



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
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LISLE, IL 60532-4352

July 22, 2011

Mr. Larry Weber  
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, INTEGRATED  
INSPECTION REPORT 05000315/2011003; 05000316/2011003**

Dear Mr. Weber:

On June 30, 2011, 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 results of this inspection, which were discussed on July 14, 2011, with Mr. J. Gebbie, and other members of your staff.

The 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.

The report documents one NRC-identified finding of very low safety significance (Green). The finding was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because the issue was entered into your corrective action program, the NRC is treating this finding as a Non-Cited Violation (NCV) consistent with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the subject or severity of this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at D. C. Cook. In addition, if you disagree with the characterization of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region III, and the NRC Resident Inspector at D.C. Cook. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

L. Weber

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

Sincerely,

**/RA/**

Mark Marshfield, Acting Chief  
Branch 6  
Division of Reactor Projects

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

Enclosure: Inspection Report 05000315/2011003; 05000316/2011003  
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 05000315; 05000316  
License Nos: DPR-58; DPR-74

Report No: 05000315/2011003; 05000316/2011003;

Licensee: Indiana Michigan Power Company

Facility: D. C. Cook Nuclear Power Plant, Units 1 and 2

Location: Bridgman, MI

Dates: April 1 through June 30, 2011

Inspectors: J. Lennartz, Senior Resident Inspector  
P. LaFlamme, Resident Inspector  
T. Briley, Reactor Engineer  
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Approved by: Mark Marshfield, Acting Chief  
Branch 6  
Division of Reactor Projects

Enclosure

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## SUMMARY OF FINDINGS

IR 05000315/2011003, 05000316/2011003; 04/01/2011 – 06/30/2011; D. C. Cook Nuclear Power Plant, Units 1 & 2; Other Activities

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

### A. NRC-Identified and Self-Revealed Findings

#### Cornerstone: Initiating Events

- Green. A finding of very low safety significance and associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," were identified by the inspectors for the licensee's failure to examine reactor coolant system (RCS) pipe surfaces affected by mechanical stress improvement to ensure that surfaces were uniform and free of cracks, buckles or other defects. As a corrective action, the licensee issued AR 2011-4426 to document the nonconforming condition of the RCS piping and was evaluating corrective actions including an action to request NRC approval to deviate from these code requirements.

The finding was determined to be more than minor because the finding was associated with the Initiating Events Cornerstone attribute of Design Control and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions. Because the licensee did not perform surface examinations intended to provide reasonable assurance in the physical integrity of the RCS boundary, the availability and reliability of the RCS may have been reduced. The RCS piping was considered operable because of the low plastic strains involved, such that the likelihood of substantive cracking or buckling was small. The inspectors answered "No" to the Phase I screening question "Assuming worst case degradation, would the finding result in exceeding the Technical Specification limit for any RCS leakage or could the finding have likely affected other mitigation systems resulting in a total loss of their safety function assuming the worst case degradation?" Therefore, the finding screened as having very low safety significance. This finding has a cross-cutting aspect in the area of human performance, resources, because the licensee did not provide complete, accurate and up-to-date design documentation. Specifically, the failure to examine RCS pipe surfaces was caused by the incomplete and inaccurate design documents for implementation of the mechanical stress improvement process (Inspection Manual Chapter 310 Item [H.2(c)]). (Section 4OA5.1).

### B. Licensee-Identified Violations

No violations of significance were identified.

## REPORT DETAILS

### Summary of Plant Status

Unit 1 operated at or near full power during the entire inspection period.

Unit 2 operated at or near full power during the entire inspection period.

### 1. REACTOR SAFETY

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

#### 1R01 Adverse Weather Protection (71111.01)

##### .1 Readiness of Offsite and Alternate AC Power Systems

##### a. Inspection Scope

The inspectors verified that plant features and procedures for operation and continued availability of offsite and alternate alternating current (AC) power systems during adverse weather were appropriate. The inspectors reviewed the licensee's procedures affecting these areas and the communications protocols between the transmission system operator (TSO) and the plant to verify that the appropriate information was being exchanged when issues arose that could impact the offsite power system. Examples of aspects considered in the inspectors' review included:

- the coordination between the TSO and the plant during off-normal or emergency events;
- the explanations for the events;
- the estimates of when the offsite power system would be returned to a normal state; and
- the notifications from the TSO to the plant when the offsite power system was returned to normal.

The inspectors also verified that plant procedures addressed measures to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system prior to or during adverse weather conditions. Specifically, the inspectors verified that the procedures addressed the following:

- the actions to be taken when notified by the TSO that the offsite power system post-trip voltage at the plant would not be acceptable to assure continued operation of safety-related loads without transferring to the onsite power supply;
- the compensatory actions identified to be performed if it would not be possible to predict the post-trip voltage at the plant for the current grid conditions;
- a reassessment of plant risk based on maintenance activities which could affect grid reliability, or the transmission system ability to provide offsite power; and

- the communications between the plant and the TSO when changes at the plant could impact the transmission system, or when the transmission system capability to provide adequate offsite power was challenged.

Documents reviewed are listed in the Attachment to this report. The inspectors also reviewed corrective action program (CAP) items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their CAP in accordance with station corrective action procedures.

This inspection constituted one readiness of offsite and alternate AC power systems sample as defined in Inspection Procedure (IP) 71111.01-05.

b. Findings

No findings were identified.

.2 Summer Seasonal Readiness Preparations

a. Inspection Scope

The inspectors reviewed the licensee's preparations for summer weather for selected systems, including conditions that could lead to an extended drought.

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. Specific documents reviewed during this inspection are listed in the Attachment. The inspectors also reviewed CAP 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 station corrective action procedures. The inspectors' reviews focused specifically on the following plant systems:

- Unit 1/2 screen house;
- Unit 1/2 fire protection water storage tank yards; and
- auxiliary building fuel handling area.

This inspection constituted one seasonal adverse weather sample as defined in IP 71111.01-05.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

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

- Unit 1 AB emergency diesel generator;
- Unit 2 east motor driven auxiliary feedwater system; and
- Unit 1 south safety injection system.

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 system function and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, UFSAR, Technical Specification (TS) requirements, outstanding work orders, condition reports, 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 operable. The inspectors examined the material condition of the components and observed operating parameters of equipment 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 CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings 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 zone 53, Unit 1 control room;
- Fire zones 44C & 44D, Unit 1 east and west residual heat removal heat exchanger rooms;
- Fire zones 63A, 63B, and 63C, Unit 2 charging pump rooms;
- Fire zone 42B, Unit 1 control rod drive room; and
- Fire zone 46D, Unit 2 AB battery room.

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, maintained passive fire protection features in good material condition, and implemented adequate compensatory measures for out-of-service, degraded, or inoperable fire protection

equipment, systems, or features in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, 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. Using the documents listed in the Attachment, 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 that minor issues identified during the inspection were entered into the licensee's CAP. Documents reviewed are listed in the Attachment to this report.

These activities constituted five quarterly fire protection inspection samples as defined in IP 71111.05-05.

b. Findings

No findings were identified.

.2 Annual Fire Protection Drill Observation (71111.05A)

a. Inspection Scope

On May 14, 2011, the inspectors observed fire brigade activation for a simulated large fire event rendering the Unit 1 control room uninhabitable. Based on this observation, the inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that the licensee staff identified deficiencies; openly discussed them in a self-critical manner at the drill debrief; and took appropriate corrective actions. Specific attributes evaluated were:

- proper wearing of turnout gear and self-contained breathing apparatus;
- proper use and layout of fire hoses;
- employment of appropriate fire fighting techniques;
- sufficient firefighting equipment brought to the scene;
- effectiveness of fire brigade leader communications, command, and control;
- search for victims and propagation of the fire into other plant areas;
- smoke removal operations;
- utilization of pre-planned strategies;
- adherence to the pre-planned drill scenario; and
- drill objectives.

Documents reviewed are listed in the Attachment to this report.

These activities constituted one annual fire protection inspection sample as defined in IP 71111.05-05.

b. Findings

No findings were identified.

1R06 Flooding (71111.06)

a. Inspection Scope

The inspectors reviewed selected risk important plant design features and licensee procedures intended to protect the plant and its safety-related equipment from internal flooding events. The inspectors reviewed flood analyses and design documents, including the UFSAR, engineering calculations, and abnormal operating procedures to identify licensee commitments. The specific documents reviewed are listed in the Attachment to this report. In addition, the inspectors reviewed licensee drawings to identify areas and equipment that may be affected by internal flooding caused by the failure or misalignment of nearby sources of water, such as the auxiliary feed water and non-essential service water systems. The inspectors also reviewed the licensee's corrective action documents with respect to past flood-related items identified in the corrective action program to verify the adequacy of the corrective actions. The inspectors walked down the following plant area to assess the adequacy of watertight doors and verify drains and sumps were clear of debris and were operable, and that the licensee complied with its commitments:

- Unit 1/2 essential service water pipe tunnel.

This inspection constituted one internal flooding sample as defined in IP 71111.06-05.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11)

.1 Resident Inspector Quarterly Review (71111.11Q)

a. Inspection Scope

On May 25, 2011, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator requalification examinations 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 operating procedures;
- control board manipulations; and
- oversight and direction from supervisors.

The crew's performance in these areas was compared to pre-established operator action expectations and successful task completion requirements. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one quarterly licensed operator requalification program sample as defined in IP 71111.11.

b. Findings

No findings were identified.

.2 Annual Operating Test Results (71111.11B)

a. Inspection Scope

The inspectors reviewed the overall pass/fail results of the Annual Operating Test, administered by the licensee from February 8 through March 11, 2011, as required by 10 CFR 55.59(a). The results were compared to the thresholds established in Inspection Manual Chapter (IMC) 0609, Appendix I, "Licensed Operator Requalification Significance Determination Process," to assess the overall adequacy of the licensee's Licensed Operator Requalification Training program to meet the requirements of 10 CFR 55.59.

This inspection constitutes one biennial licensed operator requalification inspection sample as defined in IP 71111.11B.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

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

- Unit 1 essential service water system; and
- Operating Experience Smart Sample FY 2010-01, "Recent Inspection Experience for Components Installed Beyond Vendor Service Life."

The inspectors 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 structures, systems, and components (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 CAP with the appropriate significance characterization.

With regard to the operating experience smart sample, the inspectors reviewed the licensee's safety-related component list data base, preventive maintenance program guidance and a 2-year report of condition reports and work orders generated from failed or inadequately performed preventive maintenance. The inspectors then selected portions of the following systems for additional assessment:

- Unit 1 east residual heat removal system;
- Unit 2 north safety injection system; and
- Unit 1/2 essential service water system unit cross-tie motor operated valves.

The inspectors verified vendor recommendations were incorporated into the preventive maintenance program and component replacements were being completed in a timely and effective manner.

Documents reviewed are listed in the Attachment to this report.

This inspection constituted two quarterly maintenance effectiveness samples as defined in IP 71111.12-05.

b. Findings

No findings were identified.

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

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 on Unit 2 plant air compressor on April 23-27, 2011;
- planned maintenance to replace Unit 1 east essential service water pump on May 8-10, 2011;
- planned maintenance during the week of May 17, 2011, which included preventive and corrective maintenance on Unit 1 west motor driven auxiliary feedwater pump; preventive maintenance on 69 kilo volt emergency power breakers and motor operated disconnect; and surveillance testing on Unit 1 AB emergency diesel generator; and
- emergent maintenance to repair a socket weld leak on the Unit 1 east charging pump discharge line on June 15, 2011.

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 maintenance risk assessments and emergent work control activities constituted four samples as defined in IP 71111.13-05.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- Unit 1 transformer 101CD load tap changer not working in automatic;
- Unit 2 deficiency in containment divider barrier seal calculation;
- Unit 1 and Unit 2 containment integrity analysis issues;
- Unit 1 and Unit 2 refueling water storage tank purification system piping seismic evaluation;
- Unit 2 distributed ignition system train A phase voltages out of specification; and
- Unit 1 and Unit 2 auxiliary feedwater systems gas accumulation.

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 UFSAR 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 reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment to this report.

This operability inspection constituted six samples as defined in IP 71111.15-05.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

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:

- West diesel driven fire pump 6-year preventive maintenance;
- Unit 1 east essential service water pump replacement;
- Unit 2 boric acid transfer pump 4 motor replacement; and
- Unit 2 steam generator blowdown sample containment isolation valve solenoid replacement.

These activities were selected based upon the structure, system, or component's ability to impact risk. The inspectors evaluated these activities for the following (as applicable): the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing (temporary modifications or jumpers required for test performance were properly removed after test completion); and test documentation was properly evaluated. The inspectors evaluated the activities against TSs, the UFSAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the CAP and that the problems were being corrected commensurate with their importance to safety. Documents reviewed are listed in the Attachment to this report.

This inspection constituted four post-maintenance testing samples as defined in IP 71111.19-05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

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 and to verify testing was conducted in accordance with applicable procedural and TS requirements:

- Unit 2 train A reactor trip breaker actuating logic and master relay surveillance test (routine);
- Unit 1 ice condenser intermediate deck door surveillance (containment isolation valves);
- Unit 1 primary to secondary leak rate (Reactor Coolant Systems (RCS) leak detection);
- Unit 1 turbine driven auxiliary feedwater system test (inservice test); and
- Unit 1 train B containment air recirculation system surveillance test (routine).

The inspectors observed in-plant activities and reviewed procedures and associated records to determine the following:

- did preconditioning occur;
- were the effects of the testing adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- were acceptance criteria clearly stated, demonstrated operational readiness, and consistent with the system design basis;
- plant equipment calibration was correct, accurate, and properly documented;
- as-left setpoints were within required ranges; and the calibration frequency was in accordance with TSs, the USAR, procedures, and applicable commitments;
- measuring and test equipment calibration was current;
- test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied;
- test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used;
- test data and results were accurate, complete, within limits, and valid;
- test equipment was removed after testing;
- where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers (ASME) code, and reference values were consistent with the system design basis;
- where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;
- where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- equipment was returned to a position or status required to support the performance of its safety functions; and
- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

This inspection constituted two routine surveillance testing sample, one inservice testing sample, one RCS leak detection inspection sample, and one containment isolation valve sample as defined in IP 71111.22, Sections -02 and -05.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The inspector observed a simulator training evolution for licensed operators May 27, 2011, which required emergency plan implementation by a licensee operations crew. This evolution was planned to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also reviewed the post-evolution critique for the scenario. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crew's performance and ensure that the licensee evaluators noted the same issues and entered them into the CAP. As part of the inspection, the inspectors reviewed the scenario package and other documents listed in the Attachment to this report.

This inspection of the licensee's training evolution with emergency preparedness drill aspects constituted one sample as defined in IP 71114.06-05.

b. Findings

No findings were identified.

**2. RADIATION SAFETY**

**Cornerstones: Public Radiation Safety and Occupational Radiation Safety**

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

This inspection constituted one complete sample as defined in IP 71124.01-05.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed all licensee performance indicators for the occupational exposure cornerstone. The inspectors reviewed the results of radiation protection program audits (e.g., licensee's quality assurance audits or other independent audits). The inspectors reviewed any reports of operational occurrences related to occupational radiation safety since the last inspection. The inspectors reviewed the results of the audit and operational report reviews to gain insights into overall licensee performance.

b. Findings

No findings were identified.

## .2 Radiological Hazard Assessment (02.02)

### a. Inspection Scope

The inspectors determined if there had been changes to plant operations since the last inspection that would result in a significant new radiological hazard for onsite workers or members of the public. The inspectors evaluated whether the licensee assessed the potential impact of these changes and has implemented periodic monitoring, as appropriate, to detect and quantify the radiological hazard.

The inspectors reviewed the last two to four radiological surveys from selected plant areas and evaluated whether the thoroughness and frequency of the surveys were appropriate for the given radiological hazard.

The inspectors conducted walkdowns of the facility, including radioactive waste processing, radioactive material storage building, and handling areas located in the auxiliary building's drumming room to evaluate material conditions and performed independent radiation measurements to assess conditions.

The inspectors selected the following radiologically risk-significant work activities performed during Unit-2 Outage Cycle -19 that involved exposure to radiation, specifically:

- reactor vessel examination and repair;
- Unit-2 Outage Cycle -19 core barrel activities and core barrel baffle bolts repair;
- install, modify and remove scaffolds in containment; and
- reactor coolant pumps work area and set-up.

For these work activities, the inspectors assessed whether the pre-work surveys performed were appropriate to identify and quantify the radiological hazard and to establish adequate protective measures. The inspectors evaluated the radiological survey program to determine if hazards were properly identified, including the following:

- identification of hot particles;
- the presence of alpha emitters;
- the potential for airborne radioactive materials, including the potential presence of transuranics and/or other hard-to-detect radioactive materials;
- the hazards associated with work activities that could suddenly and severely increase radiological conditions and that the licensee has established a means to inform workers of changes that could significantly impact their occupational dose; and
- severe radiation field dose gradients that can result in non-uniform exposures of the body.

The inspectors observed work in potential airborne areas and evaluated whether the air samples were representative of the breathing air zone. The inspectors evaluated whether continuous air monitors were located in areas with low background to minimize false alarms and were representative of actual work areas. The inspectors evaluated the licensee's program for monitoring levels of loose surface contamination in areas of the plant with the potential for the contamination to become airborne.

b. Findings

No findings were identified.

.3 Instructions to Workers (02.03)

a. Inspection Scope

The inspectors selected various containers holding non-exempt licensed radioactive materials that may cause unplanned or inadvertent exposure of workers, and assessed whether the containers were labeled and controlled in accordance with 10 CFR 20.1904, "Labeling Containers," or met the requirements of 10 CFR 20.1905(g), "Exemptions To Labeling Requirements."

The inspectors reviewed radiation work permits used to access high radiation areas and evaluated the specified work control instructions or control barriers for the following:

- reactor vessel examination and repair;
- core barrel activities and core barrel baffle bolts repair;
- install, modify and remove scaffolds in containment; and
- reactor coolant pumps work area and set-up.

For these radiation work permits, the inspectors assessed whether allowable stay times or permissible dose (including from the intake of radioactive material) for radiological significant work under each radiation work permit were clearly identified. The inspectors evaluated whether electronic personal dosimeter alarm set-points were in conformance with survey indications and plant policy.

The inspectors reviewed selected occurrences where a worker's electronic personal dosimeter noticeably malfunctioned or alarmed. The inspectors evaluated whether workers responded appropriately to the off-normal condition. The inspectors assessed whether the issue was included in the CAP and dose evaluations.

For work activities that could suddenly and severely increase radiological conditions, the inspectors assessed whether the licensee informs workers of changes that could significantly impact their occupational dose.

b. Findings

No findings were identified.

.4 Contamination and Radioactive Material Control (02.04)

a. Inspection Scope

The inspectors observed locations where the licensee monitors potentially contaminated material leaving the radiological control area and inspected the methods used for control, survey, and release from these areas. The inspectors observed the performance of personnel surveying and releasing material for unrestricted use and evaluated whether the work was performed in accordance with plant procedures and whether the procedures were sufficient to control the spread of contamination and

prevent unintended release of radioactive materials from the site. The inspectors assessed whether the radiation monitoring instrumentation had appropriate sensitivity for types of radiation present.

The inspectors reviewed the licensee's criteria for the survey and release of potentially contaminated material. The inspectors evaluated whether there was guidance on how to respond to an alarm that indicates the presence of licensed radioactive material.

The inspectors reviewed the licensee's procedures and records to verify that the radiation detection instrumentation was used at its typical sensitivity level based on appropriate counting parameters. The inspectors assessed whether or not the licensee has established a de facto "release limit" by altering the instrument's typical sensitivity through such methods as raising the energy discriminator level or locating the instrument in a high-radiation background area.

The inspectors selected two Category-2 sealed sources from the licensee's inventory records and assessed whether the sources were accounted for and verified to be intact.

The inspectors evaluated whether any transactions, since the last inspection, involving nationally tracked sources were reported in accordance with 10 CFR 20.2207.

b. Findings

No findings were identified.

.5 Radiological Hazards Control and Work Coverage (02.05)

a. Inspection Scope

The inspectors evaluated ambient radiological conditions (e.g., radiation levels or potential radiation levels) during tours of the facility. The inspectors assessed whether the conditions were consistent with applicable posted surveys, radiation work permits, and worker briefings.

The inspectors evaluated the adequacy of radiological controls, such as required surveys, radiation protection job coverage (including audio and visual surveillance for remote job coverage), and contamination controls. The inspectors evaluated the licensee's use of electronic personal dosimeters in high noise areas as high radiation area monitoring devices.

The inspectors assessed whether radiation monitoring devices were placed on the individual's body consistent with licensee procedures. The inspectors assessed whether the dosimeter was placed in the location of highest expected dose or that the licensee properly employed an NRC-approved method of determining effective dose equivalent.

The inspectors reviewed the application of dosimetry to effectively monitor exposure to personnel in high-radiation work areas with significant dose rate gradients.

The inspectors reviewed the following radiation work permits for work within airborne radioactivity areas with the potential for individual worker internal exposures, specifically:

- reactor vessel examination and repair;
- Unit 2 Outage Cycle 19 core barrel activities and core barrel baffle bolts repair;
- install, modify and remove scaffolds in containment; and
- reactor coolant pumps work area and set-up.

For these radiation work permits, the inspectors reviewed the licensee's airborne radioactive controls and monitoring, including potential for significant airborne levels (e.g., grinding, grit blasting, system breaches, entry into tanks, cubicles, and reactor cavities). The inspectors assessed barrier (e.g., tent or glove box) integrity and temporary high-efficiency particulate air ventilation system operation.

The inspectors examined the licensee's physical and programmatic controls for highly activated or contaminated materials (nonfuel) stored within spent fuel and other storage pools. The inspectors assessed whether appropriate controls (i.e., administrative and physical controls) were in place to preclude inadvertent removal of these materials from the pool.

The inspectors examined the posting and physical controls for selected high radiation areas and very high radiation areas to verify conformance with the occupational performance indicator.

b. Findings

No findings were identified.

.6 Risk-Significant High Radiation Area and Very High Radiation Area Controls (02.06)

a. Inspection Scope

The inspectors discussed with the radiation protection manager the controls and procedures for high-risk high radiation areas and very high radiation areas. The inspectors discussed methods employed by the licensee to provide stricter control of very high radiation area access as specified in 10 CFR 20.1602, "Control of Access to Very High Radiation Areas," and Regulatory Guide 8.38, "Control of Access to High and Very High Radiation Areas of Nuclear Plants." The inspectors assessed whether any changes to licensee procedures substantially reduce the effectiveness and level of worker protection.

The inspectors discussed the controls in place for special areas that have the potential to become very high radiation areas during certain plant operations with first-line health physics supervisors and the radiation protection manager. The inspectors assessed whether these plant operations require communication beforehand with the health physics group, so as to allow corresponding timely actions to properly post, control, and monitor the radiation hazards including re-access authorization.

The inspectors evaluated licensee controls for very high radiation areas and areas with the potential to become very high radiation areas to ensure that an individual was not able to gain unauthorized access to the very high radiation area.

b. Findings

No findings were identified.

.7 Radiation Worker Performance (02.07)

a. Inspection Scope

The inspectors observed radiation worker performance with respect to stated radiation protection work requirements. The inspectors assessed whether workers were aware of the radiological conditions in their workplace and the radiation work permit controls/limits in place, and whether their performance reflected the level of radiological hazards present.

The inspectors reviewed radiological problem reports since the last inspection that found the cause of the event to be human performance errors. The inspectors evaluated whether there was an observable pattern traceable to a similar cause. The inspectors assessed whether this perspective matched the corrective action approach taken by the licensee to resolve the reported problems. The inspectors discussed with the radiation protection manager any problems with the corrective actions planned or taken.

b. Findings

No findings were identified.

.8 Radiation Protection Technician Proficiency (02.08)

a. Inspection Scope

The inspectors observed the performance of the radiation protection technicians with respect to all radiation protection work requirements. The inspectors evaluated whether technicians were aware of the radiological conditions in their workplace and the radiation work permit controls/limits, and whether their performance was consistent with their training and qualifications with respect to the radiological hazards and work activities.

The inspectors reviewed radiological problem reports since the last inspection that found the cause of the event to be radiation protection technician error. The inspectors evaluated whether there was an observable pattern traceable to a similar cause. The inspectors assessed whether this perspective matched the corrective action approach taken by the licensee to resolve the reported problems.

b. Findings

No findings were identified.

.9 Problem Identification and Resolution (02.09)

a. Inspection Scope

The inspectors evaluated whether problems associated with radiation monitoring and exposure control were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee's CAP. The inspectors assessed

the appropriateness of the corrective actions for a selected sample of problems documented by the licensee that involve radiation monitoring and exposure controls. The inspectors assessed the licensee's process for applying operating experience to their plant.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (71124.07)

This inspection constituted one complete sample as defined in IP 71124.07-05.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed the annual radiological environmental operating reports and the results of any licensee assessments since the last inspection and assessed that the radiological environmental monitoring program was implemented in accordance with the TSs and the Offsite Dose Calculation Manual (ODCM). This review included report changes to the ODCM with respect to environmental monitoring, commitments in terms of sampling locations, monitoring and measurement frequencies, land use census, inter-laboratory comparison program, and analysis of data.

The inspectors reviewed the ODCM to identify locations of environmental monitoring stations.

The inspectors reviewed the UFSAR for information regarding the environmental monitoring program and meteorological monitoring instrumentation.

The inspectors reviewed quality assurance audit results of the program in and technical evaluations performed on the vendor laboratory program.

The inspectors reviewed the annual effluent release report and the 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste," report, to determine if the licensee is sampling, as appropriate, for the predominant and dose-causing radionuclides likely to be released in effluents.

b. Findings

No findings were identified.

.2 Site Inspection (02.02)

a. Inspection Scope

The inspectors walked down select air sampling stations and thermoluminescent dosimeter monitoring stations to determine whether stations are located as described in the ODCM and to determine the equipment material condition. Consistent with smart sampling, the air sampling stations were selected based on the locations with the highest X/Q, D/Q wind sectors, and thermoluminescent dosimeters were selected based

on the most risk significant locations (e.g., those that have the highest potential for public dose impact).

For the air samplers and thermoluminescent dosimeters selected, the inspectors reviewed the calibration and maintenance records to assess whether the licensee demonstrated operability of these components. Additionally, the review included the calibration and maintenance records of select composite water samplers.

The inspectors performed an assessment of whether the licensee has initiated sampling of other appropriate media upon loss of a required sampling station.

The inspectors observed the collection and preparation of environmental samples from different environmental media (e.g., ground and surface water, milk, vegetation, sediment, and soil). The inspectors assessed that environmental sampling is representative of the release pathways as specified in the ODCM and that sampling techniques are in accordance with procedures.

Based on direct observation and review of records, the inspectors assessed whether the meteorological instruments were operable, calibrated, and maintained in accordance with guidance contained in the UFSAR, NRC Regulatory Guide 1.23, "Meteorological Monitoring Programs for Nuclear Power Plants," and licensee procedures. The inspectors assessed whether the meteorological data readout and recording instruments in the control room and, if applicable, at the tower were operable.

The inspectors evaluated whether missed and/or anomalous environmental samples were identified and reported in the annual environmental monitoring report. The inspectors selected events that involved a missed sample, inoperable sampler, lost thermoluminescent dosimeter, or anomalous measurement to verify that the licensee had identified the cause and had implemented corrective actions. The inspectors reviewed the licensee's assessment of any positive sample results (i.e., licensed radioactive material detected above the lower limits of detection) and reviewed the associated radioactive effluent release data that was the source of the released material.

Inspectors selected structures, systems, or components that involve or could reasonably involve licensed material for which there is a credible mechanism for licensed material to reach ground water, and assessed whether the licensee has implemented a sampling and monitoring program sufficient to detect leakage of these structures, systems, or components to ground water.

The inspectors evaluated whether records, as required by 10 CFR 50.75(g), of leaks, spills, and remediation since the previous inspection are retained in a retrievable manner.

The inspectors reviewed any significant changes made by the licensee to the ODCM as the result of changes to the land census, long-term meteorological conditions (3-year average), or modifications to the sampler stations since the last inspection. The inspectors reviewed technical justifications for any changed sampling locations that the licensee performed to ensure that the changes did not affect its ability to monitor the impacts of radioactive effluent releases on the environment.

The inspectors assessed whether the appropriate detection sensitivities with respect to TSs/ODCM are used for counting samples (i.e., the samples meet the TSs/ODCM required lower limits of detection). The licensee uses a vendor laboratory to analyze the radiological environmental monitoring program samples so the inspectors reviewed the results of the vendor's quality control program, including the inter-laboratory comparison, to assess the adequacy of the vendor's program.

The inspectors reviewed the results of the licensee's inter-laboratory comparison program of the adequacy of environmental sample analyses performed by the licensee. The inspectors assessed whether the inter-laboratory comparison test included the media/nuclide mix appropriate for the facility.

b. Findings

No findings were identified.

.3 Identification and Resolution of Problems (02.03)

a. Inspection Scope

The inspectors assessed whether problems associated with the radiological environmental monitoring program are being identified by the licensee at an appropriate threshold and are properly addressed for resolution in the licensee's corrective action program. Additionally, they assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee that involved the radiological environmental monitoring program.

b. Findings

No findings were identified.

**4. OTHER ACTIVITIES**

**Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety and Occupational Radiation Safety**

4OA1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index - High Pressure Injection System

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index (MSPI) - High Pressure Injection System performance indicator for Unit 1 and Unit 2 for the period from the second quarter 2010 through the first quarter 2011. To determine the accuracy of the Performance Indicator (PI) data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, MSPI derivation reports, event reports, and NRC Integrated Inspection Reports for the period of April 2010 through March 2011 to validate

the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. 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. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI high pressure injection system samples as defined in IP 71151-05.

b. Findings

No findings were identified.

.2 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 Unit 1 and Unit 2 for the period from the second quarter 2010 through the first quarter 2011. 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 6, dated October 2009, were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, MSPI derivation reports, event reports, and NRC Integrated Inspection Reports for the period of April 2010 through March 2011 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. 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. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI residual heat removal system samples as defined in IP 71151-05.

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index - Emergency AC Power System

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Emergency AC Power System performance indicator for Unit 1 and Unit 2 for the period from the second quarter 2010 through the first quarter 2011. 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 6, dated October 2009, were used. The inspectors reviewed the licensee's operator narrative logs, MSPI derivation reports, issue reports, event reports, and NRC Integrated Inspection Reports for the period of April 2010 through March 2011 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. 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. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI emergency AC power system samples as defined in IP 71151-05.

b. Findings

No findings were identified.

.4 Mitigating Systems Performance Index - Cooling Water Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Cooling Water Systems performance indicator for Unit 1 and Unit 2 for the period from the second quarter 2010 through the first quarter 2011. 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 6, dated October 2009, were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, MSPI derivation reports, event reports, and NRC Integrated Inspection Reports for the period of April 2010 through March 2011 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. 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. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI cooling water system samples as defined in IP 71151-05.

b. Findings

No findings were identified.

.5 Mitigating Systems Performance Index – Auxiliary Feedwater System

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI – Auxiliary Feedwater System performance indicator for Unit 1 and Unit 2 for the period from the second quarter 2010

through the first quarter 2011. 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 6, were used. The inspectors reviewed the licensee's operator narrative logs, MSPI derivation reports, issue reports, event reports, and NRC Integrated Inspection Reports for the period of April 2010 through March 2011 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. 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 had been identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI auxiliary feedwater system samples as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.6 Radiological Effluent Technical Specification/Offsite Dose Calculation Manual  
Radiological Effluent Occurrences

a. Inspection Scope

The inspectors sampled licensee submittals for the Radiological Effluent Technical Specification/Offsite Dose Calculation (RETS/ODCM) Manual radiological effluent occurrences PI for the period from the first quarter 2010 through the first quarter 2011. The inspectors used PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's issue report database and selected individual reports generated since this indicator was last reviewed to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous effluent summary data and the results of associated offsite dose calculations for selected dates between the first quarter 2010 through the first quarter 2011, to determine whether indicator results were accurately reported. The inspectors also reviewed the licensee's methods for quantifying gaseous and liquid effluents and determining effluent dose. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one RETS/ODCM radiological effluent occurrences sample as defined in IP 71151 05.

b. Findings

No findings were identified.

.7 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors sampled licensee submittals for the occupational radiological occurrences PI for the period from the first quarter 2010 through the first quarter of 2011. The inspectors used PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, to determine the accuracy of the PI data reported during those periods. 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 personal dosimetry dose rate and accumulated dose alarms and 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. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one occupational exposure control effectiveness sample as defined in IP 71151-05.

b. Findings

No findings were identified.

40A2 Identification and Resolution of Problems (71152)

.1 Routine Review of Items Entered into the Corrective Action Program

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's CAP at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Attributes reviewed included: identification of the problem was complete and accurate; timeliness was commensurate with the safety significance; evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent-of-condition reviews, and previous occurrences reviews were proper and adequate; and that the classification, prioritization, focus, and timeliness of corrective actions were commensurate with safety and sufficient to prevent recurrence of the issue. Minor issues entered into the licensee's CAP as a result of the inspectors' observations are included in the Attachment to this report.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure they were considered an

integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for followup, the inspectors performed a daily screening of items entered into the licensee's CAP. This review was accomplished through inspection of the station's daily condition report 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 were identified.

.3 Semiannual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's CAP 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 CAP item screening discussed in Section 4OA2.2 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the 6 month period of October 2010 through March 2011 although some examples expanded beyond those dates where the scope of the trend warranted.

The review also included issues documented outside the normal CAP in major equipment problem lists, system health reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's CAP trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

This review constitutes one semiannual trend inspection sample as defined in IP 71152-05.

b. Findings

No findings were identified.

#### 4OA5 Other Activities

##### .1 (Closed) Unresolved Item 05000315/2010002-03; Construction Code Requirements For Bending Not Applied to Mechanical Stress Improvement of Reactor Coolant System Pipe

###### a. Inspection Scope

In March of 2010, during onsite review of the Unit 1 dissimilar metal butt welds in accordance with Temporary Instruction (TI) 2515/172, "Reactor Coolant System Dissimilar Metal Butt Welds," and IP 71111.08, "Inservice Inspection," the inspectors identified a Unresolved Item (URI) related to the licensee's interpretation of Construction Code (CC) requirements related to bending/forming for the mechanical stress improvement (MSIP) process applied to the RCS hot leg (HL) and cold leg (CL) nozzles. On March 19, 2010, the licensee issued a white paper, AEP-10-49, to document its basis for not applying the CC requirements. The NRC reviewed this document and the Agency's position on this issue was issued on April 1, 2011 as documented in task interface agreement (TIA) No. 2011-005 (ADAMs Accession No. ML110810466). Based upon review of TIA 2011-005 as discussed below, URI 05000315/2010002-03 is closed.

###### b. Findings

##### b.1 Failure to Examine Reactor Coolant System Piping Following Application of Mechanical Stress Improvement

Introduction: A finding of very low safety significance and associated Non-Cited Violation (NCV) of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," were identified by the inspectors for the licensee's failure to examine RCS pipe surfaces affected by MSIP to ensure that affected surfaces were uniform and free of cracks, buckles, or other defects.

Description: From March 15 – 17, 2010, the licensee applied the MSIP process to the HL piping adjacent to the HL nozzle dissimilar metal welds and on the CL pipe elbows adjacent to the nozzle dissimilar metal welds in accordance with engineering change (EC) 48752, "MSIP for Reactor Pressure Vessel Hot and Cold Leg Nozzle Dissimilar Metal Welds." For the MSIP process, an external radial pressure was applied to permanently reduce the inside and outside diameter of the RCS piping by approximately ½ inch. This pipe forming operation resulted in a compressive residual stress at the nearby dissimilar metal nozzle welds to reduce susceptibility to primary water stress corrosion cracking.

On March 10, 2010, the inspectors identified that the licensee had not implemented the CC requirements to examine the RCS pipe surfaces affected by MSIP. The RCS piping CC is USAS B31.1 1967 Edition as identified in the UFSAR, Section 4.1.6, "Codes and Standards." Article 129, "Bending and Forming," of the B31.1 Code contained inspection requirements following bending or forming. Specifically, Article 129.2 stated that "Pipe may be formed (swedging, lapping, or upsetting of pipe ends, extrusion of necks, etc.), by any suitable hot or cold working method, provided such processes result in formed surfaces, which are uniform and free of cracks or other defects, as determined by a method of inspection specified in the design, and substantially free of buckles." And Section 5 of the applicable RCS CL pipe elbow specification (G-676342) and HL pipe

specification (G-676580) required a liquid penetrant examination of both the outside and inside surfaces in accordance with the procedure of ASME Section III, Appendix IX, Paragraph IX-360.

After NRC identification, the licensee determined that the MSIP process was not a pipe bending or forming operation and documented their position in a white paper, AEP-10-49, dated March 19, 2010. The inspectors disagreed with the licensee's interpretation of these CC requirements and initiated an Agency review to determine the CC applicability for MSIP (reference URI 05000315/2010002-03). Following an Agency review of these CC requirements and the licensee's position paper (AEP-10-49), the NRC determined that the CC requirements associated with forming were applicable to the MSIP process applied to the D. C. Cook Unit 1 RCS piping (reference NRC TIA No. 2011-005 - ADAMs Accession No. ML110810466).

As a corrective action, the licensee issued AR 2011-4426 to document the nonconforming condition of the RCS piping and was evaluating corrective actions that included a request for NRC approval to deviate from these Code requirements. The licensee considered the RCS piping operable because the affected material was not susceptible to primary water stress corrosion cracking, and the plastic strains induced by MSIP were too small to cause adverse impacts. Specifically, the MSIP process would not reduce the pipe material strength and, in fact, would result in a slightly higher tensile and yield strength (but still within the original material specifications). The inspectors agreed that because of the low plastic strains involved (e.g., less than 2 percent), the likelihood of substantive cracking or buckling was small and thus would not represent a challenge to pipe structural integrity.

Analysis: The inspectors determined that failure to examine RCS pipe surfaces affected by MSIP to ensure that affected surfaces were uniform and free of cracks, buckles or other defects was contrary to USAS B31.1 and was a performance deficiency.

The finding was determined to be more than minor because the finding was associated with the Initiating Events Cornerstone attribute of Design Control and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions. Because the licensee did not perform surface examinations intended to provide reasonable assurance in the physical integrity of the RCS boundary, the availability and reliability of the RCS may be reduced. Specifically, the failure to perform examinations could have allowed RCS pipe with cracks or buckles to be returned to service. Cracked pipe returned to service would place safety-related piping systems at increased risk for through-wall leakage and/or failure.

The inspectors determined the finding could be evaluated using the Significance Determination Process in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase I - Initial Screening and Characterization of findings," Table 4a for the Initiating Events Cornerstone. The RCS piping was considered operable because of the low plastic strains involved, such that the likelihood of substantive cracking or buckling was small. The inspectors answered "No" to the Phase I screening question "Assuming worst case degradation, would the finding result in exceeding the TS limit for any RCS leakage or could the finding have likely affected other mitigation systems resulting in a total loss of their safety function assuming the worst case degradation?" Therefore, the finding screened as having very low safety significance (Green).

This finding has a cross-cutting aspect in the area of human performance, resources because the licensee did not provide complete accurate and up-to-date design documentation. Specifically, the failure to examine RCS pipe surfaces was caused by the incomplete and inaccurate design documents for implementation of the MSIP process (IMC 310 Item [H.2(c)]). The inspectors determined that the finding's primary cause, based upon review of EC 48752, "MSIP for Reactor Pressure Vessel Hot and Cold Leg Nozzle Dissimilar Metal Welds," was that the EC lacked the CC requirements to perform liquid penetrant examinations of RCS pipe following MSIP.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions.

The USAS B31.1 1967 Edition Code Article 129.2 "Forming," stated in part "Pipe may be formed (swedging, lapping, or upsetting of pipe ends, extrusion of necks, etc.), by any suitable hot or cold working method, provided such processes result in formed surfaces, which are uniform and free of cracks or other defects, as determined by a method of inspection specified in the design, and substantially free of buckles."

Westinghouse Design Specification G-676342, Revision 4, Section 5.0 "Quality Assurance Provisions," Paragraph 5.1.2 states in part, "A liquid penetrant examination shall be performed on both the entire outside and inside surface of each finished fitting in accordance with the procedure of ASME Section III, Appendix IX, Paragraph IX-360."

Westinghouse Design Specification G-676580, Revision 2, Section 5.0 "Quality Assurance Provisions," Paragraph 5.2 states in part, "A liquid penetrant examination shall be performed on both the outside, inside and end surfaces of all finished pipe in accordance with the procedure of ASME Section III, Appendix IX, Paragraph IX-360."

Contrary to the above, from March 15 – 17, 2010, the licensee failed to establish measures to ensure the applicable design basis RCS requirements related to forming were translated into applicable specifications and procedures. Specifically, segments of the RCS HL and CL piping were formed by application of MSIP in accordance with EC 48752 which lacked the requirements to verify that formed surfaces were uniform and free of cracks, buckles, or other defects as determined by a method of inspection specified in the design (e.g., liquid penetrant examination). Because this violation was of very low safety significance and it was entered into the licensee's corrective action program as AR 2011-4426, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy (NCV 05000315/2011003-01, Failure to Examine RCS Piping Following Application of Mechanical Stress Improvement).

.2 (Closed) NRC Temporary Instruction 2515/183, "Followup to the Fukushima Daiichi Nuclear Station Fuel Damage Event"

The inspectors reviewed the activities and actions taken by the licensee to assess its readiness to respond to an event similar to the Fukushima Daiichi nuclear plant fuel damage event. This included (1) an assessment of the licensee's capability to mitigate conditions that may result from beyond design basis events, with a particular emphasis on strategies related to the spent fuel pool, as required by NRC Security Order Section B.5.b issued February 25, 2002, as committed to severe accident management

guidelines, and as required by 10 CFR 50.54(hh), (2) an assessment of the licensee's capability to mitigate station blackout (SBO) conditions as required by 10 CFR 50.63 and station design bases, (3) an assessment of the licensee's capability to mitigate internal and external flooding events, as required by station design bases, and (4) an assessment of the thoroughness of the walkdowns and inspections of important equipment needed to mitigate fire and flood events, which were performed by the licensee to identify any potential loss of function of this equipment during seismic events possible for the site.

Inspection Report 05000315/20110111; 05000316/2011011 (ML111320302) documented detailed results of this inspection activity. Following issuance of the report, the inspectors conducted detailed followup on selected issues.

.3 (Closed) NRC Temporary Instruction 2515/184, "Availability and Readiness Inspection of Severe Accident Management Guidelines"

On May 18, 2011, the inspectors completed a review of the licensee's severe accident management guidelines (SAMGs), implemented as a voluntary industry initiative in the 1990's, to determine (1) whether the SAMGs were available and updated, (2) whether the licensee had procedures and processes in place to control and update its SAMGs, (3) the nature and extent of the licensee's training of personnel on the use of SAMGs, and (4) licensee personnel's familiarity with SAMG implementation.

The results of this review were provided to the NRC task force chartered by the Executive Director for Operations to conduct a near-term evaluation of the need for agency actions following the Fukushima Daiichi fuel damage event in Japan. Plant-specific results for D.C Cook Nuclear Power Plant were provided as an Enclosure to a memorandum to the Chief, Reactor Inspection Branch, Division of Inspection and Regional Support, dated June 1, 2011 (ML111520396).

.4 (Closed) Unresolved Item 05000315/2010006-02; 05000316/2010006-02: Non-Conservative Analysis Used to Determine LTOP Setpoint for the PORV

This issue concerned the methodology used by the licensee in establishing the pressurizer power operated relief valve (PORV) lift setting while in the low temperature overpressure (LTOP) mode of operation. Specifically, the inspectors were concerned the licensee failed to consider the instrument uncertainty associated with the pressure instrumentation that actuates the PORV to open.

Information Notice 93-58, "Non-Conservatism in Low-Temperature Overpressure Protection for Pressurized-Water Reactors," which documented LTOP setpoint errors identified by Westinghouse, appeared to state that instrument uncertainty needed to be accounted for in the PORV lift setting. The Information Notice was based on Westinghouse letter, AEP-93-208, dated March 10, 1993, which stated the pressure increase from the non-conservatisms could be offset by using the instrument uncertainty used in the development of the pressure-temperature curves. However, the pressure-temperature curves did not include instrument uncertainty in their development such that it was not available to offset the plant-specific pressure differences. The licensee did not agree based on the Westinghouse letter that instrument uncertainty needed to be accounted for in the setpoint calculation, but could be used to offset the identified non-conservatisms if available. In addition, based on a review of documents

submitted to the NRC, they concluded that instrument uncertainty for this setpoint determination was not within their license basis.

Since this issue involved a license basis issue, the inspectors contacted the Office of Nuclear Reactor Regulation (NRR) to determine whether accounting for instrument uncertainty in the PORV setpoint calculation was within the license basis. Based on discussions with NRR staff and a review of licensing documents, NRR determined that the licensee did not have to account for instrument uncertainty as it was not part of their license basis. As a result, the licensee's methodology for determining the PORV setpoint under LTOP conditions was determined to be acceptable. This unresolved item is closed.

.5 (Closed) Temporary Instruction 2515/179, "Verification of Licensee Responses to NRC Requirement for Inventories of Materials Tracked in the National Source Tracking System Pursuant to Title 10, Code of Federal Regulations, Part 20.2207 (10 CFR 20.2207)"

a. Inspection Scope

The inspectors confirmed that the licensee has reported the initial inventories of sealed sources pursuant to 10 CFR 20.2207 and reviewed that the National Source Tracking System database correctly reflects the Category 1 and 2 sealed sources in custody of the licensee. Inspectors interviewed personnel and performed the following:

- reviewed the licensee's source inventory;
- verified the presence of any Category 1 or 2 sources;
- reviewed procedures for and evaluated the effectiveness of storage and handling of sources;
- reviewed documents involving transactions of sources; and
- reviewed adequacy of licensee maintenance, posting, and labeling of nationally tracked sources.

b. Findings

No findings of significance were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On July 14, 2011, the inspectors presented the inspection results to Mr. J. Gebbie, 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 licensed operator requalification training annual operating test results, which were discussed with the Mr. M. Ferguson and other members of the licensee staff via telephone on May 6, 2011.
- The Inservice Inspection results, which were discussed with Mr. R. Ebright and other members of the licensee staff via telephone on May 5, 2011.
- Radiological Environmental Monitoring Program and Performance Indicator associated with RETS/ODCM Effluent Occurrences under the public radiation safety cornerstone with Mr. J. Gebbie and other members of the licensee staff on May 6, 2011.
- Unresolved item 05000315/2010006-02; 05000316/2010006-02 closure, which was discussed with Mr. M. Scarpello and other members of the licensee staff via telephone on June 23, 2011.
- The licensee's programs for a Performance Indicator, Radiological Hazard Assessment and Exposure Controls and Verification of National Source Tracking System under the occupational radiation safety cornerstone with Mr. J. Gebbie and other members of the licensee staff on June 24, 2011.

The inspectors confirmed that none of the potential report input discussed was considered proprietary. Proprietary material received during the inspection was returned to the licensee.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

L. Baun, Site Senior License Holder  
J. Beer, CHP, Radiation Protection Health Physicist, Primary Contact  
M. Carlson, Site Support Services Vice President  
R. Ebright, Engineering Director  
M. Ferguson, Licensed Operator Requalification Training Lead  
J. Gebbie, Site Vice President  
R. Hall, ISI Program Engineer  
J. Harner, Environmental and Health Safety Manager  
Q. Lies, Plant Manager  
E. Merchant, Environmental Specialist, Primary Contact  
C. Moeller, Radiation Protection Manager  
J. Nimtze, Regulatory Affairs Senior Licensing Activities Coordinator  
K. O'Conner, Compliance Manager  
J. Ross, Operations Director  
M. Scarpello, Regulatory Affairs Manager  
R. West, Regulatory Assurance  
R. Witzak, Radiation Protection General Supervisor

#### Nuclear Regulatory Commission

B. Dickson, PST, Branch Chief, DRS/RIII  
R. Walton, Senior Operations Engineer

## LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

### Opened

05000315/2011003-01	NCV	Failure to Examine Reactor Coolant System Piping Following Application of Mechanical Stress Improvement (4OA5.1)
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### Closed

05000315/2011003-01	NCV	Failure to Examine Reactor Coolant System Piping Following Application of Mechanical Stress Improvement (4OA5.1)
05000315/2010002-03	URI	Construction Code Requirements for Bending Not Applied to MSIP of RCS Pipe (4OA5.1)
05000315/2010006-02; 05000316/2010006-02	URI	Non Conservative Analysis Used to Determine LTOP Setpoint for the PORV (4OA5.4)

### Discussed

NONE

## 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-IMP-5040-EMP-004, Plant Winterization and De-Winterization, May 13, 2011
- 12-OHP-4022-001-010, Severe Weather, Revision 8
- AR 09077011, 1-HV-SHK-28 Heater Fan Needs Repair
- AR 09077017, 2-HV-SHE-1 Heater Fan Keeps Tripping
- AR 2010-7078, 2-HV-MSWX-2 Recirc Dampers Are Open
- AR 2010-9837, Summer Readiness Process Deficiency
- PMP-3100-IOA-001, Inter-Organizational Agreement Between the AEP Utility Operations, Revision 5
- PMP-5055-001-001, Winterization/ Summerization, May 11, 2011
- Seasonal Readiness Affirmation Letter, May 20,2011
- WR 06362518, Main Transformer Phase 3 Fan 4 is Not Working
- WR 06368257, 1-HV-SHK-27 Thermostat Needs Repair
- WR 06368259, 1-HV-SHK-34 Thermostat Needs Replacement

### 1R04 Equipment Alignment

- 12-FPP-4030-066-023, Data Sheet 1, Auxiliary Building Standpipes, Revision 5
- 1-ECCS-002-0, Unit 1 RHR Discharge Piping Through Heat Exchanger to CCP & SI Suction and RHR Mini Flow, Revision 0
- 1-ECCS-005-0, Unit 1 SI Pump Discharge From RWST & Mini Flow Line, Revision 0
- 1-OHP-4021-008-002, Placing Emergency Core Cooling System in Standby Readiness, Revision 25
- 1-OHP-4021-032-008AB, Attachment 6, DG1AB Automatic Start Alignment, Revision 10
- 1-OHP-4021-088-007, Operation of the Safety Injection Pumps, Revision 5
- 2-OHP-4021-056-001, Filling and Venting Auxiliary Feedwater System, Revision 24
- 2-OHP-4021-056-002, Auxiliary Feed Pump Operation, Revision 24
- AR 2010-7644, Possible Leak #1 SDG Fuel Storage Tank
- AR 2010-8844, R20 East ESW Header Failed Low
- AR 2011-2920, CCW Piping is Rubbing Against a Cable Tray Support
- AR 2011-4210, Unit 2 East CCW Pump Cavitating, Visual Axial Shift Movement
- AR 2011-4496, Unit 1 West CCW Pump Oil Leak at Sight Glass
- AR 2011-7353, 1-IMO-256 BIT Inlet Valve Position Indicator Approximately  $\frac{3}{4}$ "
- DB-12-AFWS, Auxiliary Feedwater System Design Basis Document, Revision 4
- DB-12-ECCS, Design Basis Document for the Emergency Core Cooling System, Revision 5
- DC-D-12-FW-07, Auxiliary Feedwater Piping and Support Calculation, November 2, 1992
- OP-2-5106-54, Flow Diagram Auxiliary Feedwater, Revision 54
- Technical Data Book, 1-Figure 19.9, Diesel Generator Pot Settings, Revision 34

### 1R05 Fire Protection

- 12-FPP-4030-066-023, Test and Inspection of the Plant Fire hose Standpipe Stations, Data Sheet 1, Auxiliary Building (TRM) Standpipes, Revision 5
- 211-047-C, 2011 Annual Fire Drill, May 14, 2011
- AR 00848384, Security CAS Fire Detection System and Dampers
- AR 2011-2302, U1 Quad Gap Seal 244G-38 Inoperable
- AR 2011-4222, Enhance Fire Pre-Plans Volume III
- AR 2011-5284, Fire Hose Reducers Replaced
- AR 2011-6281, Battery Lights out of Position
- AR 2011-6282, Discrepancy Found in Fire Hazards Analysis
- AR 2011-6675 Weeds and Ground Covering in Fire Protection Water Storage
- AR 2011-6963, Radio Communication Issues During Fire Drill
- AR 2011-6966, Supply Site Maps to Offsite Agencies
- AR 2011-7010, Lack of Interface With Local Fire Chief During Drill
- FHA, Fire Hazards Analysis, Revision 14
- Fire Pre-Plan, Revision 7
- Technical Evaluation 12.7, D.C. Cook Safe Shutdown Manual Action Feasibility Study, Revision 4

### 1R06 Flooding

- AR 00847786, Sump Pump GFCI Plug
- AR 2011-5714, ESW Pipe Tunnel Sump Pump Power Supply
- AR 2011-5716, Incorrect Closure of a GT-LRP
- SD-061206-001, Flooding Evaluation Report, Revision 2
- WO 55316714-01, 1-DLA-767, Clean Inspect and Calibrate, July 8, 2008
- WO 55345064-01, 1-DLA-767, Clean Inspect and Calibrate, July 12, 2010
- WR 06368170, Sump Pump GFCI Plug

### 1R11 Licensed Operator Requalification Program

- 12-OHP-4022-057-001, Screen House Forebay Degraded Condition, Revision 6
- AR 00829592, OHP-4023-ECA-1-3 Needs Updated for the RHR X-Tie Modification
- RQ-E-3602-U1-A, Cycle 3602 As-Found Simulator Evaluation-Primary, Revision 0

### 1R12 Maintenance Effectiveness

- 12-IHP—5021-IMP-001, Lead Lifting/Landing and Electrical Jumper/Fuse Installation and Removal, April 11, 2010
- AR 00849112, 2-PP-7W Inoperable due to high vibration
- AR 00854985, Unit 1 West ESW Pump hi vibes
- AR 00855075, 1-PP-7W has high vibrations and is inoperable
- AR 00855414, Evaluate missing shaft bearing surface material
- AR 03273016, NRC Information Notice 2003-17, "Reduced Service Life of Automatic Switch Company Solenoid Valves with Buna-N Material"
- AR 08287035, Unit 1 SSPS Card Upgrade
- AR 09232053, West RHR Pump Failed Surveillance
- AR 2010-2282, OE Posting For Failed Electric Governor on 1 CD EDG
- AR 2010-5912, Unit 1 E ESW exhibiting abnormal noise/removed from service
- AR 2011-0619, Loss of ESW Header Pressure on pump swap

- AR 2011-0632, U1 E ESW Pump Test Pump DP Less Than Low Alert Limit
- AR 2011-2033, 1-ESW-322 Drain Valve Plugged
- AR 2011-3478, 1-PP-7E MTR Oil Analysis
- AR 2011-6881, 1-Batt-AB Cell 100+ Post Abnormal
- AR 2011-7089, Inconsistencies in PM Frequencies
- Control Room Logs, July 29 – August 4, 2009
- Maintenance Rule Scoping Document, Essential Service Water, Revision 8
- P-99-21488, Evaluation of NRC IN 99-13 as Informal, Undocumented, and Did Not Address All Areas of the IN, August 26, 1999
- P-99-27531, 4KVAC Bus Protection and Metering, November 17, 1999
- PMP-5030-001-003, Preventative Maintenance, Revision 25
- Two-year Unavailability Report for the Essential Service Water System, Unit 1
- Unit 1 ESW System Health Report 1Q 2011
- WO 55343702-01, Unit 1 SSPS Train B Multiplexer Test Switch Replacement, July 8, 2009
- WO 55348246-18, Perform ISI Examinations on RHR Pipe Support, October 14, 2010
- WO 55351202-01, Relay 1-43-DGCD-LQ is Not Functioning, April 12, 2010
- WO 55361102-01, 2-FW-159 Not Tested IAW IST Program, April 11, 2010

#### 1R13 Maintenance Risk Assessments and Emergent Work Control

- 1-OHP-4022-002-020, Excessive Reactor Coolant Leakage, Revision 9
- AR 00839956, Enhancement PMP-7030-SFD-001
- AR 2011-4925, Unit 2 Plant Air Compressor Surging
- AR 2011-6039, Swagelock Fitting Leaking on 1-FFS-244
- AR 2011-6040, Swagelock Fitting Leaking on 1-FFS-245
- AR 2011-7092, Weld Leak on Discharge Piping of East Charging Pump
- Control Room Logs, April 23-27, May 8-10, May 17-21, June 15
- Daily work activity schedule, April 23-27, May 8-10, May 17-21
- PMP-2291-OLR-001, Online Risk Management, Unit 1 and Unit 2 Part 1, Configuration Risk Assessment, April 23-27, May 8-10, May 17-21, June 15
- PMP-7030-SFD-001, Safety Function Determination Program, Revision 2

#### 1R15 Operability Evaluations

- 1-OHP-5030-119-003, ESW to Auxiliary Feed Pump Cleanout Connection Flush, Revision 3
- 2-OHP-4021-018-008, Operation of RWST Support Systems, Revision 14
- AR 2011-1821, Inoperability of Unit 2 East ESW and 2 CD EDG
- AR 2011-2776, OE31996 Online (RWST) Purification
- AR 2011-2817, Inconsistency Between Dose Analyses and TS 5.5.7b(2)
- AR 2011-2819, Deficiency in Containment Barrier Seal Calculation
- AR 2011-3148, 1-TR101CD Load Tap Changer not Working in Automatic
- AR 2011-3793, Unit 1 and Unit 2 Containment Integrity Analysis Issues
- AR 2011-4089, Add Manual Action to 1 & 2 OHP-4022-001-007, 'Earthquake'
- AR 2011-4101, Update OP-12-5136
- AR 2011-5154, Air Voids in AFW Pump Emergency Suction Source From ESW
- AR 2011-5252, High Voltage on 3 phases of U2 DIS Train A Lower
- AR 2011-5784, Purchase and Stage Ladder For Abnormal Response
- DC-D-12-SF-06, Piping Operability Evaluation of Class 3 Piping of Spent Fuel System from Refueling Water Purification Pump and Filter to Valves SF-148 and SF-136, May 24, 2000
- FCN-48373-008, Field Change Notice, Divider Barrier Seal

- OP-12-5136-24, Flow Diagram Spent Fuel Pit Cooling and Clean Up Unit 1 & 2, Revision 24
- SD-080916-001, Qualification of Divider Barrier Seal Details and Replacement of Mounting Hardware (carbon Steel) to Stainless Steel for Unit 2
- SD-990720-001, Qualification of Divider Barrier Seal Details and Change of Mounting Hardware from Carbon Steel Material to Stainless Steel for Unit 2
- WO 55235304-01, Clean and Inspect Strainer, July 5, 2007
- WO 55321507-01, Flush ESW Supply Lines to the West MDAFP, April 1, 2010
- WO 55380895-04, 1-90-101CD Replace Digital Tap Changer Control, March 16, 2011
- WO 55384530-06, AB EDG Fuel Oil Transfer Pump PMT, May 24, 2011

#### 1R19 Post-Maintenance Testing

- 12-OHP-4021-066-001, Fire Protection System (Water) Operation, April 29, 2011
- 12-OHP-4030-066-121FD, Diesel Fire Pump Operability Test, April 29, 2011
- 1-OHP-4030-119-022E, East Essential Service Water System Test, May 10, 2011
- 2-OHP-4030-205-002B, #4 Boric Acid Transfer Pump Operability Test, June 3, 2011
- 2-OHP-4030-214-011, Containment Isolation and IST Valve Operability Test, June 3, 2011
- AR 2010-5125, Loose Connection on 12-WDFP-Batt-1,2
- AR 2011-4056, 12-OME-215W, West Diesel Fire Pump Cracks in Fuel Hose Jacket
- AR 2011-5743, PMT of U1 E. ESW NaOCL Injection Failed
- AR 2011-6435, 8012R-2 Boric Acid Transfer Pump Power Cable Failed Test
- OP-2-5105B-46, Flow Diagram Main Steam Unit 2, Revision 46
- OP-2-5141A-44, Flow Diagram Nuclear Sampling Unit 2, Revision 44
- Technical Data Book Figure 2-15.1, Safety-related Pump Inservice Test Hydraulic Reference, Revision 106
- Technical Data Book Figure 2-15.2, Safety-related Pump Inservice Test Vibration Reference, Revision 88
- Technical Data Book Figure 2-19.2, Power Operated Valve Stroke Time Limits, Revision 99
- WO 55345797, 12-OME-215W, Perform 6-Year PM
- WO 55345797, 12-OME-215W, Perform 6-Year Preventive Maintenance, April 28, 2011

#### 1R22 Surveillance Testing

- 12-MHP-4030-010-008, Ice Condenser Intermediate Deck Door Weekly Surveillance, April 20, 2011
- 12-THP-4030-002-208, Primary to Secondary Leak Rate, Revision 12
- 1-EHP-4030-128-003B, Train B CEQ Fan Surveillance and ESF Response Time Test, June 22, 2011
- 1-OHP-4030-156-017T, Turbine Driven Auxiliary Feedwater System Test, June 23, 2011
- 1-IHP-4030-119-001, East Essential Service Water Liquid Process Radiation Monitor 1-WRA-713 (R-20) Channel Functional Test, May 9, 2011
- 2-IHP-4030-001A, Train 'A' Solid State Protection System Automatic Trip and Actuation Logic Operational Test and Reactor Trip Breaker Operational Test, April 13, 2011
- AR 2011-1781, Ice and Frost Build Up in Unit One Upper Ice Condenser
- AR 2011-4526, OSM Printer Failed To Print During SSPS Testing
- AR 2011-5153, Unit 1 Primary to Secondary Leak Monitoring in March Outage Startup
- AR 2011-5583, Performed Channel Operational Test on 1-R-20 with Unit 2 High Alarm Setpoint
- AR 2011-6521, Corrosion Found on 1-BATT-CD
- AR 00817856, RCS Cold Leg MOV not in 89-10 Program

- GT 2011-0149, Operating Experience Related Actions per PMP 7030 OE 001
- GT 2010-11793-3, Primary to Secondary Leak Program Self-assessment
- PMP-4030-EXE-001, Conduct of Surveillance Testing, Revision 14
- PMP-5037-PSL-001, Primary to Secondary Leak Rate Program, Revision 4

#### 1EP6 Drill Evaluation

- EMD-32a, Michigan State Police, Nuclear Plant Event Notification (Drill), May 27, 2011
- PMP-2060-EPP-100, Emergency Response, Revision 19
- PMP-2080-EPP-101, Emergency Classification, Revision 14
- RQ-E-3602-U12-DEP-1, Cycle 3602 DEP Evaluation, Revision 0

#### 2RS1 Radiological Hazard Assessment and Exposure Controls

- 12-THP-6010-RPP-305, Radioactive Particle Control, Revision 12
- ALARA Plan Unit-1 Containment Building Locked High Radiation Activities RWP 111075
- ALARA Program Review of Plant Work Activities, ALARA Post Work Review, RP and MTI Workers to Enter Unit-1 Regenerative Heat Exchanger and Electrical Change Out on 1-XSO-158, May 18, 2011
- AR-2011-0921, B-9 High Radiation Area Door Found Unlocked
- AR-2011-5424, Radioactive Contaminated Equipment Stored at the Radiation Material Building in wooden Box
- AR-2011-5946, Unexpected Dose Rate Alarm RWP-1070-04 by MTI ACAD-9036 Individual in Support of the 1-QRV-111/1-XSO-158 Works
- AR-2011-6063, RP Shield Hot Spots in the Unit-2 RCDT PP Room
- AR-2011-6077, RP Shield Hot Spots in the Unit-1 RHR HX East and West
- AR-2011-6720, Radioactive Contaminations Found in a Clean Area
- CNP-1105-0077, Template 143R U1 LC 598, Survey of Annulus, May 11, 2011
- CNP-1105-0125, Template 143R U1 LC 598, Survey of Annulus, May 18, 2011
- CNP-1105-0131, Template 143R U1 LC 598, Survey of Annulus, May 11, 2011
- PA-10-01, Radiation Protection Performance Assurance Audit, March 10, 2009
- PMP-6010-ALA-001, ALARA Post Work Review, U2C19, Operation Activities in the Auxiliary Building, Containment and Restricted Areas, December 9, 2010
- PMP-6010-ALA-001, ALARA Post Work Review, U2C19, Perform Reactor Vessel Examination Repairs, January 27, 2011
- PMP-6010-ALA-001, ALARA Post Work Review, U2C19, Perform Reactor Vessel Examinations and Repairs included Baffle Bolts Repairs, January 27, 2011
- PMP-6010-ALA-001, ALARA Post Work Review, U2C19, RCP Seal Maintenance Activities, December 11, 2010
- PMP-6010-ALA-001, ALARA Post Work Review, U2C19, Refuel Prep Activities and Disassembly, December 27, 2010
- PMP-6010-ALA-001, ALARA Program – Review of Plant Work Activities, Revision 23
- PMP-6010-RPP-003, High, Locked High, and Very High Radiation Area Access, Revision 21
- RWP-10-2102, Unit-2 Cycle-19 Refuel Restoration Activities, Revision 0
- RWP-10-2104, Perform Reactor Vessel Examination and Repair, Revision 3
- RWP-10-2105, Unit-2 Cycle-19 Core Barrel Activities and Core Barrel Bolt Repairs to Include Support, Revision 1
- RWP-102140, Remove, Install and Modify Insulation in Unit-2 Containment, Revision 0
- RWP-10-2142, Unit-2 Cycle-19 Containment Install, Modify and Remove Scaffolds, Revision 1
- RWP-10-2151, RCP Seal Work Area Set Up and Removal Activities, Revision 10

- RWP-10-2175, U2C19 – Regen Heat Exchanger Locked High Radiation Area Activities, Task Refueling, Revision 0
- RWP-111070, U-1 Containment Activities During Power Operations, Revision 0
- THG-040, Locked High Radiation Area and Very High Radiation Area Key Inventory, Revision 15

#### 2RS7 Radiological Environmental Monitoring Program

- 10 CFR 50.75 (g) File, May 24, 2010
- 12-IHP-6030-036-001, Shoreline Weather Tower Instrument Calibration, March 18, 2011
- 12-THP-6010-RPP-630, Collection of REMP Surface Water Samples, Revision 7
- 12-THP-6010-RPP-632, Collection of Environmental Air Samples, Revision 7
- 12-THP-6010-RPP-634, Collection of REMP Groundwater Samples, Revision 11
- 12-THP-6010-RPP-635, Collection of Milk Samples, Revision 2
- 12-THP-6010-RPP-642, Collection of Drinking Water Samples, Revision 7
- Annual Radiological Environmental Operating Report, January 1, 2010 through December 31, 2010
- AR-00855218, AVS28-6270 Volume Totalizer Failed
- AR-00859047, Air Sampler Elapsed Time Five Hours Less of 168 Expected Hours
- AR-2010-2044, REMP Air Sampler Not Collected at ONS-4
- AR-2010-3641, Reduced Run Time REMP Air Station ONS-2
- AR-2011-1464, Fourth Quarter Broadleaf Sample Results Showed Cs-137
- AR-2011-3284, Air Sampling Device AVS28-6262 Failed “As Found” Data
- AR-2011-3499, Sample at REMP Location LTW Positive for Tritium
- AR-2011-4951, Suspected Activity from Japan Detected in REMP Samples
- AR-2011-5053, Main Met Tower Building Needs to be Replaced, the Roof Leaks
- AR-2011-5414, NRC Identified Trees Encroaching Air Sampler Station at Coloma Site
- AR-2011-5414, Trees Encroaching upon the Coloma REMP Air Sampler
- AR-2011-5416, REMP Fishing Techniques Need to Focus on Sport Fishes
- AR-2011-5478, Evaluate Installation of Power Failure Notification of the Met Tower
- AR-2011-5478, Evaluate Installation of Power Failure Notification at the MET Tower Backup Battery
- AR-2011-5479, Evaluate and Repair Trail Deficiency to Air Sampling Locations
- Donald C. Cook Effluent Report for 2010
- NUPIC AUDIT, GEL Laboratories, LLC, March 27, 2009
- Off-Site Dose Calculation Manual, Revision 23

#### 40A1 Performance Indicator Verification

- AR 2011-7518, Errors Identified in Internal MSPI Margin Report
- AR 2011-7723, Apparent Discrepancy in ROP Performance Indicator Data
- AR 2011-7391, MSPI Report Submitted Last Quarter with an Error
- GT 2011-7436, Procedure Change Request per PMP 2010 PRC 002
- PI Summary of Cook Plant, Occupational Exposure Control Effectiveness, Between January 2010 and June 2011
- PI Summary of Cook Plant, RETS/ODCM Effluent Occurrences, Between January 2010 and April 2011
- PMP-7110-PIP-001, Reactor Oversight Program Performance Indicators and Monthly Operating Report Data from First Quarter of 2010 Through Fourth Quarter 2010, and the First Quarter 2011 of RETS/ODCM Radiological Effluent Occurrences

- PMP-7110-PIP-001, Reactor Oversight Program Performance Indicators and Monthly Operating Report Data from the First Quarter of 2010 through the Fourth Quarter 2010, and the First Quarter 2011 of Occupational Exposure Control Effectiveness Occurrences
- PMP-7110-PIP-001, Reactor Oversight Program Performance Indicators and Monthly Operating Report Data, Unit 1/2, Mitigating System Performance Index, Second Quarter 2010 Through First Quarter 2011, Cooling Water Systems, Residual Heat Removal Systems, High Pressure Safety Injection System, Emergency AC Power Systems, Auxiliary Feedwater System

#### 4OA2 Identification and Resolution of Problems

- 1<sup>st</sup> Quarter 2011 Trend Report
- 4<sup>th</sup> Quarter 2010 Trend Report
- AEP-93-207, Cold Overpressure Mitigation System (COMS) Non-conservatisms, March 15, 1993
- AR 2010-0954, Cognitive Trend in Maintenance Rule Functional Failures
- AR 2010-10197, LTOP analysis does not apply instrument uncertainty
- AR 2010-12393, Security Reason Code has Exceeded the Upper Control Limit
- AR 2010-9232, Trend Evaluation Needed on Fire Doors / Dampers
- AR 2010-9240, Potential Trend
- AR 2011-0560, Adverse Trend in Roll-Up Code CM3
- AR 2011-1330, Cognitive Trend in Equipment Reliability Site Focus Area

#### 4OA5 Other Activities

- AR 2011-4426, Failure to Invoke B31.1 Requirements for RCS Piping
- EC 48752, MSIP for Reactor Pressure Vessel Hot and Cold Leg Nozzle Dissimilar Metal Welds, Revision 1
- ECP 12-N1-05, Low Temperature Overpressure Protection – LTOP Setpoint Calculation, Revision 9, 13
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## LIST OF ACRONYMS USED

AC	Alternating Current
ADAMS	Agencywide Document Access Management System
CAP	Corrective Action Program
CC	Construction Code
CFR	Code of Federal Regulations
CL	Cold Leg
EC	Engineering Change
HL	Hot Leg
IMC	Inspection Manual Chapter
IP	Inspection Procedure
LTOP	Low Temperature Overpressure
MSIP	Mechanical Stress Improvement Process
MSPI	Mitigating Systems Performance Index
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U. S. Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
ODCM	Offsite Dose Calculation Manual
PARS	Publicly Available Records System
PI	Performance Indicator
PORV	Power Operated Relief Valve
RCS	Reactor Coolant System
RETS	Radiological Effluent Technical Specification
SAMGs	Severe Accident Mitigation Guidelines
SBO	Station Blackout
TIA	Task Interface Agreement
TS	Technical Specification
TSO	Transmission System Operator
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item

L. Weber

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Sincerely,

**/RA/**

Mark Marshfield, Acting Chief  
Branch 6  
Division of Reactor Projects

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

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SUBJECT: D. C. COOK NUCLEAR POWER PLANT, UNITS 1 AND 2, INTEGRATED  
INSPECTION REPORT 05000315/2011003; 05000316/2011003

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