemented, should result in the engineering department being ready to support plant restart. (Section E6.1)

Plant Support

C During normal resident inspection activities, routine observations were conducted in the area of security and safeguards, fire protection, and health physics activities. No discrepancies were noted.

## Report Details

Summary of Plant Status

The licensee maintained both Unit 1 and Unit 2 in Mode 5, Cold Shutdown, throughout the inspection period. During this inspection period, the licensee prioritized the completion of work on Unit 1 over Unit 2.

In response to identified weaknesses in programs and processes, the licensee voluntarily curtailed site operations during this inspection period by the imposition of stop work orders. As a result, most plant work was in reaction to emergent issues. Examples of stop work orders included: All Engineering Activities, Calculations, Engineering Strategies and Restart Item Green Packages, Radiography, Component Evaluations, Root Cause Analysis, Maintenance Planning, Corrective Action Work Order for Closing Condition Reports to Action Requests, Temporary Modifications, Design Change Packages (DCPs), Plant Engineering Apparent Cause and No Cause CR [Condition Report] Investigation, M&TE [Measuring and Test Equipment] Calibration, 10 CFR 50.59, Ice Condenser Basket Installation, On-site Testing Originated by Engineering, Equipment Clearance and System Restoration Activities, Technical Direction Memoranda, and Ice Basket Bottom Welds. The stop work orders were in effect for various lengths of time during this inspection period, and not all stop work orders were rescinded by the end of the inspection period. In addition to the initiatives noted, the licensee was implementing the Expanded System Readiness Review (ESRR) process which also had a significant impact on site resources. NRC review of the ESRR program was documented in NRC Inspection Report 50-315/99002; 50-316/99002 dated March 19, 1999.

## I. Operations

### O1 Conduct of Operations

O1.1 General Comments

a. Inspection Scope (71707)

Using the referenced inspection procedure, the inspectors conducted frequent observations of control room and in-plant operation of equipment during the extended outage of both reactor units. Specific events and noteworthy observations are detailed in the sections below.

b. Observations and Findings

The inspectors found that, overall, the plant was operated in a safe manner and in accordance with procedures. In particular, the inspectors noted two examples of operators demonstrating a conservative operating philosophy:

- On January 27, 1999, while performing a surveillance on the alternate reserve power source, an unexpected alarm came in for the Unit 1 Train B Post-Accident Containment Hydrogen Monitoring System. The operators stopped the surveillance testing evolution until the cause of the alarm was determined. Once the cause for the alarm was understood, the testing was recommenced.

C On February 1, 1999, the operators identified that the procedure for removing vital bus 11B from service did not include the requirement to install temporary ventilation in the Unit 1 AB battery room. Bus 11B provided power to the Unit 1 AB battery room fan. The operators stopped the procedure and initiated the process to get a temporary modification installed.

One personnel error of note by a non-licensed operator occurred during this inspection report period. On January 24, 1999, an auxiliary equipment operator placed the control switch for the nonsafety-related Unit 1 CD diesel generator starting air compressor in run. This was done to slightly increase the air pressure in the starting air receiver. The operator left the immediate area and forgot that the compressor was running. Subsequently, the control room received a low pressure alarm on the starting air tank when the air receiver relief valve lifted on high pressure. The inspectors determined that the safety consequence of the operator leaving the air compressor running was minimal. However, the operator did not meet the expectations of licensee management for the control of plant equipment. Specifically, Operations Head Instruction (OHI) 4013, "Operators: Authorities and Responsibilities," Revision 11, required that operators inspect running equipment for proper operation. As a result, the licensee initiated condition report (CR) 99-1408 to document the occurrence and performed a root cause analysis on this event.

c. Conclusion

Overall operator performance during this inspection report period was characterized by effective procedural compliance and conservative decision making. On two occasions operators stopped evolutions in progress until abnormal conditions could be resolved. However, one notable example of poor operator control and monitoring of plant equipment occurred. Specifically, a non-licensed operator failed to meet management expectations regarding operation of an emergency diesel generator starting air compressor.

O1.2 Operability Evaluations

a. Inspection Scope (71707)

The inspectors evaluated the licensee's corrective actions for the weaknesses identified with the operability determination process, which were documented in NRC Inspection Report 50-315/98027(DRP); 50-316/98027(DRP), Section O1.2.

b. Observations and Findings

When plant equipment was degraded or potential non-conforming conditions were identified, the licensee performed an operability determination (OD). In previous NRC inspection reports, the term operability evaluation had been used to describe these documents. The terms operability determination and operability evaluation are equivalent. Previous NRC inspection reports, licensee self-assessments, third party assessments, and licensee CRs have identified problems with the performance of ODs. During this inspection period, the licensee instituted a number of improvement initiatives

The licensee had been successful in lowering the site threshold for the initiation of CRs which resulted in significantly more CRs being written. Since the operations shift

manager and the shift technical advisor (STA) were required to review every CR, a large backlog of CRs pending review developed in the operation shift manager's office. As a result, the licensee instituted a Shift Operability Review Team (SORT) to perform an initial review of all CRs to determine if an OD should be performed. If the SORT determined that an OD was required, then the CR was sent to the STA. The licensee's implementation of the SORT appeared to reduce the work load on the operations shift manager and STA and resulted in more timely and better quality ODs.

The licensee also implemented the requirement to have engineering department personnel perform a backup OD within 3 working days for all CRs that contained a prompt OD. Each backup OD was required to be reviewed by operations and engineering department management. The licensee subsequently determined that the initial backup ODs were weak and implemented several initiatives, which included higher expectations, to improve the quality. The inspectors noted that the quality of the subsequent backup ODs improved.

The licensee also designated a project manager for the OD program. The project manager was tasked with developing and implementing short and long-term improvements in the OD process. At the end of the inspection period, additional improvements for the OD process were still being evaluated by the OD project team.

c. Conclusions

In response to weaknesses previously identified with the operability determination process by both licensee and NRC personnel, the licensee instituted a number of short and long-term corrective actions. The inspectors concluded that the licensee's corrective actions were timely and appeared to be effective in improving both the quality and the timeliness of operability determinations.

O1.3 Evaluation of Working Hour Limitations

a. Inspection Scope (71707)

The inspectors conducted a review to assess the effectiveness of the licensee's process for controlling overtime. The inspectors selected a group of contractors working for the licensing department and evaluated the use and control of overtime within this group. During the evaluation, the inspectors were informed that the licensee was performing a separate review and assessment of that groups' overtime. The inspectors also evaluated the results of the licensee's assessment.

b. Observations and Findings

The inspectors selected a group of contractors working for the licensing department. This work group was selected because they were under time pressure to complete their project, they were primarily contractors, and were initially thought to be performing safety-related work. The inspectors reviewed the time sheets for the contractors and identified the following failures to comply with Plant Manager's Instruction (PMI) 4010, "Plant Operations Policy," Revision 12, regarding working hour limitations:

| | | |
|---|---|---|
| C | Supervisor 'A' | Worked 78 hours in a 7-day period (exceeding the 72 hours in a 7-day period limit) |

| | | |
|---|---|---|
| C | Worker ‘B’ | Worked 84 hours in a 7-day period |
| C | Worker ‘B’ | Five days later worked 82 hours in a 7-day period |
| C | Worker ‘C’ | Worked 78 hours in a 7-day period |
| C | Worker ‘D’ | Worked 26 hours in a 48-hour period (exceeding the 24 hours in a 48-hour period limit) |
| C | Worker ‘E’ | Worked 25 hours in a 48-hour period |

After the requested timesheets had been received, the licensee informed the inspectors of a separate working hours limitation assessment being performed by Plant Performance Assurance (PPA) on the same work group. The inspectors subsequently evaluated the results of PPA’s assessment and determined that the results differed. The PPA auditor had used a fixed 7-day period of time (for example from Saturday to Saturday) instead of a rolling 7-day period of time to calculate the working hours accumulated during a 7-day period. After the inspectors identified the error, the auditor re-performed the calculations and concurred with the inspectors findings.

The PPA auditor interviewed selected workers and the work group supervisor and determined that:

- The work group supervisor’s opinion was that safety-related work was not being performed.
- The work group supervisor mistakenly believed that since safety-related work was not being performed, PMI - 4010 did not apply to the work group.
- Workers were not directed to violate working hours limitations, but miscommunications over work schedules did occur.

The supervisor subsequently brought the work group into compliance with PMI - 4010, and the auditor initiated condition reports regarding the violations of the working hours limitations.

The inspectors reviewed the work group’s activities and determined that the work being performed was not safety related. The work group was generating licensing booklets that the engineers performing the Enhanced System Readiness Reviews would use. However, personnel would not make decisions based upon the booklets; they would use them to find the appropriate section of the Updated Final Safety Analysis Report when licensing basis questions were generated. Therefore, the inspectors concluded that no violations of regulatory requirements occurred since the contractors were performing nonsafety-related activities.

c. Conclusions

The inspectors concluded that several contractors working for the licensing department exceeded the working hour limitations specified by Plant Manager’s Instruction 4010, “Plant Operations Policy,” Revision 12. No violations of regulatory requirements occurred since the contractors were performing nonsafety-related activities.

O1.4 Core Safety Priority Meeting

a. Inspection Scope (71707)

On February 17, 1999, the inspectors observed the licensee's meeting held to determine the reactor core safety priorities. The inspectors also interviewed the shift outage manager responsible for maintaining the core safety priority list regarding the guidance used to determine what issues merited inclusion on the list.

b. Observations and Findings

The panel consisted of the operations department senior license holder and representatives from licensing, engineering, maintenance, scheduling, and the outage command center. Plant performance assurance personnel also attended the meeting.

The senior license holder determined the challenges to core safety with the assistance of the panel. The core safety priorities were then established as the highest priority issues to resolve. The inspectors determined that the panel adequately assessed the challenges to core safety and properly advised the senior license holder on the priority to be assigned to each issue.

The criteria necessary for selecting which issues were placed on the core safety priority list was not available for review by the inspectors or members of the panel. This contributed to questions regarding whether an issue was tracked on the operations focus list or the core safety priorities list. The shift outage manager subsequently informed the inspectors that the inclusion of the selection criteria would be considered for future meetings.

c. Conclusions

The establishment of the core safety priorities list was a positive step taken by the licensee to focus attention on the issues that posed the greatest risk to core safety.

## O2 Operational Status of Facilities and Equipment

O2.1 Residual Heat Removal (RHR) System Vibration and Cavitation

a. Inspection Scope (71707)

The inspectors followed the licensee's assessments and corrective actions following the identification of cavitation in the Unit 1 RHR system. The cavitation had been identified following questions by the inspectors regarding abnormal flow oscillations observed on an RHR flow meter.

b. Observations and Findings

During a routine control room panel walkdown on January 29, 1999, the inspectors identified that the Unit 1 East RHR heat exchanger outlet flow indication (1-IFI-311) was oscillating. The flow indication varied between 2,500 gallons per minute (gpm) and 2,900 gpm. In addition, the flow indicator was making sharp, jerking movements of a smaller magnitude during the oscillations.

The inspectors questioned the operators and determined that the operators had observed the flow oscillations, but considered the variations as normal. The reactor operators and the unit supervisor indicated that they did not know the cause of the oscillations and had not initiated either a CR or an Action Request (AR). The licensee subsequently initiated CR 99-1733 and AR A176983 to address the problem.

With the RHR system engineer present, system flow rates and flowpaths were varied within the limits of the normal operating procedure. It was determined that the cause of the flow fluctuations appeared to be high flow rates through one or more throttle valves (1-IRV-310 or 1-IRV-320). Walkdowns of the RHR system during these flow variations determined that flow cavitation also appeared to be occurring. The operators subsequently adjusted flow through the RHR system so that the flow cavitation stopped and requested that engineering address the long-term resolution of the issue. The licensee determined that the preferred flowpath was via the injection lines to the reactor coolant system.

The RHR system engineer verbally conveyed to the operations shift crew that the preferred flowpath was via the injection lines to the reactor coolant system. In response to the inspectors questions regarding the formality of the communication method, engineering personnel initiated a “Night Letter.” However, in response to additional questions by both the inspectors and licensee management, engineering personnel determined that a “Night Letter” was not a formal method of communication. As a result, the licensee initiated CR 99-2317 to document the use of the informal “Night Letter” and formally requested that operations maintain shutdown cooling flow via the injection lines to minimize the cavitation and vibration encountered when using the normal cooldown flow-path.

During the adjustment of the RHR system flow rates and flowpaths, licensee management concluded that the control of the activities did not meet their expectations. Specifically, licensee management expected a special test procedure to have been developed to ensure that the activities were controlled appropriately. As a result, the licensee imposed a stop work, which affected on-site testing originated by the engineering department, in order to provide additional controls on engineering testing. The stop work order had not been lifted by the end of this inspection period.

In addition, on February 11, 1999, a non-licensed operator identified that the RHR pumps were making an intermittent rumbling noise, and thought it might be similar to the cavitation concern. As a result, the licensee initiated a special test procedure to vent the reactor vessel head and the pump suctions for the east and west RHR pumps on both units. The venting of the reactor head did not result in the release of any more than a normal amount of gas for the current plant conditions; and the venting of the RHR pump suctions did not result in any gases being vented from any of the four pumps.

The licensee subsequently identified that historical data indicated that the RHR system vibration issue experienced during this inspection period may have occurred previously. Supplement 5 to the Safety Evaluation Report (SER) for the Unit 1 operating license, issued January 16, 1976, identified at least four instances of cracked welds in the RHR system due to induced vibration.

The licensee created a multi-disciplined RHR project team to address the identified noise and vibration abnormalities associated with the RHR system. The project team

consisted of Duke Engineering and Services; Sargent and Lundy; Rotating Equipment Repair Inc. and American Electric Power Company engineering and operations personnel. The team was chartered to identify both immediate and long-term concerns which could impact RHR system functionality or durability. The team determined that in the existing line-up, via the injection flow-path, there were no immediate concerns and no abnormal degradation was occurring. Operations personnel were requested to conduct hourly monitoring of the RHR systems in both units to detect any further changes in system condition. On February 19, 1999, the monitoring was relaxed to once every three hours, based on no noticeable changes in the noise or vibration levels during five days of hourly monitoring. The inspectors observed that the project team was properly focused on assessing immediate degradation of the RHR system and appeared to have a comprehensive plan to determine long-term operability.

The project team planned to complete the long-term RHR pump functional integrity assessment on March 14, 1999. Pending inspector review of the completed RHR vibration assessment, this will remain an Inspection Followup Item (50-315/99001-01(DRP)).

c. Conclusions

Operators failed to recognize indications of cavitation in the residual heat removal system until prompted by the inspectors. The inspectors also noted that the residual heat removal system cavitation and vibration on both units appeared to be recurring, long-standing deficiencies. The licensee subsequently took prompt action to assess possible degradation of the system and formed a multi-disciplined project team to assess the operability of the system.

## O3 Operations Procedures and Documentation

### O3.1 Tagging of Plant Equipment

a. Inspection Scope (71707)

On February 24, 1999, the inspectors identified that the licensee had not tagged all of the indications related to the inoperable source range detector N31. The inspectors interviewed operators regarding the licensee's practices for equipment clearances and reviewed the licensee's procedures governing the control and use of inoperable tags, caution tags, and clearance tags including:

- OHI - 2211, "Maintenance of Operations Department Logs," Revision 23
- OHI - 4000, "Conduct of Operations: Standards," Revision 1
- Plant Managers Procedure (PMP) - 2110.CPS.001, "Clearance Permit System," Revision 1
- PMI - 2110, "Clearance Permit System," Revision 25

b. Observations and Findings

The inspectors noted that the licensee's clearance permit procedures did not address tagging multiple locations for the same indication, nor did it address the tagging of multiple control switches. Safety-related equipment with multiple locations for operation included: (1) the centrifugal charging pumps, (2) the component cooling water pumps, (3) the essential service water pumps, and (4) the auxiliary feedwater pumps. The operators stated that the standard operating practice was to tag only the control room hand switch and local hand switches. The clearance permit procedure did not require the hand switches located on the hot shutdown panel or the local shutdown indications to be tagged.

The inspectors discussed the need to control all operating switches and indications with licensee management. Licensee management agreed that, while the risk was low, all hand switches and indications needed to be tagged to ensure worker safety and knowledge of equipment status. The inspectors and licensee management did not identify any instances where workers were injured or equipment was damaged due to a tagging deficiency. Condition report 99-4524 was issued regarding the licensee's tagging practices, and the licensee began modifying the clearance permit procedures.

10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Plant Managers Procedure - 2110.CPS.001, "Clearance Permit System," Revision 1, was not appropriate to the circumstances, in that, it did not contain instructions to place tags at all locations where out-of-service equipment may be operated. This was a 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 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 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 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 will be dispositioned as a NCV (50-315/316/99001-02(DRP)).

c. Conclusions

The inspectors identified that the licensee's clearance permit procedures did not address the tagging of all locations where out-of-service equipment could be operated. As allowed by the procedures, the operations department practice was to tag only the control room and local hand switches for safety-related equipment. The inspectors concluded that the licensee's tagging procedures and practices did not ensure worker safety during work on out-of-service equipment. One Non-Cited Violation was issued for the failure to have a procedure appropriate to the circumstances.

## O4 Operator Knowledge and Performance

### O4.1 Volume Control Tank Level Increase

a. Inspection Scope (71707)

During a routine trend analysis, the control room operators identified that the level in the Unit 1 volume control tank (VCT) in the reactor coolant chemical and volume control system (CVCS) increased approximately 85 gallons during a 2 week period. The inspectors reviewed the control room logs, interviewed the control room operators and operations management and evaluated the licensee's efforts to identify the cause of the level increase.

b. Observations and Findings

In early January 1999, the licensee isolated the VCT when the Unit 1 reactor coolant system was depressurized to support work on the CVCS cross-tie which was leaking. During routine trend analysis, the control room operators identified that VCT level had increased approximately 85 gallons during a 2 week period. As a result, the operators reviewed flow prints of the CVCS and interfacing systems to determine the source of the in-leakage to the VCT. In addition, operators performed valve lineups on the interfacing systems and altered equipment lineups to ensure that no flow was being directed to the VCT. During these valve lineups, operators identified that the RHR to CVCS isolation valve, 1-RH-121E, was partially open. The licensee initiated CR 99-2939 to document the occurrence of the event and track corrective actions. Following the operators fully closing 1-RH-121E, Unit 1 VCT level remained steady. Operations personnel also determined that the start of the in-leakage correlated with the RHR system manipulations performed in response to increased vibration and cavitation in the system (See Section O2.1).

c. Conclusions

Control room operators alertly identified a slow level increase in the Unit 1 volume control tank and took appropriate action to identify and correct the source of the in-leakage. In addition, the inspectors concurred with the licensee's conclusion that the volume control tank in-leakage resulted from the failure to fully close the residual heat removal to letdown isolation valve following the previous operation.

## O6 Operations Organization and Administration

### O6.1 Operations Department Leadership Plan

a. Inspection Scope (71707)

The inspectors evaluated the Operations Department Leadership Plan and interviewed licensee management.

b. Observations and Findings

In an effort to ensure that the operations department was ready for restart, the licensee developed the Operations Department Leadership Plan, which had been modeled after

other industry plans that had successfully improved performance. The inspectors noted that the plan's short-term goal was to ensure that the operations department was ready to support the restart of both units, while the plan's long-term goal was to take the operations department beyond regulatory requirements and to reach world class performance. The plan's objectives were to:

- Provide clear and concise leadership direction for all department personnel
- Support the strategic plans for:
  - Short-range initiatives
  - Restart initiatives
  - Long-term initiatives

In addition, some of the improvement initiatives previously implemented were contained in the Operations Department Leadership Plan including:

- The shift turnover process
- The shift manager mentoring program
- Staff augmentation
- The operations training program
- The operability determination program
- Department and shift re-organization
- Elevation of operations department standards
- Shift manager and unit supervisor leadership meetings

Additional initiatives being scheduled for implementation included emergency operating procedures, control room deficiencies/distractions, operator work arounds, and material condition deficiencies.

c. Conclusions

The Operations Department Leadership Plan established a framework for performance improvements, and if properly implemented, should result in the operations department being ready to support plant restart.

## O7 Quality Assurance in Operations

### O7.1 Observations of Nuclear Safety and Design Review Committee

a. Inspection Scope (71707)

The inspectors observed two Nuclear Safety and Design Review Committee (NSDRC) meetings. The NSDRC meetings observed by the inspectors were intended to provide management oversight of the enhanced system readiness reviews.

b. Observations and Findings

On February 12, 1999, the inspectors observed NSDRC meeting 188. The committee verified a quorum prior to starting the meeting. The meeting minutes for meetings 185 and 187 were reviewed but determined to be unacceptable. The minutes for meeting 186 were not available. The committee planned to discuss the development of the system readiness review attributes; however, the presenter was not aware that the meeting was scheduled and did not attend the meeting. Consequently, meeting 188 was adjourned without discussing any of the topics on the agenda. As a result, the licensee initiated CR 99-2570 to document that NSDRC meeting 188 was not effective.

On February 16, 1999, the inspectors observed NSDRC meeting 189. The meeting minutes for the previous four NSDRC meetings were reviewed and approved. The committee heard a presentation on the development of the system readiness review attributes and discussed the issues presented. Much of the discussion centered on the independent oversight of the system readiness review process and the expected results from the reviews. The NSDRC also questioned the presenters on the expected cross-departmental cooperation during the system readiness reviews. The inspectors concluded that the licensee's corrective actions from NSDRC meeting 188 appeared effective in improving the quality of NSDRC meeting 189.

c. Conclusions

The Nuclear Safety and Design Review Committee (NSDRC) performed adequate oversight of the technical issues discussed. The inspectors also concurred with the licensee's conclusion that the NSDRC meetings were of mixed quality and not always effective. In addition, the inspectors concluded that the licensee's corrective actions following the NSDRC meeting 188 appeared to be effective in improving the quality of the subsequent NSDRC meeting.

### O7.2 Corrective Action Program Issues

Recent NRC and licensee inspection activities have identified a breakdown in the licensee's corrective action program. As part of the plant restart effort docketed in the Restart Plan, the licensee has committed to performing a complete assessment of the corrective action program and implementing actions to correct the identified deficiencies. In a letter dated July 30, 1998, and updated on October 13, 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. Enclosure 1 to the NRC letter, the Case Specific Checklist, included the corrective action program as an item 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.

Previous inspection activities have also identified specific discrepancies in the licensee's corrective action program. The inspectors reviewed these previously identified deficiencies and assessed the corrective actions specific to these issues. The programmatic corrective action weaknesses will be addressed in future inspections as delineated by the NRC MC 0350 process. Therefore, the following items are closed:

C (Closed) Violation 50-315/96006-01; 50-316/96006-01: Failure to perform prompt operability assessment. The inspectors identified three examples of potentially degraded conditions which did not have an operability determination made expeditiously following the identification of the condition. The licensee's response to the violation included a commitment to communicate management's expectations for promptly performing operability determinations. The inspectors reviewed the licensee's response and determined that the specific conditions identified in the violation had been adequately addressed. Based on the discussion above, the inspectors concluded that the licensee's corrective actions to address programmatic issues will be evaluated as part of the inspection effort to close NRC MC 0350 Case Specific Checklist Item 2. This item is closed.

C (Closed) Unresolved Item 50-315/96013-05; 50-316/96013-05: Failure to identify root cause and correct repetitive, abnormal auxiliary feedwater lube oil analysis. In NRC Inspection Report 50-315/98021; 50-316/98021, as part of the follow up to an issue regarding the implementation of a ferrography program for safety-related pumps, the inspectors noted that the licensee implemented an oil sampling program as part of the predictive maintenance program. The inspectors reviewed recently issued condition reports and determined that the licensee was actively sampling oil from safety-related pumps and documenting problems and trends. The inspectors determined that the specific conditions raised by this item were adequately addressed. Based on the discussion above, the inspectors concluded that the licensee's corrective actions to address programmatic issues will be evaluated as part of the inspection effort to close NRC MC 0350 Case Specific Checklist Item 2. This item is closed.

**O8 Miscellaneous Operations Issues**

The inspectors developed findings discussed in NRC Inspection Report 50-315/316/98007 related to operability of containment hydrogen mitigation systems, including the distributed ignition system (DIS). The DIS igniter boxes are located in both upper and lower containment, arranged to give complete coverage of the containment volume where hydrogen may accumulate. The DIS relies on a thermal igniter for initiating hydrogen burning. A drip shield is installed on top of each igniter box to deflect containment sprays. The igniter boxes are sealed to exclude the containment environment. The following inspection followup and unresolved items are closed:

C (Closed) IFI 50-315/98007-08: The inspectors identified that on the DIS boxes inspected, the drip shield had not been fabricated in accordance with the drawing, as no canted lip was present on the edge of the drip shield. The licensee returned the DIS box drip shield to the configuration specified by

Design Change DC-12-2522 by bending the lip upward 30 degrees. The inspectors have no further questions on this issue; therefore this inspection follow-up item is closed.

C (Closed) IFI 50-315/98007-10; 50-316/98007-10: The inspectors reviewed the licensee's equipment qualification program status for the DIS. The inspectors agree with the licensee position that the DIS was only required for beyond design basis accidents and that, as such, 10 CFR 50.49 did not require that the DIS be environmentally qualified. The inspectors have no further questions on this issue; therefore, this inspection follow-up item is closed.

C (Closed) URI 50-315/98007-14; 50-316/98007-14: The inspectors questioned the applicability of Appendix B quality requirements to the DIS. NRC Office of Nuclear Reactor Regulation determined that the DIS is only required for beyond design basis accidents, and thus did not come under the quality requirements of Appendix B to 10 CFR Part 50. The inspectors have no further questions on this issue; therefore, this unresolved item is closed.

## II. Maintenance

### M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (62707 and 61726)

The inspectors observed selected portions of the following maintenance job orders, action requests, and surveillance testing activities.

C 01-OHP [Operations Head Procedure] 4030.STP [Surveillance Test Procedure].026, "Auxiliary Power Transfer Test Surveillance Procedure," Attachment 2

C 01-OHP 4030.STP.026, "Auxiliary Power Transfer Test Surveillance Procedure," Attachment 3

C 01-MHP [Maintenance Head Procedure] 2291.PMT [Post-Maintenance Test].HFA1CD, "Unit 1 CD Emergency Diesel Generator HFA [Hinged Armature Auxiliary] Relay Post-Maintenance Test"

C Action Request (AR) A176657, "Thermal Overload Trip of Unit 2 West Essential Service Water Discharge Strainer"

C AR A176970, "Perform Liquid Penetrant Test on RHR Instrument Branch Lines"

C AR A176983, "RHR Flow Instrument 1-IFI-311 Increase in Flow Oscillation"

c. Conclusions

Observed maintenance activities were performed in accordance with approved procedures. The inspectors noted that the maintenance personnel performing the work activities were knowledgeable of their assigned tasks and utilized appropriate radiation protection work practices. In addition, the inspectors observed frequent management oversight of work in progress.

M1.2 Shutdown Surveillance Testing

a. Inspection Scope (61726)

On January 13, 1999, the licensee identified that a monthly surveillance testing requirement for the Unit 1 power operated relief valves (PORVs) had been missed. The inspectors reviewed the circumstances surrounding the missed testing requirement and evaluated the results of the licensee's investigation.

b. Observations and Findings

As followup to the missed PORV surveillance test, the licensee performed a complete review of both routine and event-initiated surveillance tests. The licensee's investigation into the missed surveillance identified that other required periodic and event-initiated Mode 5 surveillance tests had also been missed. The inspectors determined that the licensee's review was comprehensive and appeared to methodically identify which Mode 5 surveillance testing requirements had been missed or improperly scheduled. Significant findings are discussed below.

b.1 Missed Power Operated Relief Valve Surveillance Test

On January 13, 1999, the licensee identified that monthly surveillance 01-IHP 4030.STP.089, "Power Operated Relief Valve Cold Over-pressurization Bi-stable and Backup Air Pressure System Functional Test," had exceeded its grace period by three days. However, because operations personnel were not aware that the grace period had expired, the Limiting Condition for Operation Action Statement contingency actions were not implemented for the inoperable PORVs. On January 13, 1999, operations personnel successfully completed the surveillance test and determined that the as-found condition of the PORVs was acceptable. Therefore, the inspectors concluded that the failure to perform 01-IHP 4030.STP.089 within the required periodicity was not safety significant. The licensee initiated CR 99-0930 to document the occurrence of the problem and track corrective actions.

Technical Specification (TS) 3.4.9.3 required, in part, that with one of two required PORVs or either the required PORV and the required residual heat removal safety valve inoperable, the required valve be returned to operable status within 24 hours or the reactor coolant system (RCS) be vented through a 2-square-inch vent or a single blocked open PORV within 32 hours. The failure to return the PORV to operable status within 24 hours or vent the RCS through a 2-square-inch vent or a single blocked open PORV within 32 hours is a violation of TS 3.4.9.3.

This Severity Level IV violation is being treated as a 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 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 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 will be dispositioned as a NCV (50-315/99001-03(DRP)).

b.2 Routine Surveillance Tests

C Offsite Power Source Testing

The licensee identified that TS surveillance requirement 4.8.1.1.1.b had not been completed within the required 18 month interval. Technical Specification surveillance requirement 4.8.1.1.1.b demonstrates the operability of offsite power sources by automatically transferring the unit power source from the normal auxiliary source to the preferred reserve source and manually transferring to the alternate reserve source. While the applicability of TS surveillance requirement 4.8.1.1.1.b was Modes 1 through 4, TS surveillance requirement 4.8.1.2, which was applicable in Mode 5, required the completion of TS surveillance requirements of 4.8.1.1.1.

Consequently, the licensee declared the preferred reserve source [reserve feed] inoperable. Because all four emergency diesel generators (D/Gs) had previously been declared inoperable due to the HFA relay seismic qualification issue (Discussed in Section M2.1), the licensee entered an orange shutdown risk path for 4kV power supplies. On January 27, 1999, the only remaining operable offsite power supply, the alternate reserve source, was satisfactorily tested in accordance with TS surveillance requirement 4.8.1.2. Due to ongoing work on reserve feed, this system was unavailable for immediate testing. However, the licensee satisfied the TS action requirements for having only one operable offsite power supply.

C Emergency Diesel Generator Load Sequence Testing

Technical Specification surveillance requirement 4.8.1.2 required, in part, that D/G load sequence testing be performed at least once per every 18 months. The licensee had originally scheduled the diesel load sequence testing surveillance procedure series, 01[02]-EHP [Engineering Head Procedure] 4030.STP.217A[B], "DG1[2]CD[AB] Load Sequencing and ESF [Engineered Safety Features] Testing," to be performed prior to plant restart. However, due to changes in the restart schedule, the tests were postponed several times. Because all four D/Gs were considered inoperable due to the HFA relay seismic qualification issue, the licensee did not reschedule the load sequence testing to satisfy the TS surveillance requirement periodicity. At the end of the inspection period, the licensee planned to submit a TS amendment request to obtain a one time relief from the load sequence testing requirement while in Mode 5.

b.3 Event-Initiated Surveillance Tests

Plant Manager's Instruction - 4031, "Event Initiated Surveillances," Revision 10, provided guidance for performing conditional surveillance testing. The licensee's surveillance review compared the current plant conditions to the PMI 4031 guidance. Several event-initiated surveillances were not properly scheduled:

C Spent Fuel Pool Ventilation Exhaust Charcoal Filter Media Testing

On November 5, 1998, the licensee identified and documented in CR 98-6513 that the spent fuel pool exhaust ventilation (AFX) system filter media had not been sampled for efficiency after every 720 hours of charcoal adsorber operation as required by TS 4.9.12. The filter media had been in service for nearly 2500 hours. Since the AFX system had been inoperable for other reasons since April 1998, and the operators had been complying with the Limiting Condition for Operation Action Statement, no TS violation occurred. The subsequent samples of the filter media indicated that the filter media met the TS efficiency of greater than or equal to 90 percent.

The CR also identified that Operations Head Instruction 4016, "Conduct of Operations: Guidelines," Revision 2, did not require cumulative tracking of the charcoal adsorber run time. The procedure required that the operators total the cumulative run time once the filter media was removed from service. On February 11, 1999, the licensee identified that the potential still existed for the licensee's staff to be unaware that the AFX charcoal filter media had been in service for more than 720 hours without a sample. As a result, the operators were given interim direction to log cumulative filter media run time on a daily basis until formal procedural requirements could be implemented.

C Other Ventilation Filter Media Testing

The licensee also identified that the charcoal filter media for the engineered safeguards features exhaust ventilation (AES) system had been in service in excess of 720 hours without being sampled. Since the TS do not require the AES system to be operable in Mode 5, no TS violation occurred. The licensee noted that both the AES filters and the control room emergency ventilation filter media were susceptible to the same weakness in tracking of the filter media in-service time as the AFX filters.

C Procedural enhancements

The licensee's review also identified a number of procedural enhancements that would help prevent missing an event-initiated surveillance requirement. The licensee identified specific procedural enhancements for rod drop testing, safety injection flow balancing, containment hatches and doors, radioactive source control, and fuel oil sampling.

c. Conclusions

Following the identification of a missed pressurizer power operated relief valve surveillance test, the licensee's review of scheduled and event-initiated surveillances

identified that some required Mode 5 surveillances were not being performed. The licensee also identified several weaknesses in the tracking processes to ensure that Mode 5 surveillances were properly completed. The inspectors concluded that the licensee's efforts to identify missed surveillances were comprehensive and methodical.

## M2 Maintenance and Material Condition of Facilities and Equipment

### M2.1 Emergency Diesel Generators HFA Relay Seismic Qualification

a. Inspection Scope (62707, 71707)

On January 11, 1999, the licensee declared the D/Gs for both units (four D/Gs total) inoperable due a question regarding the seismic qualification of the General Electric HFA safety-related relays installed in the D/G circuits. The inspectors observed licensee planning and technical review meetings, reviewed CRs and repair procedures and interviewed engineering and maintenance personnel.

b. Observations and Findings

On January 6, 1999, the seismic qualification of the relays was questioned because the licensee's procedures for relay contact adjustment and servicing did not meet vendor recommended requirements. Due to a backlog of CRs in the shift managers office (discussed above in Section O1.2), the safety significance of this issue was not evaluated until January 11, 1999. The licensee determined that HFA relays were used in a variety of control circuits, both in safety-related and nonsafety-related equipment. The licensee also determined that only the D/Gs were affected such that spurious operation of an HFA relay from a seismic event could prevent the D/Gs from performing their safety-related function.

Operating experience from the industry was made available to the licensee in 1985, but was not used to verify the adequacy of the licensee's HFA maintenance procedures. The General Electric HFA relays were procured with all contacts in the "normally open" position, and were converted to "normally closed" as required by the circuit in which they were installed. The maintenance procedures did not provide instructions for conversion of contact position, adjustment of contacts, and verification of contacts once they were converted from the configuration supplied by the vendor. When converting the contact "normal" position, licensee procedures did not verify that all critical relay adjustments were within the vendor specified tolerances. Additionally, the altered contact arrangements were not verified to be in one of the seismically qualified configurations tested by the vendor.

The licensee reviewed drawings for the control circuits of all safe shutdown equipment and determined that nine HFA relays associated with the D/Gs had contact configurations that were not one of the vendor seismically qualified variations. As a result, the licensee developed a design change package to reconfigure the relays. The licensee initiated work activities on the Unit 1 CD diesel, with the other D/Gs to be reconfigured one at a time after the completion of the 1CD D/G.

The post-maintenance testing (PMT) procedure 01-MHP 2291.PMT.HFA1CD, "Unit 1 CD Emergency Diesel Generator HFA Relay Post-Maintenance Test," was written to verify the proper operation of all HFA relays affected by the design change. The

licensee identified technical problems with the procedure which resulted in the PMT being stopped three times in three days for procedure revisions. The procedure approval process did not identify and correct the technical problems prior to work in the field. Consequently, multiple technical reviews were needed to obtain a quality product. As a result, the licensee documented the occurrence of the problems in CR 99-2970 and initiated an investigation to determine the root cause of the inadequate procedure review and approval process. The investigation was in progress at the end of this inspection period. This issue is considered an unresolved item (50-315/316/99001-04(DRP)) pending NRC review of the licensee's root cause determination and development of corrective actions.

On February 10, 1999, the licensee submitted Licensee Event Report (LER) 315/99-001-00, "General Electric HFA Relays Installed in Emergency Diesel Generators May Not Meet Seismic Qualification," Since the licensee had not completed their evaluation of the issue, the licensee planned to supplement the LER following completion of their root cause investigation. As a result, additional inspector review of this issue will be tracked under LER 315/99-001-00 and its supplement.

c. Conclusions

The inspectors concluded that the licensee conservatively declared all four emergency diesel generators inoperable due a question regarding the seismic qualification of the General Electric HFA safety-related relays installed in the emergency diesel generator circuits. However, the inspectors also concluded that the procedure approval process was not effective in identifying technical errors in the post-maintenance testing procedure for the HFA relay work.

## M5 Maintenance Staff Training and Qualification

### M5.1 Maintenance Proficiency Evaluations

a. Inspection Scope (62707)

The licensee initiated a new Maintenance Proficiency Evaluation (MPE) training program in order to assess and improve maintenance performance. The inspectors interviewed training and maintenance management personnel and toured the training facilities to assess the licensee's changes in the training program.

b. Observations and Findings

As a part of the ongoing assessments in the various functional areas of the licensee's organization, the maintenance department in conjunction with the training department implemented the MPE training program. The purposes of the MPE training program were to:

- Baseline worker knowledge and skills
- Provide consensus understanding of management expectations
- Improve worker and first line supervisor performance

C Provide direction for future continuing training

The MPE training program was structured in the form of three, three-week sessions with each session having one week of systems training, one week of the MPEs, and one week for remediation and re-evaluation.

Work stations were established in each of the training building maintenance training areas. The stations were designed to test the workers in their areas of expertise. For example, mechanics were tested on pump seals, basic valves, and equipment alignment. Electricians were tested on low voltage terminations, batteries, breaker and motor control center maintenance. During the tests the workers were tested on knowledge, technical skills and work practice issues. The workers were required to achieve 80 percent or better and were to be remediated prior to returning to work. By the end of this inspection period, the first group had finished their week of MPEs and were beginning the remediation and re-evaluation week. The remaining workers were scheduled to go through the MPE training program during March and April 1999.

The inspectors noted that the training appeared to be thorough with high standards and expectations being communicated to the workers. The workers were initially apprehensive but quickly acknowledged the advantages of the training, such as the workers and supervisors all being trained to the same expectations for items such as procedural adherence and quality.

c. Conclusions

The Maintenance Proficiency Evaluation training program appeared to be thorough and focused on improving the performance of both the maintenance workers and supervisors.

## M8 Miscellaneous Maintenance Issues

M8.1 (Closed) LER 50-315/94008: Spent fuel pool exhaust ventilation system inoperable due to unacceptable leakage around the charcoal filter. On June 17, 1994, an engineering review determined that the spent fuel pool exhaust ventilation system charcoal filter (adsorber) was not capable of meeting the Technical Specification 4.9.12 surveillance test acceptance criteria from January 29, 1994 until May 12, 1994. In 1996, Design Change Package (DCP) 12-DCP-0049, Revision 1, “Spent Fuel Pool (AFX) Filtration System Bypass Damper Replacement,” was installed to provide an improved bypass damper design which reduced charcoal adsorber bypass leakage. This DCP was discussed in detail in NRC Inspection Reports 50-315/96014; 50-316/96014 and 50-315/98027; 50-316/98027.

Technical Specification 3.9.12 stated, in part, “that with no fuel storage pool exhaust ventilation system operable, suspend all operations involving movement of spent fuel within the storage pool or crane operation with loads over the storage pool until at least one spent fuel storage pool exhaust ventilation system is restored to operable status. However, the licensee identified that during the Unit 1 core removal on February 23, 24, 25, and 26, 1994, and the Unit 1 core reload on April 4, 5, and 6, 1994, fuel was moved within the spent fuel pool with no operable fuel storage pool exhaust ventilation system. This was a violation of TS 3.9.12.

This Severity Level IV violation is being treated as a 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 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 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 will be dispositioned as a NCV (50-315/99001-05(DRP)).

M8.2 (Closed) LER 50-316/97010-01: Use of Teflon Packing on Containment Airlock Door Interlock Shaft Results in Potentially Degraded Condition. On December 10, 1997, the licensee identified that Teflon O-ring material had been installed on the interlock shafts of the containment airlocks, contrary to the airlock specifications. All of the airlocks were inspected and the Teflon O-rings were replaced with the proper EPDM elastomer O-rings. The airlocks are leak tested in accordance with 10 CFR50 Appendix J and meet the leakage criteria established in the Technical Specifications. The licensee determined that the cause of the incorrect material being used was ambiguous work instructions.

10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. The failure to provide work instructions appropriate to the circumstances for safety-related preventative maintenance activities on the containment airlock door was a violation of 10 CFR Part 50, Appendix B, Criteria V.

This Severity Level IV violation is being treated as a 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 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 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 will be dispositioned as a NCV (50-316/99001-06(DRP)).

M8.3 (Closed) URI 50-316/97024-04: Use of Teflon Packing on Containment Airlock Door Interlock Shaft Results in Potentially Degraded Condition. This issue is discussed and closed above in Section M8.2. This unresolved item is closed.

M8.4 (Closed) IFI 50-315/98007-12: The inspectors reviewed the correspondence between the licensee and NRC during the period that the DIS was designed and installed. American Electric Power: NRC Letter 0500C dated May 29, 1981, provided licensee commitments on periodic testing of the DIS. Specifically, the licensee proposed that the 18-month surveillance would verify energization of the igniter through visual observation

of the glow plugs. The licensee surveillance on the DIS, performed in accordance with 12 IHP 5030.EMP.008, “Distributed Ignition Test,” verified the voltage and current readings for each phase of the igniters. The surveillance did not perform visual verification of igniter energization or measure igniter temperature. The inspectors questioned the licensee concerning the adequacy of the surveillance testing of the DIS. The licensee declared the DIS inoperable on March 11, 1998, pending resolution of the surveillance testing questions. The licensee submitted Technical Specifications for the DIS on December 3, 1998. Surveillance testing of the DIS will be performed in accordance with the requirements of the approved Technical Specifications. The inspectors have no further questions on this issue; therefore, this inspection follow-up item is closed.

## III. Engineering

### E1 Conduct of Engineering

E1.1 General Comments (37551)

Engineering support to site operations was limited to responses to emergent issues. The support consisted of performing operability determinations in support of the SORT process discussed in Section O1.2, participation on the Residual Heat Removal vibration project team discussed in Section O2.1 and leading the project team correcting the HFA relay seismic qualification issues discussed in Section M2.1.

The engineering department had a number of personnel committed to the enhanced system readiness review project, which limited the resources available for other plant support work. Additionally, many of the stop work orders issued, which are listed in the plant status section of this report, directly impacted the engineering department and the ability to support work in the plant.

E1.2 Safety Evaluation Issues

Recent NRC and licensee inspection activities have identified a breakdown in the licensee’s program for performing safety evaluations in accordance with 10 CFR Part 50.59. As part of the plant restart effort docketed in the Restart Plan, the licensee has committed to performing a complete assessment of the safety evaluation program and implementing actions to correct the identified deficiencies. In a letter dated July 30, 1998, and updated on October 13, 1998, the NRC informed the licensee that an oversight panel had been established in accordance with NRC MC 0350, and a checklist was enclosed which specified activities which the NRC considered necessary to be addressed prior to restart. Enclosure 1 to the NRC letter, the Case Specific Checklist, included the failure to perform safety evaluations and the performance of inadequate evaluations as an item 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.

Previous inspection activities have also identified specific discrepancies in the licensee’s performance of safety evaluations. The inspectors reviewed these previously identified deficiencies and assessed the corrective actions specific to these issues. The

programmatic safety evaluation weaknesses will be addressed in future inspections as delineated by the NRC MC 0350 process. Therefore, the following item is closed:

C (Closed) VIO 50-315/97004-04; 50-316/97004-04: Failure to perform 50.59 evaluation. On March 6, 1997, the licensee identified that a plexiglass cover was installed below the return air duct to the Unit 2 control room without a proper 50.59 safety evaluation. The plexiglass cover was removed, and subsequent testing indicated that the Control Room Emergency Ventilation System had been capable of performing its safety function even with the cover installed. The licensee had installed the cover to collect moisture which had been entering the control room through the ventilation duct. The cover was considered a housekeeping device, not a temporary modification; therefore, no safety screening was performed. Plant Manager's Procedure 5020.LCD.001, "Control of Leak Collection Devices," Revision 0, was changed to add the requirement that leak collection devices installed immediately adjacent to operating systems, and could reasonably impact the systems during normal or emergency operations, shall be processed through the Design Change Control program. Plant Manager's Procedure 5040.MOD.001, "Temporary Modifications," Revision 7, included the leak collection device requirement as an example of a temporary modification. The inspectors reviewed the licensee's response and determined that the specific conditions identified in the violation had been adequately addressed. However, the programmatic aspects of the performance of 50.59 safety evaluations, including the root causes of this violation, will be evaluated as part of the inspection effort to close NRC MC 0350 Case Specific Checklist Item 4. This item is closed.

## E6 Engineering Organization and Administration

### E6.1 Engineering Department Leadership Plan

a. Inspection Scope (37551)

The inspectors evaluated the Operations Department Leadership Plan and interviewed licensee management.

b. Observations and Findings

In an effort to ensure that the engineering department would be ready to support plant restart, the licensee developed the Engineering Department Leadership Plan, which was modeled after other industry plans that had successfully improved performance. The plan's objectives were to improve performance to support reliable long-term station operation. The plan considered information from internal self-assessments, the NRC Architect Engineering Inspection Report, the NRC Confirmatory Action Letter, training assessments, and other third party assessments.

The plan was similar in format to the Operations Department Leadership Plan and contained problem statements, contributing factors, source documents and actions. Areas addressed within the plan included training, design, problem identification, system ownership, integrity of the design basis, and performance expectations. All actions appeared to have an assigned owner and completion dates had been established. When appropriate, the completion dates were tied to restart of the units.

c. Conclusions

The Engineering Department Leadership Plan established a framework for performance improvements, and if properly implemented, should result in the engineering department being ready to support plant restart.

## IV. Plant Support

### R1 Conduct of Radiation Protection and Chemistry (71750)

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

### 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 March 2, 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

#G. Arent, Nuclear Licensing
#J. Arias, Licensing
#G. Ault, Engineering
#P. Barrett, Performance Assurance
#M. Depuydt, Nuclear Licensing Supervisor
#R. Eckstein, Engineering
#S. Farlow, Design Engineering
#D. Garner, Engineering
#R. Gillespie, Work Control Manager
#D. Hafer, Plant Engineering Manager
#B. Hershberger, Chemistry
#R. Keppeler, Engineering
#W. Kropp, Performance Assurance
#D. Kunsemiller, Director Regulatory Affairs
#T. O'Leary, Performance Assurance
#R. Powers, Senior Vice President
#M. Rencheck, Vice President, Nuclear Engineering
#P. Schoepf, Engineering
#M. Skow, Performance Assurance
#J. Tyler, Site Services Manager
#B. Wallace, Training
#T. Wagoner, Production Manager
#L. Weber, Operations

# Denotes those present at the March 2, 1999, 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 Review of LERs |
| IP 92901: | Followup - Operations |
| IP 92902: | Followup - Maintenance |

## ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

| | | |
|---|---|---|
| 50-315/99001-01 | IFI | Review the completed RHR vibration assessment |
| 50-315/316/99001-02 | NCV | Equipment tagging procedure not appropriate to the circumstances |
| 50-315/99001-03 | NCV | Failure to perform Technical Specification surveillance test for pressurizer power operated relief valves |
| 50315/316/99001-04 | URI | Review of the licensee's root cause determination and development of corrective actions for the inadequate procedure review and approval process |
| 50-315/99001-05 | NCV | Failure to comply with TS action requirements for an inoperable spent fuel pool exhaust ventilation system due to unacceptable leakage around the charcoal filter |
| 50-316/99001-06 | NCV | Work instructions for preventative maintenance activities on the containment airlock door not appropriate to the circumstances |

Closed

| | | |
|---|---|---|
| 50-315/316/99001-02 | NCV | Equipment tagging procedure not appropriate to the circumstances |
| 50-315/316/96006-01 | VIO | Failure to perform prompt operability assessment. |
| 50-315/316/96013-05 | URI | Failure to identify root cause and correct repetitive, abnormal auxiliary feedwater lube oil analysis |
| 50-315/98007-08 | IFI | Review of the design basis for the DIS and how the raised lip supported the design basis |
| 50-315/316/98007-10 | IFI | Review of the design basis for the DIS and whether the DIS is required to be environmentally qualified |

ITEMS OPENED, CLOSED, AND DISCUSSED (cont'd)

Closed

| | | |
|---|---|---|
| 50-315/316/98007-14 | URI | Review of whether the DIS is required for design basis accidents |
| 50-315/99001-03 | NCV | Failure to perform Technical Specification surveillance test for pressurizer power operated relief valves |
| 50-315/94008 | LER | Spent fuel pool exhaust ventilation system inoperable due to unacceptable leakage around the charcoal filter |
| 50-315/99001-05 | NCV | Failure to comply with TS action requirements for an inoperable spent fuel pool exhaust ventilation system due to unacceptable leakage around the charcoal filter |
| 50-316/97010-01 | LER | Use of Teflon packing on containment airlock door interlock shaft results in potentially degraded condition |
| 50-316/99001-06 | NCV | Work instructions for preventative maintenance activities on the containment airlock door not appropriate to the circumstances |
| 50-316/97024-04 | URI | Use of Teflon packing on containment airlock door interlock shaft results in potentially degraded condition |
| 50-315/98007-12 | IFI | DIS was declared inoperable on March 11, 1998, pending resolution of the surveillance testing questions |
| 50-315/316/97004-04 | VIO | Failure to perform 50.59 evaluation |

## LIST OF ACRONYMS

| | |
|---|---|
| AES | Engineered Safety Features Ventilation System |
| AFX | Spent Fuel Pool Exhaust Ventilation System |
| AR | Action Request |
| CFR | Code of Federal Regulations |
| CR | Condition Report |
| CVCS | Chemical and Volume Control System |
| DCP | Design Change Package |
| D/G | Emergency Diesel Generator |
| DIS | Distributed Ignition System |
| DRP | Division of Reactor Projects |
| EHP | Engineering Head Procedure |
| ESF | Engineered Safety Feature |
| ESRR | Expanded System Readiness Review |
| IFI | Inspection Followup Item |
| LER | Licensee Event Report |
| MC | Manual Chapter |
| MPE | Maintenance Proficiency Evaluation |
| NCV | Non-cited Violation |
| NRC | Nuclear Regulatory Commission |
| NRR | Nuclear Reactor Regulation |
| NSDRC | Nuclear Safety and Design Review Committee |
| OD | Operability Determination |
| 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 |
| PORV | Power Operated Relief Valve |
| RCS | Reactor Coolant System |
| RHR | Residual Heat Removal System |
| SORT | Shift Operability Review Team |
| STA | Shift Technical Advisor |
| STP | Surveillance Test Procedure |
| TS | Technical Specification |
| URI | Unresolved Item |
| VCT | Volume Control Tank |
| VIO | Violation |