UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

August 13, 2008

Mr. Michael W. Rencheck
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 05000315/2008003; 05000316/2008003

Dear Mr. Rencheck:

On June 30, 2008, 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 July 9, 2008, with Mr. L. Weber 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, five NRC-identified, and one self-revealed finding of very low safety significance were identified. The findings involved violations of NRC requirements. However, because of their very low safety significance, and because the issues were entered into your corrective action program, the NRC is treating the issues as Non-Cited Violations in accordance with Section VI.A.1 of the NRC Enforcement Policy. Additionally, three licensee identified violations are listed in Section 4OA7 of this report.

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 Office at the D. C. Cook Nuclear Power Plant.

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Sincerely,

/RA/
Ross Telson, Acting Chief
Projects Branch 4
Division of Reactor Projects

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

cc w/encl: L. Weber, Site Vice President
J. Gebbie, Plant Manager
G. White, Michigan Public Service Commission
Michigan Department of Environmental Quality
Planning Manager, Emergency Management and Homeland Security Division, Michigan State Police Department
T. Strong, State Liaison Officer

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Planning Manager, Emergency Management and Homeland Security Division, Michigan State Police Department
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Letter to M. Rencheck from R. Telson dated August 13, 2008

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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.	05000315/2008003; 05000316/2008003
Licensee:	Indiana Michigan Power Company
Facility:	D. C. Cook Nuclear Power Plant, Units 1 and 2
Location:	Bridgman, MI 49106
Dates:	April 1, 2008, through June 30, 2008
Inspectors:	B. Kemker, Senior Resident Inspector J. Lennartz, Senior Resident Inspector P. LaFlamme, Resident Inspector J. Bozga, Reactor Inspector A. Garmoe, Resident Inspector, Braidwood M. Holmberg, Reactor Inspector J. Jandovitz, Reactor Inspector R. Jickling, Senior Emergency Preparedness Inspector M. Phelan, Health Physicist F. Tran, Reactor Engineer
Approved by:	R. Telson, Chief - Acting Projects Branch 4 Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

IR 05000315/2008003, 05000316/2008003; 04/01/2008 – 06/30/2008; D. C. Cook Nuclear Power Plant, Units 1 and 2; Operability Evaluations, Permanent Plant Modifications, Refueling and Other Outage Activities, Surveillance Testing, As-Low-As-Reasonably-Achievable Planning and Controls, and Followup of Events and Notices of Enforcement Discretion

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Six Green findings, all of which were non-cited violations (NCVs) 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.

NRC-Identified and Self-Revealing Findings

Cornerstone: Barrier Integrity

Green. The inspectors identified a finding of very low safety significance with an associated Non-Cited Violation of Technical Specification Surveillance Requirement 3.6.1.1. Licensee personnel failed to perform an as-found local leak rate test as required for containment isolation valves 2-WCR-922 and 2-WCR-923 (Train 'A' and Train 'B' non essential service water return from upper containment ventilation unit #1) prior to performing maintenance that affected the valves' leak tightness. This condition prohibited by Technical Specifications was subsequently reported to the NRC in accordance with 10 CFR 50.73(a)(2)(i)(B) and as left leak rate tests were completed satisfactorily.

This finding was of more than minor significance because the Barrier Integrity cornerstone objective of providing reasonable assurance that the physical design barriers (e.g., containment) protect the public from radio-nuclide releases caused by accidents or events was adversely affected since the as-found condition of containment isolation valves 2-WCR-922 and 2-WCR-923 was unknown and could not be evaluated. This finding was of very low safety significance because it did not involve a failure to maintain the capability to close containment and did not involve the hydrogen igniters. This finding was associated with a cross-cutting aspect in the area of problem identification and resolution regarding the corrective action program (IMC 0305 P.1(d). (Section 4OA3.3)

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance with an associated Non-cited Violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action." Licensee personnel failed to identify unacceptable interference between the Unit 1 Safety Injection (SI) system piping and the remote strainer waterway in the annulus, rendering the emergency core cooling system (ECCS) for Unit 1 in a degraded condition. For corrective actions, licensee personnel planned to install additional

supports to the SI piping during the next scheduled Unit 1 refueling outage in the fall of 2009.

This finding was more than minor because it could become a more significant safety concern if left uncorrected. Specifically, the close proximity of the SI piping to the remote strainer waterway resulted in the ECCS being in a degraded condition because the SI piping would contact the strainer during an operating basis earthquake event concurrent with a loss of cooling accident. This finding was of very low safety significance because no actual loss of safety function occurred. This finding was associated with a cross-cutting aspect in the area of problem identification and resolution regarding the corrective action program. (IMC 0305, P.1(c)) (Section 1R15)

- Green. The inspectors identified a finding of very low safety significance and an associated Non-Cited Violation of 10 CFR 50, Appendix B, Criteria V, "Instructions, Procedures and Drawings." Licensee personnel failed to review the Unit 1 emergency operating procedures to determine if the procedures were impacted by the plant modification that removed the check valves from the essential service water (ESW) cooling water supplies to the emergency diesel generators. Consequently, the emergency operating procedures were not revised to include appropriate guidance when aligning ESW cooling to the emergency diesel generators after the modification was installed. As an interim corrective action, caution tags were placed on the control room switches utilized for aligning ESW to the emergency diesel generators to provide appropriate guidance to the operators. Licensee personnel also planned on revising the emergency operating procedures.

  This finding could become a more significant safety concern if left uncorrected and therefore was more than minor. Specifically, the emergency operating procedures contained inadequate guidance that could result in opening both the normal and alternate ESW supply valves to the emergency diesel generators. Consequently, the design function of the valves to isolate one train of ESW from the other would be adversely impacted. This finding was of very low safety significance because no actual loss of safety function occurred. This finding was associated with a cross-cutting aspect in the area of problem identification and resolution regarding the corrective action program. (IMC 0350, P.1(a)) (Section 1R18)

- Green. The inspectors identified a finding of very low safety significance and a Non-Cited Violation of 10 CFR 50, Appendix B, Criteria V, "Instructions, Procedures, and Drawings." The licensee failed to adequately implement surveillance test inspection requirements for the Unit 1 ECCS recirculation sump. The inspectors identified instances where the licensee did not correctly implement procedural requirements for conducting the recirculation sump inspection or where the sump inspection procedure lacked sufficient detail to ensure that the sump would support ECCS operability. In addition, procedural controls were inadequate to ensure that the main strainer bottom panel back rail was properly installed with all of the bolts torqued when installation of the remote strainer and waterway plant modification was completed. The licensee corrected the inspector identified problems with the recirculation sump prior to Unit 1 entering Mode 4.

This finding could become a more significant safety concern if left uncorrected and was therefore more than a minor concern. The failure to adequately perform surveillance testing could result in the failure to identify degraded or inoperable safety-related equipment. This finding was of very low safety significance because the recirculation sump was not required to be capable of performing a safety-related function immediately following the inadequate surveillance. This finding was associated with a cross-cutting aspect in the area of human performance regarding resources (IMC 0305, H.2(c)) (Section 1R22)

Cornerstone: Miscellaneous

- Green. The inspectors identified a finding of very low safety significance and an associated Non-Cited Violation of Technical Specification 5.2.2.d. The licensee failed to adhere to the Technical Specification overtime restrictions for personnel performing safety related work during the Unit 1 Cycle 22 refueling outage specified in NRC Generic Letter 82-12, "Nuclear Power Plant Staff Working Hours." The licensee approved blanket overtime requests for several hundred workers performing outage work activities. Licensee personnel entered this issue into its corrective action program for evaluation.

  This finding was of more than minor significance because the excessive work hours would increase the likelihood of human errors during refueling outage activities, which if left uncorrected could become a more significant safety concern. Consistent with the guidance in IMC0612, Section 05.04.c, this finding was reviewed by NRC management and was determined to be a finding of very low safety significance because there were no actual adverse plant or equipment conditions identified that were attributed to worker fatigue. This finding was associated with a cross-cutting aspect in the area of human performance regarding resources. (IMC 0305 H.2(c)) (Section 1R20)

Cornerstone: Occupational Radiation Safety

- Green. A self-revealed finding of very low safety significance was identified for the failure to effectively implement dose reducing radiological and engineering controls consistent with maintaining occupational doses as-low-as-is-reasonably-achievable (ALARA). The failure resulted in an actual dose outcome that was not consistent with the planned, intended dose for work associated with modifications to the reactor recirculation sump strainer during Refuel Outage U2C17. Corrective actions were implemented to address organization and programmatic deficiencies, as well as capturing lessons learned to support the detailed planning necessary for the installation of the modification on Unit 1.

  The finding was more than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of ALARA planning/dose projection, and affected the cornerstone objective of programs and processes for ensuring adequate protection of worker health and safety from exposure to radiation, in that, ineffective work control and ALARA planning deficiencies contributed to an actual increase in worker doses in excess of five person-rem and exceeded the licensee's initial intended dose estimates by more than 50 percent. This finding was of very low safety significance because it did not involve: (1) an overexposure; (2) a substantial potential for an overexposure; or

(3) an impaired ability to assess dose. It did involve ALARA planning and controls; however, the three-year rolling average for DC Cook Plant is less than SDP threshold of 135-person-rem for Pressurized Water Reactors. The finding was determined to be associated with a cross-cutting aspect in the area of human performance regarding work controls (IMC 0305 H.3(a)). (Section 2OS2.2)

B. Licensee-Identified Violations

Violations of very low safety significance that were identified by the licensee have been reviewed by inspectors. Corrective actions taken by the licensee have been entered into the licensee's corrective action program. The violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 was shutdown and in Mode 6 (Refueling) for Cycle 22 refueling outage when the inspection period began. Following the refueling outage, the main generator was synchronized to the grid on April 29, 2008, and the unit returned to full power on May 3, 2008. Unit 1 remained at full power until June 28, 2008, when power was initially reduced to 90 percent to perform planned maintenance activities on non-safety related "A" main condenser water box. Power was subsequently raised to approximately 96 percent while the maintenance activities were being completed. Following the maintenance, Unit 1 was returned to full power on June 30, 2008, and remained at full power when the inspection period ended.

Unit 2 was operated at or near full power during the inspection period with the following exceptions:

- On April 1, 2008, the Unit 2 condensate storage tank chemistry was unknowingly adversely impacted by outage work activities that were ongoing on Unit 1. This resulted in exceeding action limits for Unit 2 steam generator chemistry on April 2, 2008, and required power to be reduced to 75 percent. Unit 2 was returned to full power on April 3, 2008.

- On May 16, 2008, Unit 2 commenced a power reduction and Mode 2 (Startup) was entered on May 17, 2008, when the main turbine was tripped for planned maintenance to the non-safety related low pressure turbine reheat steam intercept valves. The plant remained in Mode 2 with reactor power at approximately 2.5 percent during the maintenance activities. Following the maintenance, the main generator was synchronized to the grid on May 18, 2008, and the Unit 2 was subsequently returned to full power on May 19, 2008.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 Summer Seasonal Readiness Preparations

a. Inspection Scope

The inspectors performed a review of the licensee's preparations for summer weather for selected systems, including problems that could result from extended high temperatures.

During the inspection, the inspectors focused on plant specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified that

operator actions were appropriate as specified by plant specific procedures. The inspectors' reviews focused specifically on the following plant systems:

- Unit 1 and Unit 2 auxiliary feedwater system pump rooms;
- Unit 1 and Unit 2 digital instrumentation control system;
- supplemental diesel generator system; and
- supplemental containment cooling system.

The inspectors also reviewed corrective action program items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their corrective action program in accordance with plant procedures.

This inspection constitutes one seasonal adverse weather sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings of significance were identified.

.2 Summer Readiness of Offsite and Alternate AC Power Systems.

a. Inspection Scope

The inspectors performed a review of the licensee's plant features and procedures for responding to issues that could impact the offsite and onsite alternate AC (alternating current) power systems. Specially, the inspectors verified that:

- communications and coordination between the transmission system operator (TSO) and the plant were in place to ensure that appropriate information is exchanged when issues arise that could impact availability of the offsite and alternate AC power systems;
- procedures sufficiently addressed actions to monitor and maintain availability and reliability of the off site and the onsite alternate AC power systems; and
- risk assessments were required for maintenance activities that could affect grid reliability or the ability of the transmission system to provide off site power.

This inspection constitutes one grid stability sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk-significant systems:

- Alternate methods for spent fuel pool cooling;
- Unit 2 CD emergency diesel generator; and
- Unit 1 north safety injection

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, UFSAR, Technical Specification (TS) requirements, outstanding work orders, action requests, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions 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 and support equipment were aligned correctly and examined the material condition of the components to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization.

These activities constituted three partial system walkdown samples as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

The inspectors conducted fire protection walkdowns which were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- Fire Zones 29C and 29D, Unit 2 Essential Service Water Pump Rooms.
- Fire Zone 29F, Unit 2 Motor Control Center for Essential Service Water Pump Rooms.

- Fire Zone 66, Unit 1 Containment Piping Annulus.
- Fire Zone 22, Unit 2 Quadrant 2 Piping Tunnel.
- Fire Zone 68, Unit 1 Containment Upper Volume.

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, and maintained passive fire protection features in good material condition. The inspectors selected fire areas based on their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. The inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed, that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified fire protection problems entered into the licensee's corrective action program with the appropriate characterization.

These activities constitute five quarterly fire protection inspection samples as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings of significance were identified.

.2 Fire Protection – Drill Observation (71111.05A)

a. Inspection Scope

During an unannounced drill on May 14, 2008, associated with the Unit 2 turbine auxiliary cooling water pump fire, the inspectors assessed the timeliness of the fire brigade in arriving at the scene, the fire fighting equipment brought to the scene, the donning of fire protective clothing, the effectiveness of communications, and the exercise of command and control by the fire brigade leader. The inspectors also assessed the acceptance criteria for the drill objectives; the rigor and thoroughness of the post-drill critique; and verified that fire protection drill problems were being entered into the licensee's corrective action program with the appropriate characterization.

This activity constitutes one annual fire protection inspection sample as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings of significance were identified.

1R07 Annual Heat Sink Performance (71111.07)

.1 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed the licensee's inspections and cleaning of the Unit 1 east containment spray heat exchanger and the Unit 1 west containment spray heat exchanger. The inspectors verified that potential deficiencies did not mask the licensee's ability to detect degraded performance, to identify any common cause issues that had the potential to increase risk, and to ensure that the licensee was adequately addressing problems that could result in initiating events that would cause an increase in risk. The inspectors reviewed the licensee's observations as compared against the acceptance criteria. The inspectors also reviewed action requests regarding heat sink problems to verify that the problems were entered into the licensee's corrective action program with the appropriate characterization. Select action requests were reviewed to verify that corrective actions were appropriate.

This inspection constitutes two samples as defined in Inspection Procedure 71111.07-05.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection Activities (71111.08P)

For Unit 1, from March 26, 2008, through April 8, 2008, the inspectors reviewed implementation of the licensee's Inservice Inspection (ISI) Program for monitoring degradation of the reactor coolant system, steam generator tubes, emergency feedwater systems, risk significant piping and components, and containment systems.

The inspections described in Sections 1R08.1, 1R08.2, R08.3, IR08.4 and 1R08.5 below count as one inspection sample as defined by Inspection Procedure 71111.08-05.

.1 Piping Systems ISI

a. Inspection Scope

The inspectors observed the following nondestructive examinations required by the American Society of Mechanical Engineers (ASME) Section XI Code to evaluate compliance with the ASME Code Section XI and Section V requirements and if any indications and defects were detected, to determine if these were dispositioned in accordance with the ASME Code or an NRC approved alternative requirement.

- Ultrasonic Examination (UT) of bolting for valve MSIV-MRV-210.
- UT of Safety Injection System piping welds 1-SI-29-03S and 1-SI-29-04F.
- Visual VT-1 examination of bolting for valve RH-134.

The inspectors reviewed the following examinations completed during the previous outage with relevant/recordable conditions/indications accepted for continued service to determine if acceptance was in accordance with the ASME Code Section XI or an NRC approved alternative.

- UT of feedwater reducer-to-elbow weld 1FW-11-13S.

The inspectors reviewed the following pressure boundary welds completed for risk significant systems during the last Unit 1 refueling outage to determine if the licensee applied the pre-service non-destructive examinations and acceptance criteria required by the construction Code, and an NRC approved Code Case N-416. Additionally, the inspectors reviewed the welding procedure specification and supporting weld procedure qualification records to determine if the weld procedures were qualified in accordance with the requirements of Construction Code and the ASME Code Section IX.

- Welds OW 1, OW 2, OW 3, OW 4 and OW 5 fabricated during replacement of auxiliary feedwater system valve 1-FRV-255.

b. Findings

No findings of significance were identified.

.2 Reactor Pressure Vessel Upper Head Penetration Inspection Activities

a. Inspection Scope

For the Unit 1 vessel head, no examination was required pursuant to NRC Order EA-03-009 and the licensee did not complete one during the current refueling outage. Therefore, no NRC review was completed for this inspection procedure attribute.

b. Findings

No findings of significance were identified.

.3 Boric Acid Corrosion Control

a. Inspection Scope

The inspectors reviewed licensee Boric Acid Corrosion Control visual examinations for portions of the reactor coolant and emergency core cooling systems within containment to determine if these visual examinations emphasized locations where boric acid leaks can cause degradation of safety significant components.

The inspectors reviewed the following licensee evaluations of reactor coolant system components with boric acid deposits to determine if degraded components were documented in the corrective action system. The inspectors also evaluated corrective actions for any degraded reactor coolant system components to determine if they met the ASME Section XI Code.

- 1-PP-45-2, coupling connection.
- 1-NCR-105, reactor coolant hot leg sample valve.
- 1-1MO-275, emergency core cooling valve.

The inspectors reviewed the following corrective actions related to evidence of boric acid leakage to determine if the corrective actions completed were consistent with the requirements of the ASME Code Section XI and 10 CFR Part 50, Appendix B, Criterion XVI.

- AR 00805195, 1-ICM-111 packing leak.
- AR 00826310, 1-IMO-275 dry boric acid.
- AR 00806891, reactor coolant pump seal water.
- AR 00821286, boric acid at thermocouple fitting.

b. Findings

No findings of significance were identified.

.4 Steam Generator (SG) Tube Inspection Activities

a. Inspection Scope

For the Unit 1 SGs, no examination was required pursuant to the TSs and the licensee did not complete one during the current refueling outage. Therefore, no NRC review was completed for this inspection procedure attribute.

b. Findings

No findings of significance were identified.

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspectors performed a review of ISI/SG related problems entered into the licensee's corrective action program and conducted interviews with licensee staff to determine if;

- the licensee had established an appropriate threshold for identifying ISI/SG related problems;
- the licensee had performed a root cause (if applicable) and taken appropriate corrective actions; and
- the licensee had evaluated operating experience and industry generic issues related to ISI and pressure boundary integrity.

The inspectors performed these reviews to evaluate compliance with 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements. The corrective action documents reviewed by the inspectors are listed in the attachment to this report.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Resident Inspector Quarterly Review (71111.11Q)

a. Inspection Scope

On June 03, 2008, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator requalification training to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- licensed operator performance;
- crew's clarity and formality of communications;
- ability to take timely actions in the conservative direction;
- prioritization, interpretation, and verification of annunciator alarms;
- correct use and implementation of abnormal and emergency procedures;
- control board manipulations;
- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications.

The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements.

This inspection constitutes one quarterly licensed operator requalification program sample as defined in Inspection Procedure 71111.11.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations(71111.12Q)

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk significant systems:

- Unit 1 Emergency Core Cooling High Head Injection System
- Unit 2 Emergency Core Cooling High Head Injection System

The inspectors reviewed events such as where ineffective equipment maintenance had resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for SSCs/functions classified as (a)(2) or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization.

This inspection constitutes two quarterly maintenance effectiveness samples as defined in Inspection Procedure 71111.12-05.

b. Findings

No findings of significance were identified.

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

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- Emergent maintenance during the week of March 31st on Unit 2 CD emergency diesel generator and 69 kilo volt undervoltage relay.
- Planned maintenance on April 12 on both Unit 1 essential service water pumps during the refueling outage.
- Planned Unit 1 mid-loop operations on April 20 for reactor coolant system fill and vent during the refueling outage.
- Planned maintenance during the week of May 5 on Unit 2 plant air compressor, Unit 1 CD emergency diesel generator and the supplemental diesel generators.

- Planned maintenance during the week of June 16 on Unit 2 for the south safety injection pump, the AB emergency diesel generator and the turbine driven auxiliary feedwater pump.

These activities were selected based on their potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

These activities constituted five samples as defined in Inspection Procedure 71111.13-05.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- AR 00830724, “Pipe Interaction With Remote Strainer Waterway”
- AR 00829549, “Support 1-2-GRH-R508 Has Been Removed”
- AR 00809803, “Air Void Found In Piping Downstream of 1-IMO-350”
- AR 00829549, “Aggregate Operability Determination Evaluation for Unit 1”

The inspectors selected these potential operability issues based on the risk-significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and Updated Safety Analysis Report to the licensee’s evaluations, to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations.

This inspection constitutes four samples as defined in Inspection Procedure 71111.15

b. Findings

Introduction

The inspectors identified a finding of very low safety significance (Green) with an associated Non-cited Violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action." Licensee personnel failed to identify unacceptable interference between the Unit 1 safety injection (SI) system piping and the remote strainer waterway in the annulus, rendering the ECCS (Emergency Core Cooling System) for Unit 1 operable but degraded.

Description

During the review of Operability Determination Evaluation AR 829848, "Support 1-2-GRH-R508 has been removed," which identified the close proximity of the residual heat removal (RHR) piping to the remote strainer waterway, the inspectors visually inspected the clearance issue during a partial walkdown of the Unit 1 containment annulus on April 28, 2008. During the walkdown, the inspectors noted an 8-inch SI system pipe that was as close in proximity to the remote strainer waterway as the RHR pipe and questioned licensee personnel regarding the close proximity.

Licensee personnel subsequently initiated a prompt operability evaluation, which was documented in AR 830724, "Potential Interference Between 8-inch SI Piping and Recirculation Sump Remote Strainer Waterway." The prompt operability evaluation was completed on April 29, 2008, and concluded that the Unit 1 ECCS was operable but degraded. In addition, the prompt operability extent of condition concluded that sufficient clearances between the SI piping and sump waterway existed on Unit 2. The inspectors reviewed the evaluation and did not identify any issues of significance.

The inspectors noted that the degraded classification was based on the SI piping interaction with the remote strainer waterway during an earthquake concurrent with loss of coolant accident (LOCA). Specifically, if an Operating Basis Earthquake were to occur during a LOCA, the combined thermal and seismic stresses would result in the SI piping contacting the remote strainer waterway. Subsequently, the evaluation illustrated that the piping stress resulting from contact did not exceed operability limits and therefore the ECCS system was determined to be operable but degraded. For corrective actions, the licensee plans to install an additional structural support on the SI piping to limit piping deflection and thereby return the ECCS system to a non-degraded condition.

The inspectors concluded that the failure to identify the close proximity of the SI piping to the remote strainer waterway during an extent of condition review for AR 829848, was a licensee performance deficiency that warranted an evaluation in accordance with the significance determination process.

Analysis

The inspectors reviewed the samples 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 the failure to identify the close proximity of the SI system piping to the remote strainer waterway could become a more significant safety concern if left uncorrected and was therefore more than a minor concern. Specifically, the close proximity of the SI piping to the remote strainer waterway resulted in the ECCS being in a degraded condition because the SI piping would contact the strainer during an operating basis earthquake event concurrent with a LOCA.

Because this issue directly impacts the ECCS, which is required to mitigate a LOCA event, the inspectors concluded that this finding was associated with the Mitigating Systems cornerstone. The inspectors performed a Phase 1 SDP review of this finding using the guidance provided in IMC 0609, Attachment 4, “Phase 1 - Initial Screening and Characterization of Findings,” and determined that this finding was of very low safety significance because the finding: (1) was not a design or qualification deficiency; (2) did not represent an actual loss of a systems safety function; (3) did not represent an actual loss of safety function of a single train for greater than its TS allowed outage time; (4) did not represent an actual loss of safety function of one or more non-TS trains of equipment designated as risk significant; and (5) did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

Cross-cutting Aspects

The inspectors concluded that this finding has a cross-cutting aspect in the area of problem identification and resolution. Licensee personnel failed to adequately perform an extent of condition review during an operability evaluation pertaining to an RHR system piping interface with the remote strainer waterway. (IMC 0305, P.1(c))

Enforcement

10 CFR 50 Appendix B, Criterion XVI, “Corrective Action,” required in part that conditions adverse to quality are promptly identified and corrected.

Contrary to the above, on April 16, 2008, licensee personnel failed to promptly identify that the SI line was too close in proximity to the remote strainer. Consequently, the ECCS was in a degraded condition in that the SI piping would have contacted the remote strainer waterway during a seismic event concurrent with a LOCA. For corrective action, the licensee plans to install an additional support during the next Unit 1 refueling outage scheduled for the fall of 2009, which would return the ECCS to a non-degraded condition. Because of the very low safety significance, this violation is being treated as a Non-Cited Violation consistent with Section VI.A of the NRC Enforcement Policy This finding was entered into the licensee's corrective action program as AR 830724 (NCV 05000315/2008003-01).

1R18 Plant Modifications (71111.18)

.1 Permanent Plant Modifications

a. Inspection Scope

The following engineering design packages were reviewed and selected aspects were discussed with engineering personnel:

- EC-00000 47653, "Modify Component Cooling Water Heat Exchanger Outlet Motor Operated Valves to Open on Loss of Offsite Power Without Safety Injection"
- 1-CMM-55053, "Remove Unit 1 Normal and Alternate Essential Service Water Supply to Emergency Diesel Generator Check Valves"

The design documents and related documentation were reviewed for adequacy of the associated 10 CFR 50.59 safety evaluation screening, consideration of design parameters, implementation of the modification, post-modification testing, and relevant procedures, design, and licensing documents were properly updated. The inspectors observed portions of ongoing and completed work activities to verify that installation was consistent with the design control documents.

This inspection constitutes two samples as defined in Inspection Procedure 71111.18.

b. Findings

Introduction

The inspectors identified a finding of very low safety significance (Green) with an associated Non-cited Violation of 10 CFR 50, Appendix B, Criteria V, "Instructions, Procedures and Drawings." Licensee personnel failed to review the Unit 1 emergency operating procedures to determine if the procedures were impacted by the plant modification that removed the check valves from the essential service water cooling water supplies to the emergency diesel generators. Consequently, the emergency operating procedures were not revised as necessary after the modification was installed.

Description

During the review of modification 1-CMM-55053, "Removal of Unit 1 Normal and Alternate ESW Supply to Emergency Diesel Generators (EDG) Check Valves 1-ESW-111, 1-ESW-113, 1-ESW-112 and 1-ESW-114" the inspectors noted that the design package open items list required several operations procedures to be revised. Because the modification removed the check valves, the procedure revisions were required to ensure that the motor operated valves provided the flow isolation function previously accomplished by the check valves to prevent flow diversion to the opposite header (train). Specifically, the procedure revisions ensured that the normal ESW supply valve was closed and verified closed before the alternate ESW supply valve was opened. The inspectors noted that the operations procedures had been revised as required.

The inspectors also noted that the design package open items list required a review of emergency operating procedures prior to returning the modification to operations to determine if similar revisions were required. However, there was no evidence that the procedures had been reviewed as required. After the inspectors asked licensee personnel to provide a status of the open item to review the emergency operating procedures, Action Request (AR) 00832337 was generated. The AR stated that the emergency operating procedures had been reviewed and there was no impact from the modification. The AR further stated that the review had not been documented and that this AR was to formally document the review.

During a subsequent review, the inspectors identified examples where the modification did impact the emergency operating procedures. For example, 1-OHP-4023, Supplement 012, "Restoring DG (Diesel Generator) Power," step 11, directed the operators to check that the ESW flowpath was established to the emergency diesel generators; and 1-OHP-4023-ECA-0.0, "Loss of All AC (Alternating Current) Power," step 7 directed the operators to verify that cooling was established to the emergency diesel generator. However, the procedure steps did not contain any precautions, notes or specific guidance to ensure that either the normal or alternate ESW supply valve was closed prior to opening the other supply valve. Consequently, both ESW supply valves could be opened at the same time and the isolation function to prevent ESW flow diversion from one train to the other would be adversely impacted.

Licensee personnel subsequently identified that the Unit 1 emergency operating procedures were not reviewed because a review of the Unit 2 procedures in September 2007 for the same modification did not identify any impact. The procedure review performed for the Unit 2 modification was documented in AR 00806028, which stated that it appears that the emergency operating procedures are unaffected by the check valve removal. Therefore, the Unit 1 procedures were not reviewed when the modification was completed for Unit 1. Consequently, the procedures did not get revised as necessary after the modifications were completed.

The inspectors concluded that the failure to review the Unit 1 emergency operating procedures to determine if the modification adversely impacted the procedures was a licensee performance deficiency that warranted an evaluation in accordance with the significance determination process.

Analysis

The inspectors reviewed the samples of minor issues in IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," and determined hat there were no examples related to this issue. Consistent with the guidance in IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Disposition Screening," the inspectors determined that the failure to review the emergency operating procedures to determine if the modification impacted the procedures could become a more significant safety concern if left uncorrected and was therefore more than a minor concern. Specifically, the procedures contained inadequate guidance that could result in opening the normal and alternate ESW supply valves to the emergency diesel generator at the same time. Consequently, the valves' isolation function to prevent ESW flow diversion from one train to the other would be adversely impacted.

Because this issue had a potential to impact the emergency diesel generators, which are primarily associated with mitigating a loss of electrical power events, the inspectors concluded that this finding was associated with the Mitigating Systems cornerstone. The inspectors performed a Phase 1 SDP review of this finding using the guidance provided in IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," and determined that this finding was of very low safety significance because the finding: (1) was not a design or qualification deficiency; (2) did not represent an actual loss of a systems safety function; (3) did not represent an actual loss of safety function of a single train for greater than its TS allowed outage time; (4) did not represent an actual loss of safety function of one or more non-TS trains of equipment designated as risk significant; and (5) did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

Cross-cutting Aspects

This finding has a cross cutting aspect in the area of problem identification and resolution. Specifically, during a review of Unit 2 emergency operating procedures, licensee personnel failed to identify that the procedures were impacted by the plant modification. ((IMC 0350, P.1(a))

Enforcement

10 CFR 50 Appendix B, Criteria V, "Instructions, Procedures and Drawings," required in part that activities affecting quality shall be prescribed by documented instructions or procedures of a type appropriate to the circumstances. Contrary to the above, during the spring 2008 refueling outage on Unit 1, Emergency Operating Procedures OHP-4023 Supplement 012, "Restoring DG Power," and OHP-4023-ECA-0.0, "Loss of All AC," were not appropriate to the circumstances. The procedures did not contain appropriate precautions, notes or steps to ensure that either the normal or alternate ESW supply valve was closed prior to opening the other supply valve when aligning ESW to the emergency diesel generators. Consequently, the valves' isolation function to prevent ESW flow diversion from one train to the other would be adversely impacted.

Licensee personnel included corrective actions to revise the emergency operating procedures in AR 0832337, which was entered into the corrective action program. As an interim corrective action, caution tags were placed on the control switches for the ESW supply valves to the emergency diesel generators in the control room to alert the operators that one supply valve has to be closed prior to opening the other supply valve. Because of the very low safety significance, this violation is being treated as a Non-Cited Violation consistent with Section VI.A of the NRC Enforcement Policy (NCV 05000315/2008003-02, NCV 05000316/2008003-02).

1R19 Post Maintenance Testing (71111.19)

.1 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed post-maintenance testing for the following activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- replacement of Unit 2 solid state protection system Train B card at location A3;
- Unit 1 “AB” emergency diesel generator 18 month maintenance;
- replacement of fuel injector pump for cylinder 4F on Unit 2 “CD” emergency diesel generator;
- preventative maintenance on Unit 2 “AB” emergency diesel generator ventilation system;
- corrective maintenance on Unit 1 south safety injection pump discharge containment isolation valve 1-ICM-265; and
- replacement of fuel injector pumps for cylinders 2F, 4F, 2R and 5R on Unit 2 “AB” emergency diesel generator.

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 contained clear acceptance criteria, which demonstrated operational readiness and that the acceptance criteria was met; that appropriate test instrumentation was used; the equipment was returned to its operational status following testing, and test documentation was properly evaluated.

In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to verify that identified problems were entered into the licensee's corrective action program with the appropriate characterization. Selected action requests were reviewed to verify that the corrective actions were appropriate and implemented as scheduled.

This inspection constitutes six samples as defined in Inspection Procedure 71111.19.

b. Findings

No findings of significance were identified.

1R20 Outage Activities (71111.20)

.1 Refueling Outage Activities

a. Inspection Scope

The inspectors evaluated the licensee's conduct of Unit 1 Cycle 22 refueling outage activities to assess the licensee's control of plant configuration and management of

shutdown risk. The inspectors reviewed the Unit 1 outage risk assessment as well as the Unit 2 online risk assessment due to the Unit 1 outage to verify that the licensee maintained defense-in-depth to minimize shutdown risk. During the refueling outage, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below.

- Licensee configuration management, including maintenance of defense-in-depth commensurate with the risk assessment for key safety functions and compliance with the applicable TS when taking equipment out of service.
- Implementation of clearance activities and confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing.
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error.
- Monitoring of decay heat removal processes, systems, and components.
- Controls to ensure that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system.
- Reactor water inventory controls including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss.
- Controls over activities that could affect reactivity.
- Maintenance of secondary containment as required by TS.
- Refueling activities, including fuel handling and sipping to detect fuel assembly leakage.
- Startup and ascension to full power operation, tracking of startup prerequisites, walkdown of upper and lower containment to verify that debris had not been left which could block emergency core cooling system suction strainers, and reactor physics testing.
- Licensee identification and resolution of problems related to refueling outage activities.

The inspectors also reviewed implementation of overtime guidelines or limitations as required by TS.

This inspection constitutes one refueling outage sample as defined in Inspection Procedure 71111.20.

b. Findings

Introduction

The inspectors identified a finding of very low safety significance (Green) with an associated Non-cited Violation of TS 5.2.2.d. The licensee failed to adhere to the TS overtime restrictions specified in NRC Generic Letter 82-12, “Nuclear Power Plant Staff Working Hours,” for personnel performing safety related work during the Unit 1 Cycle 22 refueling outage.

Description

The inspectors reviewed the licensee's use of overtime for personnel performing safety related work during the refueling outage and found one issue of concern regarding the use of blanket overtime requests for several hundred workers performing outage work activities.

Unit 1 TS 5.2.2.d required that the amount of overtime worked by unit staff members performing safety related functions must be limited in accordance with the NRC Policy Statement on working hours (NRC Generic Letter 82-12).

Generic Letter 82-12 states, in part, that:

"Enough plant operating personnel should be employed to maintain adequate shift coverage without routine heavy use of overtime. The objective is to have operating personnel work a normal 8-hour day, 40-hour week while the plant is operating. However, in the event that unforeseen problems require substantial amounts of overtime to be used, or during extended periods of shutdown for refueling, major maintenance or major plant modifications, on a temporary basis, the following guidelines shall be followed:

1. An individual should not be permitted to work more than 16 hours straight (excluding shift turnover time).

2. An individual should not be permitted to work more than 16 hours in any 24-hour period, nor more than 24 hours in any 48-hour period, nor more than 72 hours in any 7 day period (all excluding shift turnover time).

3. A break of at least eight hours should be allowed between work periods (including shift turnover time).

4. Except during extended shutdown periods, the use of overtime should be considered on an individual basis and not for the entire staff on shift.

Recognizing that very unusual circumstances may arise requiring deviation from the above guidelines, such deviation shall be authorized by the plant manager or his deputy, or high levels of management."

The licensee implemented administrative procedure PMP-4010-WHL-001, "Working Hours Limitations," Revision 6, to control working hours for plant staff. The procedure allowed deviations from the overtime guidelines to be approved by the Plant Manager; or designee when the reason was properly documented. However, the procedure did not limit approval of these deviations to "very unusual circumstances" as specified in Generic Letter 82-12. The inspectors reviewed approved overtime deviation requests to support planned refueling outage work activities, and found that hundreds of workers who performed safety related work received blanket authorization to exceed the TS required overtime guidelines. Because periodic refueling outages are not considered to be "very unusual circumstances" these authorizations did not constitute an appropriate deviation from the guidelines.

The inspectors noted that the workers had exceeded the overtime guidelines as part of their regular outage work schedule. One of the most egregious examples was a blanket request covering 133 workers involved with plant modifications for the ECCS recirculation sump. This approved request allowed these workers to work 12-hour shifts (excluding shift turnovers) for up to 13 days straight without a day off and with no reason provided. Another example was a blanket request (actually three separate requests totaling 65 workers) approved for mechanical maintenance supervisors and craftsmen to work 12-hour shifts (excluding shift turnovers) for 13 days straight with the 14th day off during the refueling outage for no reason other than "due to schedule and time frame of the outage."

The inspectors determined that the licensee's failure to adhere to the TS overtime restrictions for personnel performing safety related work during the refueling outage was a performance deficiency warranting a significance evaluation.

Analysis

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 of more than minor significance because the excessive work hours would increase the likelihood of human errors during refueling outage activities, which if left uncorrected could become a more significant safety concern. The significance of this finding could not readily be assessed using the SDP. Therefore, consistent with the guidance in IMC 0612, Section 05.04.c, this finding was reviewed by NRC management and was determined to be a finding of very low safety significance (Green) because there were no actual adverse plant or equipment conditions identified that were attributed to worker fatigue.

Cross-cutting Aspects

This finding has a cross-cutting aspect in the area of human performance. The licensee's administrative procedure was not complete and accurate in that it inappropriately allowed deviation from work hour limitations for safety-related work activities during a scheduled refueling outage. (IMC 0305 H.2(c))

Enforcement

Unit 1 TS 5.2.2.d required that the amount of overtime worked by unit staff members performing safety related functions must be limited in accordance with the NRC Policy Statement on working hours (NRC Generic Letter 82-12). Generic Letter 82-12 specifies, in part, that during extended periods of shutdown for refueling, guidelines shall be followed that limit individuals to working no more than 72 hours in any 7-day period. Contrary to this, hundreds of workers who performed safety related activities during the Unit 1 Cycle 22 refueling outage exceeded the 72 hours in any 7-day period working hour guidelines. Because this violation was of very low safety significance and was entered into the licensee's corrective action program, it is being treated as a Non-Cited Violation consistent with Section VI.A of the NRC Enforcement Policy (NCV

05000315/2008003-03). The licensee entered this violation into its corrective action program as AR 08098058.

.2 Other Outage Activities

a. Inspection Scope

The inspectors evaluated the conduct of activities during a planned outage on May 16-18, 2008, to repair two main steam reheat intercept valves and clean the main turbine voltage regulator circuit cards The inspectors reviewed activities to ensure that the licensee considered risk in developing, planning, and implementing the outage schedule.

The inspectors also reviewed the outage equipment configuration, electrical lineups, selected clearances, control and monitoring of reactivity addition rates and identification and resolution of problems associated with the outage.

This inspection constitutes one other outage sample as defined in Inspection Procedure 71111.20-05.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

.1 Routine Surveillance Testing

a. Inspection Scope

The inspectors reviewed the test results for the following activities to determine whether risk-significant systems and equipment were capable of performing their intended safety function:

- Unit 1 Train B Reactor Protection System and Engineered Safeguards Feature Reactor Trip Breaker and Solid State Protection System Automatic Trip/Actuation Logic Operational Test.
- Unit 1 Prior to Startup Instrumentation Channel Operational Test and Trip Actuating Device Operational Tests.
- Unit 1 Ice Condenser Surveillance and Operability Evaluation.
- Unit 1 Ice Condenser Intermediate Deck Door Surveillance.
- Unit 1 Local Leak Rate Surveillance Test (Local Leak Rate).
- Unit 1 Inspection of the Recirculation Sump.
- Unit 1 Turbine Driven Auxiliary Feedwater System Test (In-Service Testing).

The inspectors observed selected portions of in-plant activities to verify that testing was conducted in accordance with applicable procedural and TS requirements. 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 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.

This inspection constitutes seven surveillance test samples, which included: one in-service surveillance test sample, three routine surveillance test samples, one local leak rate surveillance test sample and two ice condenser surveillance test samples as defined in Inspection Procedure 71111.22.

b. Findings

b.1 Failure to Adequately Implement Requirements of the Unit 1 Lower Containment and Emergency Core Cooling System (ECCS) Recirculation Sumps Surveillance Test Procedure

Introduction

The inspectors identified a finding of very low safety significance (Green) and an associated Non-Cited Violation of 10 CFR 50, Appendix B, Criteria V, “Instructions, Procedures, and Drawings,” regarding the failure to adequately implement surveillance test inspection requirements for the Unit 1 ECCS recirculation sump.

Description

On April 16, 2008, during a final closeout (interior) inspection of the ECCS recirculation sump, the inspectors identified several instances where the licensee failed to correctly implement procedural requirements for conducting the sump inspections. The inspectors also identified examples where the sump inspection procedure lacked sufficient detail to ensure that the sump would support ECCS operability. For example:

- The inspectors identified multiple (13) loose shoulder bolts inside of the main recirculation sump strainer at the lower ledge, which secured the bottom panel back rail to the bottom panel. The back rail was removed during the refueling outage by workers installing the new waterway and remote strainer. Procedural controls were inadequate to ensure that it was correctly reinstalled when the main strainer was reassembled. The surveillance test procedure used for the recirculation sump inspection provided no steps to verify that the rail was properly installed with all of the bolts torqued. The inspectors were concerned that one or more of the loose bolts could be swept into the residual heat removal or containment spray pumps during an accident and cause these pumps to fail. The loose bolts would also provide questionable support at the lower ledge for the strainer and could possibly result in gaps larger than the 1.5 millimeter design criteria. This could possibly allow debris of sufficient size to enter the ECCS or containment spray system, potentially plugging throttle valves or spray nozzles during a design basis accident. After the inspectors questioned whether there was a torque requirement for these bolts licensee personnel confirmed that the installation drawing for the main recirculation sump strainer specified a torque

requirement of 96-120 inch-pounds. Work Order 55308390-73 was subsequently completed to verify the torque for all of the bottom panel back rail shoulder bolts.

- The inspectors identified that there was clear silicone sealant smeared on the wall adjacent to the waterway opening inside the main recirculation sump. A thin area, approximately 20 inches long was found. The inspectors were concerned that during an accident this material could be swept into the ECCS or containment spray system, potentially plugging throttle valves or spray nozzles. If the material reached the reactor coolant system it could potentially collect on the fuel. A maintenance supervisor removed the sealant from the wall while the inspectors were present.

- The inspectors identified that there was a silicone sealant also along the bottom side of the waterway in the space between the metal and the concrete wall. This was believed to be sealant that was used to contain the grout when the waterway was installed during the refueling outage. Based on discussions with licensee personnel, this sealant should have been removed after the grout solidified. Plant workers subsequently removed the sealant material.

- The inspectors identified loose debris including dirt, metal shavings, and three pieces of weld wire lodged between two flanged sections of the new waterway. The loose debris and the three pieces of weld wire were removed while the inspectors were present.

Technical Specification 3.5.2 and TS 3.5.3 required the ECCS, including the recirculation sump to be operable in Modes 1, 2, 3 and 4. Technical Specification Surveillance Requirement (SR) 3.5.2.7 required a visual inspection of the sump and to verify that each ECCS train containment sump suction inlet was not restricted by debris and that the suction inlet strainers showed no evidence of structural distress or abnormal corrosion. Procedure 12-MHP-4030-031-001, “Inspection of the Recirculation Sump,” was performed to satisfy the requirements of TS SR 3.5.2.7. The licensee developed Design Information Transmittal (DIT) S-00408-08, “Inspection Requirements for Unit 1 and Unit 2 Containment Recirculation Strainers and Sumps, Remote Strainers and Containment Debris Interceptors,” to establish the bases for the procedural requirements and acceptance criteria included in 12-MHP-4030-031-001.

During a review of the completed surveillance test procedure for the Unit 1 ECCS recirculation sump (12-MHP-4030-031-001) and DIT S-00408-08 the inspectors identified several issues.

- As highlighted above in the first bullet, the surveillance test procedure provided no steps to verify that the main strainer bottom panel back rail was properly installed with all of the bolts torqued. The inspectors also noted that while DIT S-00408-08 was very detailed, it did not address verifying the installation of the bottom panel back rail.

- The inspectors noted that 12-MHP-4030-031-001, Attachment 2, Step 1.7 required the licensee to check the structural concrete surfaces inside the recirculation sump for cracks, efflorescence, exposed rebar, staining due to

corrosion or embedded rebar, or dislodged sections of concrete (i.e., spalling). While this step did not specifically address the presence of foreign material (e.g., silicone sealant), it would be reasonable for the licensee to have identified the silicone sealant material spread on the wall adjacent to the waterway opening and along the bottom side of the waterway while performing this step.

Step 1.8 required the licensee to check the recirculation sump for loose debris or waste material. Therefore, licensee personnel should have identified and removed the silicone sealant material while performing this step because it was considered to be waste material. Also, DIT S-00408-08, Section 6.1 stated that the recirculation sump shall be maintained at Cleanliness Rating 3C in accordance with PMP-2220-SCC-001, "Cleanliness Inspection Criteria." The criteria for Cleanliness Rating 3C would not permit the presence of the silicone sealant material.

- The inspectors noted that Procedure 12-MHP-4030-031-001, Attachment 8 appeared to be written only for an external inspection of the remote strainer and waterway. The procedure provided no steps to verify that the inside of the
- remote strainer and waterway were free of foreign material. Similarly, there was no guidance in DIT S-00408-08 to inspect the inside of the remote strainer and waterway.

The inspectors determined that the licensee's failure to adequately implement surveillance test inspection requirements for the ECCS recirculation sump was a licensee performance deficiency warranting a significance evaluation.

Analysis

The inspectors reviewed the samples 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 Disposition Screening," the inspectors determined that a failure to correct these surveillance test procedure implementation inadequacies could become a more significant safety concern if left uncorrected and was therefore more than a minor concern. Specifically, the failure to adequately perform surveillance testing could reasonably result in the failure to identify degraded or inoperable safety-related equipment.

Because the ECCS recirculation sump was primarily associated with long term decay heat removal following certain design basis accidents, the inspectors concluded that this issue was associated with the Mitigating Systems cornerstone. The inspectors performed a Phase 1 SDP review of this finding using the guidance provided in IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," and determined that this finding was of very low safety significance because the finding: (1) was not a design or qualification deficiency; (2) did not represent an actual loss of safety function of a system; (3) did not represent an actual loss of safety function of a single train for greater than its TS allowed outage time; (4) did not represent an actual loss of safety function of one or more non-TS trains of equipment

designated as risk significant; and (5) did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

Cross-cutting Aspects

This finding has a cross-cutting aspect in the area of human performance. Specifically, the surveillance test procedure used for the recirculation sump and remote strainer waterway inspection lacked sufficient detail to ensure that the sump would support ECCS operability. In addition, procedural controls associated with the installation of the remote strainer and waterway plant modification were inadequate to ensure that the main strainer bottom panel back rail was properly installed with all of the bolts torqued when installation was completed and the main strainer was reassembled. (IMC 0305, H.2(c))

Enforcement

10 CFR 50, Appendix B, Criteria V, "Instructions, Procedures, and Drawings" required, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.

Contrary to the above:

(a) The licensee failed to implement the requirements of 12-MHP-4030-031-001, "Inspection of the Recirculation Sump," Revision 11. Specifically, the licensee failed to adequately check the recirculation sump for loose debris or waste material as required by Step 1.8 of the surveillance test procedure.

(b) Surveillance test procedure 12-MHP-4030-031-001 used for the recirculation sump and remote strainer waterway inspection was not appropriate to the circumstances because it lacked sufficient detail to ensure that the sump would support ECCS operability. Specifically: (1) the procedure provided no steps to verify that the strainer bottom panel back rail inside the main recirculation sump was properly installed with all of the bolts torqued, and (2) the surveillance test procedure provided no steps to verify that the inside of the remote strainer and waterway were free of foreign material.

(c) Procedural controls associated with the installation of the remote strainer and waterway plant modification were inadequate to ensure that the bottom panel back rail was properly installed with all of the bolts torqued when installation of the waterway and remote strainer was completed and the main strainer was reassembled.

Because of the very low safety significance, this violation is being treated as a Non-Cited Violation consistent with Section VI.A of the NRC Enforcement Policy (NCV 05000315/2008003-04). The inspector identified issues with the recirculation sump were corrected prior to Unit 1 entering Mode 4 and the licensee entered this violation into its corrective action program as AR 00830064 and AR 00830387.

1EP2 Alert and Notification System Evaluation (71114.02)

.1 Alert and Notification System Evaluation

a. Inspection Scope

The inspectors reviewed documents and conducted discussions with Emergency Preparedness (EP) staff regarding the operation, maintenance, and periodic testing of the Alert and Notification System (ANS) in the D. C. Cook Plant's plume pathway Emergency Planning Zone. The inspectors reviewed monthly trend reports and siren test failure records from July 2006 through May 2008. Information gathered during document reviews and interviews was used to determine whether the ANS equipment was maintained and tested in accordance with Emergency Plan commitments and procedures.

This inspection constitutes one sample as defined in Inspection Procedure 71114.02-05.

b. Findings

No findings of significance were identified.

1EP3 Emergency Response Organization Augmentation Testing (71114.03)

.1 Emergency Response Organization Augmentation Testing

a. Inspection Scope

The inspectors reviewed and discussed with plant EP staff the emergency plan commitments and procedures that addressed the primary and alternate methods of initiating an Emergency Response Organization (ERO) activation to augment the on-shift ERO as well as the provisions for maintaining the plant's ERO emergency telephone directory. The inspectors also reviewed reports and a sample of corrective action program records of unannounced off hour augmentation tests, which were conducted May 2006 through March 2008, to determine the adequacy of problem identification and associated corrective actions for ERO activation and augmentation. The inspectors also reviewed a sample of the EP training records, approximately 39 records for ERO personnel, who were assigned to key and support positions, to determine the status of their training as it related to their assigned ERO positions.

This inspection constitutes one sample as defined in Inspection Procedure 71114.03-05.

b. Findings

No findings of significance were identified.

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies (71114.05)

.1 Correction of Emergency Preparedness Weaknesses and Deficiencies

a. Inspection Scope

The inspectors reviewed a sample of performance assurance staff's 2006 and 2007 audits of the D. C. Cook emergency preparedness program to determine that these independent assessments met the requirements of 10 CFR 50.54(t). The inspectors also reviewed critique reports and samples of corrective action program records associated with the 2007 biennial exercise, as well as various EP drills conducted in 2006, 2007, and 2008, in order to determine that the licensee fulfilled its drill commitments and to evaluate the licensee's efforts to identify, track, and resolve concerns identified during these activities.

Additionally, the inspectors reviewed two actual emergency plan activations that involved Notice of Unusual Event declarations on April 18, 2008, due to an earthquake and aftershock centered in Illinois. The inspectors independently evaluated the events and the licensee self-assessment to determine if the licensee effectively implemented the requirements of the emergency plan. The inspectors also reviewed a sample of EP items and corrective actions related to the facility's EP program and activities to determine whether corrective actions were completed in accordance with the sites corrective action program

This inspection constitutes one sample as defined in Inspection Procedure 71114.05-05.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on May 27, 2008, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator control room, the technical support center and the emergency offsite facility to determine whether the event classification and notifications were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector-observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program. As part of the inspection, the inspectors reviewed the drill objectives, the drill timeline and drill critique report.

The inspectors also reviewed a sample of action requests to verify that problems regarding emergency preparedness entered into the corrective action program were appropriately characterized and that corrective actions were appropriate.

This inspection constitutes one sample as defined in Inspection Procedure 71114.06.

b. Findings

No findings of significance were 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 the licensee's occupational exposure control cornerstone performance indicators (PIs) to determine whether the conditions resulting in any PI occurrences had been evaluated, and identified problems had been entered into the corrective action program for resolution.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

b. Findings

No findings of significance were identified.

.2 Plant Walkdowns and Radiation Work Permit Reviews

a. Inspection Scope

The inspectors reviewed licensee controls and surveys associated with the following radiologically significant work activities within radiation areas, high radiation areas (HRAs) and airborne radioactivity areas in the plant to determine if radiological controls including surveys, postings and barricades were acceptable:

- Lifting of the reactor internals;
- Fuel sipping including area set-up and preparation;
- Reactor recirculation strainer modification (in-plant and remote control facility); and
- Reactor fuel moves.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

The inspectors reviewed the radiation work permits (RWPs) and work packages used to access these areas and other high radiation work areas to identify the work control instructions and control barriers that had been specified. Electronic dosimeter alarm set points for both integrated dose and dose rate were evaluated for conformity with survey indications and plant policy. Workers were interviewed to verify that they were aware of the actions required when their electronic dosimeters noticeably malfunctioned or alarmed.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

The inspectors walked down and surveyed (using an NRC survey meter) these areas to verify that the prescribed RWP, procedure, and engineering controls were in place; that licensee surveys and postings were complete and accurate; and that air samplers were properly located.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

The inspectors reviewed RWPs for airborne radioactivity areas to verify barrier integrity and engineering controls performance (e.g., high-efficiency particulate air ventilation system operation) and to determine if there was a potential for individual worker internal exposures of >50 millirem committed effective dose equivalent, including refuel cavity decontamination activities.

Work areas having a history of, or the potential for, airborne transuranics were evaluated to verify that the licensee had considered the potential for transuranic isotopes and provided appropriate worker protection.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

The adequacy of the licensee's internal dose assessment process for internal exposures >50 millirem committed effective dose equivalent was assessed. However, there were no internal exposures >50 millirem committed effective dose equivalent.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

The inspectors also reviewed the licensee's physical and programmatic controls for highly activated and/or contaminated materials (non-fuel) stored within spent fuel or other storage pools.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

b. Findings

No findings of significance were identified.

.3 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed a sample of the licensee's self-assessments, audits, Licensee Event Reports, and Special Reports related to the access control program to verify that identified problems were entered into the corrective action program for resolution.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

The inspectors reviewed corrective action reports related to access controls and high radiation area radiological incidents (issues that did not count as PI occurrences identified by the licensee in high radiation areas <1R/hr). Staff members were interviewed and corrective action documents were reviewed to verify that follow-up activities were being 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;
- Identification and implementation of effective corrective actions;
- Resolution of Non-Cited-Violations tracked in the corrective action system; and
- Implementation/consideration of risk significant operational experience feedback.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

The inspectors evaluated the licensee's process for problem identification, characterization, prioritization, and verified that problems were entered into the corrective action program and resolved. For repetitive deficiencies and/or significant individual deficiencies in problem identification and resolution, the inspectors verified that the licensee's self-assessment activities were capable of identifying and addressing these deficiencies.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

The inspectors reviewed licensee documentation packages for all PI events occurring since the last inspection to determine if any of these PI events involved dose rates >25 R/hr at 30 centimeters or >500 R/hr at 1 meter. Barriers were evaluated for failure and to determine if there were any barriers left to prevent personnel access. Unintended exposures >100 millirem total effective dose equivalent (or >5 rem shallow

dose equivalent or >1.5 rem lens dose equivalent), were evaluated to determine if there were any regulatory overexposures or if there was a substantial potential for an overexposure.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

b. Findings

No findings of significance were identified.

.4 Job-In-Progress Reviews

a. Inspection Scope

The inspectors observed the following jobs that were being performed in radiation areas, airborne radioactivity areas, or High Radiation Areas (HRAs) for observation of work activities that presented the greatest radiological risk to workers:

- Lifting of the reactor internals;
- Fuel sipping, including area and equipment set-up and preparation;
- Reactor recirculation strainer modification (in-plant and remote control facility); and
- Reactor fuel moves.

The inspectors reviewed radiological job requirements for these activities, including RWP requirements and work procedure requirements, and attended the station ALARA committee meeting.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

Job performance was observed with respect to these requirements to assess whether radiological conditions in the work area were adequately communicated to workers through pre-job briefings and postings. The inspectors also evaluated the adequacy of radiological controls including required radiation, contamination, and airborne surveys for system breaches; radiation protection job coverage, including any applicable audio and visual surveillance for remote job coverage; and contamination controls.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

Radiological work in high radiation work areas having significant dose rate gradients was reviewed to evaluate the application of dosimetry to effectively monitor exposure to personnel and to assess the adequacy of licensee controls. These work areas involved areas where the dose rate gradients were severe thereby increasing the necessity of providing multiple dosimeters or enhanced job controls.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

b. Findings

No findings of significance were identified.

.5 High Risk Significant, High Dose Rate, High Radiation Area, and Very High Radiation Area Controls

a. Inspection Scope

The inspectors held discussions with the Radiation Protection Manager concerning high dose rate/HRA and very high radiation area (VHRA) controls and procedures, including procedural changes that had occurred since the last inspection, in order to assess whether any procedure modifications substantially reduced the effectiveness and level of worker protection.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

The inspectors discussed with radiation protection supervisors the controls that were in place for special areas that had the potential to become very high radiation areas during certain plant operations, to determine if these plant operations required communication before hand with the radiation protection group, so as to allow corresponding timely actions to properly post and control the radiation hazards.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

The inspectors conducted plant walkdowns to assess the posting and locking of entrances to high dose rate HRAs and VHRAs including:

- In-core shaft, fuel transfer room and their locked HRA foyers;
- Cavity seal table;
- Demineralizer Vaults; and
- Temporary lead wall and permanent gate to reactor coolant drain tank.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

b. Findings

No findings of significance were identified

.6 Radiation Worker Performance

a. Inspection Scope

During job performance observations, the inspectors evaluated radiation worker performance with respect to stated radiation protection work requirements and evaluated whether workers were aware of the significant radiological conditions in their workplace, of the RWP controls and limits in place, and of the level of radiological hazards present. The inspectors also evaluated that worker performance accounted for these radiological hazards.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

The inspectors reviewed radiological problem reports for which the cause of the event was due to radiation worker errors to determine if there was an observable pattern traceable to a similar cause and to determine if this perspective matched the corrective action approach taken by the licensee to resolve the reported problems. Problems or issues with planned and taken corrective actions were discussed with the Radiation Protection Manager.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

b. Findings

No findings of significance were identified.

.7 Radiation Protection Technician Proficiency

a. Inspection Scope

During job performance observations, the inspectors evaluated radiation protection technician performance with respect to radiation protection work requirements and evaluated whether they were aware of the radiological conditions in their workplace, the RWP controls and limits in place, and if their performance was consistent with their training and qualifications with respect to the radiological hazards and work activities.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

The inspectors reviewed radiological problem reports for which the cause of the event was radiation protection technician error to determine if there was an observable pattern traceable to a similar cause and to determine if this perspective matched the corrective action approach taken by the licensee to resolve the reported problems.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

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 exposure history, current exposure trends, ongoing and planned 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.

This inspection constitutes one required sample as defined in Inspection Procedure 71121.02-5.

The inspectors reviewed the outage work scheduled during the inspection period and associated work activity exposure estimates for the following work activities which were likely to result in the highest personnel collective exposures:

- Reactor head and reactor internals lift;
- Reactor cavity decontamination activities;
- Reactor recirculation strainer modification (in-plant and remote control facility);
- Reactor fuel shuffle and support work;
- Radioactive waste processing in the drumming room; and
- Temporary shielding.

This inspection constitutes one required sample as defined in Inspection Procedure 71121.02-5.

The inspectors reviewed documents to determine if there were site-specific trends in collective exposures and source-term measurements.

This inspection constitutes one required sample as defined in Inspection Procedure 71121.02-5.

The inspectors reviewed procedures associated with maintaining occupational exposures ALARA and processes used to estimate and track work activity specific exposures.

This inspection constitutes one required sample as defined in Inspection Procedure 71121.02-5.

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 in progress and reviewed the following work activities of highest exposure significance:

- Reactor head and reactor internals lift;
- Reactor cavity decontamination activities;
- Reactor recirculation strainer modification (in-plant and remote control facility);
- Reactor fuel shuffle and support work;
- Radioactive waste processing in the drumming room; and
- Temporary shielding.

This inspection constitutes one required sample as defined in Inspection Procedure 71121.02-5.

For these six activities, the inspectors reviewed the ALARA work activity evaluations, exposure estimates, and exposure mitigation requirements in order to verify that the licensee had established procedures and engineering and work controls that were based on sound radiation protection 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.

This inspection constitutes one required sample as defined in Inspection Procedure 71121.02-5.

The inspectors compared the results achieved including dose rate reductions and person-rem used with the intended dose established in the licensee's ALARA planning for these work activities. Reasons for inconsistencies between intended and actual work activity doses were reviewed.

This inspection constitutes one required sample as defined in Inspection Procedure 71121.02-5.

The interfaces between operations, radiation protection, maintenance, maintenance planning, scheduling and engineering groups were evaluated to identify interface problems or missing program elements.

This inspection constitutes one optional sample as defined in Inspection Procedure 71121.02-5.

The integration of ALARA requirements into work procedure and RWP documents was evaluated to verify that the licensee's radiological job planning would reduce dose.

This inspection constitutes one optional sample as defined in Inspection Procedure 71121.02-5.

The inspectors compared the person-hour estimates, provided by maintenance planning and other groups to the radiation protection group, with the actual work activity time requirements in order to evaluate the accuracy of these time estimates.

This inspection constitutes one optional sample as defined in Inspection Procedure 71121.02-5.

The inspectors evaluated if work activity planning included consideration of the benefits of dose rate reduction activities such as shielding provided by water filled components/piping, job scheduling, and shielding and scaffolding installation and removal activities.

This inspection constitutes one optional sample as defined in Inspection Procedure 71121.02-5.

The licensee's post-job (work activity) reviews were evaluated to verity that identified problems were entered into the licensee's corrective action program.

This inspection constitutes one optional sample as defined in Inspection Procedure 71121.02-5.

b. Findings

Introduction: One self-revealing finding of very low safety significance (Green) was identified for the failure to effectively implement dose reducing radiological and engineering controls for work associated with modifications to the reactor recirculation sump strainer during Refuel Outage U2C17. Ineffective work control, job planning, and work execution issues resulted in field rework and multiple design changes that contributed to significantly more in-field work hours for craft personnel than was originally planned, resulting in a corresponding increase in worker doses that were not effectively maintained ALARA, consistent with 10 CFR part 20. The actual collective dose (31.781 person-rem) experienced for the modifications to the reactor recirculation sump strainer activities was in excess of five person-rem and exceeded the licensee's initial intended dose estimates by more than 50 percent.

Description: The initial dose estimates for modifications to the reactor recirculation sump strainer activities were primarily based on historical dose rates of the work area and person-hour estimates that were based on an incomplete understanding of the detail of the work needed to be performed, which was attributable by the licensee, in part, to an incomplete project design. The initial dose estimate for this RWP (07-2172) was 7.290 person-rem and the actual dose expenditure exceeded this estimate by more than 400 percent. Actual person-hours were a nominal 3.5 times their initial estimate. Although some of the increase in dose was attributable to an increase in field dose rates, the bulk of the accrued dose was attributable to poor work controls and work planning deficiencies (i.e., lack of worker training, mock-up, etc.). There were several rework issues associated with the job including installing the vent piping extension backwards, necessitating pipe removal and reinstallation. Also, the licensee recognized that more effective ALARA planning would have ensured better sequencing of work near the residual heat removal system, such that the increase in water shielding (i.e., system water levels) would have yielded a resultant decrease in ambient field dose rates. The dose estimates for the modification to the reactor recirculation sump RWP were re-adjusted several times as the licensee developed a more complete understanding of the actual in-field work scope and established more effective control of in-field activities.

Analysis: The failure to adequately implement radiological dose controls to maintain doses ALARA represents a performance deficiency as defined in NRC IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening." The inspectors determined that the issue was associated with the Program and Process attribute of the Occupational Radiation Safety Cornerstone and affected the cornerstone objective to ensure the adequate protection of the worker health and safety from exposure to radiation, in that ineffective work control and ALARA planning deficiencies contributed to an actual increase in worker doses in excess of 5 person-rem and exceeded the licensee's initial intended dose estimates by more than 50 percent. Therefore, the issue

was more than minor and represented a finding which was evaluated using the SDP. Since this finding involved radiological controls and ALARA planning, the inspectors utilized Manual Chapter 0609, Appendix C, "Occupational Radiation Safety SDP," to assess its significance. The inspectors concluded that the finding did not result in an occupational overexposure, a substantial potential for an overexposure, or a compromised ability to assess dose. The inspectors determined that the finding involved ALARA planning and work controls. Since the licensee's current 3-year rolling collective dose average is less than 135 person-rem per unit, the inspectors concluded that the SDP assessment for this finding was of very low safety significance (Green). Because this finding does not involve a violation of regulatory requirements and has very low safety significance, it is identified as FIN 05000315/2008003-05; 05000316/2008003-05.

Cross-cutting Aspect: This finding was associated with an aspect in the area of human performance in work control for appropriately planning work activities. (IMC 0305 H.3.(a)).

Enforcement: Enforcement action does not apply because the performance deficiency did not involve a violation of a regulatory requirement. The issue was entered into the licensee's corrective action program (AR 00821722), and corrective actions were implemented to address the organization and programmatic deficiencies in managing the containment sump strainer modification, as well as capturing lessons learned to support the detailed planning necessary for the installation of the modification on Unit-1.

.3 Verification of Dose Estimates and Exposure Tracking Systems

a. Inspection Scope

The licensee's process for adjusting exposure estimates or re-planning work, when unexpected changes in scope, emergent work or higher than anticipated radiation levels were encountered, was evaluated. This included determining that adjustments to estimated exposure (intended dose) were based on sound radiation protection and ALARA principles and not adjusted to account for failures to control the work. The frequency of these adjustments was reviewed to evaluate the adequacy of the original ALARA planning process.

This inspection constitutes one required sample as defined in Inspection Procedure 71121.02-5.

The licensee's exposure tracking system was evaluated to determine whether the level of exposure tracking detail, exposure report timeliness, and exposure report distribution was sufficient to support control of collective exposures. Several RWPs were reviewed to determine if they covered too many work activities to allow work activity specific exposure trends to be detected and controlled. During the conduct of exposure significant work, the inspectors evaluated if licensee management was aware of the exposure status of the work and would intervene if exposure trends increased beyond exposure estimates.

This inspection constitutes one optional sample as defined in Inspection Procedure 71121.02-5.

b. Findings

No findings of significance were identified.

.4 Declared Pregnant Workers

a. Inspection Scope

The inspectors reviewed dose records of declared pregnant workers for the current assessment period to verify that the exposure results and monitoring controls employed by the licensee complied with the requirements of 10 CFR Part 20.

This inspection constitutes one required sample as defined in Inspection Procedure 71121.02-5.

b. Findings

No findings of significance were identified.

.5 Problem Identification and Resolutions

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, and Special Reports related to the ALARA program since the last inspection to determine if the licensee's overall audit program's scope and frequency for all applicable areas under the Occupational Cornerstone met the requirements of 10 CFR 20.1101(c).

This inspection constitutes one required sample as defined in Inspection Procedure 71121.02-5.

The inspectors verified that identified problems were entered into the corrective action program for resolution and that they had been properly characterized, prioritized, and resolved. This included dose significant post-job (work activity) reviews and post-outage ALARA report critiques of exposure performance.

This inspection constitutes one optional sample as defined in Inspection Procedure 71121.02-5.

Corrective action reports related to the ALARA program were reviewed and staff members were interviewed to verify that follow-up activities had been conducted in an effective and timely manner commensurate with their importance to safety and risk using the following criteria:

- 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;
- Identification and implementation of effective corrective actions;
- Resolution of NCVs tracked in the corrective action system; and
- Implementation/consideration of risk significant operational experience feedback.

This inspection constitutes one optional sample as defined in Inspection Procedure 71121.02-5.

The licensee's corrective action program was also reviewed to determine if repetitive deficiencies and/or significant individual deficiencies in problem identification and resolution had been addressed.

This inspection constitutes one required sample as defined in Inspection Procedure 71121.02-5.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151-05)

.1 Mitigating Systems Performance Index - Emergency AC Power System

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index (MSPI) - Emergency AC Power System performance indicator for both units for the period from the first through the fourth quarter of 2007. To determine the accuracy of the Performance Indicator (PI) data reported during those periods, PI definitions and guidance contained in revision 5 of the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," were used. The inspectors reviewed the licensee's operator narrative logs, action requests, event reports and NRC Integrated Inspection reports to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified.

This inspection constitutes two MSPI emergency AC power system samples as defined in Inspection Procedure 71151.

b. Findings

No findings of significance were identified.

.2 Mitigating Systems Performance Index - High Pressure Injection Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - High Pressure Injection Systems performance indicator for both units for the period from the first through the fourth quarter of 2007. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's operator narrative logs, action requests, event reports and NRC Integrated Inspection reports to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified.

This inspection constitutes two MSPI high pressure injection system samples as defined in Inspection Procedure 71151.

b. Findings

No findings of significance were identified.

.3 Mitigating Systems Performance Index – Auxiliary Feedwater System

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Auxiliary Feedwater System performance indicator for both units for the period from the first through the fourth quarter of 2007. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's operator narrative logs, action requests, event reports and NRC Integrated Inspection reports to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified.

This inspection constitutes two MSPI auxiliary feedwater system samples as defined in Inspection Procedure 71151.

b. Findings

No findings of significance were identified.

.4 Mitigating Systems Performance Index - Residual Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Residual Heat Removal System performance indicator for both units for the period from the first through the fourth quarter of 2007. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's operator narrative logs, action requests, event reports and NRC Integrated Inspection reports to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified.

This inspection constitutes two MSPI residual heat removal system samples as defined in Inspection Procedure 71151.

b. Findings

No findings of significance were identified.

.5 Mitigating Systems Performance Index - Cooling Water Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Cooling Water Systems performance indicator for both units for the period from the first through the fourth quarter of 2007. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's operator narrative logs, action requests, event reports and NRC Integrated Inspection reports to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified.

This inspection constitutes two MSPI cooling water system samples as defined in Inspection Procedure 71151.

b. Findings

No findings of significance were identified.

.6 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors sampled licensee submittals for the Occupational Radiological Occurrences PI for the period from the second quarter 2007 through the first quarter 2008. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's assessment of the PI for occupational radiation safety to determine if indicator related data was adequately assessed and reported. To assess the adequacy of the licensee's PI data collection and analyses, the inspectors discussed with radiation protection staff, the scope and breadth of its data review and the results of those reviews. The inspectors independently reviewed electronic dosimetry dose rate and accumulated dose alarms, dose reports, and the dose assignments for any intakes that occurred during the time period reviewed to determine if there were potentially unrecognized occurrences. The inspectors also conducted walkdowns of numerous locked high and very high radiation area entrances to determine the adequacy of the controls in place for these areas. Specific documents reviewed are described in the Attachment to this report.

This inspection constitutes one occupational radiological occurrences sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.7 Drill/Exercise Performance

a. Inspection Scope

The inspectors sampled licensee submittals for the Drill/Exercise PI for the period from the third quarter 2007 through first quarter 2008. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's records associated with the PI to verify that the licensee accurately reported the indicator in accordance with relevant procedures and the NEI guidance. Specifically, the inspectors reviewed licensee records and processes including procedural guidance on assessing opportunities for the PI; assessments of PI opportunities during predesignated control room simulator training sessions, performance during the 2007 biennial exercise, and performance during other drills.

This inspection constitutes one drill/exercise performance sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.8 Emergency Response Organization Drill Participation

a. Inspection Scope

The inspectors sampled licensee submittals for the ERO Drill Participation PI for the period from the third quarter 2007 through first quarter 2008. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's records associated with the PI to verify that the licensee accurately reported the indicator in accordance with relevant procedures and the NEI guidance. Specifically, the inspectors reviewed licensee records and processes including procedural guidance on assessing opportunities for the PI; performance during the 2007 biennial exercise and other drills; and revisions of the roster of personnel assigned to key emergency response organization positions.

This inspection constitutes one ERO drill participation sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.9 Alert and Notification System

a. Inspection Scope

The inspectors sampled licensee submittals for the ANS performance indicator for the period from the third quarter 2007 through first quarter 2008. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's records associated with the PI to verify that the licensee accurately reported the indicator in accordance with relevant procedures and the NEI guidance. Specifically, the inspectors reviewed licensee records and processes including procedural guidance on assessing opportunities for the PI and results of periodic ANS operability tests.

This inspection constitutes one alert and notification system sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Daily Corrective Action Program Reviews

a. Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. This review was accomplished through inspection of the station's daily action request packages.

These daily reviews were performed by procedure as part of the inspectors' daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings of significance were identified.

.2 Semi-Annual Trend Review

a. Scope

The inspectors performed a review of the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspector action request item screening discussed in Section 4OA2.1 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the six month period of October 2007 through March 2008, although some examples expanded beyond those dates where the scope of the trend warranted.

The review also included issues documented outside the normal corrective action program such as items documented in departmental roll-up meeting reports, system health reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's corrective action program trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

This review constituted one semi-annual trend inspection sample as defined in Inspection Procedure 71152.

b. Findings

No findings of significance were identified.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153)

.1 Unit 2 High Pressure Turbine Inner Seal Steam Pressure Depressurized Momentarily.

a. Inspection Scope

The inspectors reviewed the events and circumstances surrounding a momentary loss of gland seal steam pressure to the high pressure turbine inner seal system on June 4, 2008. The inspectors conducted control room observations to verify that the operators took the appropriate actions to restore the main turbine steam seal system to its normal operating pressure while preventing any adverse affects on the plant.

This inspection constitutes one non-routine operation involving personnel performance sample as defined in Inspection Procedure 71153-05.

b. Findings

No findings of significance were identified.

.2 (Closed) Licensee Event Report (LER) 05000316/2007-001-00: "As-Found Local Leak Rate Tests Not Performed"

On October 28, 2007, the licensee failed to perform an as-found LLRT on Unit 2 containment isolation valves 2-WCR-942 and 2-WCR-946 (Train 'A' non-essential service water supply and return to reactor coolant pump #2 motor air coolers) prior to performing maintenance on the valves that could have affected the valves' leak tightness. The licensee reported this failure to meet TS SR 3.6.1.1 as a condition prohibited by the plant's TS in accordance with 10 CFR 50.73(a)(2)(i)(B). The inspectors reviewed the LER, the associated cause evaluation and extent of condition evaluation. The significance and enforcement aspects for this licensee-identified violation are discussed further in Section 4OA7 of this report.

During the review, the inspectors found errors in the LER regarding the extent of condition and operational Mode of the event. The significance and enforcement aspects of these errors are discussed further in Section 4OA3.3 of this report.

The inspector identified errors were subsequently corrected in supplemental LER 05000316/2007-001-01 that was issued on June 13, 2008, and is discussed further in Section 4OA3.4 of this report. This LER is closed.

This inspection constituted one sample as defined by Inspection Procedure 71153-05.

.3 Failure to Perform As-found Local Leak Rate Testing for Containment Isolation Valves 2-WCR-922 and 2-WCR-923

a. Inspection Scope

The inspectors reviewed the cause evaluation and extent of condition evaluation associated with LER 05000316/2007-001-00, to explore the thoroughness of the licensee's evaluation.

This inspection did not constitute a separate baseline inspection sample.

b. Findings

Introduction

The inspectors identified a finding of very low safety significance (Green) and an associated Non-Cited Violation of TS SR 3.6.1.1 regarding the failure to perform an as-found LLRT for containment isolation valves 2-WCR-922 and 2-WCR-923 (Train 'A' and Train 'B' non-essential service water return from upper containment ventilation unit #1) prior to performing maintenance that affected the valves' leak tightness.

Description

Licensee personnel performed maintenance on 2-WCR-922 and 2-WCR-923 from September 26th through October 7th, without having performed an as-found LLRT for the valves. Previous attempts on September 18, 2007, to perform an as-found LLRT on the outboard isolation valve, 2-WCR-922, was unsuccessful and licensee personnel believed that testing would not be possible due to flow blockage from sediment in the system.

Subsequent investigation by licensee personnel identified that the valve diaphragm for the inboard isolation valve, 2-WCR-923 had separated from the valve compressor and the valve had failed closed, which prevented performing the as-found leak rate tests. The investigation also identified that incorrect valve assembly during maintenance in 2004 caused the valve failure. The inspectors concluded that the licensee's failure to correctly assemble 2-WCR-923 during maintenance in 2004 was a violation of minor significance because the valve failed closed, which would satisfy the valve's safety function to isolate the containment penetration. 2-WCR-923 was repaired during the refueling outage and an as-left LLRT was satisfactorily completed on October 8th.

The inspectors reviewed AR 00821487 and noted that licensee personnel had identified that as-found testing data was not obtained for containment isolation valves 2-WCR-922 and 2-WCR-923 because of the initial problem encountered during testing. However, licensee personnel incorrectly believed that the leak rate program did not require an as found LLRT test if flow blockage from sediment in the lake water cooling loop prevented the testing. Consequently, the decision was made to not perform an as-found LLRT and licensee personnel failed to recognize this as a failure to comply with TS SR 3.6.1.1.

The licensee entered this issue into its corrective action program as AR 08105080 for evaluation. After the inspectors identified this violation, licensee personnel subsequently reported this as a condition prohibited by TS in LER 05000316/2007-001-01, which is discussed further in Section 4OA3.4 of this report.

Because an as-found LLRT was not performed, the true as-found condition of 2-WCR-922 and 2-WCR-923 was unknown and could not be evaluated. The purpose of performing as-found testing was to prove that the containment penetration integrity was sufficient to prevent a release of radioactivity following an accident in excess of established limits during the previous operating cycle. The failure to complete an as-found LLRT for 2-WCR-922 and 2-WCR-923 was a licensee performance deficiency that warranted a significance evaluation.

Analysis

The inspectors reviewed the examples of minor issues in IMC 0612, Appendix E and determined that there were no examples related to this issue. Consistent with the guidance in IMC 0612, Appendix B, the inspectors determined that this issue was of more than minor significance because it was associated with the SSC and Barrier Performance attribute of the Barrier Integrity cornerstone. The cornerstone objective of providing reasonable assurance that the physical design barriers (e.g., containment) protect the public from radio-nuclide releases caused by accidents or events was adversely affected because the true as-found condition of containment isolation valves 2-WCR-922 and 2-WCR-923 was unknown and could not be evaluated.

The inspectors performed a Phase 1 SDP review of this issue using the guidance provided in IMC 0609, Appendix H, “Containment Integrity Significance Determination Process,” and determined that this was a Type “B” finding. Type “B” findings have no impact on the determination of Core Damage Frequency and therefore they are not processed through the Core Damage Frequency based SDP. These findings, however, are potentially important to Large Early Release Frequency determinations. Using Section 6.2, “Approach for Assessing Type 'B' Findings at Shutdown,” the inspectors determined that this finding was of very low safety significance (Green) because the issue did not involve a failure to maintain the capability to close containment and did not involve the hydrogen igniters.

Cross-Cutting Aspects

This finding has a cross-cutting aspect in the area of problem identification and resolution because licensee personnel did not take appropriate corrective actions to address a similar LER (05000316/2006-005) for the failure to conduct required as-found leak rate testing prior to performing maintenance on containment isolation valves. (IMC 0305 P.1(d))

Enforcement

Technical Specification SR 3.6.1.1 required, in part, that the licensee perform required leak rate testing in accordance with the Containment Leakage Rate Testing Program. Technical Specification 5.5.14 required, in part, the licensee to establish a program for

leak rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B. The licensee implemented its Containment Leakage Rate Testing Program using Engineering Head Instruction 5300, "D. C. Cook Nuclear Plant Containment Leakage Rate Testing Program (Appendix J)," Revision 5. Engineering Head Instruction 5300, step 4.4.5.a requires, in part, that as-found LLRT of containment components shall be performed prior to maintenance, repairs, or inspections that could reduce containment leakage integrity.

Contrary to the above:

- On September 26, 2007, the licensee disassembled Unit 2 containment isolation valve 2-WCR-922 (Train 'A' non-essential service water return from upper containment ventilation unit #1) for repair without having performed an as-found LLRT.

- On October 7, 2007, the licensee disassembled Unit 2 containment isolation valve 2-WCR-923 (Train 'B' non-essential service water return from upper containment ventilation unit #1) for repair without having performed an as-found LLRT.

Following maintenance, as left leak rate tests were completed satisfactorily on 2-WCR-922 and 2-WCR-926. Because of the very low safety significance, this violation is being treated as a Non-Cited Violation consistent with Section VI.A of the NRC Enforcement Policy (NCV 05000316/2008003-06). The licensee entered this violation into its corrective action program as AR 08105080.

.4 (Closed) LER 05000316/2007-001-01 "As-Found Local Leak Rate Tests Not Performed'

This event report supplement was issued to correct the inspector identified errors in LER 05000316/2007-001-00 dated December 20, 2007, and discussed in Section 4OA3.2 of this report. This LER supplement included two additional valves for which as-found leak rate testing was not performed prior to maintenance being performed. The events and circumstances surrounding this issue are discussed further in Section 4OA3.3 of this report.

The licensee reported this failure to meet TS SR 3.6.1.1 as a condition prohibited by the plant's TS in accordance with 10 CFR 50.73(a)(2)(i)(B). Corrective actions included planned revisions to engineering procedures governing the conduct of the LLRT program to specify required actions for a missed LLRT. Also, work planning templates were enhanced to verify that an as-found LLRT was completed prior to performing work on containment isolation valves. The significance and enforcement aspects for this violation are discussed further in Section 4OA3.3 of this report. This LER is closed.

This inspection constituted one sample as defined by Inspection Procedure 71153-05.

.5 Unusual Event for Confirmed Seismic Event

a. Inspection Scope

The inspectors reviewed actions taken by licensee personnel for a declared Unusual Event on April 18, 2008. The Unusual Event was declared at 06:02, after ground motion was sensed by plant personnel and confirmed with the National Earthquake Center by the control room operators. The Unusual Event was initially terminated at 09:05 after actions directed by plant procedures had been completed. However, a second confirmed seismic event occurred at 11:45 and licensee personnel again entered the emergency plan and declared an Unusual Event, which was terminated at 16:00.

The inspectors reviewed emergency plan implementing procedures, abnormal operating procedures, control room logs, and the event notification worksheets. The inspectors verified that the event classification was accurate, that required notifications to NRC and to state and local officials were completed in a timely manner, and that control room operator actions were completed in accordance with plant procedures. The inspectors also conducted plant tours to verify that the seismic event did not cause any damage to plant equipment.

The inspectors reviewed action requests to verify that identified problems pertaining to event response were entered into the corrective action program with the appropriate significance characterization.

This inspection constitutes one sample as defined in Inspection Procedure 71153-05.

b. Findings

No findings of significance were identified.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspector observations of security force personnel did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

b. Findings

No findings of significance were identified.

.2 Reactor Coolant System Dissimilar Metal Butt Welds emporary Instruction (TI) 2515/172, Revision 0)

a. Inspection Scope

The inspectors conducted a review of the licensee's activities regarding licensee dissimilar metal butt weld (DMBW) mitigation and inspection implemented in accordance with the industry self-imposed mandatory requirements of Materials Reliability Program (MRP)-139, "Primary System Piping Butt Weld Inspection and Evaluation Guidelines." TI 2515/172, "Reactor Coolant System Dissimilar Metal Butt Welds" was issued to support NRC review and evaluation of the licensees' implementation of MRP-139.

From March 4, 2008, through April 2, 2008, the inspectors performed a review in accordance with Sections of TI-172 as described below.

Section 03.01 of TI-172 - Implementation of the Baseline MRP-139 Inspections. The inspectors conducted a review under this Section for Units 1 and 2 to determine if the licensee completed the baseline UTs required by the MRP-139 schedule or an NRC approved alternative schedule. This review included:

- inspection schedules which include the completed or planned UTs of DMBW's;
- approved or planned deviations from MRP-139; and
- plant drawings and piping specifications.

Section 03.02 of TI-172 – Evaluation of Volumetric Examinations. The inspectors conducted a review under this Section for Unit 1 to determine if UTs were completed in accordance with MRP-139. Because the licensee had not performed UT of unmitigated welds at Unit 1, this aspect of the TI review was not applicable. The inspectors reviewed records of the preservice UT for the weld overlay repair of the Unit 1 surge nozzle (1-PRZ-25). This review included:

- UT data sheets, procedures, procedure qualifications, personnel certifications;
- UT calibration blocks and equipment;
- disposition of ultrasonic indications resulting from the inspection;
- NRC relief requests; and
- deficiencies identified in the corrective action program.

Section 03.03 of TI-172 - Weld Overlays. The inspectors conducted a review under this Section for Unit 1 to determine if weld overlays were performed consistent with ASME Code requirements and NRC relief requests. The inspectors reviewed records of the weld overlay repairs on weld 1-PRZ-25. This review included:

- welding procedure specifications, procedure qualifications, welder qualifications;
- NRC relief requests; and
- deficiencies identified in the corrective action program.

Section 03.04 of TI-172 - Mechanical Stress Improvement. This section was completed for Unit 1 and 2 to determine licensee plans for mechanical stress improvement

activities. The licensee had not implemented mechanical stress improvement for DMBWs and no plans existed to implement this weld remediation technique.

Section 03.05 of TI-172 - Inservice Inspection Program. The inspectors conducted a review under this section for Unit 1 and 2 to determine if the inservice weld inspection requirements for DMBW categories as defined by MRP-139 were being met, and to determine the basis for any deviations (if any). This review included:

- the risk informed Inservice Inspection (RI-ISI) Program and interviews with the ISI engineer;
- corrective actions for MRP-139 associated activities; and
- NRC relief requests associated with MRP-139 activities.

The documents reviewed by the inspector for this inspection are listed in the attachment to this report.

b. Observations

Summary: D.C. Cook Unit 1 is a Westinghouse 4 loop design with DMBW's containing 82/182 material on six pressurizer nozzles and eight reactor vessel (RV) nozzles. By the end of 2006, the licensee had completed mitigation for each of the Unit 1 pressurizer nozzle DMBWs by installation of a full structural weld overlay that included a performance demonstration initiative (PDI) qualified UT preservice examination for the required weld volume. The licensee had developed a plan to perform weld inlay mitigation on the remaining DMBWs at the RV nozzles including a post inlay PDI qualified UT.

D.C. Cook Unit 2 is a Westinghouse 4 loop design with DMBW's containing 82/182 material on six pressurizer nozzle welds. Unlike Unit 1, the Unit 2 RV nozzle welds are stainless steel material and therefore not within the scope of MRP-139. By the end of 2006, the licensee had completed mitigation for each of the Unit 2 pressurizer nozzle DMBWs by installation of a full structural weld overlay that included a performance demonstration initiative qualified UT preservice examination for the required weld volume.

The inspectors concluded that the licensee activities and plans complied with the MRP-139 inspection or mitigation requirements and applicable Code requirements and relief requests. No deviations from MRP-139 requirements were identified for Unit 1 or Unit 2.

In accordance with requirements of TI 2515/172, Revision 0, the inspectors evaluated and answered the following questions:

a. For MRP-139 baseline inspections:

1. Have the baseline inspections been performed or are they scheduled to be performed in accordance with MRP-139 guidance? Were the baseline inspections of the pressurizer temperature DMBW's of the nine plants listed in 03.01.b completed during the spring 2008 outages.

Yes. For Unit 1 and Unit 2, the DMBW's at pressurizer temperatures were mitigated using full structural overlays by the end of 2006, which complied with the MRP-139 schedule. The remaining DMBW's containing 82/182 material are the Unit 1 RV inlet and outlet nozzle-to-safe end welds (four of each). The licensee had scheduled mitigation and inspection of these eight welds in 2009, which complied with the MRP-139 schedule.

D.C. Cook Unit 1 and Unit 2 are not among the population of nine plants scheduled for inspection and mitigation of DMBWs in the spring 2008 outages.

2. Is the licensee planning to take any deviations from the MRP-139 baseline inspection requirements of MRP-139? If so, what deviations are planned, what is the general basis for the deviation, and was the NEI- 03-08 process for filing a deviation followed?

No. The inspectors did not identify any deviations from MRP-139 and the licensee had not planned on any deviations from MRP-139 for either Unit.

b. For each examination inspected, was the activity:

1. Performed in accordance with the examination guidelines in MRP-139, Section 5.1, for unmitigated welds or mechanical stress improvement welds and consistent with NRC staff relief request authorization for weld overlaid welds?

Yes. The inspectors reviewed the Unit 1 pressurizer surge nozzle post overlay preservice UT records completed in 2006. This examination was completed with PDI qualified procedures and personnel and in accordance with the approved NRC relief request. The licensee's examination records documented that 100 percent coverage of the required weld overlay/base metal volume was obtained. However, the inspectors could not independently verify the volume of the examination coverage based upon the information in the UT data sheets and sketches.

There were no PDI qualified UTs conducted on DMBWs prior to mitigation, therefore this aspect of the TI was not applicable at this time. The licensee had scheduled UTs for the Unit 1 vessel nozzle welds prior to mitigation in 2009.

A review of Unit 2 UTs for DMBWs was not completed at this time and is scheduled to be completed at a later date.

2. Performed by qualified personnel? (Briefly describe the personnel training/qualification process used by the licensee for this activity.)

Yes. The licensee's contractors that completed preservice UT of the weld overlay repair of 1-PRZ-25 were qualified to the applicable PDI requirements.

3. Performed such that deficiencies were identified, dispositioned, and resolved?

Not applicable. No deficiencies or limitations were identified

c. For each weld overlay inspected, was the activity:

1. Performed in accordance with ASME Code welding requirements and consistent with NRC staff relief request authorizations? Has the licensee submitted a relief request and obtained NRR staff authorization to install the weld overlays?

Yes. For the weld overlay repairs the licensee had submitted relief request ISI-R-21, which provided alternatives to Code Cases N-504-2 and N-638-1 and also ASME Section XI, Appendix VIII, Supplement 11, and Appendix Q for the purpose of installing preemptive weld overlays on the pressurizer nozzle-to-safe end dissimilar metal welds. The inspectors confirmed that the licensee had followed relief request ISI-R-21 approved by the NRC on April 26, 2007. Specifically, the inspectors reviewed the weld travelers and welding procedure specifications to confirm that the overlay repair welds were completed in accordance with the ASME Code Section IX and the approved relief requests.

2. Performed by qualified personnel? (Briefly describe the personnel training/qualification process used by the licensee for this activity.)

Yes. The inspectors reviewed welder performance qualification records to confirm that the welders used for the overlay repairs were qualified in accordance with ASME Section IX.

3. Performed such that deficiencies were identified, dispositioned, and resolved?

Yes. The weld related deficiencies that were identified were dispositioned and resolved in accordance with the welding contractor's process for identifying nonconformances, problems and concerns.

d. For each mechanical stress improvement used by the licensee during the outage, was the activity performed in accordance with a documented qualification report for stress improvement processes and in accordance with demonstrated procedures?

Not applicable. For both Units, the licensee had not performed mechanical stress improvement of DMBWs and no mechanical stress improvement was planned as a mitigation technique for DMBWs at D.C. Cook.

e. For the Inservice Inspection Program:

1. Has the licensee prepared an MRP-139 Inservice Inspection Program? If not, briefly summarize the licensee's basis for not having a documented program and when the licensee plans to complete preparation of the program.

No. For Unit 1 and Unit 2, the licensee did not develop a separate MRP-139 program. Instead, the licensee incorporated the DMBW's including those mitigated by weld overlays into their risk informed ISI program. The inspectors noted that the completed inspections and planned DMBW inspection frequencies in the ISI program met the inspection frequency requirements of MRP-139.

2. In the MRP-139 Inservice Inspection Program, are the welds appropriately categorized in accordance with MRP-139? If any welds are not appropriately categorized, briefly explain the discrepancies.

No. The inspectors identified that the licensee had not identified the specific inspection category defined by MRP-139 for each of these DMBW's in their ISI program. The licensee entered this issue into the corrective action program (AR 08065016). As a corrective action, the licensee subsequently added the applicable MRP-139 inspection categories within the ISI data base for these DMBWs including those mitigated by weld overlays.

3. In the MRP-139 Inservice Inspection Program, are the inservice inspection frequencies, which may differ between the first and second intervals after the MRP-139 baseline inspection, consistent with the inservice inspections frequencies called for by MRP-139?

Yes. The licensee's inservice inspection frequency of DMBWs was consistent with MRP-139 and the inspectors confirmed that the licensee's inspection schedule met the requirements for Category F welds (mitigated with a full structural overlay and assumed to be cracked). Specifically, the pressurizer DMBW's for both Units were overlaid and UT examined in 2006 and the remaining DMBWs on the RV nozzles for Unit 1 were scheduled for inlay mitigation and UT in 2009.

Although, not required by MRP-139, the licensee had committed to the NRC in a relief request, to perform a UT for the next two refueling outages on the overlay weld repair completed on DMBW 1-PRZ-23 in 2005. Contrary to this commitment, the inspectors identified that the licensee had deleted the second of these two examinations, and had not scheduled an inspection of the 1-PRZ-23 weld overlay during the current refueling outage. The licensee's ISI program engineer had deleted this item from the current outage schedule, because the ISI weld inspection data base did not include identification of the source requirements for augmented examinations such as this one. The licensee entered this issue into the corrective action program (AR 08077054). As a corrective action, the licensee included the examination of the 1-PRZ-23 weld overlay in the current refueling outage schedule to meet the NRC inspection commitment of the approved relief request.

4. If any welds are categorized as H or I, briefly explain the licensee's basis of the categorization and the licensee's plans for addressing potential PWSCC.

Not applicable. The inspectors confirmed that the licensee's ISI database did not include welds categorized as H or I for either Unit.

5. If the licensee is planning to take deviations from the inservice inspection "requirements" of MRP-139, what are the deviations and what are the general bases for the deviations? Was the NEI 03-08 process for filing deviations followed?

Not applicable. The licensee did not deviate from MRP-139 and no deviations are planned for either Unit.

c. Findings

No findings of significance were identified.

.3 Pressurized Water Reactor Containment Sump Blockage (TI 2515/166)

a. Inspection Scope

On September 13, 2004, the NRC issued GL 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors," in response to evolving NRC staff concerns with the adequacy of pressurized water reactor recirculation sump designs. In GL 2004-02, the NRC requested that pressurized water reactor licensees evaluate the potential for post-accident debris to impede or prevent the recirculation functions of emergency core cooling and containment spray systems. The NRC also requested that addressees implement any needed plant modifications to ensure system functionality and stated that all actions should be completed by December 31, 2007.

The objective of Temporary Instruction (TI) 2515/166, "Pressurized Water Reactor Containment Sump Blockage (NRC Generic Letter 2004-02)," was to verify that the actions committed to by the licensee in its GL 2004-02 responses were completed, and where applicable, were programmatically controlled. Specifically, the inspection requirements were to:

(1) verify the implementation of the plant modifications and procedure changes committed to by the licensee in its GL 2004-02 responses;

(2) verify that changes to the facility or procedures, as described in the UFSAR, that were identified in the licensee's GL 2004-02 responses were reviewed and documented in accordance with 10 CFR 50.59; and

(3) verify that the licensee has obtained NRC approval prior to implementing those changes that require such approval as stated in 10 CFR 50.59.

During this inspection period, the inspectors reviewed the licensee's responses to GL 2004-02 to verify that the licensee had completed plant modifications and procedure changes, which it committed to accomplish for Unit 1 during the spring 2008 refueling outage. The licensee had already accomplished modifications to the main recirculation sump as well as some other associated plant modifications during the fall 2006 Unit 1 Cycle 21 refueling outage. The inspectors' review of those plant modifications using TI 2515/166 was documented in NRC Inspection Report 05000315/316/2006007. The inspectors' review of TI 2515/166 for Unit 2 was completed during the fall 2007 refueling outage and it was documented in NRC Inspection Report 05000315/316/2007006.

b. Observations

Summary

The inspectors did not identify any discrepancies based upon review of plant modifications and procedure changes completed for Unit 1 to address GL 2004-02.

Evaluation of Inspection Requirements

In accordance with the requirements of TI 2515/166, the inspectors evaluated and answered the following questions:

(1) Did the licensee implement the plant modifications and procedure changes committed to in its GL 2004-02 responses?

Yes. The licensee completed plant modifications and procedure changes for Unit 1 that it committed to accomplish during the spring 2008 refueling outage. This along with the associated licensing bases changes completed all of the actions necessary for Unit 1 to achieve full compliance with the requirements in the Applicable Requirements section of GL 2004-02.

The inspectors reviewed the commitments specifically relevant to the scope of TI 2515/166 for Unit 1 during the spring 2008 refueling outage. The following completed actions for Unit 1 were reviewed:

(a) Containment Building walkdowns for determination and/or validation of debris sources including insulation and latent debris.

The initial Unit 1 Containment Building walkdowns were completed during the fall 2006 refueling outage. Final walkdowns were completed during the spring 2008 refueling outage.

(b) Replacement of containment recirculation sump strainers.

During the Unit 1 fall 2006 refueling outage, the main recirculation sump strainer was replaced with a larger, new design strainer. Installation of the new strainer resulted in an increase in surface area from about 85 square feet (ft^2) to about 900 ft^2 and an increase in available flow area through the strainer from about 37 ft^2 to about 270 ft^2. The new design consists of a pocket style strainer. The complex geometry of this type strainer should preclude the formation of a thin bed of fibrous debris that could increase head loss across the strainer. The new strainer should also provide increased margin against blockage or excessive wear of downstream components due to debris in the water and provide increased margin for emergency core cooling and containment spray systems pump suction head and vortexing. The replacement strainer has nominal 1/12 - 3/32” round openings; whereas, the previous strainer consisted of nominal 1/4” square openings in a vertical screen and grating arrangement. The reduction in opening size represents a 300 percent improvement in filtration capability.

During the Unit 1 spring 2008 refueling outage, the licensee installed a remote strainer in the Unit 1 Containment Building annulus. The remote strainer uses the same pocket style design and is connected to the main recirculation sump via a waterway through the Containment Building crane wall. The remote strainer provides additional surface area (about 1072 ft^2) for filtration of water during post-accident recirculation phase operation of the residual heat removal and containment spray pumps. The available flow area through the remote strainer is about 321 ft^2. When combined with the main recirculation sump strainer, the total available flow area for the containment recirculation sump strainers is about 591 ft^2.

(c) Installation of debris interceptor/trash rack modifications. This included debris interceptors to protect the drain paths from the containment equalization - hydrogen skimmer fan rooms, the existing flow holes from the loop compartment to the annulus through the vent well walls, the approach area to the strainer section in the annulus, and the area of the inlet nozzles for the containment wide range level instruments.

The following debris interceptor/trash rack modifications were installed during the Unit 1 fall 2006 refueling outage:

1. Installation of debris interceptors to protect the drain paths from the containment equalization - hydrogen skimmer fan rooms. This should reduce the potential for debris blockage of these design flow routes.

2. Installation of debris interceptors at the wide range containment level instrumentation. This should prevent plugging the bottom opening of the stilling well piping to ensure reliability of the level instruments.

The following additional modifications were also completed during the Unit 1 spring 2008 refueling outage:

1. Modification of the five existing 10” diameter flood-up wall openings by chamfering the edges. This should reduce the hydraulic pressure drop across the openings.

2. Modification of the existing steel radiation shield outside the flood-up wall that limits shine through the existing 10” holes so that the bottom plate is cut (or lifted) 2” off the floor. This should provide a path to flush small debris that might otherwise tend to settle between the 10” holes and the shield.

3. Installation of an annular barrier with an access gate. The function of this gate is to act as a debris barrier for large pieces of transient debris in the Containment Building annulus to prevent its transport to the remote strainer.

4. Installations of debris interceptors at the flood-up overflow wall core holes. These debris interceptors cover the five flood-up wall core hole openings. This should ensure that larger debris does not block flow at the core hole openings.

(d) Installation of redundant, safety-related level instruments inside the recirculation sump to provide early indication of sump blockage.

During the Unit 1 fall 2006 refueling outage, redundant, safety-related level instruments were installed inside the recirculation sump to provide early indication of strainer blockage. An associated alarm was installed in the Control Room. This additional instrumentation should aid operators' identification of recirculation sump blockage or air entrainment earlier than solely relying on available indications of emergency core cooling and containment spray systems pump flow rate oscillations and motor amperage swings. Operators may then take action in accordance with their procedures to reduce flow, thus reducing the head loss across the strainer.

(e) Modification of recirculation sump vents to reduce debris screen openings to less than or equal to 1/8".

During the Unit 1 fall 2006 refueling outage, the front recirculation sump vents were extended using collector boxes. These were connected to the existing 6 inch vent line that comes from the rear recirculation sump area and vents above the maximum flood level of the containment. The vent path was also reconfigured to remove the former flat plate design. These changes provide margin against downstream effects by removing potential strainer bypass areas that had a nominal 1/4" opening. The openings are now smaller than the 1/12" opening of the new strainer. Reconfiguration of the front cover vent should also ensure that any air in this section of the sump will be vented outside of the sump.

(f) Modification of the existing cross-over pipe from the recirculation sump to the adjacent lower containment sump.

During the Unit 1 fall 2006 refueling outage, the existing 8" diameter crossover pipe between the recirculation sump and the lower containment sump was capped. This should prevent unfiltered water from bypassing the recirculation sump strainers and entering the recirculation sump. This removed a potential strainer bypass that had a nominal 1/4" opening.

(g) Removal of the asbestos based calcium silicate insulation currently installed on the pressurizer relief tank and the pressurizer relief valve discharge pipe from the pressurizer enclosure to the pressurizer relief tank.

During the Unit 1 fall 2006 refueling outage, calcium silicate insulation was removed from the pressurizer relief tank, pressurizer safety and relief valve pipe, and pressurizer relief tank drain piping inside the crane wall. This removed 100 percent of the calcium silicate insulation assumed removed in the baseline analysis. Low density fiberglass insulation was removed on a non-RCS systems relief valve discharge line to the pressurizer relief tank drain line.

(h) Removal of unqualified labels, tags, signs, tape, and similar materials to the extent practical in Unit 1, and will collect data for unqualified labels in Unit 1.

During the Unit 1 fall 2006 refueling outage, the licensee removed a significant quantity of unqualified labels, tags, signs, tape and similar materials inside containment. Additional labels/tags were removed during the spring 2008 refueling outage. Labels/tags were removed to the extent practical, since some were not accessible without substantial personnel dose accumulation due to scaffold installation. The licensee estimated that 2250.72 in^2 of labels/tags remain and factored this quantity into its analyses.

(i) Implementation of programmatic, process, and procedural changes to ensure that potential sources of debris introduced into containment will be assessed for potential adverse effects on the post-accident recirculation phase operation of the RHR and containment spray pumps.

The licensee updated numerous plant processes and procedures to address debris introduction into the containment and to reflect the above plant modifications. The processes included work control, design change, configuration management, maintenance, and testing. The procedures included maintenance procedures, work control procedures, surveillance test procedures, alarm response procedures, normal operating procedures and instrument calibration procedures. The inspectors reviewed a sample of the procedure changes including labeling procedures, coatings procedures, engineering change, modifications and configuration procedures, and procedures in design control as they relate to the containment sump. PMP-2220-SPP-002, “Evaluation and Control of Materials Affecting the Containment Recirculation Sump Protection Program,” Revision 0 was issued to document the details associated with the licensee's containment recirculation sump protection program. An update was also made to one of the emergency operating procedures, 1-OHP-4023-ES-1.3, “Transfer to Cold Leg Recirculation,” Revision 12, to provide guidance to operators in the event that sump blockage is indicated by the newly installed recirculation sump level instruments.

(j) Modification to the insulation on the non-essential service water lines inside the crane wall below the steam generator enclosures such that the foam insulation is double jacketed without moisture barrier backing.

The licensee completed the modification to the insulation on the non-essential service water lines supplying the reactor coolant pump motors inside the crane wall below the steam generator enclosures and the Upper Containment Building ventilation units below the 650' elevation, such that the foam insulation is double jacketed without moisture barrier backing.

(2) Has the license updated its licensing bases to reflect the corrective action taken in response to GL 2004-02?

Yes. The licensee has updated its licensing bases to reflect the corrective actions taken for Unit 1 in response to GL 2004-02.

The inspectors reviewed the changes identified by the licensee to the UFSAR and the associated 10 CFR 50.59 screenings/evaluations for the physical plant

modifications and found no significant issues. The licensee identified changes to the Unit 1 TS and obtained a license amendment to implement those changes. License Amendment 299 was approved by the NRC on October 18, 2007, and was incorporated into the Unit 1 TS. The changes included: (1) revision to TS 3.3.3, "Post Accident Monitoring Instrumentation," to include containment recirculation sump level instrumentation, which will be used for indication of recirculation sump strainer blockage; (2) revision to TS 3.5.2, "ECCS – Operating," to replace the term "trash racks and screens" with the more descriptive term "strainers;" and, (3) revision to TS 3.6.14, "Containment Recirculation Drains," to include Limiting Conditions for Operation, Actions, and Surveillance Requirements to ensure the operability of flow paths credited in the evaluation of potential adverse effects of post-accident debris on the containment recirculation function. Changes to the UFSAR included Section 6.2, Section 6.3, Figure 6.2-1A, and Figure 9.3-1 to reflect installation of the remote strainer, and Section 7.8 to reflect the new Regulatory Guide 1.97 sump level instrumentation.

Additional licensing bases changes for Unit 1 and Unit 2 to reflect the deterministic methodology associated with the ex-vessel and in-vessel downstream effects analysis and integrated chemical effects analysis were identified by the licensee. However, review of these changes is beyond the scope of TI 2515/166 and is reserved for the Office of Nuclear Reactor Regulation. No other changes to the plant were identified by the licensee that would require NRC approval prior to implementing as stated in 10 CFR 50.59.

(3) Where an extension past the December 31, 2007 completion date has been approved, document what actions have been completed and what actions are outstanding.

All of the actions needed for final resolution of recirculation sump related issues have been completed for Unit 1 and Unit 2.

On June 27, 2006, the licensee submitted a request to defer the completion of several Unit 1 physical plant modifications until the spring 2008 refueling outage, including installation of the remote strainer in the Containment Building annulus, creation of additional openings in the overflow wall and modification of the associated radiation shields, and installation of debris interceptors in the Containment Building annulus and the overflow wall. On July 28, 2006, the NRC staff granted approval of the extension request. These modifications were completed as discussed above during the spring 2008 refueling outage.

On December 6, 2007, the licensee submitted a request for extension of the completion date for completing the downstream effects analysis, integrated chemical effects analysis, and GL 2004-02 licensing bases changes needed for final resolution of recirculation sump related issues for Unit 1 and Unit 2. On December 26, 2007, the NRC staff granted approval of the extension request, allowing until the end of May 2008 for completion of the work. Detailed review of this work is beyond the scope of TI 2515/166 and is reserved for the Office of Nuclear Reactor Regulation.

The December 6, 2007 request also included Unit 1 specific actions for the removal of additional labels and other debris sources from the Containment Building, associated TS changes, and plant modification related licensing bases updates to be completed prior to restart of Unit 1 from the spring 2008 refueling outage. The NRC also approved this extension request in the December 26, 2007 letter. This work was completed as discussed above prior to the restart of Unit 1 from the spring 2008 refueling outage.

This TI is closed for both units. This documentation of TI-2515/166 completion as well as any results of sampling audits of licensee actions will be reviewed by the NRC staff (Office of Nuclear Reactor Regulation - NRR) as input along with licensee's GL 2004-02 responses to support closure of GL 2004-02 and Generic Safety Issue (GSI)-191 "Assessment of Debris Accumulation on Pressurized-Water Reactor (PWR) Sump Performance." The NRC will notify each licensee by letter of the results of the overall assessment as to whether GSI-191 and GL 2004-02 have been satisfactorily addressed at that licensee's plants.

c. Findings

No findings of significance were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On July 9, 2008, the inspectors presented the inspection results to Mr. L. Weber and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

.2 Interim Exit Meetings

Interim exits were conducted for:

- The results of the Inservice Inspection Procedure 7111108 and TI 172 with Mr. J. Jensen on April, 8, 2008.
- The results of the radiological access control and ALARA planning and control inspections with Mr. M. Peifer on April 4, 2008.
- The results of the Emergency Preparedness inspection with Mr. L. Weber on June 6, 2008.

During each of the interim exit meetings, the inspectors confirmed that none of the potential report input discussed was considered proprietary.

4OA7 Licensee-Identified Violations

The following violations of very low significance (Green) were identified by the licensee and are violations of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as NCVs.

- Technical Specification SR 3.6.1.1 required, in part, that the licensee perform leak rate testing in accordance with the Containment Leakage Rate Testing Program. Technical Specification 5.5.14 required, in part, the licensee to establish a program for leak rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B. The licensee implemented its Containment Leakage Rate Testing Program using Engineering Head Instruction 5300, "D. C. Cook Nuclear Plant Containment Leakage Rate Testing Program (Appendix J)," Revision 5. Engineering Head Instruction 5300, Step 4.4.5.a required, in part, that as-found LLRTs of containment components shall be performed prior to maintenance, repairs, or inspections that could reduce containment leakage integrity. Contrary to this, on October 29, 2007, the licensee failed to perform the required as-found LLRT on Unit 2 containment isolation valves 2-WCR-942 and 2-WCR-946 prior to performing maintenance that could have had the potential to affect the valves' leak tightness. The licensee entered this violation into its corrective action program as AR 00821487. This violation was of very low safety significance because Unit 2 was in Mode 5 (Cold Shutdown) with the reactor coolant system filled at the time and containment integrity was not required.

- Technical Specification 5.7.1 requires, in part, that areas with dose rates greater than 100 mrem but less than or equal to 1000 mrem in one-hour be barricaded and conspicuously posted and controlled as an HRA. Contrary to the above, on September 30, 2007, a high radiation area barricade was found out of place (i.e., a swing gate that was serving as the HRA barricade) and apparently pushed aside for work on the sump drain. This action resulted in the entry point to the HRA being ineffectively barricaded. The incident was identified by and documented in the licensee's corrective action program as AR 00819816 and immediate corrective actions were taken to correct the configuration of the HRA barricade and re-establish appropriate radiological access control. The violation was determined to be of very low safety significance because it was not an ALARA planning issue, there was no overexposure nor potential for overexposure, and the licensee's ability to assess dose was not compromised.

- Regarding emergency plans, Title 10 CFR 50.54(q) states, in part, that the "licensee may make changes to these plans without Commission approval only if the changes do not decrease the effectiveness of the plans. Proposed changes that decrease the effectiveness of the approved emergency plans may not be implemented without application to and approval by the Commission." Contrary to this, the licensee made changes to its standard EAL scheme required by 10 CFR 50.47(b)(4). During a review of Revision 11 of PMP-2080-EPP-101, "Emergency Classification" against the latest NRC approved EAL scheme, Revision 2 of PMP-2080-EPP-101, the licensee identified three potential deviations. Of the three identified EAL changes, the most significant change was to the Site Area Emergency EAL for System Malfunctions, S-6, Loss of Alarms.

  Revision 2 indicated, in part, that all four conditions had to be met to declare a Site Area Emergency:

Loss of the following:

1. Loss of one or more safety system annunciator panels in a unit for >15 minutes

-AND-

2. A known loss of indications associated with the following parameters (Attachment B) which … significantly affects the ability to safely operate or shutdown the unit

-AND-

3. Compensatory non-alarming indications from the plant process computer or safety parameter display system are not available

-AND-

4. A significant transient is in progress.

Revision 11 indicated, in part, changed an -AND- statement to an implied -OR- statement which inappropriately added additional classifiable events for a Site Area Emergency:

Loss of one of the following:

1. Loss of one or more safety system annunciator panels for >15 minutes

2. A known loss of indications associated with the following parameters (Attachment 2) which … significantly affects the ability to safely operate or shutdown the unit

-AND-

3. Compensatory non-alarming indications from the plant process computer or safety parameter display system are not available

-AND-

4. A significant transient is in progress.

The violation was of very low safety significance because loss of capability to declare the Site Area Emergency did not occur with the change to this EAL. However, a degradation of the standardized emergency classification scheme occurred by adding events that could be declared which did not meet the threshold of the last approved EAL scheme and reduced the effectiveness of the emergency plan. This change was not submitted to the NRC for approval prior to implementation. Immediate actions were taken upon discovering this condition to

verify no other EALs were out of compliance with the NRC approved classification scheme and to return the changed EALs to compliance. The licensee entered this issue into its corrective action program as AR 00828019.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

S. Adkins, Regulatory Affairs/Licensing Coordinator
P. Donavan, ISI Engineer
J. Gebbie, Plant Manager
L. Green, Radiation Protection/ALARA Supervisor
W. Hart, Radiation Protection General Supervisor
J. Jensen, Site Support Services Vice President
C. Hutchinson, Emergency Preparedness Manager
C. Lane, Engineering Programs Manager
Q. Lies, Site Engineering Director
C. Moeller, Radiation Protection Manager
J. Newmiller, Licensing Activities Coordinator
R. Niedzielski, Regulatory Affairs Specialist
J. Nimtz, Regulatory Affairs Compliance Coordinator
S. Partin, Acting Plant Manager
R. Pickard, Engineering Programs Supervisor
P. Schoepf, Regulatory Compliance Supervisor
L. Weber, Site Vice President
J. Zwolinski, Regulatory Affairs Manager

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000315/2008003-01	NCV	Failure to identify unacceptable interference between the Unit 1 safety injection system piping and the remote strainer waterway in the annulus. (Section 1R15)
05000315/2008003-02 05000316/2008003-02	NCV	Failure to review emergency operating procedures to determine if they were impacted by plant modification. (Section 1R18)
05000315/2008003-03	NCV	Failure to Comply with TS 5.2.2.d, Overtime Restrictions (Section 1R20)
05000315/2008003-04	NCV	Failure to adequately implement surveillance test inspection requirements for the Unit 1 ECCS recirculation sump. (Section 1R22)
05000315/2008003-05; 05000316/2008003-05	FIN	Failure to effectively implement dose reducing radiological and engineering controls associated with modifications to the reactor recirculation sump strainer during U2C17. (Section 2OS2)
05000315/2008003-06	NCV	Failure to Comply with TS SR 3.6.1.1. Failure to perform an as-found LLRT for containment isolation valves (Section 4OA3)

Closed

05000315/2008003-01	NCV	Failure to identify unacceptable interference between the Unit 1 safety injection system piping and the remote strainer waterway in the annulus. (Section 1R15)
05000315/2008003-02 05000316/2008003-02	NCV	Failure to review emergency operating procedures to determine if they were impacted by plant modification. (Section 1R18)
05000315/2008003-03	NCV	Failure to Comply with TS 5.2.2.d, Overtime Restrictions (Section 1R20)
05000315/2008003-04	NCV	Failure to adequately implement surveillance test inspection requirements for the Unit 1 ECCS recirculation sump. (Section 1R22)
05000315/2008003-05; 05000316/2008003-05	FIN	Failure to effectively implement dose reducing radiological and engineering controls associated with modifications to the reactor recirculation sump strainer during U2C17. (Section 2OS2)
05000315/2008003-06	NCV	Failure to Comply with TS SR 3.6.1.1. Failure to perform an as-found LLRT for containment isolation valves (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

The following is a partial list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspector 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 on 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.

1R01 Adverse Weather Protection

- 12-HP-5040-EMP-004, "Plant Winterization and De-Winterization" Revision 11
- PMP-5055-001-001, "Winterization/Summerization" Revision 6
- 12-OHP-4023-ECA-0.0, "Loss of All AC Power" Revision 18
- 12-OHP-4022-001-010, "Severe Weather" Revision 5
- "Seasonal Readiness Affirmation," May 19th, 2008
- AR 08008017, "AFP Room Cooler Drainage"
- AR 08156077, "2-NSW-688 Will Not Isolate (Supplemental Containment Cooling)"
- WR 06363094, "2-SCC-CH-3 Unit 2 Chiller #3 Has Cotton Wood Covering Cooling Fins"
- AR 08165044, "Supplemental Containment Cooling Water Supply Pumps Leaking Oil"
- AR 07327004, "Dampers for 12-OME-250-SDG2 Not Closing Properly"

1R04 Equipment Alignment

- 12-OHP-4022-018-001, "Loss of Spent Fuel Pit Cooling," Revision 11
- 2-OHP-4021-032-008CD, "Operating DG2CD Subsystems," Revision 9
- 1-OHP-4021-008-002, "Placing ECCS in Standby Readiness", Revision20
- OP-1-5142-43, "Flow Diagram Emergency Core Cooling (SIS)"

1R05 Fire Protection

- Fire Hazards Analysis, Fire Zones 29C, 29D, 29F, 22, 66, and 68, Revision 13
- Fire Pre-Plan, Fire Area 22, Revision 4
- AR 08183127, "Fire Zone 29E is Mislabeled Unit 2"
- Fire Drill Pre-Plan, May 14th, 2008,
- AR 08140001, "Ops Radios Performed Poorly During Unannounced Fire Drill"
- AR 00831852, "Quick Hit Self-Assessment of Critique Items of 5/14 Unannounced Fire Drill"
- AR 00832836, "Evaluate Potential Areas of Concern with Operations Radios"
- AR 00832003, "Address NEIL Observations From Fire Drill"

1R08 Inservice Inspection Activates

- AR 08077054, "Weld Overlay 1-PRZ-23 not included in U1C22"
- AR 08087097, "Ultragel Temperature Limit,
- AR 08088040, "Procedure Compliance Boric Acid"
- AR 08088078, "Galvanic Corrosion in Dissimilar Metal SW Connections"
- AR 08098071, "Code Case N-566 Requirements Need to be Documented"
- AR 08065016, "MRP-139 Implementation – Welds not Categorized"
- AR 00120050, "Tracking AR Review SG Outage Integrity"
- AR 00802744, "Boric Acid Packing Leak Valve 1-QCR-300"
- AR 00805195, "1-ICM-111 Packing Leak"
- AR 00806497, "Circ Cracking in Stainless Steel Heater Sleeves"

- AR 00806891, “RCP Seal Water,
- AR 00818959, “LBLOCA PCT Sensitivity”
- AR 00819443, “Foreign Object Found in SG-22”
- AR 00821286, “Boric Acid at Thermocouple Fitting”
- AR 00822364, “Thermal Fatigue Effects”
- AR 00825484, “Review of EPRI SG Guidance Documents”
- AR 00825711, “Negative Trend in Missed Examinations”
- AR 00826310, “1-IM0-275 Dry Boric Acid”
- AR 08071074, “NDE not per IWA-4340”
- “Ultrasonic Calibration Data Sheet, No U1C22-UT-08-002, MSIV-MRV-210,” March 27, 2008
- “Ultrasonic Calibration Data Sheet, No U1C22-UT-08-014, 1-SI-29-03S,” March 31, 2008
- “Ultrasonic Calibration Data Sheet, No U1C22-UT-08-015, 1-SI-29-04F,” March 31, 2008
- “Visual Examination of Pressure Retaining Bolting (VT-1) U1C22-VT-08-033, RH-134,” April 1, 2008
- “NDE Examination Summary Package for 1-PRZ-25-OVERLAY, Surge Line WOR,” November 10, 2006
- 12-QHP-5070-NDE-002, “Visual VT-2 Examinations: Inservice and Repair/Replacements,” Revision 4
- 12-EHP-4030-001-002, “ASME Code Section XI Inservice Pressure Testing,” Revision 2
- 12-QHP-5050-NDE-006, “Visual Examinations: VT-1 and VT-3,” Revision 3
- ISI-PDI-UT-2, “Ultrasonic Examination of Austenitic Piping Welds in Accordance with PDI-UT-2,” Revision 4
- ISI-PDI-UT-5, “PDI Ultrasonic Bolting Procedure,” Revision 4
- 4-ISI-838-07, “Manual Ultrasonic Examination of Weld Overlaid Similar and Dissimilar Metal Welds,” Revision 7
- SDCN 30-8016870-000, “Manual Ultrasonic Examination of Weld Overlaid Similar and Dissimilar Metal Welds,” September 21, 2006
- 4-ISI-240, “Visible Solvent Removable Liquid Penetrant Examination Procedure,” Revision 40\
- “Boric Acid Evaluation,” 1-1MO-275, March 14, 2008
- “Boric Acid Evaluation,” 1-NCR-105, November 8, 2006
- “Boric Acid Evaluation,” 1-PP-45-2, November 6, 2006
- Drawing OP-1-5126-27, “Flow Diagram - Reactor Coolant Unit 1,” Revision 27
- Drawing 8015321D, “Pressurizer Relief Nozzles (1PRZ-21 & 22) Overlay Design D.C. Cook Unit 1,” Revision 0
- Drawing 8015322D, “Pressurizer Spray Nozzle (1PRZ-24) Overlay Design D.C. Cook Unit 1,” Revision 2
- Drawing 8015323D, “Pressurizer Surge Nozzle (1PRZ-26) Overlay Design D.C. Cook Unit 1,” Revision 0
- Drawing 8015324D, “Pressurizer Relief Nozzle (1PRZ-20) Overlay Design D.C. Cook Unit 1,” Revision 0
- Drawing E233-445, “Nozzle Details,” Revision 3
- WCAP-16198-P, “PWSCC Susceptibility Assessment of the Alloy 600 and Alloy82/182 Components in D.C. Cook Units 1 and 2,” Revision 1
- Letter AEP-NRC-07055-01, “D.C. Cook Nuclear Plants Unit and Unit 2 Inspection and Mitigation of Alloy 82/182 Pressurizer Butt Welds,” January 26, 2007
- Specification, ES-PIPE-1013-QCN, Revision 1
- Liquid Penetrant Examination Report, Weld OW1R1, October 10, 2006
- Liquid Penetrant Examination Report, Weld OW1, OW2, OW3, OW4, October 8, 2006
- Magnetic Particle Examination Report, Weld OW5, October 8, 2006
- Radiography Report,” Weld OW-2, October 11, 2006
- Radiography Report, Weld OW-1, October 7, 2006

- Weld Procedure Specification, 1.2TS, September 14, 2006
- Weld Procedure Specification, 1-8.1TS, April 23, 2003
- Weld Procedure Specification, 55-WP1/8/43/F430LTBSCa3, Revision 0
- Procedure Qualification Record, 234, September 15, 1989
- Procedure Qualification Record, 235, September 15, 1989
- Procedure Qualification Record, 255, August 8, 1989
- Procedure Qualification Record, 232, December 2, 1994
- Procedure Qualification Record, 5394-01, February 7, 2002
- Procedure Qualification Record, 7200-02, January 16, 2004
- Procedure Qualification Record, 7213-00, November 10. 2003
- Procedure Qualification Record, 7214-00, January 9. 2004
- Receipt Inspection Report, 29958, March 2, 2005
- Receipt Inspection Report, 30404, August 19, 2005
- VT-2 Data Sheet 1 Examination Results, 1-FRV-255, October 17, 2006
- Work Order 55251497 Task 18, "Perform Weld Overlay Activities for Pressurizer," September 15, 2006
- AREVA Process Traveler 50-9022046-000, "Pressurizer Surge Nozzle Section only," September 7, 2006
- Drawing 8015323D, "Pressurizer Surge Nozzle Overlay Design," Revision 2

1R11 Licensed Operator Requalification Program

- AR 08011011, "Provide Stable Pressure/ Temperature Control of RCS"
- AR 08100061, "OHP-4023-ECA-1-3 Needs Updated for the RHR Xtie Mod"
- RQ-S-3302-S1, "Period 3302 Simulator Session 1- Emergency Plan Drill, May 8th, 2008

1R12 Maintenance Effectiveness

- "Maintenance Rule Scoping Document," Revision 4
- "ECCS System Health and Status Report," December 31st, 2007
- "Maintenance Rule Two-year Unavailability Report for ECCS," March 31st, 2008
- "Charging 24-Month Unavailability Report," May 30th, 2008
- "Maintenance Rule (a)(1) Action Plan for Safety Injection valve 1-SI-158-L1"
- AR 00830019, "17 Drop Per Minute Oil Leak on East CCP"
- AR 08156069, "W-CCP, 1-QMO-226 failed to actuate from Control Room"
- AR 00819373, "2-PP-50W Pump/Speed Inc Coupling Damage"

1R13 Maintenance Risk Assessments and Emergent Work Control

- PMP-2291-OLR-001, "On-Line Risk Management," Unit 1 and Unit 2 Part 1 Configuration Risk Assessment, April 2 thru 8, April 12 thru 13, April 20, May 5 thru 9, June 16 thru 17
- Control Room logs, April 2 thru 8, April 12 thru 13, April 20, May 5-9, June 16 thru 17
- PMP-2291-OLR-001, "On-Line Risk Management," Unit 1 and Unit 2 Part 1 Configuration Risk Assessment, April 2 thru 8, April 12 thru 13, April 20, May 5 thru 9, June 16 thru 17
- AR 08104026, "U1 Dual ESW Outage PRA Risk Management Plan Was Not Followed"
- Infrequently Performed Test and Evolution Briefing, "Dual ESW Outage,"

1R15 Operability Evaluations

- AR 08120025, "Rework Unit 1 Remote Strainer Waterway"
- AR 08120090, "Inadequate Extent of Condition Review"

- AR 00829549, “Modes 1-4 Aggregate Operability Determination Evaluation for Unit 1”
- AR 00814362, “CCP Suction Line Piping Analysis Used Incorrect Temperature”
- AR 00830724, “Potential Interface Between 8 Inch SI Piping and Remote Strainer Waterway”
- SD-080505-001, “Operability Evaluation of Interaction Between Unit 1 Remote Strainer Waterway and SI Pipe,” May 19th, 2008
- CR 04336038, “2-RH-152, Identified gas pockets in RHR Piping”
- CR 05262008, “Gas Void Identified In Piping downstream of 1-IMO-350”
- ES-PIPE-1002-QCN, “Operability Screening Guideline For Pipe Support Conditions and Discrepancies Found by In-Service Inspections,” November 25th, 1998
- EDG-Pipe-11, “Interim Acceptance Criteria For Safety Related Piping Systems,” June 1993
- DWG 1-2-5876-4, “Containment Unit 1 and 2 Rupture Restraints For Large Diameter Piping Annulus Area Sections-Quadrant II”
- EC-48922, “Provide New RHR Pipe Support For Partially Removed Support 1-GRH-R-508”
- AR 00809803, “An Air Void was Found in the Piping Downstream of 1-IMO-350”
- AR 00829848, “Support 1-2-GRH-R508 Has Been Removed”

1R18 Plant Modifications

- EC 47652, “Modify Component Cooling Water Heat Exchanger Outlet Motor Operated Valves CMO-410 and CMO-420 to Open on Loss of Offsite Power Without Safety Injection,” Revision 0
- Work Order 55296154, “EC 47652 Train B Installation 1-CMO-420”
- Work Order 55296601, “EC 47652 Train A Installation 1-CMO-410”
- AR 00832337, “EOP Procedure Review Conclusions Not Formally Documented”
- AR 00807108, “Removal of U1 Normal and Alternate ESW Supply to EDG Check Valves”
- 1-OHP-4025-R-4, “Restore ESW,” Revision 2
- 1-OHP-4023-ECA-0.1, “Loss of All AC Power Recovery Without SI Required,” Revision 13
- 1-OHP-4023-ECA-0.0, “Loss of All AC Power,” Revision 23
- 1-CMM-55053, “Removal of Unit 1 Normal and Alternate Essential Service Water Supply to Emergency Diesel Generators Check Valves,” Revision 0

1R19 Post Maintenance Testing

- WO 55313626, “Replace Unit 2 SSPS Train B Card at Location A3,” May 29, 2008
- WO 5530087701, “1-XRV-223, Replace with Upgrade,” April 2, 2008
- WO 5524499307, “Replace 1R and 4R Rear Bank Fuel Injector Pumps,” March 31, 2008
- 1-OHP-4030-132-027AB, “AB Diesel Generator Operability Test,” April 8, 2008
- WO 55311640, “2CD EDG Fuel Injector Pump Cylinder 4F Replaced,” April 9, 2008
- 2-OHP-4030-232-027CD, “CD Diesel Generator Operability Test,” April 9, 2008
- WO 55254619, “2-HV-DGS-DAB, 2AB Emergency Diesel Generator Room Ventilation,” June 17, 2008
- WO 55298984, “2-HV-DG-FLT-1, 2AB Emergency Diesel Generator Room Cabinet Ventilation,” June 17, 2008
- WO 55319000, “Replace Fuel Injector Pumps 2F, 4F, 2R, 5R-AB,” June 26, 2008
- 2-OHP-4030-232-027AB, “AB Diesel Generator Operability Test,” June 26, 2008
- AR 08171014, “PMT on U1 AB Diesel Components Not Performed During Work Week”

1R20 Outage Activities

- OHI-6100, Attachment 2, “Unit 1 RCS Cooldown Rate Limit Curve, March 26 thru 27, 2008
- PMP-4100-SDR-001, “Plant Shutdown Safety and Risk Management,” Revision 17

- 1-OHP-4021-002-005, “RCS Draining,” Revision 29
- 1-OHP-4030-127-041, “Refueling Integrity,” Revision 11
- 12-OHP-4050-FHP-001, “Refueling Procedure Guidelines,” Revision 17
- 2-OHP-4021-017-002, “Placing in Service the Residual Heat Removal System,” Revision 19
- 2-OHP-4021-001-004, “Plant Cooldown From Hot Standby to Cold Shutdown,” Revision 45
- 1-OHP-4021-001-002, “Reactor Start-Up,” Revision 38
- 1-OHP-4021-001-006, “Power Escalation,” Revision 45
- NRC Generic Letter 82-12, “Nuclear Power Plant Staff Working Hours,” June 15, 1982
- PMP-4010-WHL-001, “Working Hour Limitations,” Revision 6
- AR 08098058, “Blanket Overtime Use and Insufficient Reasons for Deviations”
- AR 08091081, “Violation of Working Hour Limitations”
- Multiple Request for Deviation in Working Hour Limitations Forms dated March 26, 2008 through April 4, 2008
- AR 08091014, “Unit 1 Control Room Ventilation Failed Charcoal Leak Test”
- AR 00829652, “1-ECR-10 Failed Local Leak Rate Test”
- AR 00828872, “Drop Test Failure for 1-NRV-152 Actuator”
- AR 00830117, “Evaluate 1W CCP Differential Pressure Issue”
- AR 00829028, “1-FRV-240-PU As Left Diagnostic Test Was Not Acceptable”
- AR 00828292, “Source Range N-32 Reading Low After Unit 1 Shutdown”
- AR 00829339, “1-ECR-10 Valve Does Not Travel”
- AR 00828865, “As Found LLRT Failure of ICM-250 and ICM-251”
- AR 00830119, “1-NRV-152 Failed Stroke Time Open”

1R22 Surveillance Testing

- 1-IHP-4030-STP-411, “Train ‘B’ RPS and ESF Reactor Trip Breaker and SSPS Automatic Trip/Actuation Logic Operational Test”, Rev. 14
- 1-IHP-4030-STP-080, “Prior to Startup (SU) Instrumentation Channel Operational Test and Trip Actuating Device Operational Test”, Rev. 17
- NRC Generic Letter 98-04, “Potential for Degradation of the Emergency Core Cooling System and the Containment Spray System After a Loss-of-Coolant Accident Because of Construction and Protective Coating Deficiencies and Foreign Material in Containment,” July 14, 1998
- 12-MHP-4030-031-001, “Inspection of the Recirculation Sump,” Revision 11
- PMP-2220-SCC-001, “Cleanliness Inspection Criteria,” Revision 15
- Design Information Transmittal S-00408-08, “Inspection Requirements for Unit 1 and Unit 2 Containment Recirculation Strainers and Sumps, Remote Strainers and Containment Debris Interceptors,” Revision 8
- AR 00830063, “Items Associated With Management, Performance Assurance, and NRC Inspection of Recirculation Sump”
- AR 00830064, “Document Items Associated With NRC Inspection of Recirculation Sump”
- AR 00830387, “NRC Identification of Sump Items After Management and Performance Assurance Closure”
- AR 08106067, “Results of NRC Inspection of New Strainer Waterway”
- 12-MHP-4030-010-004, “Ice Condenser Intermediate Deck Door Surveillance,” Revision 5
- 12-EHP-4030-010-262, “Ice Condenser Surveillance and Operability Evaluation,” Revision 7
- AR 00827862, “U1C22 Aggregate Ice Basket Damage Evaluation”
- AR 00828130, “U1C22 Aggregate Heavy Ice Basket Weight Evaluation”
- AR 00827946, “U1C22 Aggregate Light Ice Basket Weight Evaluation”
- 1-EHP-4030-134-203, “Unit 1 [Local Leak Rate Testing] LLRT,” Revision 5
- AR 08175022, “Procedure Steps Were Signed and Should Have Been N/A”

1EP2 Alert and Notification System Evaluation

- "2007 Annual ANS Siren Maintenance Summary"
- Annual Siren Preventative Maintenance Inspection Sheets, October - November 2007
- Annual Siren Preventative Maintenance Inspection Sheets, September 2006
- "D. C. Cook Nuclear Plant Alert and Notification System Final Design Report," December 2007
- "D. C. Cook Nuclear Plant Siren Maintenance Work Screening Checklist," July 2006 - May 2008
- EPP-2080-ANS-001, "Alert and Notification System Operation," April 3, 2008

1EP3, Emergency Response Organization Staffing and Augmentation 71114.03

- "Donald C. Cook Nuclear Plant Emergency Plan, Section B, Emergency Response Organization," Revision 26
- "Donald C. Cook Nuclear Plant Emergency Plan, Section E, Notification Methods and Procedures," Revision 26
- "Current ERO Position Assignment Report," June 2, 2008
- "ERO Crafts Qualification List," May 28, 2008
- "ERO Phone Directory Phone Directory," May 7, 2008
- PMP-2080-EPP-100, Attachment 2, "Activation of Dialogics Pagers," Revision 11
- TPD-600-EPT, "Emergency Preparedness Training Program Description," Revision 13
- AR 00827568, "March 10, 2008 Unannounced Off-Hours Drive-In Drill,"
- AR 00823477, "December 15, 2007 Unannounced Off-Hours Pager Drill,"
- AR 00814402, "June 5, 2007 Off-Hours Augmentation Drive-In Drill Results,"
- AR 00807850, "August 9, 2006 Off-Hours Notification Pager Drill Results,"

1EP5 Correction of Emergency Preparedness Weaknesses, 71114.05

- PA-07-09, "Emergency Plan Performance Assurance Audit," September 6, 2007
- PA-06-07, "Emergency Plan Performance Assurance Audit," August 31, 2006
- AR 08158018, "Emergency Plan Performance Indicator Needs Times Included,"
- AR 00830327, "Assessment of April 18, 2008 Earthquake Unusual Events,"
- AR 00829561, "Pre-Inspection Quick Hit Self-Assessment Report - Emergency Planning,"
- AR 00801675, "NRC Apparent Violation - EA-06-177,"
- AR 00127173, "Tracking CR to Document Unannounced Off-Hours ERO Drive-In Drill TSC, EOF and OSC Activation Times Greater Than Goals,"
- AR 00127844, "Emergency Action Level Bases Review against NUMARC/NESP-007 Bases,"

1EP6 Drill Evaluation

- Critique Report, May 27, 2008 Emergency Plan Drill for ERO Team #1
- Exercise Time Line, Cook Nuclear Plant, May 27, 2008, Drill
- EMD-32a, Michigan State Police, Nuclear Plant Event Notification, May 27, 2008, Drill
- PMP-2080-EPP-101, "Emergency Classification," Revision 12
- PMMP-2080—EPP-100, "Emergency Response," Revision 12

2OS1 Access Control to Radiologically Significant Areas; and

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

- 00819330, "Root Cause Evaluation of U2C17 Elevated RCS Dose Rates," December 20, 2007

- 00819816, “Unauthorized HRA Boundary Manipulation,” October 1, 2007
- 00820244, “Sump Modification RWP Required Revision to Add Dose,” October 7, 2007
- 00821722, “Containment Sump Modification Dose Estimate Exceeded,” November 1, 2007
- 00821803, “Containment Sump Project lessons learned from U2C17,” November 6, 2007
- 00821976, “Maintain Water in RGR Piping for Shielding,” November 7, 2007
- 00822306, “Self-Assessment – ALARA Planning and Controls,” December 26, 2007
- 00822307, “Self-Assessment – Access Control to Radiologically Significant Areas,” February 19, 2008
- 00822736, “ump Modification Organizational and Programmatic Issues,” November 29, 2007
- RWP 072123, “ALARA In-Progress Review of Temporary Shielding (Containment, Auxiliary Building and Turbine Building,” October 10, 2007
- RWP 072172, “ALARA Post Job Review U2C17-Recirculation Containment Sump Debris Project,” November 20, 2007
- RWP 072173, “ALARA Post Job Review U2C17-RTD Bypass Removal,” October 19, 2007
- RWP 072189, “ALARA Post Job Review RHR Cross Tie Modification,” November 13, 2007
- Dose Reduction 5-Year Plan – 2007, 2007
- Outage Dose Tracking Packages (Daily, Work Activity, Work Group) Multiple
- RP Outage Critique – U2C17, Undated
- RP/ENV Department Roll-Up Meeting (DRUM) Minutes, Various
- RWP 061173, “U1C21-RTD Bypass Removal, Multiple”
- RWP 072107, “U2C17 Reactor Vessel Channel Head Replacement,” Revision 00
- RWP 072123, “U2C17 Temporary Shielding,” Multiple
- RWP 072172, “U2C17 Recirculation Containment Sump,” Multiple
- RWP 072173, “U2C17-RTD Bypass Removal,” Multiple
- RWP 072189, “U2C17 RHR Cross Tie Modification,” Multiple
- RWP 081172, “U1C22 Recirculation Containment Sump,” Multiple
- 12-THP-6010-RPP-104, “Personnel Dosimetry Use in Varying Radiation Fields,” Revision 08
- 12-THP-6010-RPP-121, “Dose Monitoring for Declared Pregnant Women,” Revision 03
- 12-THP-6010-RPP-405, “Analysis of Airborne Radioactivity,” Revision 12
- 12-THP-6010-RPP-121, “Dose Monitoring for Declared pregnant Woman,” Revision 03
- 12-THP-6010-RPP-400, “Radiological Protection Job Coverage,” Revision 10
- 12-THP-6010-RPP-407, “Special Radiological Evolutions,” Revision 21
- 12-THP-6010-RPP-414, “Radiological Controls for Work on Flux Mapping System,” Revision 08
- 12-THP-6010-RPP-418, “Radiological Posting,” Revision 15
- CLG-138, “Projecting RCS CRUD Release During Forced Oxidation,” Revision 01
- PMP-6010-ALA-001, “ALARA Program – Review of Plant Work Activities,” Revision 16
- PMP-6010-RPP-001, “General Radiation Worker Instructions,” Revision 10
- PMP-6010-RPP-003, “High, Locked High, and Very High Radiation Area Access,” Revision 19
- PMP-6010-RPP-016, “Radiation Protection Department Shift Responsibilities,” Revision 16
- THG-004, “Radiological Posting Guidelines,” Revision 11
- THG-026, “Locked High Radiation Area and Very High Radiation Area Weekly Verification Process,” Revision 09
- THG-040, “Locked High Radiation Area and Very High Radiation Area Key Inventory,” Revision 12

4OA1 Performance Indicator Verification

- Unit 1 and Unit 2 Control Room Logs, January 1, 2007 through December 31, 2007
- Licensee Event Reports, January 1, 2007 through December 31, 2007

- PMP-7110-PIP-001, “Reactor Oversight Program Performance Indicators and Monthly Operating Report Data,” Revisions 9 and 10
- Nuclear Energy Institute 99-02, “Regulatory Assessment Performance Indicator Guideline,” Rev. 5
- PRA-MSPI-BASIC, “MSPI Basic Document,” Rev. 4
- PMP-7110-PIP-001, Data Sheet 4, “Safety System Unavailable – Emergency AC Power System,” January 2007 through December 2007
- PMP-7110-PIP-001, Data Sheet 5, “Safety System Unavailability - High Pressure Safety Injection System,” January 2007 - December 2007
- PMP-7110-PIP-001, Data Sheet 6, “Safety System Unavailability - Auxiliary Feedwater System,” January 2007 - December 2007
- PMP-7110-PIP-001, Data Sheet 7, “Safety System Unavailability - Residual Heat Removal System,” January 2007 - December 2007
- PMP-7110-PIP-001, Data Sheet 9, “Cooling Water System,” January 2007 – December 2007
- AR 00814616, “W-CCP ELO, 1-QMO-226, Failed to Actuate from Control Room”
- AR 00812696, “Cannot Raise Load on Diesel to More Than 1900KW”
- AR 00816760, “1CD EDG Starting Air to Turbocharger Safety Valve Lifting”
- AR 00820978, “U2 CD EDG Failed to Synchronize Across T21D8 Breaker”
- 00811076, “Self-Assessment – Effectiveness Review of Action Taken to Address ED Dose Alarms,” April 27, 2007
- PMP-6010-RPP-100, “Radiation Exposure Monitoring, Reporting and Dose Control,” Revision 10
- PMP-7110-PIP-001, “Reactor Oversight Program Performance Indicators and Monthly Operating Report Data,” Revision 10
- Berrien County EWS Siren Failure Report, July 2006 -May 2008
- PMP-7110-PIP-001, “Regulatory Oversight Program Performance Indicators and Monthly Operating Report Data,” July 2007 - March 2008
- D. C. Cook Monthly Drill and Exercise Performance PI Data Sheets, July 2007 - March 2008
- D. C. Cook ERO Member Drill Participation PI Data Sheets, September 2007 - March 2008
- D. C. Cook Monthly Siren Performance Indicator Test Results, July 2007 - March 2008
- AR 07228078, “Iodine Exposure during Emergency Plan Activities”
- AR 07221063, “2007 Evaluated Exercise Incorrect Protective Action Recommendation”

4OA2 Problem Identification and Resolution

- DTG-DRUM-001, Attachment 1, Department Roll-Up Meeting Agenda for Design Engineering on July 20, 2007
- DTG-DRUM-001, Attachment 1, Department Roll-Up Meeting Agenda for Design Engineering on January 18, 2008
- Operations Department Roll-Up Meeting Package for July 26, 2007
- Operations Department Roll-Up Meeting Package for January 30, 2008
- AR 00117502, “Tracking Condition Report for Operations Self Assessment”
- AR 00823979, “Potential Decline in Operations Procedure Use/Adherence”
- AR 00813244, “Continued Trend in C7a, Modification Issues”

4OA3 Followup of Events and Notices of Enforcement Discretion

- AR 08156069, “2-SRV-12 Bypass Steam to High Pressure Seals Went Closed for Unknown Reason”

- AR WR06362899, “2-SRV-12 Went Closed for No Apparent Reason Causing a Loss of Sealing Steam Pressure”
- NRC Regulatory Guide 1.163, “Performance-Based Containment Leak-Test Program,” September 1995
- Nuclear Energy Institute 94-01, “Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50 Appendix J,” Revision 0, July 16, 1995
- EHI 5300, “D. C. Cook Nuclear Plant Containment Leakage Rate Testing Program (Appendix J),” Revision 5
- AR 00821487, “2-WCR-942 and 2-WCR-946 Planned and Worked Without As-Found LLRT”
- AR 00820188, “2-WCR-923 Found Incorrectly Assembled”
- AR 08093051, “Consider Revision of LER 2007-001-00 for 2-WCR-923”
- AR 08100042, “Incorrect Conclusion for AR 00821487-08”
- AR 08105080, “LER 316/2007-01 Did Not Capture All Missed As-Found Tests”
- Work Order 55273843-01, “2-WCR-922 – Refurbish Actuator and Replace Valve Diaphragm”
- Work Order 55301684-05, “Disassemble, Inspect and Repair 2-WCR-923”
- AR 06100045, “Valve 2-SI-189 Was Unable to Be Pressurized While Attempting As-Found LLRT Testing During U2C16 Refueling Outage”
- AR 06101012, “Valve 2-SI-189 Was Disassembled and Internal Visual Inspection Performed Prior to Performance of As-Found Local Leak Rate (B&C) Test”
- AR 06151087, “Failure to Comply with TS SR 3.6.1.1 Was Never Evaluated in CRs 06101012 and 06100045”
- Reactor Plant Event Notification Worksheet, EN#44147, April 18, 2008
- EMD-32a Michigan State Police, Nuclear Plant Event Notification, April 18, 2008
- 2 -OHP-4022-001-007, “Earthquake,” Revision 9
- PMP-2080-EPP-100, “Emergency Response,” Revision 11
- PMP-2080-EPP-101, “Emergency Classification,” Revision 11
- AR 08109031, “Earthquake Response”
- AR 08109018, “Earthquake Procedure Enhancement”
- AR 08112058, “Earthquake Response Aftershock”

4OA5 Other Activities

- D.C. Cook Unit 1 TSs
- Letter AEP:NRC:5054-11 from J. Jensen, Indiana Michigan Power, to U.S. NRC, “Donald C. Cook Nuclear Plant Units 1 and 2, NRC GL 2004-02 - Information Requested by September 1, 2005,” August 31, 2005
- Letter AEP:NRC:5054-14 from J. Jensen, Indiana Michigan Power, to U.S. NRC, “Donald C. Cook Nuclear Plant Units 1 and 2, NRC GL 2004-02 Revision of Commitments,” December 19, 2005
- Letter AEP:NRC:6054-05 from J. Jensen, Indiana Michigan Power Company, to U.S. NRC, “Donald C. Cook Nuclear Plant Units 1 and 2, Update to Response to NRC GL 2004-02: Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors,” June 27, 2006
- Letter AEP:NRC:6054-06 from J. Jensen, Indiana Michigan Power Company, to U.S. NRC, “Donald C. Cook Nuclear Plant Unit 1, Request for Extension of Completion Date for Unit 1 Actions in Response to GL 2004-02, 'Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors,” June 27, 2006
- Letter AEP:NRC:6054-07 from J. Jensen, Indiana Michigan Power Company, to U.S. NRC, “Donald C. Cook Nuclear Plant Units 1 and 2, Revision of Commitment for Update of Response to RAI Regarding NRC GL 2004-02,” December 19, 2006

- Letter AEP:NRC:7036 from J. Jensen, Indiana Michigan Power Company, to U.S. NRC, "Donald C. Cook Nuclear Plant Units 1 and 2, Docket Nos. 50-315 and 50-316, License Amendment Request to Revise TSs Associated with GL 2004-02," June 27, 2007
- Letter AEP:NRC:7054-05 from J. Jensen, Indiana Michigan Power Company, to U.S. NRC, "Donald C. Cook Nuclear Plant Units 1 and 2, Request for Extension of Completion Date for Unit 1 and 2 Actions in Response to GL 2004-02, 'Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors,'" December 6, 2007
- Letter AEP:NRC:8054-02 from M. Peifer, Indiana Michigan Power Company, to U.S. NRC, "Donald C. Cook Nuclear Plant Units 1 and 2, Supplemental Response to Nuclear Regulatory Commission Generic Letter 2004-02: Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors," February 29, 2008
- Letter from P. Tam, U.S. NRC, to M. Nazar, Indiana Michigan Power Company, "Donald C. Cook Nuclear Plant, Unit 1 - Extension of Completion Date for Actions in Response to GL 2004-02," July 28, 2006
- Letter from P. Tam, U.S. NRC, to M. Rencheck, Indiana Michigan Power Company, "Donald C. Cook Nuclear Plant, Units 1 and 2 – GL 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors," Extension Request Approval (TAC NOS. MC4679 and MD4680)," December 26, 2007
- Letter from P. Tam, U.S. NRC to M. Nazar, Indiana Michigan Power Company, "Donald C. Cook Nuclear Plant, Units 1 & 2 (DCCNP-1 and DCCNP-2) – Issuance of Amendments Re: Containment Sump Modifications Per Generic Letter 2004-02 (TAC NOS. MD5901 and MD5902)," October 18, 2007
- EC 0000047994, "Unit 1 Recirculation Sump Remote Strainer," Revision 0
- EHI-5045, "Design Control", Revision 5
- EHI-5065. "Safety-Related Coatings Program", Revision 2
- EHI-5201, "Containment Recirculation Sump Protection Program", Revision 4
- 12-EHP-5040-MOD-009, "Engineering Change Reference Guide", Revision 18
- 12-MHP-4030-031-001, "Inspection of the Recirculation Sump," Revision 11
- 1-OHP-4030-001-002, "Containment Inspection Tours," Revision 25
- 1-OHP-4023-ES-1.3, "Transfer to Cold Leg Recirculation," Revision 12
- PMI-2115, "Plant Labeling and Operating Information", Revision 4
- PMI-2220, "Foreign Material Exclusion, Cleanliness, and Housekeeping/Material Condition," Revision 15
- PMI-5040, "Engineering Change Program", Revision 18
- PMP-2220-SPP-002, "Evaluation and Control of Materials Affecting the Containment Recirculation Sump Protection Program," Revision 0
- PMP-5040-ECC-001, "Engineering Configuration Changes", Revision 6
- PMP-5040-MOD-007, "Engineering Modifications", Revision 12

4OA7 Licensee-Identified Violations

- PMP-2080-EPP-101, "Emergency Classification," Revisions 2, 11, and 12
    - AR 00828019, "Potential Deviations between Current and NRC Approved EALs,"

LIST OF ACRONYMS USED

ADAMS	Agency Documents Access and Management System
ALARA	As-Low-As-Is-Reasonably-Achievable
ANS	Alert and Notification System
AR	Action Request
ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
DIT	Design Information Transmittal
DMBW	Dissimilar Metal Butt Welds
ECCS	Emergency Core Cooling system
EDG	Emergency Diesel Generator
EP	Emergency Preparedness
ERO	Emergency Response Organization
ESW	Essential Service Water
HRA	High Radiation Area
IMC	Inspection Manual Chapter
ISI	Inservice Inspection
LER	Licensee Event Report
LOCA	Loss of Cooling Accident
LLRT	Local Leak Rate Testing
MRP	Materials Reliability Program
MSPI	Mitigating Systems Performance Index
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
PARS	Publicly Available Records
PDI	Post Demonstration Initiative
PI	Performance Indicator
RHR	Residual Heat Removal
RV	Reactor Vessel
RWP	Radiation Work Permit
SDP	Significance Determination Process
SG	Steam Generator
SI	Safety Injection
SR	Surveillance Requirement
SSC	Structure, System, or Component
TI	Temporary Instruction
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
UT	Ultrasonic Examination
VHRA	Very High Radiation Area