May 9, 2007

Mr. Mano K. Nazar
Senior Vice President and
Chief Nuclear Officer
Indiana Michigan Power Company
Nuclear Generation Group
One Cook Place
Bridgman, MI 49106

SUBJECT: D. C. COOK NUCLEAR POWER PLANT, UNITS 1 AND 2
NRC INTEGRATED INSPECTION REPORT 05000315/2007003;
05000316/2007003

Dear Mr. Nazar:

On March 31, 2007, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your D. C. Cook Nuclear Power Plant, Units 1 and 2. The enclosed report documents the inspection results, which were discussed on April 12, 2007, with Mr. J. Jensen and other members of your staff.

This inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, one Severity Level IV Non-Cited Violation and two findings of very low safety significance (Green), one of which also involved a violation of NRC requirements, were identified. However, because of the very low safety significance and because the issues were entered into your corrective action program, the NRC is treating the violations as Non-Cited Violations in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you contest the subject or severity of a Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector's Office at the D. C. Cook Nuclear Power Plant.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Christine A. Lipa, Chief
Branch 4
Division of Reactor Projects

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

Enclosure: Inspection Report 05000315/2007003; 05000316/2007003
w/Attachment: Supplemental Information

cc w/encl: J. Jensen, Site Vice President
L. Weber, Plant Manager
G. White, Michigan Public Service Commission
L. Brandon, Michigan Department of Environmental Quality - Waste and Hazardous Materials Division
Emergency Management Division
MI Department of State Police
State Liaison Officer, State of Michigan

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Letter to Mano K. Nazar from Christine A. Lipa dated May 9, 2007

SUBJECT: D. C. COOK NUCLEAR POWER PLANT, UNITS 1 AND 2
NRC INTEGRATED INSPECTION REPORT 05000315/2007003;
05000316/2007003

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos.:	50-315; 50-316
License Nos.:	DPR-58; DPR-74
Report Nos.:	05000315/2007003; 05000316/2007003
Licensee:	Indiana Michigan Power Company
Facility:	D. C. Cook Nuclear Power Plant, Units 1 and 2
Location:	Bridgman, MI 49106
Dates:	January 1 through March 31, 2007
Inspectors:	B. Kemker, Senior Resident Inspector J. Lennartz, Resident Inspector A. Garmoe, Reactor Engineer M. Phalen, Health Physicist N. Valos, Senior Operations Engineer
Approved by:	C. Lipa, Chief Projects Branch 4 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000315/2007-003, IR 05000316/2007-003; 01/01/2007-03/31/2007; D. C. Cook Nuclear Power Plant, Units 1 and 2; Maintenance Effectiveness, Maintenance Risk Assessments and Emergent Work Control, Operability Evaluations.

The report covered a 13-week period of inspection by the resident inspectors and announced inspections by regional inspectors. One Severity Level IV Non-Cited Violation (NCV) and two Green findings, one of which had an associated NCV, were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be "Green" or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealed Findings

Cornerstone: Initiating Events

- Green. On December 14, 2006, a finding of very low safety significance was self-revealed when the valve packing on 2-NPS-121-II, (instrument shutoff valve for reactor coolant system (RCS) loop 2 hot leg wide range pressure instrument), blew out during a planned maintenance activity to adjust the packing. This resulted in a 6 gallon-per-minute (gpm) RCS leak that was subsequently isolated by operations personnel. Additional planned corrective actions included revisions to work control procedures, and an engineering inspection of the valve and investigation of the failure mechanism. No violation of regulatory requirements was identified.

  This finding was of more than minor significance because it is related to the Equipment Performance attribute regarding RCS Barrier Integrity in the Initiating Events Cornerstone. The cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations was affected. Specifically, the resultant 6 gallon-per-minute (gpm) RCS leak continued for approximately three hours before it was isolated because contingency actions were not identified for credible failures and problems that could occur during the work activity. The finding was not greater than Green because the leak did not exceed the Technical Specification limit for identified RCS leakage and all other mitigating systems were available. The primary cause of this finding was related to the cross-cutting area of human performance because work control risk review procedures were not complete and accurate in that they did not identify packing adjustments on manual valves in the pressurized RCS as a high risk activity with respect to nuclear safety. (IMC 0305, H.3(b)) (Section 1R13)

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance and an NCV of 10 CFR 50.65(a)(2). The licensee failed to demonstrate that the performance or condition of the Unit 1 and Unit 2 power range and intermediate range nuclear instruments was effectively controlled through appropriate preventive maintenance. As a result, the licensee failed to establish goals or monitor the performance of these instruments in accordance with paragraph (a)(1) of the Maintenance Rule to ensure that appropriate corrective actions were taken. The licensee was further evaluating corrective actions, including training, for this issue at the end of the inspection period and had placed the system into 10 CFR 50.65(a)(1) status.

This finding was of more than minor significance because violations of 10 CFR 50.65(a)(2), such as failure to demonstrate effective control of performance or condition and failure to classify the affected structure, system, or components (SSC) in (a)(1) status, involve degraded SSC performance or condition. The finding was of very low safety significance because the finding was associated with the Mitigating Systems Cornerstone and did not represent a design or qualification deficiency, loss of safety function for a train or system, and was not risk-significant due to external event initiators. The primary cause of this finding was related to the cross-cutting area of problem identification and resolution because the licensee failed to thoroughly evaluate multiple nuclear instrumentation component failures by appropriately completing the Maintenance Rule Evaluations. (IMC 0305, P.1(c)) (Section 1R12.1)

- Severity Level IV. The inspectors identified a Severity Level IV NCV of 10 CFR 50.73(a)(1). The licensee failed to submit a required Licensee Event Report within 60 days after discovery of an event requiring a report. The licensee failed to correctly evaluate the failure of two Unit 2 Residual Heat Removal (RHR) system pressure relief valves, which affected the operability of both trains of the RHR system. This was reportable as a condition prohibited by the plant's Technical Specification and as an event where a single cause resulted in two independent trains becoming inoperable in a single system designed to remove residual heat and mitigate the consequences of an accident. The licensee implemented several corrective actions to address a potential adverse trend in correctly identifying and evaluating the reportability of plant events, including additional training for selected operations, regulatory affairs, and plant engineering department personnel.

  This finding was of more than minor significance because the NRC relies on licensees to identify and report conditions or events meeting the criteria specified in the regulations and the Technical Specification in order to perform its regulatory function. Because this issue affected the NRC's ability to perform its regulatory function, it was evaluated with the traditional enforcement process. Consistent with the guidance in Section IV.A.3 and Supplement I, Paragraph D.4, of the NRC Enforcement Policy, this finding was determined to be a Severity Level IV NCV. Although this NRC identified violation was repetitive, the inspectors concluded that it was not due to inadequate corrective actions for the previous violation. The primary cause of this finding was related to the cross-cutting area of problem identification and resolution because the licensee did not correctly evaluate the two safety valve test failures with respect to the reporting requirements in 10 CFR 50.73. (IMC 0305, P.1(c)) (Section 1R15)

REPORT DETAILS

Summary of Plant Status

Unit 1 and Unit 2 were operated at or near full power during the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness

1R01 Adverse Weather Protection (71111.01)

.1 Extended Freezing Period Walkdown

a. Inspection Scope

During post-winterization walkdowns conducted on January 25, 29 and 31, 2007, the inspectors toured plant areas to monitor the physical condition of cold weather protection features following a period of extended freezing temperatures. The inspectors observed insulation, heat trace circuits, space heater operation, and weatherized enclosures to ensure operability of affected systems. This activity represented one site sample to evaluate overall protection for cold weather conditions.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial System Walkdowns

a. Inspection Scope

The inspectors completed three partial equipment alignment inspection samples by performing walkdowns of the following risk significant systems and components:

- Unit 1 West Residual Heat Removal (RHR) System Train
- Unit 1 West Containment Spray System Train
- Unit 2 Manual Containment Isolation Valves Outside Containment

The inspectors selected these systems and components based on their risk significance relative to the reactor safety cornerstones. The inspectors reviewed operating procedures, system diagrams, Technical Specification (TS) requirements, and the impact of ongoing work activities on redundant trains of equipment. The inspectors verified that conditions did not exist that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components were aligned correctly and available as necessary.

In addition, the inspectors verified that equipment alignment problems were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

b. Findings

No findings of significance were identified.

.2 Complete System Walkdown

a. Inspection Scope

The inspectors completed one full system equipment alignment inspection sample by performing a walkdown of the following risk significant system:

- Unit 1 Component Cooling Water System

The inspectors interviewed the system engineer and reviewed ongoing system maintenance, open job orders, and design issues for potential effects on the ability of the system to perform its design functions. The inspectors reviewed operating procedures, system diagrams, TS requirements, and applicable sections of the Updated Final Safety Analysis Report (UFSAR) to ensure the correct system configuration. The inspectors verified acceptable material condition of system components, availability of electrical power to system components, and that ancillary equipment or debris did not interfere with system performance.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours

a. Inspection Scope

The inspectors completed eleven quarterly fire protection inspection samples by performing walkdowns in the following plant areas:

- Unit 1 Turbine Deck - Elevation 633' (Zone 129)
- Unit 1 and 2 Chemical Volume Control System Holdup Tank Rooms (Zone 138)
- Unit 1 RHR Pump Rooms (Zones 1C and 1D)
- Unit 2 RHR Pump Rooms (Zones 1G and 1H)
- Unit 1 and 2 Auxiliary Building - Elevation 573' (Zone 1)
- Unit 1 and 2 Turbine Building Pump Bay - Elevation 569'6" (Zone 2)

- Unit 1 and 2 Auxiliary Building Sampling Room (Zone 4)
- Unit 1 Cable Tunnel Quadrant 1 (Zone 7)
- Unit 1 Cable Tunnel Quadrant 4 (Zone 8)
- Unit 2 Cable Tunnel Quadrant 4 (Zone 26)
- Unit 2 Cable Tunnel Quadrant 1 (Zone 27)

The inspectors verified that transient combustibles and ignition sources were appropriately controlled; and, assessed the material condition of fire suppression systems, manual fire fighting equipment, smoke detection systems, fire barriers and emergency lighting units.

In addition, the inspectors verified that fire protection related problems were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Resident Inspector Quarterly Review

a. Inspection Scope

The inspectors completed one quarterly inspection sample of licensed operator requalification training by observing a crew of licensed operators during simulator training on January 30, 2007. The inspectors assessed the operators' response to the simulated events focusing on alarm response, command and control of crew activities, communication practices, procedural adherence, and implementation of emergency plan requirements. The inspectors also observed the post-training critique to assess the licensee evaluators' and the operating crew's ability to self-identify performance deficiencies.

b. Findings

No findings of significance were identified.

.2 Annual Operating Test Results

a. Inspection Scope

The inspectors reviewed the overall pass/fail results of Job Performance Measure operating tests, and simulator operating tests (required to be given per 10 CFR 55.59(a)(2)) administered by the licensee from February 21 through March 30, 2007. The overall results were compared with the significance determination process in accordance with NRC Inspection Manual Chapter (IMC) 0609,

Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)." This review represented one sample.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Resident Inspector Quarterly Review

a. Inspection Scope

The inspectors completed three quarterly maintenance effectiveness inspection samples by evaluating the licensee's handling of selected degraded performance issues involving the following risk-significant structures, systems, and components (SSC):

- Unit 1 and 2 Ice Condensers
- Unit 1 and 2 Power Range and Intermediate Range Nuclear Instruments
- Unit 1 and 2 4160 Volt Breakers

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the SSC. Specifically, the inspectors independently verified the licensee's handling of SSC performance or condition problems in terms of:

- appropriate work practices,
- identifying and addressing common cause failures,
- scoping of SSC in accordance with 10 CFR 50.65(b),
- characterizing SSC reliability issues,
- tracking SSC unavailability,
- trending key parameters (condition monitoring),
- 10 CFR 50.65(a)(1) or (a)(2) classification and reclassification, and
- appropriateness of performance criteria for SSC/functions classified (a)(2) and/or appropriateness and adequacy of goals and corrective actions for SSC/functions classified (a)(1).

In addition, the inspectors verified that problems associated with the effectiveness of plant maintenance were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

b. Findings

b.1 Power Range and Intermediate Range Nuclear Instruments

Introduction

The inspectors identified a finding of very low safety significance (Green) and a Non-Cited Violation of 10 CFR 50.65(a)(2). The inspectors identified that the licensee failed to demonstrate that the performance or condition of the Unit 1 and Unit 2 power range and intermediate range nuclear instruments was effectively controlled through appropriate preventive maintenance. As a result, the licensee failed to establish goals or monitor the performance of these instruments in accordance with paragraph (a)(1) of the Maintenance Rule to ensure that appropriate corrective actions were taken.

Description

During the third quarter of 2006, the inspectors reviewed equipment performance issues associated with the power range and intermediate range nuclear instruments for both units and found multiple examples where Maintenance Rule Evaluations (MRE) were either not performed for component failures or where the completed MRE conclusion was questionable. Sufficient information or justification was not provided in some of the MRE that were completed to support the conclusion that was reached. As a result, it appeared that there were several functional failures that were either not evaluated or not correctly evaluated. The licensee wrote action requests to address these examples and other questions raised by the inspectors in its corrective action program. The inspectors documented this issue as Unresolved Item (URI) 05000315/316/2006006-01 pending review of MRE that needed to be completed or revised for the examples identified during the inspection.

During this inspection period, the inspectors reviewed twelve completed or revised MRE. The scope of this review included power range and intermediate range nuclear instrumentation component failures from May 27, 2002, to November 21, 2005. The inspectors noted that there were ten maintenance preventable functional failures identified, of which seven were determined to be repeat maintenance preventable functional failures. Because these component failures were not appropriately evaluated and presented to the licensee's Expert Panel, there was no consideration to establish goals and monitor the performance of these instruments in accordance with paragraph (a)(1) of the Maintenance Rule to ensure that appropriate corrective actions were taken. The inspectors noted that the nuclear instrumentation system was previously monitored in (a)(1) from May 1, 2003, to February 1, 2004. Eight of the above ten maintenance preventable functional failures occurred after this time and two failures occurred before this time. None of the failures occurred during this time. The licensee has presented several of these MRE to the Expert Panel for (a)(1) consideration, has placed the system into (a)(1) status, has identified training needs, and was further evaluating other corrective actions for this issue at the end of this inspection period.

Consistent with Section 7.11.1.b.1 of the NRC Enforcement Manual, the inspectors concluded that the multiple repeat maintenance preventable functional failures indicate that the licensee failed to demonstrate the effectiveness of preventive maintenance for the power range and intermediate range nuclear instruments; and, consequently the nuclear instrumentation system should have been monitored in accordance with paragraph (a)(1) of the Maintenance Rule.

Analysis

The inspectors determined that the failure to demonstrate that the performance or condition of the power range and intermediate range nuclear instruments was effectively controlled through appropriate preventive maintenance was a licensee performance deficiency warranting a significance evaluation. The inspectors assessed this finding using the SDP. The inspectors reviewed the examples of minor and more than minor issues in IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," and determined that there was one example related to this issue. Example 7b states that violations of 10 CFR 50.65(a)(2), failure to demonstrate effective control of performance or condition and not putting the affected SSC in (a)(1), are not minor because they necessarily involve degraded SSC performance or condition. The inspectors performed a Phase 1 SDP review of this finding using the guidance provided in IMC 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations." In accordance with the "SDP Phase 1 Screening Worksheet for IE [Initiating Events], MS [Mitigating Systems], and B [Barriers] Cornerstones," the inspectors determined that this finding was of very low safety significance (Green) because the finding was associated with the Mitigating Systems Cornerstone and did not represent a design or qualification deficiency, loss of safety function for a train or system, and was not risk-significant due to external event initiators.

Cross-cutting Aspects

The inspectors concluded that this finding affected the cross-cutting area of problem identification and resolution. Specifically, the licensee failed to thoroughly evaluate multiple nuclear instrumentation component failures by appropriately completing the necessary MRE. (P.1(c))

Enforcement

10 CFR 50.65 (a)(1), requires, in part, that the holders of an operating license shall monitor the performance or condition of SSC within the scope of the rule as defined by 10 CFR 50.65 (b), against licensee-established goals, in a manner sufficient to provide reasonable assurance that such SSC are capable of fulfilling their intended functions.

10 CFR 50.65 (a)(2) states, in part, that monitoring as specified in 10 CFR 50.65 (a)(1) is not required where it has been demonstrated that the performance or condition of an SSC is being effectively controlled through the performance of appropriate preventive maintenance, such that the SSC remains capable of performing its intended function.

Contrary to the above, as of September 30, 2006, the licensee failed to demonstrate that the performance or condition of the Unit 1 and Unit 2 power range and intermediate range nuclear instruments had been effectively controlled through the performance of appropriate preventive maintenance and did not monitor against licensee-established goals. Specifically, the licensee failed to identify and properly account for ten maintenance preventable functional failures of power range and intermediate range nuclear instrumentation components, of which seven were determined to be repeat maintenance preventable functional failures, occurring from May 27, 2002, to November 21, 2005. This demonstrates that the performance or condition of these SSC was not being effectively controlled through the performance of appropriate preventive maintenance and, as a result, goal setting and monitoring was required. Because of the very low safety significance, this violation is being treated as an NCV consistent with Section VI.A of the NRC Enforcement Policy

(NCV 05000315/316/2007003-01). The licensee entered this violation into its corrective action program as Action Request (AR) 07054074.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation (71111.13)

a. Inspection Scope

The inspectors completed six inspection samples regarding maintenance risk assessments and emergent work evaluations for the following maintenance activities:

- Unit 1 and 2 Emergent Maintenance on 34.5 Kilovolt Breaker 'BC' and Emergent Maintenance to Replace All Steam Generator Power Operated Relief Valve Air Supply Hoses
- Unit 1 Emergent Maintenance/Troubleshooting to Restore From Main Generator Voltage Regulator Channel 1 Power Interruption
- Unit 1 Essential Service Water Pump Planned Maintenance Concurrent with Unit 2 Plant Air Compressor Planned Maintenance and Unit 2 Pressurizer Pressure Setpoint Calibrations
- Unit 1 East Component Cooling Water System Train Planned Maintenance, 345 Kilovolt Switchyard Planned Maintenance, Unit 2 'CD' Emergency Diesel Generator (EDG) Surveillance Testing, and Unit 1 East Charging Pump Planned Maintenance During Week of March 5, 2007
- Unit 1 and 2 Supplemental Diesel Generators Planned Maintenance Activities and Emergent Maintenance on Unit 1 'AB' EDG
- Unit 2 Review of Emergent Maintenance to Address Packing Leak from Instrument Shutoff Valve for Reactor Coolant Loop 2 Hot Leg Wide Range Pressure Instrument 2-NPS-121-II

These activities were selected based on their potential risk significance relative to the reactor safety cornerstones. As applicable for each of the above activities, the inspectors reviewed the scope of maintenance work in the plant's daily schedule, reviewed control room logs, verified that plant risk assessments were completed as required by 10 CFR 50.65(a)(4) prior to commencing maintenance activities, discussed the results of the assessment with the licensee's probabilistic risk analyst and/or shift technical advisor, and verified that plant conditions were consistent with the risk assessment assumptions. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify that risk analysis assumptions were valid, that redundant safety-related plant equipment necessary to minimize risk was available for use, and that applicable requirements were met.

In addition, the inspectors verified that maintenance risk related problems were entered into the licensee's corrective action program with the appropriate significance characterization. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

b. Findings

b.1 Planned Maintenance to Adjust Packing on 2-NPS-121-II

Introduction

On December 14, 2006, a finding of very low safety significance (Green) was self-revealed when the valve packing on 2-NPS-121-II, (instrument shutoff valve for RCS loop 2 hot leg wide range pressure instrument), blew out while making planned adjustments. Because contingency actions had not been developed, a resultant six gpm reactor coolant system (RCS) leak continued for approximately three hours before it was isolated. No violation of NRC requirements was identified.

Description

On December 7th, a twelve drop-per-minute leak was identified on 2-NPS-121-II inside the Unit 2 containment building during a system walkdown by engineering personnel. A corrective maintenance work order, WO 55286893-01, was generated to adjust the packing on 2-NPS-121-II, which was a normally open 3/8" instrument needle valve. The work order was processed as "short cycled" work in accordance with the licensee's work control process so that the repairs could be scheduled for the next regular containment entry. However, while planning the work, Data Sheet 1, "Sponsored Work Authorization," of procedure PMP-2291-SCH-001, "Work Control Activity Scheduling Process," was not completed as required for short cycled work. Consequently, some formal reviews and approvals for the work activity, including final approval by the operations work control manager and the work control manager, were bypassed. Also, by not completing PMP-2291-SCH-001, Data Sheet 1, the work control process risk review required by procedure PMP-2291-WAR-001, "Work Activity Risk Management Process" was delayed until the morning that the job was to be completed.

The purpose of the work activity risk review completed on December 14th, as prescribed by PMP-2291-WAR-001, was intended to complement and not conflict with the formal probabilistic risk assessment that was completed in accordance with PMP-2291-OLR-001, "On-Line Risk Management," regarding Maintenance Rule (a)(4) assessments. The risk review was intended to consider five areas of concern, which included nuclear safety, personnel safety, radiological safety, environmental and chemistry safety, and corporate and regulatory performance. For applicable areas of concern, potential credible failures and problems that could occur while adjusting the packing on valve 2-NPS-121-II that was at RCS pressure were to be evaluated to aid in identifying necessary contingency actions.

The risk review was documented on PMP-2291-WAR-001, Data Sheet 1, "Work Activity Risk Management Process," as required. However, the risk review was not completed in the manner prescribed by PMP-2291-WAR-001. The completed evaluation did not identify any credible failures or problems that could occur during the packing adjustment regarding nuclear safety and radiological safety, and the evaluation for personnel safety simply indicated "standard industrial safety," again without identifying credible problems or failures that could occur. Consequently, worst case consequences and associated contingency actions were not identified regarding the nuclear and radiological safety areas of concern.

The risk review completed in accordance with PMP-2291-WAR-001 concluded that the work was high risk with respect to corporate and regulatory performance areas of concern because the work was inside a locked high radiation area. Contingencies for this high risk area of concern were to ensure that a RP supervisor verified that the high radiation area door was locked and actions were established to exit the area if dose or dose rate alarms were received. However, PMP-2291-WAR-001 did not identify packing adjustments on manual valves in the RCS as a high risk activity; and, personnel involved with the work activity did not believe that it was possible for the valve packing to blow out. These factors contributed to the failure to identify contingencies when considering nuclear safety, personnel safety, and radiological safety areas of concern during the risk review.

A pre-job briefing and locked high radiation area briefing were conducted prior to executing the work as required by the work control process. The radiological briefing included the contingencies to exit containment if dose rate alarms were received and controls for the locked high radiation area door. The packing adjustment valve work briefing included industrial safety precautions to prevent bumps, burns, falls and heat stress; and included a discussion on cleaning the packing gland threads and performing visual inspections before adjusting the packing gland fasteners. However, the briefing did not discuss any contingency actions to take if the leak increased while making the adjustment. After the first packing gland nut was tightened approximately one flat the valve leak rate raised significantly. The radiological protection technician supporting the work noted high dose rates and requested the maintenance personnel to exit the area in accordance with the prescribed contingency actions.

Before exiting containment, the maintenance personnel attempted to contact their supervisor via the plant page system. Unit 2 control room operators had noted that the pressurizer level was lowering and picked up the plant page to find out what was happening. The maintenance personnel informed the control room operators of the increased leak rate and requested permission to shut the valve, which was granted by the control room operators. However, the radiological protection technician and supervisor appropriately did not allow reentry into the area because they were not prepared for the industrial safety and radiological conditions that resulted from the leak. Consequently, actions to isolate the RCS leak were delayed while contingency plans were developed. Approximately three hours later, operations personnel and radiological protection personnel were briefed and entered containment. Operations personnel were able to shut 2-NPS-121-II to isolate the leak. In addition to the delay in isolating the leak, six personnel contaminations occurred and higher than estimated radiation dose was received by the workers. The higher than estimated radiation dose was less than regulatory reporting requirements.

In response to the lowering pressurizer level, control room operators had entered abnormal operating procedure 2-OHP-4022-002-020, "Excessive Reactor Coolant Leakage." Based on the volume control tank level trend, control room operators determined that the leak was six gpm, which was considered identified leakage. Therefore, the leak was less than the TS limit of ten gpm identified leakage. Control room operators continued to monitor plant parameters and re-calculated the leak rate at 15 minute intervals. The leak rate remained at 6 gpm until it was subsequently isolated. The inspectors observed the control room operator's response during the leak on December 14 and did not identify any findings of significance.

Licensee personnel documented this issue in AR 00806546 and performed a root cause evaluation. The inspectors reviewed the root cause evaluation, which is documented in Section 4OA2.2 of this report. No issues of significance were identified with the evaluation. An equipment apparent cause evaluation was also completed for valve 2-NPS-121-II, which was documented in AR 00806546. The apparent cause evaluation concluded that the previously degraded, and actively leaking, valve stem packing was further exacerbated by tightening the packing gland nut. The tightening produced an unbalanced compression distribution on the packing that caused packing material to blow out, resulting in an increase in leak rate. However, the exact failure mechanism could not be determined until the valve is removed for inspection during the next outage. Corrective actions were included in AR 00806546 for engineering personnel to inspect the valve and perform a failure mechanism investigation.

Analysis

The inspectors determined that the failure to identify appropriate contingency actions during the work risk review to adjust the packing on 2-NPS-121-II was a licensee performance deficiency warranting a significance evaluation. The inspectors assessed this finding using the SDP. The inspectors reviewed the examples of minor issues in IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," and determined that there were no examples related to this issue. Consistent with the guidance in IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," the inspectors determined that this finding was more than minor because it was related to the Equipment Performance attribute for RCS Barrier Integrity in the Initiating Events Cornerstone. The cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations was affected. Specifically, the resultant six gpm RCS leak continued for approximately three hours before it was isolated because contingency actions were not identified for credible failures and problems that could occur during the packing adjustment.

The inspectors performed a Phase 1 SDP review of this finding using the guidance provided in IMC 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations." Using the Initiating Events column in the "SDP Phase 1 Screening Worksheet for IE [Initiating Events], MS [Mitigating Systems], and B [Barriers] Cornerstones," the inspectors determined that this finding was of very low safety significance (Green) because the leak did not exceed the TS limit for identified RCS leakage and all other mitigating systems were available.

Cross-cutting Aspects

The inspectors concluded that this finding affected the cross-cutting area of human performance. The work control risk review procedures were not complete and accurate in that they did not identify packing adjustments on manual valves in the pressurized RCS as a high risk activity with respect to nuclear safety. (H.3(b))

Enforcement

The inspectors concluded that no violation of regulatory requirements occurred. The licensee's probabilistic risk assessment did not identify 2-NPS-121-II as a component that was significant to public health and safety and therefore did not require a risk assessment as required by 10 CFR 50.65(a)(4). Also, the procedures that were not followed by licensee personnel and that contributed to the cause of the finding were administrative work control procedures and not required by 10 CFR 50, Appendix B. This issue was considered to be a finding of very low safety significance (FIN 05000316/2007003-02).

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors completed twelve inspection samples associated with operability evaluations by reviewing the following action requests:

- AR 00122516, "Performance Assurance Identified During PA-06-02, That the Current Testing Does Not Demonstrate That the Fuel Oil Transfer System Can Perform All of its Intended Functions as Designed"
- AR 00127851, "Reactor Vessel Level Instrumentation System Elevation Discrepancy"
- AR 00808762, "Aggregate Affects of Non-conservative Values Impacting Control Room Habitability and Offsite Dose Analyses"
- AR 00809059, "EDG Steady State Frequency Limits Contained in TSs - Potential Non-conservative Upper Frequency Limit"
- AR 00809467, "Request for Past Operability Review of Essential Service Water Configuration With One Pump Out of Service"
- AR 00809013, "Reactor Coolant Drain Tank Level Calculation Shows Volume Higher Than Actual Volume"
- AR 00808116, "Station Ability to Monitor 69 Kilovolt Alternate Offsite Source"
- AR 07058020, "Unit 2 Lower Personnel Air Lock As-Found Leak Test Failed"
- AR 06094043, "As-Found Visual Inspection of 2-HV-AFP-T2AC (Unit 2 Turbine Driven Auxiliary Feedwater Pump Room Cooler) Found 11 Tubes Plugged with Lake Debris (Sand/Silt/Lake Grass)"
- AR 00125378, "While Performing R0246231 to Test and Replace 2-SV-104E Due to the Failure of 2-SV-104W, the Installed Valve Failed its Set Pressure Test By Failing to Lift at 1.25 Time the Setpoint Value"
- AR 07024031, "Received Auto Start of Both Control Room Pressurization Fans"
- AR 00808767, "Spent Fuel Pool Ventilation System Charcoal Sample Test Results Outside Acceptance Criteria"

The inspectors verified that the conditions did not render the associated equipment inoperable or result in an unrecognized increase in plant risk. When applicable, the inspectors verified that the licensee appropriately applied TS limitations, appropriately returned the affected equipment to an operable status, and reviewed the licensee's evaluation of the issues with respect to the regulatory reporting requirements.

In addition, the inspectors verified that problems related to the operability of safety-related plant equipment were entered into the licensee's corrective action program with the appropriate characterization and significance.

b. Findings

b.1 Failure to Submit a Required Licensee Event Report (LER)

Introduction

The inspectors identified a Severity Level IV Non-Cited Violation of 10 CFR 50.73(a)(1). The licensee failed to submit a required LER within 60 days after discovery of an event requiring a report. The licensee failed to correctly evaluate the failure of two Unit 2 RHR system pressure relief valves, which affected the operability of both trains of the RHR system. This was reportable as a condition prohibited by the plant's TS and as an event where a single cause resulted in two independent trains to become inoperable in a single system designed to remove residual heat and mitigate the consequences of an accident.

Discussion

The inspectors reviewed AR 00125377 and AR 00125378, which documented two failed pressure lift tests for the Unit 2 RHR discharge header safety valves (2-SV-104E and 2-SV-104W) during the Unit 2 Cycle 16 refueling outage on April 19, 2006. The Operations Review section of both action requests correctly identified the need for a past operability and reportability evaluation. Operators reasoned that if either safety valve had been called upon to perform its function, there was reason to doubt whether it would have been successful. The result could have been over-pressurization of the protected piping and a potential for degradation of the piping and the passive function it fulfilled. The Initial Screening Committee cancelled the past operability and reportability evaluation, concluding that the two events were not reportable because they were "point of discovery" issues. The inspectors challenged this conclusion because the apparent cause of the two safety valve failures was determined to be due to a common cause (i.e., bonding of the disc and seating surfaces caused by the formation of an oxide film on the disc and seat). The inspectors based this challenge on the guidance contained in NUREG 1022, "Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73," Section 3.2.2, "Operation or Condition Prohibited by TSs." In response to the inspectors' questions, the licensee wrote AR 00808822 to evaluate the past operability of the Unit 2 RHR system and to review the issue with respect to the regulatory reporting requirements. The inspectors determined that the licensee had incorrectly concluded that the valve test failures had not affected system operability, and therefore failed to report the event as required by 10 CFR 50.73(a)(1).

The inspectors reviewed the licensee's apparent cause evaluation and corrective actions for the safety valve test failures and discussed the evaluation with the licensee's staff. The apparent cause evaluation thoroughly evaluated the two valve failures, valve performance history, and extent of condition. The inspectors noted that the performance history of these safety valves was generally good and that appropriate maintenance and testing had been performed in accordance with the regulatory requirements. The potential extent of condition was limited to these two valves in the Unit 2 RHR system and two additional valves in the Unit 1 RHR system, since these were the only four safety valves of the same make and model used at the Cook Plant. The inspectors noted that the corrective actions to address the safety valve failures appeared to be reasonable; however, one of the corrective actions was not completed. The normal inservice testing sample is one of the two safety valves during a refueling outage. If the first valve fails its pressure test or seat leakage test, the second valve is tested. Because both of the Unit 2 RHR discharge header safety valves failed while testing during the Unit 2 refueling outage, a corrective action was specified by the cognizant engineer to test both of the Unit 1 RHR discharge header safety valves during the upcoming Unit 1 Cycle 21 refueling outage. However, during the Unit 1 refueling outage, only one of the two RHR safety valves (1-SV-104E) was tested. The Outage Scope Management Team concluded that because the satisfactory test of 1-SV-104E represented a 50 percent sample, there was no need to test 1-SV-104W during the refueling outage and cancelled the test. Although the inservice testing requirements were met, the inspectors considered this to be a non-conservative decision because the condition of the untested safety valve remained unknown. This concern was discussed with the licensee.

The inspectors reviewed the licensee's apparent cause evaluation for the failure to meet the 10 CFR 50.73 reporting requirements. The licensee concluded that multiple reviewers in the operations, regulatory affairs, and plant engineering departments lacked sufficient knowledge of the reporting requirements and failed to recognize that the two separately documented safety valve test failures were due to a potential common cause failure, and that this was reportable as described in the multiple test failures example in Section 3.2.2 of NUREG 1022. This conclusion (i.e., lack of knowledge of reporting requirements) was consistent with the cause of other examples previously identified by the inspectors, one of which was documented as a finding in NRC Inspection Report 05000315/316-2006004 (NCV 05000316/2006004-07). The inspectors identified and discussed these examples as a potential adverse trend in problem identification during the Problem Identification and Resolution inspection, which was documented in NRC Inspection Report 05000315/316-2006008. The licensee has implemented several corrective actions to address this potential adverse trend in correctly identifying and evaluating the reportability of plant events, including additional training for selected operations, regulatory affairs, and plant engineering department personnel.

Analysis

The inspectors determined that the failure to report this issue as a condition prohibited by the plant's TS in accordance with 10 CFR 50.73(a)(2)(i)(B) and as an event where a single cause resulted in two independent trains to become inoperable in a single system designed to remove residual heat and mitigate the consequences of an accident in accordance with 10 CFR 50.73(a)(2)(vii)(B and D) was a licensee performance deficiency warranting a significance evaluation. The inspectors determined that this finding was of more than minor significance because the NRC relies on licensees to identify and report conditions or events meeting the criteria specified in the TS and the regulations in order to perform its regulatory function. Because this issue affected the NRC's ability to perform its regulatory function, it was evaluated with the traditional enforcement process. Consistent with the guidance in Section IV.A.3 and Supplement I, Paragraph D.4, of the NRC Enforcement Policy, this finding was determined to be a Severity Level IV Non-Cited Violation.

Cross-cutting Aspects

The inspectors concluded that this finding affected the cross-cutting area of problem identification and resolution. Specifically, the licensee failed to correctly evaluate the two safety valve test failures with respect to the reporting requirements in 10 CFR 50.73. (P.1(c))

Enforcement

10 CFR 50.73(a)(1) required, in part, that the licensee submit an LER for any event of the type described in this paragraph within 60 days after the discovery of the event. 10 CFR 50.73(a)(2)(i)(B) required, in part, that the licensee report any operation or condition prohibited by the plant's TS. 10 CFR 50.73(a)(2)(vii)(B and D) required, in part, that the licensee report any event where a single cause or condition caused two independent trains to become inoperable in a single system designed to remove residual heat and mitigate the consequences of an accident. Contrary to the above, the licensee failed to submit a required LER within 60 days after discovery of an event on April 19, 2006. The event involved the failure of two Unit 2 RHR system pressure relief valves affecting the operability of both trains of the RHR system, a condition prohibited by the plant's TS and a common cause failure in a system designed to remove residual heat and mitigate accidents. This is a Severity Level IV violation consistent with Section 7.10 and Supplement I, Paragraph D.4, of the NRC Enforcement Policy and is being treated as a Non-Cited Violation consistent with Section VI.A of the NRC Enforcement Policy (NCV 05000316/2007003-03). Although this NRC identified violation was repetitive, the inspectors concluded that it was not due to inadequate corrective actions for the previous violation. The licensee entered this violation into its corrective action program as AR 00808822. The licensee's submission of an LER is pending.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors completed four inspection samples pertaining to post maintenance testing by assessing testing activities that were conducted on the following plant equipment:

- Unit 1 AB EDG Fuel Oil Day Tank Level Switch
- Unit 1 Steam Generator Power Operated Relief Valve 1-MRV-233
- Unit 1 AB EDG 2R Fuel Injection Pump
- Unit 1 East Charging Pump

The inspectors reviewed the scope of the work performed and evaluated the adequacy of the specified post maintenance testing. The inspectors verified that the post maintenance testing was performed in accordance with approved procedures, that the procedures clearly stated the acceptance criteria, and that the acceptance criteria were met. The inspectors interviewed operations, maintenance, and engineering department personnel and reviewed the completed post maintenance testing documentation.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors completed five inspection samples regarding surveillance testing by reviewing the activities listed below. This included two Inservice Testing (IST) samples and one RCS leakrate detection sample. The inspectors also reviewed and closed URI 05000315/2006007-02, "Review of Unit 1 RCS Boundary Leakage Requirements During Startup From Refueling Outage." Refer to Section 4OA5.3 of this report.

- 1-OHP-4030-102-016, "Reactor Coolant System Leak Rate Test" (RCS Leak Rate)
- 1-OHP-4030-112-015, "Full Length Control Rod Operability Test"
- 1-MRV-223 Stroke Test Failure During Performance of 1-OHP-4030-114-049, "Hot Shutdown Panel Operability Test," Attachment 14, "Steam Generator PORV Operability Test" (IST)
- 2-OHP-4030-256-017T, "Turbine Driven Auxiliary Feedwater System Test" (IST)
- 1-IHP-4030-182-006, "Reactor Coolant Pump (4KV) Bus 1A Channel 4 Underfrequency Relay Channel Calibration"

The inspectors observed portions of the test activities to verify that the testing was accomplished in accordance with plant procedures. The inspectors reviewed the test methodology and documentation to verify that equipment performance was consistent with safety analysis and design basis assumptions, and that testing acceptance criteria were satisfied. In addition, the inspectors verified that surveillance testing problems were being entered into the licensee's corrective action program with the appropriate characterization and significance.

b. Findings

No findings of significance were identified.

1R23 Temporary Modifications (71111.23)

a. Inspection Scope

The inspectors completed one inspection sample by reviewing the following temporary modification that was utilized on plant equipment:

- 1-TM-00-76-00-1, "On-line Leak Seal Repair of Steam Generator Blowdown Flow Control Valve 1-DRV-342"

The inspectors interviewed engineering and operations department personnel, and reviewed the design documents and applicable 10 CFR 50.59 evaluation to verify that TS and the UFSAR requirements were satisfied. The inspectors reviewed documentation and conducted plant walkdowns to verify that the modification was implemented as designed and that the modification did not adversely impact system operability or availability.

The inspectors also reviewed a sample of action requests pertaining to temporary modifications to verify that problems were entered into the licensee's corrective action program with the appropriate significance characterization and that corrective actions were appropriate.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The inspectors completed one inspection sample by observing activities in the plant simulator, Technical Support Center, and Operations Support Center during an emergency preparedness training drill conducted on February 13, 2007. The inspectors verified the emergency classifications and notifications to offsite agencies were completed in an accurate and timely manner as required by the Emergency Plan implementing procedures. The inspectors also verified that the training drill was conducted in accordance with the prescribed sequence of events, drill objectives were satisfied and that the required prompts from the licensee drill controllers were appropriately communicated to the drill participants.

The inspectors observed the post-drill critique in the Technical Support Center and reviewed documented post-drill critique comments by licensee evaluators to verify licensee personnel and licensee drill evaluators adequately self-identified drill performance problems of significance. The inspectors also verified that action requests were generated for drill performance problems of significance and entered into the corrective action program with the appropriate characterization and significance.

b. Findings

No findings of significance identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

.1 Review of Licensee Performance Indicators for the Occupational Exposure Cornerstone

a. Inspection Scope

The inspectors reviewed licensee's event reports, corrective action documents, electronic dosimetry transaction data for radiologically controlled area egress, internal dose assessment summary information, and data reported on the NRC's web site relative to the licensee's occupational exposure control performance indicator (PI). The inspectors confirmed that the conditions surrounding any actual or potential PI occurrences had been evaluated, and identified problems had been entered into the corrective action program for resolution.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

.2 Plant Walkdowns/Boundary Verifications and Radiation Work Permit Reviews

a. Inspection Scope

The inspectors identified work performed within high and locked high radiation areas (LHRA) of the plant and other potentially exposure significant work activities and selectively reviewed radiation work permit (RWP) packages and radiation surveys for these areas. The inspectors evaluated the radiological controls to determine if these controls, including postings and access control barriers, were adequate. Work areas included, but were not limited to:

- Remove Used Unit 1 Incore Detectors from Containment Wall;
- Radioactive Material Building Storage Activities; and
- Unit-2 Containment Accumulator Rooms LHRA Activities.

With a survey instrument, the inspectors walked down and surveyed selected radiation areas, high and LHRA boundaries in the radioactive waste, auxiliary, and inside the Unit 1 containment buildings to determine if the prescribed radiological access controls were in place, if licensee postings were complete and accurate, and if physical barricades/barriers were adequate. During the walkdowns, the inspectors challenged access control boundaries to determine if high radiation area (HRA) and LHRA access was controlled in compliance with the licensee's procedures, TSs, and the requirements of 10 CFR 20.1601 and were consistent with Regulatory Guide 8.38, "Control of Access to High and Very High Radiation Areas in Nuclear Power Plants."

The adequacy of the licensee's internal dose assessment process for internal exposures exceeding 50 millirem committed effective dose equivalent was assessed to determine if affected personnel were properly monitored utilizing calibrated equipment and if the data was analyzed and internal exposures were properly assessed in accordance with licensee procedures.

The inspectors reviewed the licensee's physical and administrative controls for the storage of highly activated and/or contaminated materials (non-fuel) within the spent fuelpool. In particular, the radiological control for non-fuel materials stored in these pools was evaluated to ensure that adequate barriers were in-place to reduce the potential for the inadvertent movement of these materials and to assess compliance with the licensee's procedures and for consistency with NRC regulatory guidance.

These reviews represented four inspection samples.

b. Findings

No findings of significance were identified.

.3 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed the corrective action program database along with individual action requests related to the radiological access and exposure control programs to determine if identified problems were entered into the corrective action program for resolution. In particular, the inspectors reviewed radiological issues which occurred over approximately the 12-month period that preceded the inspection including the review of any HRA radiological incidents (non-PI occurrences identified by the licensee in high and locked high radiation areas) to determine if follow-up activities were conducted in an effective and timely manner commensurate with their importance to safety and risk based on the following:

- Initial problem identification, characterization, and tracking;
- Disposition of operability/reportability issues;
- Evaluation of safety significance/risk and priority for resolution;
- Identification of repetitive problems;
- Identification of contributing causes; and
- Identification and implementation of corrective actions.

The inspectors evaluated the licensee's process for problem identification, characterization, and prioritization and determined if problems were entered into the corrective action program and were being resolved in a timely manner. For potential repetitive deficiencies or possible trends, the inspectors determined if the licensee's self-assessment activities were capable of identifying and addressing these deficiencies, if applicable.

The inspectors reviewed the licensee's documentation for all potential PI events occurring since the NRC's last review of these areas in October 2006 to determine if any of these events involved dose rates greater than 25 Rem/hour at 30 centimeters or greater than 500 Rem/hour at 1 meter or involved unintended exposures greater than 100 millirem total effective dose equivalent (or greater than 5 Rem shallow dose equivalent or greater than 1.5 Rem lens dose equivalent). None were identified.

These reviews represented four inspection samples.

b. Findings

No findings of significance were identified.

.4 Job-In-Progress Reviews and Review of Work Practices in Radiologically Significant Areas

a. Inspection Scope

The inspectors attended the pre-job briefings and accompanied licensee staff into the Unit 1 containment inside a LHRA boundary and observed the disposal of the 1F in-core radiation monitoring detector. The inspectors evaluated the radiological control, job coverage, and radiation worker practices associated with the activities. Radiation survey information to support these work activities was reviewed and the radiological job requirements and the access control provisions were assessed for conformity with TS and with the licensee's procedures.

Job performance was observed to determine if radiological conditions in the work areas were adequately communicated to workers through the pre-job briefings and area postings. The inspectors also evaluated the adequacy of the oversight provided by the RP staff and the administrative and physical controls used over ingress/egress into these areas.

The inspectors reviewed the licensee's procedures and discussed with RP staff its practices for access into high and very high radiation areas and into areas with the potential for changing radiological conditions, such as the containment shortly after plant shutdown, and observed work in the radioactive waste building during waste transfer evolutions for the 1F in-core radiation monitoring detector. The inspectors evaluated the adequacy of the radiological controls and the radiological hazards assessment associated with such entries, including the additional requirements necessary for controlling the spent in-core radiation monitoring detector as special nuclear material. Work instructions provided in RWPs and in pre-entry briefing documents were discussed with RP staff to determine their adequacy.

These reviews represented two inspection samples.

b. Findings

No findings of significance were identified.

.5 High Risk Significant, LHRA and Very High Radiation Area (VHRA) Access Controls

a. Inspection Scope

The inspectors reviewed the licensee's procedures and RP job standards and evaluated RP practices for the control of access to radiologically significant areas (high, locked high, and very high radiation areas). The inspectors discussed locked high and very high radiation area controls with the RP staff to assess compliance with the licensee's TS, procedures and the requirements of 10 CFR 20 and for consistency with the guidance contained in Regulatory Guide 8.38. In particular, the inspectors evaluated the RP staff's control of keys to LHRAs and VHRAs, the use of access control guards during work in these areas, and methods and practices for independently verifying proper closure and locking of access doors upon area egress. The inspectors selectively reviewed key issuance/return, door lock verification records, and key accountability logs for selected periods in 2006 to determine the adequacy of accountability practices and documentation.

The inspectors discussed with RP staff the controls that were in place for areas that had the potential to become high radiation areas during radioactive waste operations to determine if these activities required communication before-hand with the RP group, so as to allow corresponding timely actions to properly post and control the radiation hazards.

The inspectors conducted plant walkdowns to verify the posting and locking of entrances to numerous LHRAs throughout the plant.

These reviews represented three inspection samples.

b. Findings

No findings of significance were identified.

.6 Radiation Protection (RP)Technician Proficiency

a. Inspection Scope

During job observations and general plant walkdowns, the inspectors evaluated RP staff performance with respect to RP work requirements, conformance with procedures and those requirements specified in the RWP, and assessed proficiency with respect to RP requirements, station procedures, and health physics practices.

The inspectors reviewed selected radiological problem reports generated between mid-August and December 2006 to determine the extent of any specific problems or trends that may have been caused by deficiencies with RP technician work control and to determine if the corrective action approach taken by the licensee to resolve the reported problems, if applicable, was adequate.

These reviews represented two inspection samples.

b. Findings

No findings of significance were identified.

2OS2 As-Low-As-Is-Reasonably-Achievable (ALARA) Planning And Controls (71121.02)

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed plant collective outage exposure history, current exposure trends, and ongoing outage activities in order to assess current performance and exposure challenges. This included determining the plant's current three-year rolling average for collective exposure in order to help establish resource allocations and to provide a perspective of significance for any resulting inspection finding assessment.

The inspectors reviewed site specific trends in collective exposures based on plant historical exposure and source term data. The inspectors reviewed procedures associated with maintaining occupational exposures ALARA and assessed those processes used to estimate and track work activity exposures.

b. Findings

No findings of significance were identified.

.2 Radiological Work Planning

a. Inspection Scope

The inspectors evaluated the licensee's list of work activities ranked by estimated exposure that were completed during the Unit 1 Cycle 21 refueling outage (U1C21) and reviewed the following work activities of highest exposure significance:

- Reactor Vessel Head Replacement;
- Temporary Shielding;
- Scaffold Activities in Containment;
- Valve Maintenance/Repair in Containment;
- Steam Generator Platform Activities;
- RP Auxiliary Building and Containment Activities;
- Containment Minor Work Activities;
- Containment Recirculation Sump Modification;
- Pressurizer Alloy 600 Weld Overlay; and
- Reactor Coolant Pump 12 Rotating Assembly Replacement.

For the activities listed above, the inspectors reviewed the ALARA Plan and associated RWP, exposure estimates, and exposure mitigation requirements in order to verify that the licensee had established radiological engineering controls that were based on sound RP principles in order to achieve occupational exposures that were ALARA. This also involved determining that the licensee had reasonably grouped the radiological work into work activities, based on historical precedence, industry norms, and/or special circumstances.

The inspectors compared the exposure results achieved during U1C21, including the dose rate reductions and person-rem expended, with the dose projected in the licensee's ALARA planning. Reasons for inconsistencies between intended (projected) and actual work activity doses were evaluated to determine if the activities were planned reasonably well and to ensure the licensee identified any work interface/planning deficiencies.

b. Findings

No findings of significance were identified.

.3 Source Term Reduction and Control

a. Inspection Scope

The inspectors reviewed licensee records to understand historical trends and current status of plant source terms. The inspectors discussed the plant's source term with ALARA staff to determine if the licensee had developed an adequate understanding of the input mechanisms and the methodologies and practices necessary to achieve reductions in source term. The inspectors discussed the water chemistry control initiatives implemented during the cool-down for the outage and its impact on source term reduction compared to industry practices.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

Cornerstone: Initiating Events

.1 Unplanned Scrams per 7000 Critical Hours and Unplanned Scrams with Loss of Normal Heat Removal

a. Inspection Scope

The inspectors verified the Unplanned Scrams per 7000 Critical Hours and the Unplanned Scrams with Loss of Normal Heat Removal performance indicators for both units. The inspectors reviewed each LER from January 1, 2006, through December 31, 2006, and noted that there were no scrams for either unit during the year.

These reviews represent four samples.

b. Findings

No findings of significance were identified.

.2 Unplanned Transients per 7000 Critical Hours

a. Inspection Scope

The inspectors verified the Unplanned Transients per 7000 Critical Hours performance indicator for both units. The inspectors reviewed power history data for both operating units from January 1, 2006, through December 31, 2006, determined the number of power changes greater than 20 percent full power that occurred, evaluated each of those power changes against the performance indicator definition, and verified the licensee's calculation of critical hours for both units.

These reviews represent two samples.

b. Findings

No findings of significance were identified.

Cornerstone: Mitigating Systems

.3 Safety System Functional Failures

a. Inspection Scope

The inspectors verified the Safety System Functional Failures Performance Indicator for both units (two samples). The inspectors reviewed each LER from January 1, 2006, through December 31, 2006, determined the number of safety system functional failures that occurred, evaluated each LER against the performance indicator definitions, and verified the number of safety system functional failures reported.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action system at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Some minor issues were entered into the licensee's corrective action system as a result of these inspectors' observations; however, these are not discussed in this report.

b. Findings

No findings of significance were identified.

.2 Annual In-Depth Review Sample

a. Inspection Scope

The inspectors completed three annual inspection samples by selecting the following action requests for in-depth review:

- AR 06032055, "Repeat Missed Surveillances During January 2006"
- AR 00806546, "Reactor Coolant System Packing Leak, December 2006"
- AR 00804579, "Loss of Train B Containment Vent Isolation During Refueling"

The inspectors verified the following attributes during their review of the licensee's corrective actions for the above action requests and other related action requests:

- complete and accurate identification of the problem in a timely manner commensurate with its safety significance and ease of discovery;
- consideration of the extent of condition, generic implications, common cause and previous occurrences;
- evaluation and disposition of operability/reportability issues;
- classification and prioritization of the resolution of the problem, commensurate with safety significance;
- identification of the root and contributing causes of the problem; and
- identification of corrective actions which were appropriately focused to correct the problem.

The inspectors discussed the corrective actions and associated action request evaluations with licensee personnel.

b. Assessment and Observations

A finding of very low safety significance (Green) associated with AR 00806546 is discussed in Section 1R13 of this report. A minor violation of TS 3.3.6 associated with AR 00804579 is discussed in Section 4OA3.2 of this report. No other findings or observations of significance were identified.

4OA3 Event Followup (71153)

.1 (Closed) LER 05000315/2006-002-00: "Failure to Comply with TS Requirement 3.6.13."

The licensee failed to correct a previously identified degraded condition affecting the Unit 1 containment divider barrier seal, which rendered the divider barrier seal inoperable. On October 5, 2006, the licensee discovered one divider barrier seal retaining bolt was missing and a second divider barrier seal retaining bolt was missing its associated nut. Unit 1 was shut down for the Cycle 21 refueling outage when this condition was discovered. The licensee's investigation of this condition determined that the missing fasteners had previously been identified in November 1998; however, an evaluation of the degraded condition in 1998 failed to identify the TS noncompliance and appropriate corrective actions were not taken to replace the missing fasteners. Three successive inspections of the divider barrier seal by the licensee during refueling outages in 2002, 2003, and 2005 failed to re-identify the condition.

The inspectors reviewed the licensee's apparent cause evaluation and corrective actions for this event. The licensee determined that the failure to correctly evaluate and correct the degraded condition in 1998 was due to personnel error. The licensee attributed the failure to re-identify the missing fasteners during the following three inspections to inadequate procedural guidance, stating that the surveillance test procedure allowed the same five percent of the divider barrier seal to go uninspected for about eight years. Technical Specification Surveillance Requirement 3.6.13.5 required the licensee to inspect $\geq$ 95 percent of the divider barrier seal length. The inspectors did not agree with the licensee's conclusion that a lack of procedural guidance contributed to this event. The inspectors reviewed the completed divider barrier seal inspection surveillance test procedures from the 2002, 2003 and 2005 refueling outages. All three inspections were performed by the same individual and the quality records did not identify that the affected area of the divider barrier seal was not inspected. To the contrary, the completed procedures indicated that most all of the divider barrier seal was inspected each time. A more reasonable explanation for the failure to re-identify the missing fasteners would be inadequate oversight, personnel error, and/or inadequate training. The licensee took immediate corrective actions to restore the divider barrier seal to a fully operable condition by replacing the missing fasteners prior to Unit 1 entering Mode 4 (Cold Shutdown) following refueling.

The licensee reported this as a condition prohibited by the plant's TS in accordance with 10 CFR 50.73(a)(2)(i)(B). The inspectors concluded that this violation of TS 3.6.13 constitutes a violation of minor significance and is not subject to formal enforcement action in accordance with Section IV of the NRC's Enforcement Policy. This finding was of minor significance because the degraded condition did not result in a loss of safety function for the divider barrier. The divider barrier seal was fully intact and would have continued to fulfill its function during a design basis event. This LER is closed.

.2 (Closed) LER 05000315/2006003-00: "Failure to Comply With TS Requirement 3.3.6."

The inspectors reviewed control room logs, documented surveillance tests, the TS and plant procedures to verify that the event report was accurate. Technical Specification 3.3.6, "Containment Purge Supply and Exhaust System Isolation Instrumentation," required two operable trains of automatic and manual isolation capability for the containment purge system when moving irradiated fuel assemblies in containment.

On October 24, 2006, Unit 1 was in Mode 6 (Refueling), with irradiated fuel assemblies being moved inside containment and the containment purge system in service. In parallel with the ongoing core alterations, maintenance and operations personnel were performing actions to establish the required initial conditions for EDG load sequencing and engineered safety features testing. One action placed the solid state protection system Train 'B' output mode selector switch in the "test" position, which rendered the automatic isolation capability for the Train 'B' containment purge system supply and exhaust valves inoperable. However, the inoperable condition was not recognized when the output mode selector switch was placed in the "test" position. Consequently, the required actions of TS 3.3.6 to immediately isolate the Train 'B' containment purge supply and exhaust system penetration flow paths were not completed.

Control room operators subsequently identified that the solid state protection system Train 'B' output mode selector switch was in the "test" position while completing a surveillance and recognized the non-compliance with TS 3.3.6. The resultant investigation determined that the TS requirements had not been satisfied for approximately two hours. The mode selector switch had been placed in the "test" position at approximately 0400 hours rendering the automatic isolation capability for Train 'B' containment purge system inoperable. However, the containment purge supply and exhaust valves were closed when the containment purge system was removed from service at approximately 0550 hours, which isolated the containment penetration to comply with TS 3.3.6 action requirements. Licensee personnel documented this issue in AR 00804579. Additional corrective actions included procedure revisions to ensure that the containment purge system was not in service while moving irradiated fuel assemblies in containment if the solid state protection system output mode selector switch was in the "test" position.

The licensee reported this event as a condition prohibited by the plant's TS in accordance with 10 CFR 50.73(a)(2)(i)(B). The inspectors concluded that this licensee identified violation of TS 3.3.6 constitutes a violation of minor significance and is not subject to formal enforcement action in accordance with Section IV of the NRC's Enforcement Policy. This finding was of minor significance because Train 'A' automatic isolation and both trains of manual isolation capabilities for the containment purge system remained operable during the time that Train 'B' automatic isolation capability was inoperable. Therefore, the ability to isolate the containment purge system to mitigate a postulated radioactivity release remained available. This LER is closed.

4OA5 Other Activities

.1 (Closed) URI 05000315/316/2006006-01: "Incomplete Maintenance Rule Evaluations for Nuclear Instrumentation Component Failures."

This issue was reviewed in Section 1R12.1 of this report. A Non-Cited Violation of 10 CFR 50.65(a)(2) for the licensee's failure to demonstrate that the performance or condition of the Unit 1 and Unit 2 power range and intermediate range nuclear instruments was effectively controlled through appropriate preventive maintenance was identified. This URI is closed.

.2 (Closed) URI 05000315/316/2006007-03: "Review of Maintenance Rule Evaluations for Unit 1 and Unit 2 Ice Condensers."

During the fourth quarter of 2006, the inspectors reviewed a sample of equipment performance issues associated with the Unit 1 and Unit 2 ice condensers and found one example where a Maintenance Rule Evaluation (MRE) was not completed when the performance criteria for ice bed flow blockage was exceeded. As a result, the inspectors expanded the scope of their review and the licensee conducted an apparent cause evaluation. Based on the expanded scope review by the NRC and the ongoing evaluation by the licensee, the inspectors opened URI 05000315/316/2006007-03 in the inspection report to determine the scope of inadequate performance monitoring for the ice condensers.

During the expanded scope review, the inspectors identified one additional example of inadequate performance criteria monitoring. The licensee's apparent cause analysis identified 52 additional action requests that should have included MREs, but did not. The licensee identified the apparent cause to be a lack of knowledge relative to the Maintenance Rule performance criteria and a lack of a formal monitoring program. Corrective actions included performance of an MRE for the initially identified issue, a review of the current performance criteria, presentation of the extent of condition results to the Maintenance Rule Expert Panel for (a)(1) consideration, and increased training.

The Expert Panel concluded that the performance and condition of the ice condensers was effectively controlled through appropriate preventive maintenance in accordance with paragraph (a)(2) of the Maintenance Rule and that monitoring in accordance with paragraph (a)(1) was not warranted since the conditions identified would not have challenged overall ice condenser performance. The inspectors determined that the Expert Panel's conclusion was appropriate. As a result, no violation of regulatory requirements was identified. This URI is closed.

.3 (Closed) URI 05000315/2006007-04: "Review of Compliance with Unit 1 RCS Boundary Leakage TS Surveillance Requirements During Plant Startup."

The inspectors reviewed the Unit 1 RCS boundary leakage requirements from entry into Mode 4 on November 5, 2006, until after the first RCS leakrate calculation was performed with the unit at full power on November 21st, and noted that the licensee had not performed an RCS inventory balance for Unit 1 since November 9th. The inspectors asked the licensee how it complied with TS Surveillance Requirement 3.4.13.1, which required verification that RCS operational leakage is within limits by performance of an RCS water inventory balance every 72 hours with the unit in Modes 1 through 4. There is a note in the TS that states that the leakrate calculation is not required to be performed until 12 hours after establishment of steady state operation. Steady state operation is defined in the TS Bases as steady RCS pressure, temperature and power level. The inspectors reviewed Unit 1 plant power history since November 9th and noted that there were several periods of time when it appeared that the plant was stable, at steady state conditions, during the power ascent. In response to the inspectors' questions, the licensee wrote AR 06330008 to evaluate the processes and procedures for ensuring that the RCS boundary leakage requirements are met during plant startup. The inspectors reviewed the licensee's evaluation and concurred with the licensee's conclusion that steady state operation had not been sufficiently established during the power ascension to permit a meaningful RCS operational leakage calculation. This URI is closed.

4OA6 Meetings

.1 Resident Inspectors' Exit Meeting

The inspectors presented the inspection results to Mr. J. Jensen and other members of the licensee's staff at the conclusion of the inspection on April 12, 2007. The licensee acknowledged the findings presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. Proprietary information was examined during this inspection, but is not specifically discussed in this report.

.2 Interim Exit Meetings

Interim exits were conducted for:

- Occupational Radiation Safety Access Control to Radiologically Significant Areas and ALARA Planning and Controls inspection with Mr. M. Peifer and other licensee staff on January 12, 2007.

- Licensed Operator Requalification examination review with Mr. R. Brown on April 3, 2007, via telephone.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

J. Beer, Staff Health Physicist
R. Brown, Licensed Operator Requalification Training Supervisor
T. Brown, Radiation Protection Manager
L. Bush, Site Senior License Holder
J. Carlson, Environmental Manager
P. Carteaux, Emergency Preparedness Manager
R. Crane, Regulatory Compliance Supervisor
T. Craven, System Engineering
M. Dixon, System Engineering
J. Eaton, Maintenance Rule Program Engineer
H. Etheridge, Regulatory Affairs Specialist
D. Fadel, Design Engineering Director
J. Gebbie, Plant Engineering Director
C. Graffenius, Emergency Preparedness Coordinator
J. Jensen, Site Vice President
C. Lane, Engineering Programs Manager
Q. Lies, Operations Manager
J. Long, Senior Nuclear Specialist
R. Meister, Regulatory Affairs Specialist
M. Peifer, Support Services Vice President
S. Simpson, Regulatory Affairs Manager
S. Vasquez, Maintenance Manager
D. Walton, ALARA Supervisor
L. Weber, Plant Manager

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000315/2007003-01 05000316/2007003-01	NCV	Failure to Demonstrate Performance or Condition of Nuclear Instruments Were Effectively Controlled Through Performance of Appropriate Preventive Maintenance (Section 1R12.1)
05000316/2007003-02	FIN	Failure to Identify Appropriate Contingency Actions During the Work Risk Review to Adjust Packing on Valve 2-NPS-121-II (Section 1R13)
05000316/2007003-03	NCV	Failure to Submit a Required Licensee Event Report (Section 1R15)

Closed

05000315/2007003-01 05000316/2007003-01	NCV	Failure to Demonstrate Performance or Condition of Nuclear Instruments Were Effectively Controlled Through Performance of Appropriate Preventive Maintenance (Section 1R12.1)
05000316/2007003-02	FIN	Failure to Identify Appropriate Contingency Actions During the Work Risk Review to Adjust Packing on Valve 2-NPS-121-II (Section 1R13)
05000316/2007003-03	NCV	Failure to a Submit Required Licensee Event Report (Section 1R15)
05000315/2006-002-00	LER	Failure to Comply with TS Requirement 3.6.13 (Section 4OA3.1)
05000315/2006003-00	LER	Failure to Comply With TS Requirement 3.3.6 (Section 4OA3.2)
05000315/2006006-01 05000316/2006006-01	URI	Incomplete Maintenance Rule Evaluations for Nuclear Instrumentation Component Failures (Section 4OA5.1)
05000315/2006007-03 05000316/2006007-03	URI	Review of Maintenance Rule Evaluations for Unit 1 and Unit 2 Ice Condensers (Section 4OA5.2)
05000315/2006007-04	URI	Review of Compliance with Unit 1 RCS Boundary Leakage TS Surveillance Requirements During Plant Startup (Section 4OA5.3)

Discussed

05000316/2006004-07	NCV	Failure to a Submit Required Licensee Event Report (Section 1R15)

LIST OF DOCUMENTS REVIEWED

The following is a list of licensee documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document in this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

1R04 Equipment Alignment

1-OHP-4021-016-003, "Component Cooling Water System Operation," Revision 22
1-OHP-4022-016-001, "Malfunction of the Component Cooling Water System," Revision 5
1-OHP-4030-116-020W, "West Component Cooling Water Loop Surveillance Test," Revision 4
1-OHP-4030-116-020E, "East Component Cooling Water Loop Surveillance Test," Revision 5
1-OHP-4025-R3, "Restore CCW," Revision 3
D. C. Cook Nuclear Plant Updated Final Safety Analysis Report, Section 9.5, "Component Cooling System," Revision 20
D. C. Cook Nuclear Plant Unit 1 TSs
1-TDB-FIG-1-19.8, "Safety-Related Throttle Valves," Revision 25
Drawing OP-1-5153-41, "Flow Diagram CCW Pumps and CCW Heat Exchangers," Revision 41
Drawing OP-1-5153A-43, "Flow Diagram CCW Safety-Related Loads," Revision 43
Drawing OP-1-5153B-23, "Flow Diagram CCW Miscellaneous Services Auxiliary Building, Revision 23
Drawing OP-1-5153C-7, "Flow Diagram CCW Miscellaneous Services Auxiliary Building, Revision 7
Drawing OP-1-5153D-5, "Flow Diagram CCW Miscellaneous Services Containment Loads, Revision 5
Drawing OP-1-5153E-6, "Flow Diagram CCW Miscellaneous Services Penetration Cooling, Revision 6
Work Request 06321833, "1-CCW-114 Replace Valve Due to Leak By"
Work Request 06321587, "1-CCW-160 Replace Valve Operator"
Work Request 06314135, "1-CCW-107 Correct Position of Operating Chain"
Work Request 06351685, "As-Found Local Leak Rate Test Failure of Valve 1-CCR-455"
Work Request 06333944, "1-CCW-232 Repair Valve From Leaking By"
Work Request 06333943, "1-CCW-230 Repair Valve From Leaking By"
Work Request 06327177, "1-CCR-455 Replace Actuator Spring"
Work Request 06331077, "1-HE-15E Conduct Thermal Performance Testing"
Work Request 06304699, "Repair Concrete Supporting a CCW Pipe Bracket"
Work Request 06303231, "1-PP-10E Repair Inboard Mechanical Seal Packing Leak"
Work Request 06299357, "1-CRV-412 Replace Obsolete Valve"
1-OHP-4021-008-002, Line Up Sheet 5, Placing the RHR System in Standby Readiness (Manual Valves Outside of Containment), Revision 19
Flow Diagram OP-1-5143, Emergency Core Cooling (RHR) Unit 1, Revision 67
AR 06326011, "Typographical Error in Attachment A of CCW AOP"
AR 05278001, "Procedural Inconsistencies in Auxiliary Feedwater System Injection Piping Temperature Limits"
2-OHP-4030-214-010, "Containment Isolation," Lineup Sheet 1, "Containment Operability Manual Valves Outside Containment," Revision 0

1-OHP-4021-009-001, "Placing Containment Spray System in Standby Readiness," Lineup Sheet 1, "CTS Valve Lineup for Standby Readiness," Revision 12
Flow Diagram OP-1-5144, "Containment Spray Unit 1," Revision 41
AR 0804911-01, "Cause Evaluation for NRC Information Notice 2006-22, New Ultra-Low Sulfur Diesel"

<u>1R05</u> <u>Fire Protection</u>
Fire-Pre-Plans, Fire Areas A, F, G, D, CC, DD, Revision 2
Fire Hazards Analysis, Fire Zones 1C, 1D, 1H, 1G, 4, 7, 8, 26, 27, 129,138A/B/C, Revision 13
AR 07047017, "Fire Zone Description Errors in the FHA"
AR 00807394, "Unannounced Fire Drills Not Truly Unannounced"
Job Order RO282355, "Inventory / Inspect Appendix R Temporary Power Equipment," March 6, 2006
CR 0528055, "A PM for the Inventory of Appendix R Staged Equipment Documented in Procedures 12-IHP-5021-EMP-038 and IHP-5040-IMP-008 May Not Exist"

<u>1R11</u> <u>Licensed Operator Requalification Program</u>
RQ-E-3107A, Cycle 3107 As-Found Simulator Evaluation A, Revision 0

<u>1R12</u> <u>Maintenance Effectiveness</u>
Maintenance Rule Scoping Document, "Nuclear Instrumentation," Revision 1
Maintenance Rule a(1) Action Plan, "Nuclear Instrumentation," July 1, 2001 through January 1, 2002
Maintenance Rule a(1) Action Plan, "Nuclear Instrumentation," May 1, 2003 through March 31, 2004
Maintenance Rule (a)(1) Consideration for Repetitive Maintenance Preventable Functional Failures of Function AES-01 for Train B of the AES (Auxiliary Building Ventilation) System, February 23, 2007 and revised March 9, 2007
AR 00802736, "Failure Not Considered Maintenance Rule Functional Failure"
AR 00802910, "Maintenance Rule Functional Failure Not Evaluated"
AR 00802911, "Improper Implementation of Maintenance Rule Desk Top Guide"
AR 00803316, "Evaluation Not Repetitive Maintenance Rule Functional Failure"
AR 00803315, "Maintenance Rule Functional Failure Not Evaluated"
AR 00802912, "Maintenance Rule Evaluation Too Narrow for Failure Type"
AR 00803309, "Maintenance Rule Program Implementation Weaknesses"
AR 00802737, "Maintenance Rule Evaluation Lacks Basis"
CR 04054002, "Unit 1 Intermediate Range N-35 Loss of Detector Voltage"
CR 05111055, "N-36, Nuclear Instrumentation Intermediate Range Detector Channel II, Has Oscillating Indication on Amperes and Startup Rate"
CR 05114058, "N-36 Appears to Have Failed Low"
CR 04154072, "Trending of Intermediate Range Nuclear Instruments Identified that the Plant Process Computer Indication for 2-NRI-35 Has Increased Significantly"
CR 04327040, "N-35 Intermediate Range Flux Level High Trip Did Not Clear When Nuclear Instrument Power Was 13 Percent"
CR 02147002, "During Time Response Testing the Negative Rate Trip for N-42 Exceeded Its Target Value by 0.06 Second"
CR 02044016, "Power Range Rate Circuit Card for 1-NRI-43 Drawer Is Giving an Unusual Trace for the Time Delay"

CR 02305001, "Power Range Upper Detector Flux Deviation Alarm Came In - Cause of Alarm is N-43"
CR 05022010, "The High Level Rod Stop Did Not Clear on 2-NRI-35"
CR 05131024, "Step Change in N-44 Lower Detector Signal"
CR 05325004, "Step Change in N-44 Lower Detector Signal"
CR 05030022, "Power Range Channel N-43 Spiked High to About 102.5 Percent and Caused Rods (Control Bank D) to Insert Rods 1.5 Steps"
AR 00805935, "1-ESW-115 Unable to Be Opened"
AR 00805798, "1-ESW-115 Unable to Be Opened"
CR 02017002, "1-ESW-115, ESW to TDAFW [Turbine Driven Auxiliary Feedwater] Pump Shutoff Valve Will Not Open"
AR 00124086, "2-HV-AES-2 Failed to Start on West CTS [Containment Spray] Pump Auto Start During Performance of 2-OHP-4030-232-217B"
AR 00120818, "Failure of the Unit 2 West Centrifugal Charging Pump Supply Breaker T-21A8 to Properly Make Up All Auxiliary Contacts"

<u>1R13</u> <u>Maintenance Risk Assessments and Emergent Work Evaluation</u>
Control Room Logs, January 22 through 26, 2007, March 5 through 9, 2007
Daily Work Schedules, January 22 through 26, 2007, March 5 through 9, 2007
PMP-2291-OLR-001, "On-Line Risk Management," Data Sheet 1, "Work Schedule Review and Approval Form," January 22 through 26, 2007
Configuration Risk Assessment, January 22 through 26, 2007, March 5 through 9, 2007
AR 06354503, "Bushing #5 on Breaker 12-52-BC Has No Visible Oil"
AR 00807702, "Air Hose to 2-MRV-233 Found Disconnected From Actuator"
PMP-2291-WAR-001, "Work Activity Risk Management Process," Data Sheet 1, "Work Activity Risk Evaluation Form," December 14, 2006
PMP-2291-SCH-001, "Work Control Activity Scheduling Process," Revision 16
PMP-2291-OLR-001, "On-Line Risk Management," Revision 010
AR 00806546-06, "2-NPS-121-II Equipment Failure Apparent Cause Evaluation"

<u>1R15</u> <u>Operability Evaluations</u>
AR 00125377, "While Performing R0226722 to Test and Replace 2-SV-104W, the Installed Valve Failed Its Set Pressure Test by Failing to Lift at 1.25 Times the Setpoint Value"
AR 00125378, "While Performing R0246231 to Test and Replace 2-SV-104E, the Installed Valve Failed Its Set Pressure Test by Failing to Lift at 1.25 Times the Setpoint Value"
AR 00808822, "Inappropriate Closure of Past Operability Determination and Reportability"
AR 07024031, "Received Auto Start of Both Control Room Pressurization Fans"
CR 06094043, "As-Found Visual Inspection of 2-HV-AFP-T2AC (Unit 2 Turbine Driven Auxiliary Feedwater Pump Room Cooler) Found 11 Tubes Plugged with Lake Debris (Sand/Silt/Lake Grass)"
CR 02023086, "While Performing U2C13 Generic Letter 89-13 Inspection of 2-HV-AFP-T2AC Room Cooler, Found 9 Tubes Completely Blocked and 4 Additional Tubes Partially Blocked"
AR 00122516, "Performance Assurance Identified During PA-06-02, 'Security,' That the Current Testing Does Not Demonstrate That the Security Diesel Fuel Oil Transfer System Can Perform All of its Intended Functions as Designed"
AR 07058020, "Unit 2 Lower Personnel Air Lock As-Found Leak Test Failed"
AR 00808762, "Aggregate Affects of Non-conservative Values Impacting Control Room Habitability and Offsite Dose Analyses"

10 CFR 50.59 Screening 2007-0070-00, "Compensatory Measure in Support of Control Room Habitability and Offsite Dose Analyses," March 1, 2007
AR 00127851, "Reactor Vessel Level Instrumentation System Elevation Discrepancy"
AR 00809467, "Request for Past Operability Review of Essential Service Water Configuration with One Pump Out-of-Service"
AR 00808767, "Spent Fuel Pool Ventilation System Charcoal Sample Test Results Outside Acceptance Criteria"
AR 00122516, "Performance Assurance Identified During PA-06-02, That the Current Testing Does Not Demonstrate That the Fuel Oil Transfer System Can Perform All of its Intended Functions as Designed"
AR 00809059, "EDG Steady State Frequency Limits Contained in TSs - Potential Non-conservative Upper Frequency Limit"
AR 00809013, "Reactor Coolant Drain Tank Level Calculation Shows Volume Higher Than Actual Volume"
AR 00808116, "Station Ability to Monitor 69 Kilovolt Alternate Offsite Source"

1R19 Post Maintenance Testing
Work Order 55274301-01, 1-LLS-121, Calibrate Level Switch, January 16, 2007
Work Order 55274302-01, 1-LLS-120, Calibrate Level Switch, January 16, 2007
Work Order 55274303-01, 1-LLS-122, Calibrate Level Switch, January 16, 2007
Work Order 55274304-01, 1-LLS-123, Calibrate Level Switch, January 16, 2007
Work Order 55286817-01, 1-MRV-233-PU, Replace Pilot Valve, January 25, 2007
1-OHP-4030-114-049, Attachment 14, "Steam Generator PORV Operability Test," January 25, 2007
Work Order 55231506,11, Unit 1 AB EDG 2R Fuel Injection Pump Replacement, March 15, 2006

1R22 Surveillance Testing
1-OHP-4030-112-015, Full Length Control Rod Operability Test, January 12, 2007
2-OHP-4030-256-017T, "Turbine Driven Auxiliary Feedwater System Test," Revision 2
1-OHP-4030-102-016, "Reactor Coolant System Leak Rate Test," Revision 11
2-TDB-FIG-2-15.1, "Safety-Related Pump Inservice Test Hydraulic Reference," Revision 76
2-TDB-FIG-2-19.1, "Power Operated Valve Stroke Time Limits," Revision 68
AR 00809365, "#12 Steam Generator Power Operated Relief Valve 1-MRV-223 Failed Stroke Closed Test Time"
Shift Manager's Logs, February 23-24, 2007
1-OHP-4030-114-049, "Hot Shutdown Panel Operability Test," Attachment 14, "Steam Generator PORV Operability Test," Revision 6
1-IHP-4030-182-006, "Reactor Coolant Pump (4KV) Bus 1A Channel 4 Underfrequency Relay Channel Calibration," Revision 2
Design Information Transmittal (DIT)-B-02840-05, "Allowable Values and Limiting Nominal Trip Setpoints for Improved TSs with Extended Surveillance Intervals," Revision 5
EHI-5071, "Inservice Testing Program Implementation," Data Sheet 4, "Valve Reference Value Data Sheet for Establishing New Baseline Values for 1-MRV-223," February 24, 2007

1R23 Temporary Modifications
1-TM-00-76-00-1, "On-line Leak Seal Repair of Steam Generator Blowdown Flow Control Valve 1-DRV-342," Revision 0, Supplement 1
Work Order 55285467-04, "1-DRV-342 Packing Leak," November 11, 2006
D. C. Cook UFSAR, Revision 20

1EP6 Drill Evaluation
EMD-32a, Michigan State Police, Nuclear Plant Event Notification, February 13, 2007
PMP-2080-EPP-101, "Emergency Classification," Revision 9
PMP-2080-EPP-100, "Emergency Response," Revision 7
AR 07051019, "EOF Late Activation During 2-13-07 Drill"
AR 07051032, "Delay in Placing TSC on Recirc 2-13-07 E-Plan Drill"

2OS2 As-Low-As-Reasonably-Achievable Planning and Controls
AR 00801182, Radiation Area Posting Was Not Properly Identifying Area, August 3, 2006
AR 00803693, RP Instructions Were Circumvented By an Area Coordinator, October 5, 2006
AR 00805158, RP Postings in U1 Containment Need Changed, November 6, 2006
AR 00805159, RP Needs to Change the Signs in U2 Containment, November 6, 2006
AR 00806950, Revised Form-5 Dose Records Not Submitted to NRC, December 13, 2006
12-THP-6010 RPP-014, TEDE Calculation Sheets, Revision 7, Various Jobs
12-THP-6010-RPP-016, Radiation Protection Department Shift Responsibilities, Revision 14
12-THP-6010-RPP-104, Issue and Control of Special Dosimetry, Revision 07
12-THP-6010-RPP-206, Internal Dose Assessment and Calculation, Revision 05
12-THP-6010-RPP-405, Analysis of Airborne Radioactivity, Revision 10
12-THP-6010-RPP-420, Radiological Controls for Radiography, Revision 04
12-THP-6010-RPP-421, Radiological Controls for Steam Generator Maintenance, Revision 01
PMP-6010-RPP-003, High, Locked High, and Very High Radiation Area Access, Revision 17
PMP-6010-RPP-006, Radiation Work Permit Program, Revision 09
PMP-6010-RPP-200, Internal Radiation Dose Monitoring, Revision 06
High Radiation Area Key Inventory Logs, Various Dates
PMI-6010 - Radiation Protection Plan, Revision 15
PMP-6010-ALA-001, ALARA Program - Review of Plant Work Activities, Revision 15
Radiation Protection Calculation (Internal Dose) RP-06-03, October 28, 2006
Radiological Survey Data Sheets, Various Areas, Various Dates
RWP Totals Reports, Various Dates
RWP User Exposure Report, January 12, 2007
RWP 06-1081, Unit-2 Containment Accumulator Rooms LHRA Activities, Revision 01
RWP 06-1107, U1C21 - Reactor Vessel Head Replacement, Revision 02
RWP 06-1123, U1C21 - Temporary Shielding, Revision 00
RWP 06-1142, U1C21 - Scaffold Activities in Containment, Revision 00
RWP 06-1145, U1C21 - Unit-1 Valve Maintenance / Repair in Containment, Revision 02
RWP 06-1148, U1C21 - Steam Generator Platform Activities, Revision 01
RWP 06-1153, U1C21 - RP Aux and Containment Activities, Revision 00
RWP 06-1162, U1C21 - Containment Minor Work Activities, Revision 00
RWP 06-1172, U1C21 - Containment Recirculation Sump Modification, Revision 00
RWP 06-1190, U1C21 - Pressurizer Alloy 600 Weld Overlay, Revision 0
RWP 06-1191, U1C21 - RCP 12 Rotating Assembly Replacement, Revision 01
RWP 07-1076, Remove Used Unit 1 and Unit 2 In-core Detectors from Containment Wall, Revision 00

TS 5.7 High Radiation Area, Amendment No. 287
THG-026, Locked High Radiation Area and Very High Radiation Area Weekly Verification Process, Revision 07
U1C21 Outage Job Checklists, Various Dates 2006
U1C21 Outage RWP Dose Reports, Undated

4OA1 Performance Indicator Verification
Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 4
Licensee Event Reports, January 1, 2006 through December 31, 2006
Control Room Logs, January 1, 2006 through December 31, 2006

4OA2 Identification and Resolution of Problems
CR 06032055, "Repeat Missed Surveillances During January 2006"
Root Cause Analysis of CR 06032055, "Repeat Missed Surveillances During January 2006," April 4, 2006
Root Cause Investigation Effectiveness Review of CR 06032055, "Adverse Trend: Surveillance Program Issues," September 12, 2006
Root Cause Analysis of CR 00806546, "Reactor Coolant System Packing Leak December 2006," February 28, 2007

4OA3 Event Response
LER 05000315/2006002-00, "Failure to Comply with TS Requirement 3.6.13," November 30, 2006
AR 06276085, "Missing Bolts on Divider Barrier Seal"
1-EHP-4030-195-249, "Containment Divider Barrier Seal Surveillance Test," Revision 3
Job Order R0253300, "Perform Barrier Seal Visual Inspection Per 1-EHP-4030-195-249," February 4, 2005
Job Order R0230624, "Perform Barrier Seal Visual Inspection Per 1-EHP-4030-195-249," June 16, 2003
Job Order R0211294, "Perform Barrier Seal Visual Inspection Per 1-EHP-4030-195-249," April 6, 2002
LER 05000315/2006-003-00, "Failure to Comply With TS Requirement 3.3.6," December 13, 2006
1-OHP-4021-028-005, "Operation of the Containment Purge System," Attachment 3, "Stopping the Containment Purge System," Revision 25, October 24, 2006
1-OHP-4030-127-037, "Refueling Surveillance," Data Sheet 3, "Shiftly Surveillance Requirements To Continue Core Alterations," Revision 7, October 24, 2006

4OA5 Other
AR 06330008, "Weaknesses in Processes/Procedures Creates Potential for Missed Surveillance"
Unit 1 Control Room Log, November 5 through 21, 2006
D. C. Cook Unit 1 TSs and Bases

LIST OF ACRONYMS USED

ADAMS	Agency-wide Documents and Management System
ALARA	As-Low-As-Reasonably-Achievable
AR	Action Request
CCW	Component Cooling Water
CFR	Code of Federal Regulations
EDG	Emergency Diesel Generator
HRA	High Radiation Area
IMC	Inspection Manual Chapter
IST	Inservice Testing
LER	Licensee Event Report
LHRA	Locked High Radiation Area
MRE	Maintenance Rule Evaluation
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
PARS	Publicly Available Records
PI	Performance Indicator
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RP	Radiation Protection
RWP	Radiation Work Permit
SDP	Significance Determination Process
SSC	Structures, Systems, and Components
TS	Technical Specifications
U1C21	Unit 1 Cycle 21 Refueling Outage
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VHRA	Very High Radiation Area