

## UNITED STATES NUCLEAR REGULATORY COMMISSION

REGION III 2443 WARRENVILLE ROAD, SUITE 210 LISLE, IL 60532-4352

November 18, 2013

Mr. Kevin Davison Site Vice President Prairie Island Nuclear Generating Plant Northern States Power Company, Minnesota 1717 Wakonade Drive East Welch, MN 55089

## SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2 NRC INTEGRATED INSPECTION REPORT 05000282/2013004; 05000306/2013004

Dear Mr. Davison:

On September 30, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Prairie Island Nuclear Generating Plant, Units 1 and 2. The enclosed report documents the results of this inspection, which were discussed on October 10, 2013, with you 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.

Two NRC-identified and two self-revealed findings of very low safety significance (Green) were identified during this inspection. The findings were determined to involve violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) in accordance with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the subject or severity of any NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Prairie Island Nuclear Generating Plant.

If you disagree with the cross-cutting aspect assigned to 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 the Prairie Island Nuclear Generating Plant.

#### K. Davison

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and 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 Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <a href="http://www.nrc.gov/reading-rm/adams.html">http://www.nrc.gov/reading-rm/adams.html</a> (the Public Electronic Reading Room).

Sincerely,

## /**RA**/

Kenneth Riemer Branch 2 Division of Reactor Projects

Docket Nos. 50-282; 50-306; 72-010 License Nos. DPR-42; DPR-60; SNM-2506

- Enclosure: Inspection Report 05000282/2013004; 05000306/2013004 w/Attachment: Supplemental Information
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## U.S. NUCLEAR REGULATORY COMMISSION

# **REGION III**

Docket Nos: License Nos:	50-282; 50-306; 72-010 DPR-42; DPR-60; SNM-2506
Report No:	05000282/2013004; 05000306/2013004
Licensee:	Northern States Power Company, Minnesota
Facility:	Prairie Island Nuclear Generating Plant, Units 1 and 2
Location:	Welch, MN
Dates:	July 1 through September 30, 2013
Inspectors:	<ul> <li>K. Stoedter, Senior Resident Inspector</li> <li>T. Daun, Acting Resident Inspector</li> <li>E. Sanchez-Santiago, Acting Resident Inspector</li> <li>R. Baker, Operator Licensing Examiner</li> <li>K. Barclay, Resident Inspector – Point Beach</li> <li>J. Beavers, Emergency Preparedness Inspector</li> <li>P. LaFlamme, Resident Inspector – D.C. Cook</li> <li>B. Palagi, Senior Operator Licensing Examiner</li> <li>M. Phalen, Senior Health Physicist</li> <li>D. Szwarc, Fire Protection Inspector</li> <li>M. Speck, Senior Emergency Preparedness Inspector</li> <li>M. Ziolkowski, Reactor Engineer</li> </ul>
Approved by:	K. Riemer, Chief Branch 2 Division of Reactor Projects

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## SUMMARY OF FINDINGS

Inspection Report 05000282/2013004, 05000306/2013004; 07/01/2013 – 09/30/2013; Prairie Island Nuclear Generating Plant, Units 1 and 2; Maintenance Effectiveness, Operability Determinations and Post-Maintenance Testing.

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Four Green findings were identified by the inspectors. The findings were considered non-cited violations (NCVs) of NRC regulations. The significance of inspection findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Components Within the Cross Cutting Areas" dated October 28, 2011. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated January 28, 2013. 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: Mitigating Systems**

Green. A self-revealing finding of very low safety significance (Green) and an non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings" was identified on July 2, 2013, for the failure to have documented instructions, procedures, or drawings, of a type appropriate to the circumstances while performing maintenance. Specifically, maintenance personnel rendered Unit 2 Containment High Range Area Monitor 2R-49 inoperable after lifting a wire as part of a Unit 1 Containment High Range Area Monitor 1R-49 power supply replacement. Corrective actions for this issue included returning 1R-49 and 2R-49 to service and providing additional supervisory involvement to ensure all maintenance personnel were aware of expectations for ensuring that energized leads were appropriately identified, that adequate barriers were established to prevent inadvertent contact with energized leads, and ensuring that access to leads to be lifted were adequate for safe manipulation.

The inspectors determined that this issue was more than minor because it was associated with the configuration control and procedure quality attributes of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). This issue was of very low safety significance because each of the questions provided in IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," were answered "no." This issue was cross cutting in the Human Performance, Work Control area because the licensee failed to appropriately plan work activities by incorporating job site conditions which may impact human performance or plant structures, systems, and components (H.3(a)). (Section 1R12)

• <u>Green</u>. A self-revealing finding of very low safety significance (Green) and an NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings" was identified on July 24, 2013, for the failure to have documented instructions, procedures, or drawings, of a type appropriate to the circumstances when performing maintenance on the 2R-49 Unit 2 Containment High Range Area Monitor power supply. Specifically, the #13

reactor protection instrument inverter was rendered inoperable when two terminals were shorted during the power supply replacement. Corrective actions for this issue included returning the #13 instrument inverter to an operable status and providing additional supervisory involvement to ensure all maintenance personnel were made aware of expectations for ensuring that energized leads were appropriately identified, that adequate barriers were established to prevent inadvertent contact with energized leads, and ensuring that access to leads to be lifted were adequate for safe manipulation.

This issue was more than minor because it was associated with the design control, configuration control and procedure quality attributes of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The inspectors determined that this issue was of very low safety significance because each question provided in IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," was answered "no." This issue was cross cutting in the Human Performance, Work Control area because the licensee failed to appropriately plan work activities by incorporating job site conditions which may impact human performance; plant structures, systems, and components; human-system interface; or include the need for planned compensatory actions (H.3(a)). (Section 1R12)

<u>Green</u>. An inspector-identified finding of very low safety significance (Green) and an NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures or Drawings," was identified on August 15, 2013, due to the licensee's failure to follow
 Procedure FP-OP-OL-01, "Operability/Functionality Determination." Specifically, the licensee failed to evaluate the ability of the D6 emergency diesel generator (EDG) to perform its specified safety function over the expected voltage range of 3740-4580 volts after identifying that the radiator fan motor overload relays were improperly sized. Corrective actions for this issue included removing the D6 EDG from service to replace the relays and sharing the lessons learned from the failure to follow procedures with engineering personnel.

The inspectors determined that this issue was more than minor because it was associated with the design control and equipment performance attributes of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The inspectors determined that this issue was of very low safety significance because each question provided in IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," was answered "no." This issue was cross cutting in the Human Performance, Decision Making area because the licensee failed to use conservative assumptions regarding EDG operating voltage when making decisions regarding the D6 EDG's ability to perform its specified safety function with inadequately sized radiator fan motor thermal overload relays (H.1(b)). (Section 1R15)

<u>Green</u>. An inspector identified finding of very low safety significance (Green) and an NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified on August 26, 2013, due to the licensee's failure to follow Procedure FP-E-EQV-01, "Equivalency Evaluations and Changes." Specifically, the licensee failed to evaluate the operational vibration and establish that the removal of a valve mounting as part of Engineering Change 17270 did not adversely change the design function of the D2 EDG lube oil pressure boundary. The licensee's planned long-term corrective actions included replacing the copper tubing lines and restoring the mounting of the valves.

The finding was determined to be more than minor because if left uncorrected, the issue had the potential to lead to a more significant safety concern. Specifically, continued vibrational contact between the oil filter housing and the brass fitting had the potential cause failure of the brass fitting or copper tubing and a loss of the lube oil pressure boundary. The inspectors determined the finding was of very low safety significance because question #1 provided in IMC 0609, Appendix A, Exhibit 2, "Mitigating Screening Questions," was answered "yes." This finding was cross-cutting in the Human Performance, Work Practices area because the licensee did not ensure supervisory and management oversight of work activities such that nuclear safety is supported (H.4(c)). (Section 1R19)

## B. Licensee-Identified Violations

None

## **REPORT DETAILS**

## **Summary of Plant Status**

Unit 1 began the inspection period operating at full power. On September 12, 2013, operations personnel lowered reactor power to approximately 80 percent to align the plant for a planned zebra mussel treatment. Following the treatment, operations personnel lowered reactor power further to complete turbine valve testing. The operators restored the reactor to its full power level upon completion of the testing. Unit 1 operated at full power for the remainder of the inspection period.

Unit 2 began the inspection period operating at approximately 80 percent power due to increased vibrations on the main generator end turns. On September 20, 2013, operations personnel began lowering reactor power in preparation for refueling outage 2R28. At 12:02 a.m., on September 21, 2013, the main generator was removed from service and the refueling outage began. Major activities to be completed during the outage included extensive switchyard maintenance, replacement of the steam generators, emergency diesel generator (EDG) maintenance, reactor baffle bolt inspections, heat exchanger testing and cleaning, and the installation of new reactor coolant pump seals. Unit 2 remained shutdown at the conclusion of the inspection period.

## 1. **REACTOR SAFETY**

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

- 1R01 Adverse Weather Protection (71111.01)
  - .1 External Flooding
  - a. Inspection Scope

The inspectors evaluated the design, material condition, and procedures for coping with the design basis probable maximum flood. The evaluation included a review to check for deviations from the descriptions provided in the Updated Safety Analysis Report (USAR) for features intended to mitigate the potential for flooding from external factors. As part of this evaluation, the inspectors checked for obstructions that could prevent draining, checked that the roofs did not contain obvious loose items that could clog drains in the event of heavy precipitation, and determined that barriers required to mitigate the flood were in place and operable. Additionally, the inspectors performed a walkdown of the protected area to identify any modification to the site which would inhibit site drainage during a probable maximum precipitation event or allow water ingress past a barrier. The inspectors also walked down underground bunkers/manholes subject to flooding that contained multiple train or multiple function risk significant cables. The inspectors also reviewed the abnormal operating procedure (AOP) for mitigating the design basis flood to ensure it could be implemented as written. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one external flooding sample as defined in Inspection Procedure (IP) 71111.01-05.

## b. Findings

No findings were identified.

- 1R04 Equipment Alignment (71111.04)
  - .1 Quarterly Partial System Walkdowns
  - a. Inspection Scope

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

- R-23 Control Room Air Supply Radiation Monitor A;
- 11 Safety Injection System;
- 21 Containment Spray System; and
- D6 EDG.

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures. system diagrams, USAR, Technical Specification (TS) requirements, outstanding work orders (WOs), corrective action documents, 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 were 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 corrective action program (CAP) with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

- .2 <u>Semi Annual Complete System Walkdown</u>
  - a. Inspection Scope

On August 15, 2013, the inspectors performed a complete system alignment inspection of the Unit 2 Component Cooling Water System to verify the functional capability of the system. This system was selected because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment lineups;

electrical power availability; system pressure and temperature indications; as appropriate; component labeling; component lubrication; component and equipment cooling; hangers and supports; operability of support systems; and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding WOs was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the CAP database to ensure that system equipment alignment problems were being identified and appropriately resolved. Documents reviewed are listed in the Attachment to this report.

These activities constituted one complete system walkdown sample as defined in IP 71111.04-05.

b. Findings

No findings were identified.

## 1R05 Fire Protection (71111.05)

- .1 <u>Routine Resident Inspector Tours (71111.05Q)</u>
- 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 12 Relay and Cable Spreading Room;
- Fire Zone 43 Bus 111 and 121 Switchgear Rooms;
- Fire Zone 74 Plant Screenhouse 670' elevation;
- Fire Zone 75 Plant Screenhouse 695' elevation; and
- Fire Zone 97 D5/D6 EDG Building.

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 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 licensee's ability to respond to a security event. The inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified 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.

- 1R11 Licensed Operator Regualification Program (71111.11)
  - .1 <u>Resident Inspector Quarterly Review of Licensed Operator Regualification</u> (71111.11Q)

#### a. Inspection Scope

On July 13, 2013, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator requalification training to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

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

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

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

b. Findings

No findings were identified.

#### .2 <u>Resident Inspector Quarterly Observation of Heightened Activity or Risk</u> (71111.11Q)

a. Inspection Scope

On September 14, 2013, the inspectors observed licensed operators in the Unit 1 control room during power reduction activities associated with performing turbine valve testing. This was an activity that required heightened awareness or was related to increased risk. 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 (if applicable);
- correct use and implementation of procedures;
- control board (or equipment) manipulations;
- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications (if applicable).

The performance in these areas was compared to pre-established operator action expectations, procedural compliance and task completion requirements. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one quarterly licensed operator heightened activity/risk sample as defined in IP 71111.11.

b. Findings

No findings were identified.

.3 <u>Annual Testing Results</u> (71111.11A)

Biennial Written and Annual Operating Test Results (71111.11A)

a. Inspection Scope

The inspectors reviewed the overall pass/fail results of the Biennial Written Examination, and the Annual Operating Test, administered by the licensee from July 22 through September 12, 2013, required by 10 CFR 55.59(a). The results were compared to the thresholds established in IMC 0609, Appendix I, "Licensed Operator Requalification Significance Determination Process (SDP)," to assess the overall adequacy of the licensee's Licensed Operator Requalification Training (LORT) Program to meet the requirements of 10 CFR 55.59. (Section 02.02)

This inspection constituted one annual licensed operator requalification examination results sample as defined in IP 71111.11-05.

b. Findings

No findings were identified.

- .4 <u>Biennial Review</u> (71111.11B)
- a. Inspection Scope

The following inspection activities were conducted during the weeks of September 3 and 9, 2013, to assess: 1) the effectiveness and adequacy of the facility licensee's implementation and maintenance of its systems approach to training (SAT) based LORT Program, put into effect to satisfy the requirements of 10 CFR 55.59; 2) conformance with the requirements of 10 CFR 55.46 for use of a plant referenced simulator to conduct operator licensing examinations and for satisfying experience requirements; and 3) conformance with the operator license conditions specified in 10 CFR 55.53. Documents reviewed are listed in the Attachment to this report.

- <u>Licensee Requalification Examinations (10 CFR 55.59(c); SAT Element 4 as</u> <u>Defined in 10 CFR 55.4)</u>: The inspectors reviewed the licensee's program for development and administration of the LORT biennial written examination and annual operating tests to assess the licensee's ability to develop and administer examinations that were acceptable for meeting the requirements of 10 CFR 55.59(a).
  - The inspectors conducted a detailed review of two biennial requalification written examination versions to assess content, level of difficulty, and quality of the written examination materials. (Section 02.03)
  - The inspectors conducted a detailed review of 10 Job Performance Measurers (JPMs) and six dynamic simulator scenarios to assess content, level of difficulty, and quality of the operating test materials. (Section 02.04)
  - The inspectors observed the administration of the annual operating test to assess the licensee's effectiveness in conducting the examination(s), including the conduct of pre-examination briefings, evaluations of individual operator and crew performance, and post-examination analysis. The inspectors evaluated the performance of two simulator crews in parallel with the facility evaluators during four dynamic simulator scenarios and evaluated various licensed crew members concurrently with facility evaluators during the administration of several JPMs. (Section 02.05)
  - The inspectors assessed the adequacy and effectiveness of the remedial training conducted since the last requalification examinations and the training planned for the current examination cycle to ensure that they addressed weaknesses in licensed operator or crew performance identified during training and plant operations. The inspectors reviewed remedial training procedures and individual remedial training plans. (Section 02.07)
- <u>Conformance with Examination Security Requirements (10 CFR 55.49)</u>: The inspectors conducted an assessment of the licensee's processes related to examination physical security and integrity (e.g., predictability and bias) to verify compliance with 10 CFR 55.49, "Integrity of Examinations and Tests." The inspectors reviewed the facility licensee's examination security procedure, and observed the implementation of physical security controls (e.g., access restrictions and simulator I/O controls) and integrity measures (e.g., security agreements, sampling criteria, bank use, and test item repetition) throughout the inspection period. (Section 02.06)

• <u>Conformance with Operator License Conditions (10 CFR 55.53)</u>: The inspectors reviewed the facility licensee's program for maintaining active operator licenses and to assess compliance with 10 CFR 55.53(e) and (f).

The inspectors reviewed the procedural guidance and the process for tracking on-shift hours for licensed operators, and which control room positions were granted watch-standing credit for maintaining active operator licenses. Additionally, medical records for 10 licensed operators were reviewed for compliance with 10 CFR 55.53(I). (Section 02.08)

- <u>Conformance with Simulator Requirements Specified in 10 CFR 55.46</u>: The inspectors assessed the adequacy of the licensee's simulation facility (simulator) for use in operator licensing examinations and for satisfying experience requirements. The inspectors reviewed a sample of simulator performance test records (e.g., transient tests, malfunction tests, scenario based tests, post-event tests, steady state tests, and core performance tests), simulator discrepancies, and the process for ensuring continued assurance of simulator fidelity in accordance with 10 CFR 55.46. The inspectors reviewed and evaluated the discrepancy corrective action process to ensure that simulator fidelity was being maintained. Open simulator discrepancies were reviewed for importance relative to the impact on 10 CFR 55.45 and 55.59 operator actions, as well as on nuclear and thermal hydraulic operating characteristics. (Section 02.09)
- <u>Problem Identification and Resolution (10 CFR 55.59(c); SAT Element 5 as</u> <u>Defined in 10 CFR 55.4)</u>:

The inspectors assessed the licensee's ability to identify, evaluate, and resolve problems associated with licensed operator performance (a measure of the effectiveness of its LORT Program and their ability to implement appropriate corrective actions to maintain its LORT Program up to date). The inspectors reviewed documents related to licensed operator performance issues (e.g., recent examination and inspection reports including cited and Non-Cited Violations; NRC End of Cycle and Mid-Cycle reports; NRC plant issue matrix; licensee event reports; licensee condition/problem identification reports including documentation of plant events and review of industry operating experience). The inspectors also sampled the licensee's quality assurance oversight activities, including licensee training department self-assessment reports. (Section 02.10)

This inspection constituted one biennial licensed operator requalification program inspection sample as defined in IP 71111.11-05.

## b. Findings

## 1R12 <u>Maintenance Effectiveness</u> (71111.12)

## .1 <u>Routine Quarterly Evaluations</u> (71111.12Q)

#### a. Inspection Scope

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

- Radiation Monitors 1R-49 and 2R-49;
- Fuel Handling Equipment; and
- Shield Building Special Ventilation.

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

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for 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. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

# Radiation Monitor 2R-49 Rendered Inoperable during Maintenance on Radiation Monitor 1R-49

<u>Introduction</u>: A self-revealing finding of very low safety significance (Green) and a non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings" was identified on July 2, 2013, for the failure to have documented instructions, procedures, or drawings, of a type appropriate to the circumstances, while performing maintenance on radiation monitor 1R-49 (the Unit 1 Containment High Range Area Monitor). Specifically, during the replacement of the 1R-49 power supply, maintenance personnel rendered safety-related radiation

monitor 2R-49 inoperable due to the procedure directing a wire to be lifted which resulted in power being removed to 2R-49 as well as 1R-49.

Description: On July 2, 2013, maintenance personnel performed WO 405967, "Rad Monitor 1RM-49 has a High AC Ripple on Power Supply," to replace the power supply for radiation monitor 1R-49. Since multiple radiation monitors were powered off of the same electrical circuit, the licensees' work plan directed the replacement of the power supply by lifting the energized wires on the power supply for the 1R-49 radiation monitor. Instrumentation and Control (I&C) Specialists encountered difficulty removing the energized wires while working in the location directed by the WO. As a result, the specialists sought an alternate location which provided better access to the wiring needed to de-energize the power supply. The licensee's WO was modified to permit lifting the energized wires in the new location. The personnel involved in modifying the WO believed that the wiring in the new location was electrically equivalent to the location originally proposed. The licensee recommenced work and when the energized wires were lifted at the alternate location, power was interrupted to radiation monitor 2R-49. The specialists immediately stopped work, and operations personnel declared radiation monitor 2R-49 inoperable. The operators subsequently returned radiation monitor 2R-49 to service once power was restored.

<u>Analysis</u>: The inspectors determined that the failure to have instructions, procedures, and drawings of a type appropriate to the circumstances for an activity affecting quality was a performance deficiency associated with the Mitigating Systems Cornerstone. This issue was more than minor because it was associated with the configuration control and procedure quality attributes of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage) specifically, radiation monitor 2R-49 was inadvertently rendered inoperable.

The inspectors utilized IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," and determined that this issue was of very low safety significance (Green) because each question provided in IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," was answered "no." The inspectors determined that this issue was a cross cutting in the Human Performance, Work Control area because the licensee did not appropriately plan work activities by incorporating job site conditions which may impact human performance or plant structures, systems, and components (H.3(a)). Specifically, the work plan did not consider the difficulty with working on energized electrical terminals in the directed location. When difficulty was encountered, the personnel involved made changes to the WO which erroneously were considered equivalent in nature to the original scope but resulted in the inoperability of radiation monitor 2R-49.

<u>Enforcement</u>: Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality be prescribed by documented instructions, procedures, and drawings, of a type appropriate to the circumstances and be accomplished in accordance with these procedures. The licensee established WO 405967, "Rad Monitor 1RM-49 has a High AC Ripple on Power Supply," as the implementing procedure for removing and replacing the power supply for radiation monitor 1RM-49, an activity affecting quality.

Contrary to the above, on July 2, 2013, the licensee failed to have instructions, procedures and drawings appropriate to the circumstance when performing maintenance on radiation monitor 1RM-49. Specifically, the WO directed an energized electrical wire to be disconnected which unintentionally removed power from radiation monitor 2R-49. As a result, the 2R-49 was rendered inoperable for approximately 3 hours 53 minutes.

Because this violation was of very low safety significance and it was entered into the licensee's corrective action program as CAP 1388700, "Unplanned LCO Entry and Trip of Unit 2 steam generator blowdown," this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy

(NCV 05000282/2013004-01; 05000306/2013004-01: Improper Work Instructions Rendered 2R-49 Inoperable). Corrective actions for this issue included returning 1R-49 and 2R-49 to service and providing additional supervisory involvement to ensure all I&C personnel were made aware of expectations for ensuring that energized leads were appropriately identified, that adequate barriers were established to prevent inadvertent contact with energized leads, and ensuring that access to leads to be lifted were adequate for safe manipulation. The licensee has also taken actions to implement a design change which would install fuses to provide electrical isolation for radiation monitors.

# Reactor Protection Instrument Inverter #13 Rendered Inoperable During Maintenance on Radiation Monitor 2R-49

<u>Introduction</u>: A self-revealing finding of very low safety significance (Green) and an NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instruction, Procedures, and Drawings" was identified on July 24, 2013, for the failure to have documented instructions, procedures, or drawings, of a type appropriate to the circumstances when performing maintenance on the power supply for radiation monitor 2R-49 (the Unit 2 Containment High Range Area Monitor). Specifically, the #13 reactor protection instrument inverter was rendered inoperable when two terminals were shorted during the replacement of the power supply.

Description: On July 24, 2013, the licensee performed WO 483922, "2RE-49 Increasing Downward Trend," to replace the power supply for the 2R-49 radiation monitor. The work plan used to remove and replace the power supply (WO 483922-03) required the licensee to lift the energized wires at the power supply terminals. The work plan contained two caution boxes, the first cautioned against contact with exposed ends of wires and the second provided information regarding the use of insulated tools. The old power supply was removed and the new power supply was fastened in place as directed by the WO. The energized wires to the power supply were then landed on the power supply terminals. While checking the terminal tightness, maintenance personnel inadvertently contacted an adjacent ground terminal shorting the power supply to ground. This short circuit resulted in an electrical transient that caused alternating current (AC) input breaker CB401 on the #13 reactor protection instrument inverter to trip open. This caused the #13 inverter to automatically transfer to its bypass power supply. The control room received the "13 Inverter Instrument Bus III Bypassed" alarm and responded per Annunciator Response Procedure 47005-0308. Operations personnel also declared the #13 inverter inoperable since the bypass power supply was not credited to maintain the inverter in an operable status. After entering Procedure 1C20.8 AOP1, "Abnormal Operation, Instrument AC Inverters," operations personnel restored the #13 inverter to an operable status.

The inspectors reviewed the circumstances surrounding this event and the licensee's apparent cause evaluation. The inspectors determined that although WO 483922 contained precautions regarding contact with exposed leads and the use of insulated tools, there were no precautions or WO steps that directed the use of plastic sheeting, tape or other devices to prevent or minimize inadvertent contact with energized electrical connections located near the work location. As a result, the inspectors determined that the WO instructions were not appropriate to the circumstance.

<u>Analysis</u>: The inspectors determined that the failure to have instructions, procedures, and drawings of a type appropriate to the circumstances for an activity affecting quality was a performance deficiency associated with the Mitigating Systems Cornerstone. The inspectors determined that this issue was more than minor because it was associated with the design control, configuration control and procedure quality attributes of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the reactor protection instrument AC inverters have safety related functions to maintain circuit integrity, provide electrical isolation, and provide power to safety related equipment and instruments.

The inspectors utilized IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," and determined that this issue was of very low safety significance (Green) because each question provided in IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," was answered "no." The inspectors determined that this issue was cross cutting in the Human Performance, Work Control area because the licensee failed to appropriately plan work activities by incorporating job site conditions which may impact human performance; plant structures, systems, and components; human-system interface; or include the need for planned compensatory actions (H.3(a)). Specifically, the cautions provided in the work plan were inadequate for the job site conditions present to prevent the workers from shorting across the terminals which resulted in the inoperability of the inverter.

<u>Enforcement</u>: Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality be prescribed by documented instructions, procedures, and drawings, of a type appropriate to the circumstances and be accomplished in accordance with these procedures. The licensee established WO 483922-03, "Replace Rad Monitor 2R-49 Power Supply," as the implementing procedure for removing and replacing the power supply for the 2R-49 radiation monitor, an activity affecting quality.

Contrary to the above, on July 24, 2013, the licensee failed to have instructions, procedures and drawings appropriate to the circumstance when performing maintenance on the 2R-49 radiation monitor. Specifically, WO 483922-03 failed to provide instructions and conditions to prevent shorting across terminals during the performance of the work. As a result, the #13 inverter was rendered inoperable for approximately 1 hour 35 minutes when AC input breaker CB401 tripped opened due to maintenance personnel inadvertently contacting an adjacent ground terminal.

Because this violation was of very low safety significance and it was entered into the licensee's corrective action program as CAP 1391352, "13 Inverter Bypassed to Alternate Source during 2R-49 Maintenance," this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy (NCV 05000282/2013004-02; 05000306/2013004-02: Improper Work Instructions Rendered Reactor Protection Instrument AC Inverter 13 Inoperable). Corrective actions for this issue included returning the inverter to service per Procedure 1C20.8 AOP1 and providing additional supervisory involvement to ensure that maintenance personnel were made aware of expectations regarding working around energized electrical components and implemented measures to prevent inadvertent contact with energized equipment. The licensee has also taken action to implement a design change which would install fuses to provide a better means for electrically isolating radiation monitors prior to performing maintenance.

## 1R13 <u>Maintenance Risk Assessments and Emergent Work Control</u> (71111.13)

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

## a. Inspection Scope

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

- Unit 2 Main Generator; and
- Anticipatory Mitigating Systems Actuation Circuitry (AMSAC) testing.

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.

Documents reviewed are listed in the Attachment to this report. These maintenance risk assessments and emergent work control activities constituted two samples as defined in IP 71111.13-05.

#### b. <u>Findings</u>

## 1R15 Operability Determinations and Functional Assessments (71111.15)

## .1 Operability Evaluations

#### a. Inspection Scope

The inspectors reviewed the following issues:

- Control Room Special Ventilation System (CRSVS) Tracer Gas Testing preconditioning;
- D2 EDG Droop Setting Causes High Frequency;
- Bus 111/121 Steam Exclusion Damper Temperature Indication Downscale;
- Unit 2 Resistance Temperature Detector Bypass Flowmeter failure;
- Operability of the D5/D6 EDGs following Air Compressor failures;
- Operability Recommendation (OPR) 1389344 Operability of the Shield Building Ventilation System with Drifting Pressure Switch; and
- OPR 1392583 Continued operability of the D6 EDG with improperly sized radiator fan motor thermal overload relays.

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 USAR 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 seven samples as defined in IP 71111.15-05.

b. Findings

## (1) Failure to Properly Assess D6 Emergency Diesel Generator Operability

<u>Introduction</u>: An inspector-identified finding of very low safety significance (Green) and an NCV of 10 CFR Part 50, Appendix B, Criterion V, was identified due to the failure to follow Procedure FP-OP-OL-01, "Operability/Functionality Determination." Specifically, the licensee failed to evaluate the ability of the D6 EDG to perform its specified safety function over the expected EDG voltage range of 3740-4580 volts after identifying that the radiator fan motor overload relays were improperly sized. <u>Description</u>: On August 13, 2013, the licensee completed OPR 1392583 to assess the ability of the D6 EDG to perform its specified safety function with inappropriately sized radiator fan motor thermal overloads. Specifically, the licensee was concerned that the increased air density experienced during cold weather conditions could result in the radiator fan motor drawing currents in excess of the thermal overload setpoints. If this occurred, the radiator fan motor breaker would open resulting in a loss of power to the radiator fan. The respective EDG would also be rendered inoperable due to the reduced radiator fan cooling capability.

The inspectors reviewed the OPR and found that the licensee had concluded that the D6 EDG remained operable as long as the outside air temperature remained greater than 25°F. However, the inspectors were concerned that the licensee had not considered the increased current drawn by the radiator fan motors when the D6 EDG was operating at reduced voltage conditions (TS stated that the EDGs could operate at voltages between 3740V and 4580V).

On August 21, 2013, the licensee initiated CAP 1394184 to document the inspectors concerns. Approximately two weeks later, engineering personnel informed the operations department that preliminary review of the inspectors question showed that if the D6 EDG was operating at reduced voltage levels the radiator fan motor overloads could actuate and render the EDG inoperable when outside air temperatures were less than 52°F. However, the engineering department requested additional time to validate their results. Several hours later, the licensee decided to remove the D6 EDG from service to replace the radiator fan thermal overload relays with relays that were properly sized since nightly outside air temperatures were near 52°F. The inspectors monitored the licensee's repair efforts and had no concerns.

<u>Assessment</u>: The inspectors performed an additional evaluation of the sequence of events discussed above and determined that engineering personnel failed to complete an OPR which adequately assessed the ability of the D6 EDG to perform its specified safety function with inadequately sized radiator fan thermal overload relays as required by Step 5.3.1.3a of Procedure FP-OP-OL-01, "Operability/Functionality Determination." In addition, engineering and operations personnel failed to recognize the need to reassess operability of the D6 EDG as required by Step 5.1.11 of the same procedure when engineering personnel determined that they no longer had reasonable assurance of operability of the D6 EDG when temperatures were less than 25°F.

The inspectors determined that the failure to follow Procedure FP-OP-OL-01 when assessing the ability of the D6 EDG to perform its specified safety function was a performance deficiency associated with the Mitigating Systems Cornerstone. The inspectors determined that this issue was more than minor because it was associated with the design control and equipment performance attributes of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically the installed motor overload relays failed to meet the licensee's design requirements, and actuation of the overloads during cold weather would have caused the D6 EDG to become inoperable.

The inspectors utilized IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," and determined that this issue was of very low safety significance (Green) because each question provided in IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," was answered "no." The inspectors determined that this issue was cross cutting in the Human Performance, Decision Making area because the licensee failed to use conservative assumptions regarding EDG operating voltage when making decisions regarding the D6 EDG's ability to perform its specified safety function (H.1(b)).

<u>Enforcement</u>: Criterion V of 10 CFR Part 50, Appendix B, requires, in part, that activities affecting quality be prescribed and accomplished by instructions, procedures and drawings of a type appropriate to the circumstance. The licensee implemented the operability determination process (an activity affecting quality) using Procedure FP-OP-OL-01, "Operability/Functionality Determinations." Step 5.3.1.3 of FP-OP-OL-01, Revision 12, stated that an operability determination/recommendation shall be sufficient to address the capability of a structure, system or component to perform their specified safety functions. In addition, Step 5.1.11 stated that an SSC shall be declared inoperable and appropriate actions taken if a reasonable expectation of operability cannot be demonstrated.

Contrary to the above, on August 6, 2013, the licensee failed to perform an operability determination sufficient to address the D6 EDG's capability to perform its specified safety functions after discovering that the radiator fan motor thermal overload relays were inadequately sized. In addition, the licensee failed to declare the D6 EDG inoperable on September 3, 2013, after discovering there was no longer a reasonable expectation of the D6 EDG's operability at temperatures less than 52°F. Because this violation was of very low safety significance and it was entered into your corrective action program as CAP 1400082, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy (NCV 05000306/2013004-03: Failure to Properly Assess D6 EDG Operability). Corrective actions for this issue included removing the D6 EDG from service to replace the fan motor thermal overload relays and sharing lessons learned with engineering personnel.

- 1R18 Plant Modifications (71111.18)
  - .1 Plant Modifications
    - a. Inspection Scope

The inspectors reviewed the following modification(s):

- Engineering Change (EC) 22408 Replace D6 EDG High Temperature Gaskets (permanent);
- EC 21916 Replace Steam Exclusion Dampers CD-34187 and CD-34188 (permanent); and
- EC 22746 Install Blind Flange in place of Control Room Special Ventilation System Damper CD-34177 (temporary).

The inspectors reviewed the configuration changes and associated 10 CFR 50.59 safety evaluation screening against the design basis, the USAR, and the TS, as applicable, to verify that the modification did not affect the operability or availability of the affected

system(s). The inspectors, as applicable, observed ongoing and completed work activities to ensure that the modifications were installed as directed and consistent with the design control documents; the modifications operated as expected; post-modification testing adequately demonstrated continued system operability, availability, and reliability; and that operation of the modifications did not impact the operability of any interfacing systems. As applicable, the inspectors verified that relevant procedure, design, and licensing documents were properly updated. Lastly, the inspectors discussed the plant modification with operations, engineering, and training personnel to ensure that the individuals were aware of how the operation with the plant modification in place could impact overall plant performance. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one temporary modification sample and two permanent plant modification samples as defined in IP 71111.18-05.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

Post-Maintenance Testing

a. Inspection Scope

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

- Bus 16 Load Sequencer Testing following Programmable Logic Controller maintenance;
- D2 EDG following lube oil pressure switch and annunciator power supply replacement;
- 122 Control Room Chiller following preventive maintenance; and
- D2 EDG following semi-annual inspection activities.

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 USAR, 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

## (1) Inappropriate Removal of Diesel Lube Oil Valve Mounting Causes Vibration and Fretting

Introduction: An inspector identified finding of very low safety significance (Green) and an NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified on August 23, 2013, due to the licensee's failure to follow Procedure FP-E-EQV-01, "Equivalency Evaluations and Changes." Specifically, Attachment 2 of FP-E-EQV-01, states "An Alternate Configuration Evaluation shall establish that the changes in the replacement item do not adversely change the design function, or method of performing the function of the item or host component." Contrary to this, engineering change (EC) 17270, "Imperial Brass Model 118-HD-04 and Whitey Series 60 Valves," failed to evaluate operational vibration and establish that the removal of the valve mounting did not adversely change the design function of maintaining the lube oil pressure boundary.

Description: While observing operation of the D2 EDG on August 26, 2013, the inspectors identified a vibration concern on valve 2DG-54 (a root isolation valve for pressure instrument PI-11512). The inspectors found that the brass fitting used to connect the valve to the copper tubing was contacting the oil filter housing. The inspectors observed that the continuous vibrational contact and fretting had removed the paint at the point of contact on the oil filter housing. The inspectors also found that the same condition existed on the D1 EDG. The inspectors discussed this issue with the licensee, and the issue was entered into the CAP as CAP 1394672. The inspectors reviewed CAP 1394672 and discovered that valve 2DG-54 was recently changed to a new type of valve. In addition, the EC completed to document the change, EC 17270, had concluded that the previously installed valve mounting was no longer needed. The inspectors reviewed EC 17270 and found that although the EC had evaluated removing the valve mounting from a seismic perspective it failed to assess the effects of operational vibrations. The inspectors found that multiple sources of information existed to prompt consideration of operational vibrations. One source was a specific question in Procedure FP-E-EQV-01, Attachment 4, "Consultation Determination," which stated, "Could the change be more susceptible to the effects of vibration, stress, shock, and reaction forces?" Procedure FP-E-EQV-01 also contained a note after Step 5.3, "Equivalency Evaluation," that stated, "The Preparer should consider performing an operating experience review (i.e., INPO, NRC, ICES, etc.) to assist in this determination." Two sources of relevant operating experience were NRC Information Notice 1989-07, "Failures of Small-Diameter Tubing in Control Air, Fuel Oil, and Lube Oil Systems Which Render Emergency Diesel Generators Inoperable" and NRC Information Notice 2007-27, "Recurring Events Involving Emergency Diesel Generator Operability." Both of these documents discussed vibration induced failures of EDG piping and tubing. The licensee subsequently evaluated the material condition of the valve, brass fitting, copper piping, and oil filter housing and concluded that reasonable assurance existed that the components and EDG would perform their design functions.

<u>Analysis</u>: The inspectors determined that failing to follow Procedure FP-E-EQV-01 was contrary to 10 CFR Part 50, Appendix B, Criterion V and was a performance deficiency. The finding was determined to be more than minor because if left uncorrected, the issue had the potential to lead to a more significant safety concern. Specifically, continued vibrational contact between the oil filter housing and the brass fitting had the potential cause failure of the brass fitting or copper tubing and a loss of the D2 EDG lube oil pressure boundary.

The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," dated June 19, 2012. The inspectors determined that the finding did not result in the loss of operability for the D2 EDG; therefore, the inspectors answered "Yes" to Mitigating Systems Screening Question 1, and screened the finding as having very low safety significance (Green).

This finding has a cross-cutting aspect in the area of Human Performance, Work Practices, because the licensee failed to ensure supervisory and management oversight of work activities such that nuclear safety is supported. Specifically, the failure to procedures when performing EC 17270 should be been identified by the approver of the engineering change. (H.4(c))

<u>Enforcement</u>: Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.

Contrary to the above, between August 26, 2010 and December 21, 2010, the licensee failed to accomplish EC 17270, "Imperial Brass Model 118-HD-04 and Whitey Series 60 Valves," in accordance with Procedure FP-E-EQV-01, Revision 4, "Equivalency Evaluations and Changes." Specifically, Attachment 2 of FP-E-EQV-01, states "An Alternate Configuration Evaluation shall establish that the changes in the replacement item do not adversely change the design function, or method of performing the function of the item or host component." Contrary to this, EC 17270, failed to establish that the removal of the valve mounting did not adversely change the design function of maintaining the lube oil pressure boundary. Because this violation was of very low safety significance and it was entered into the licensee's CAP as CAP 1394672. this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy (NCV 05000282/2013004-04; Inappropriate Removal of Diesel Lube Oil Valve Mounting Causes Vibration and Fretting). Corrective actions for this issue included an evaluation of the material condition of the brass fitting and copper piping, which concluded they would still perform their function as a lube oil pressure boundary and sharing the lessons learned with engineering personnel. The licensee's planned long-term corrective actions included replacing the copper tubing lines and restoring the mounting of the valves.

## 1R20 <u>Outage Activities</u> (71111.20)

#### .1 <u>Refueling Outage Activities</u>

#### a. Inspection Scope

The inspectors reviewed the Outage Safety Plan (OSP) and contingency plans for the Unit 2 refueling outage (RFO) 2R28, which began on September 20, 2013, to confirm that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth. The inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below:

- licensee configuration management, including maintenance of defense-in-depth commensurate with the OSP for key safety functions and compliance with the applicable TS when taking equipment out of service;
- installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error;
- controls over the status and configuration of electrical systems to ensure that TS and OSP requirements were met, and controls over switchyard activities;
- monitoring of decay heat removal processes, systems, and components;
- reactor water inventory controls including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss;
- controls over activities that could affect reactivity;
- maintenance of secondary containment as required by TS;
- fuel handling activities; and
- licensee identification and resolution of problems related to RFO activities.

Documents reviewed are listed in the Attachment to this report.

The refueling outage inspection sample as defined in IP 71111.20-05 was not completed as the outage was ongoing at the conclusion of the inspection period.

b. <u>Findings</u>

No findings were identified.

#### 1R22 <u>Surveillance Testing</u> (71111.22)

- .1 Surveillance Testing
- a. Inspection Scope

The inspectors reviewed the test results for the following activities to determine whether risk-significant systems and equipment were capable of performing their intended safety function and to verify testing was conducted in accordance with applicable procedural and TS requirements:

• SP 1449 - Tracer Gas Test of Control Room (routine);

- SP 2370 Residual Heat Removal Heat Exchanger Outlet Control Valves Stroke Test (routine); and
- SP 1155B Unit 1 Component Cooling Water Quarterly Test (inservice test).

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

- did preconditioning occur;
- the effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- acceptance criteria were clearly stated, demonstrated operational readiness, and were 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 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 and one inservice testing sample as defined in IP 71111.22, Sections 02 and 05.

b. Findings

## 1EP2 Alert and Notification System Evaluation (71114.02)

#### .1 <u>Alert and Notification System Evaluation</u>

#### a. Inspection Scope

The inspectors held discussions with Emergency Preparedness (EP) staff regarding the operation, maintenance, and periodic testing of the primary and backup Alert and Notification System (ANS) in the plume pathway Emergency Planning Zone. The inspectors reviewed monthly trend reports and siren test failure records from August 2011 through June 2013. Information gathered during document reviews and interviews was used to determine whether the ANS equipment was maintained and tested in accordance with Emergency Plan Commitments and Procedures. The inspectors also observed a weekly test of the ANS system. Documents reviewed are listed in the Attachment to this report.

This ANS evaluation inspection constituted one sample as defined in IP 71114.02-06.

b. Findings

No findings were identified.

## 1EP3 <u>Emergency Response Organization Staffing and Augmentation System</u> (71114.03)

- .1 Emergency Response Organization Staffing and Augmentation System
  - a. Inspection Scope

The inspectors reviewed and discussed the Emergency Plan Commitments and Procedures for Emergency Response Organization (ERO) on-shift and augmentation staffing levels with plant EP staff. A sample of approximately 15 ERO training records was reviewed to evaluate ERO key and support positional training. The inspectors reviewed the ERO augmentation system and activation process, the primary and alternate methods of initiating ERO activation, unannounced off-hour augmentation tests from August 2011 through June 2013, and the provisions for maintaining the licensee's ERO roster.

The inspectors reviewed a sample of corrective actions related to the facility's ERO Staffing and Augmentation System Program and activities from August 2011 through June 2013 to determine whether corrective actions were completed in accordance with the CAP. Documents reviewed are listed in the Attachment to this report.

This ERO staffing and augmentation system inspection constituted one sample as defined in IP 71114.03-06.

b. Findings

## 1EP5 Maintenance of Emergency Preparedness (71114.05)

#### .1 <u>Maintenance of Emergency Preparedness</u>

#### a. Inspection Scope

The inspectors reviewed a sample of EP Program audits performed by the Nuclear Oversight Department to determine whether these independent assessments met the requirements of 10 CFR 50.54(t). The inspectors also reviewed critique reports and samples of CAP records associated with the 2012 Biennial Exercise, as well as various EP drills conducted, in order to determine whether the licensee fulfilled its drill commitments and to evaluate the licensee's efforts to identify, track, and resolve concerns identified during these activities. The inspectors reviewed a sample of EP items and corrective actions related to the facility's EP Program and activities initiated between August 2011 through June 2013 to determine whether corrective actions were completed in accordance with the CAP. Documents reviewed are listed in the Attachment to this report.

This correction of EP weaknesses and deficiencies inspection constituted one sample as defined in IP 71114.05-06.

b. Findings

No findings were identified.

## 2. RADITION SAFETY

## **Cornerstone: Occupational and Public Radiation Safety**

2RS2 Occupational As-Low-As-Reasonably-Achievable Planning and Controls (71124.02)

These inspection activities supplement those documented in NRC Inspection Report 05000282/2012002; 05000306/2012002; 05000282/2012005; and 05000306/2012005 and constitute one complete sample as defined in IP 71124.02-05.

#### .1 <u>Source Term Reduction and Control</u> (02.04)

a. Inspection Scope

The inspectors used licensee records to determine the historical trends and current status of significant tracked plant source terms known to contribute to elevated facility aggregate exposure. The inspectors assessed whether the licensee made allowances or developed contingency plans for expected changes in the source term as the result of changes in plant fuel performance issues or changes in plant primary chemistry.

b. <u>Findings</u>

#### 2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03)

This inspection constituted one complete sample as defined in IP 71124.03-05.

#### .1 <u>Inspection Planning</u> (02.01)

The inspectors reviewed the USAR to identify areas of the plant designed as potential airborne radiation areas and any associated ventilation systems or airborne monitoring instrumentation. Instrumentation review included continuous air monitors (continuous air monitors and particulate-iodine-noble-gas-type instruments) used to identify changing airborne radiological conditions, such that actions to prevent an overexposure may be taken. The review included an overview of the Respiratory Protection Program and a description of the types of devices used.

The inspectors reviewed USAR, TS, and emergency planning documents to identify location and quantity of respiratory protection devices stored for emergency use.

Inspectors reviewed the licensee's procedures for maintenance, inspection, and use of respiratory protection equipment including self-contained breathing apparatus (SCBA). Additionally, inspectors reviewed procedures for air quality maintenance and the reported PIs to identify any related to unintended dose resulting from intakes of radioactive materials.

## .2 Engineering Controls (02.02)

## a. Inspection Scope

The inspectors reviewed the licensee's use of permanent and temporary ventilation to determine whether the licensee used ventilation systems as part of its engineering controls (in lieu of respiratory protection devices) to control airborne radioactivity. The inspectors reviewed procedural guidance for use of installed plant systems, such as containment purge, spent fuel pool ventilation, and auxiliary building ventilation, and verified that the systems are used, to the extent practicable, during high-risk activities (e.g., using containment purge during cavity floodup).

The inspectors selected installed ventilation systems used to mitigate the potential for airborne radioactivity and reviewed the ventilation airflow capacity, flow path (including the alignment of the suction and discharges), and filter/charcoal unit efficiencies, as appropriate, were consistent with maintaining concentrations of airborne radioactivity in work areas below the concentrations of an airborne area to the extent practicable. The inspectors selected temporary ventilation system setups, high-efficiency particulate air (HEPA)/charcoal negative pressure units, down draft tables, tents, metal "Kelly buildings," and other enclosures used to support work in contaminated areas. The inspectors determined whether the use of these systems is consistent with licensee procedural guidance and as-low-as-reasonably-achievable (ALARA) concept.

The inspectors reviewed airborne monitoring protocols by selecting installed systems used to monitor and warn of changing airborne concentrations in the plant and determined whether the alarms and setpoints were sufficient to prompt licensee/worker action to ensure that doses were maintained within the limits of 10 CFR Part 20 and the

ALARA concept. The inspectors also determined whether the licensee had established trigger points (e.g., the Electric Power Research Institute's "Alpha Monitoring Guidelines for Operating Nuclear Power Stations") for evaluating levels of airborne beta-emitting (e.g., plutonium-241) and alpha-emitting radionuclides.

b. Findings

No findings were identified.

- .3 Use of Respiratory Protection Devices (02.03)
- a. Inspection Scope

For those situations where it is impractical to employ engineering controls to minimize airborne radioactivity, the inspectors determined whether the licensee provided respiratory protective devices such that occupational doses were ALARA. The inspectors selected work activities where respiratory protection devices were used to limit the intake of radioactive materials, and determined whether the licensee performed an evaluation concluding that further engineering controls were not practical and that the use of respirators was ALARA. The inspectors also determined whether the licensee had established means (such as routine bioassay) to determine if the level of protection (protection factor) provided by the respiratory protection devices during use was at least as good as that assumed in the licensee's work controls and dose assessment.

The inspectors determined whether respiratory protection devices used to limit the intake of radioactive materials were certified by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration (NIOSH/MSHA) or were approved by the NRC per 10 CFR 20.1703(b). The inspectors selected work activities where respiratory protection devices were used. The inspectors determined whether the devices were used consistent with their NIOSH/MSHA certification or any conditions of their NRC approval.

The inspectors reviewed records of air testing for supplied-air devices and SCBA bottles to determine whether the air used in these devices met or exceeded Grade D quality. The inspectors reviewed plant breathing air supply systems to determine whether they met the minimum pressure and airflow requirements for the devices in use.

The inspectors selected several individuals qualified to use respiratory protection devices, and determined whether they have been deemed fit to use the devices by a physician.

The inspectors selected several individuals assigned to wear a respiratory protection device and observed them donning, doffing, and functionally checking the device as appropriate. The inspectors determined through interviews with these individuals whether they knew how to safely use the device and how to properly respond to any device malfunction or unusual occurrence (loss of power, loss of air, etc.).

The inspectors chose multiple respiratory protection devices staged and ready for use in the plant or stocked for issuance for use to assess the physical condition of the device components (i.e., mask or hood, harnesses, air lines, regulators, air bottles, etc.) and reviewed records of routine inspections for each. The inspectors selected several of the

devices and reviewed records of maintenance on the vital components (e.g., pressure regulators, inhalation/exhalation valves, hose couplings). The inspectors reviewed the Respirator Vital Components Maintenance Program to ensure that the repairs of vital components were performed by the respirators' manufacturer.

b. Findings

No findings were identified.

#### .4 <u>Self-Contained Breathing Apparatus for Emergency Use</u> (02.04)

#### a. Inspection Scope

Based on the USAR, TSs, and emergency operating procedure requirements, the inspectors reviewed the status and surveillance records of SCBAs staged in-plant for use during emergencies. The inspectors reviewed the licensee's capability for refilling and transporting SCBA air bottles to and from the control room and operations support center during emergency conditions. The inspectors selected several individuals on control room shift crews and from designated departments currently assigned emergency duties (e.g., onsite search and rescue duties) to determine if control room operators and other emergency response and radiation protection personnel (assigned in-plant search and rescue duties or as required by emergency operating procedures or the emergency plan) were trained and qualified in the use of SCBAs (including personal bottle changeout). The inspectors determined whether personnel assigned to refill bottles were trained and qualified for that task.

The inspectors determined whether appropriate mask sizes and types were available for use (i.e., in-field mask size and type match what was used in fit-testing). The inspectors determined whether on-shift operators had no facial hair that would interfere with the sealing of the mask to the face and whether vision correction (e.g., glasses inserts or corrected lenses) was available as appropriate.

The inspectors reviewed the past two years of maintenance records for select SCBA units used to support operator activities during accident conditions and designated as "ready for service" to determine that any maintenance or repairs on any SCBA unit's vital components were performed by an individual, or individuals, certified by the manufacturer of the device to perform the work. The vital components typically are the pressure-demand air regulator and the low-pressure alarm. The inspectors reviewed the onsite maintenance procedures governing vital component work to determine any inconsistencies with the SCBA manufacturer's recommended practices. For those SCBAs designated as "ready for service," the inspectors determined whether the required, periodic air cylinder hydrostatic testing was documented and up to date, and the retest air cylinder markings required by the U.S. Department of Transportation were in place.

#### b. Findings

## .5 <u>Problem Identification and Resolution</u> (02.05)

#### a. Inspection Scope

The inspectors determined whether problems associated with the control and mitigation of in-plant airborne radioactivity were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee's CAP. The inspectors determined whether the corrective actions were appropriate for a selected sample of problems involving airborne radioactivity and were appropriately documented by the licensee.

b. Findings

No findings were identified.

## 2RS4 Occupational Dose Assessment (71124.04)

This inspection constituted one complete sample as defined in IP 71124.04-05.

- .1 <u>Inspection Planning</u> (02.01)
- a. Inspection Scope

The inspectors reviewed the results of Radiation Protection Program audits related to internal and external dosimetry (e.g., licensee's quality assurance (QA) audits, self-assessments, or other independent audits) to gain insights into overall licensee performance in the area of dose assessment and focus the inspection activities consistent with the principle of "smart sampling."

The inspectors reviewed the most recent National Voluntary Laboratory Accreditation Program (NVLAP) accreditation report on the vendor's most recent results to determine the status of the contractor's accreditation.

A review was conducted of the licensee's procedures associated with dosimetry operations, including issuance/use of external dosimetry (routine, multibadging, extremity, neutron, etc.), assessment of internal dose (operation of whole body counter, assignment of dose based on derived air concentration (DAC)-hours, urinalysis, etc.), and evaluation of and dose assessment for radiological incidents (distributed contamination, hot particles, loss of dosimetry, etc.).

The inspectors determined whether the licensee established procedural requirements for determining when external and internal dosimetry is required.

#### b. Findings

## .2 External Dosimetry (02.02)

#### a. Inspection Scope

The inspectors determined whether the licensee's personnel dosimeters that require processing are NVLAP accredited including that the approved irradiation test categories for each type of personnel dosimeter used was conducted and are consistent with the types and energies of the radiation present and the way the dosimeter is being used (e.g., to measure deep dose equivalent, shallow dose equivalent, or lens dose equivalent).

The inspectors evaluated the onsite storage of dosimeters before their issuance, during use, and before processing/reading. The inspectors also reviewed the guidance provided to rad-workers with respect to care and storage of dosimeters.

The inspectors determined whether non-NVLAP accredited passive dosimeters (e.g., direct ion storage sight read dosimeters) were used according to the licensee's procedures that provide for periodic calibration, application of calibration factors, usage, reading (dose assessment), and zeroing.

The inspectors assessed the use of active dosimeters (i.e., electronic personal dosimeters) to determine if the licensee uses a "correction factor" to address the response of the electronic dosimeter (ED) as compared to the TLD/OSL for situations when the ED must be used to assign dose and whether the correction factor is based on sound technical principles.

The inspectors reviewed dosimetry occurrence reports or CAP documents for adverse trends related to EDs, such as interference from electromagnetic frequency, dropping or bumping, failure to hear alarms, etc. The inspectors determined whether the licensee identified any trends and implemented appropriate corrective actions.

b. Findings

No findings were identified.

- .3 Internal Dosimetry (02.03)
- (1) Routine Bioassay (In Vivo)
- a. Inspection Scope

The inspectors reviewed procedures used to assess the dose from internally deposited nuclides using whole body counting equipment. The inspectors determined whether the procedures addressed methods for differentiating between internal and external contamination, the release of contaminated individuals, the route of intake and for the assignment of dose.

The inspectors reviewed the whole body count process to determine if the frequency of measurements was consistent with the biological half-life of the nuclides available for intake. The inspectors reviewed the licensee's evaluation for use of its portal radiation monitors as a passive monitoring system to determine if instrument minimum detectable

activities were adequate to determine the potential for internally deposited radionuclides sufficient to prompt additional investigation, as provided in 10 CFR 20.1502.

The inspectors selected several whole body counts and evaluated whether the counting system used had sufficient counting time/low background to ensure appropriate sensitivity for the potential radionuclides of interest. The inspectors reviewed the radionuclide library used for the count system to determine its appropriateness. The inspectors evaluated whether any anomalous count peaks/nuclides indicated in each output spectra received appropriate disposition. The inspector's reviewed the licensee's 10 CFR Part 61 data analyses to determine whether the nuclide libraries included appropriate gamma-emitting nuclides. The inspectors evaluated how the licensee accounts for hard-to-detect nuclides in the dose assessment.

## b. Findings

No findings were identified.

- (2) Special Bioassay (In-Vitro)
- a. Inspection Scope

There was no internal dose assessments obtained using in-vitro monitoring for the inspectors to review. The inspectors reviewed and assessed the adequacy of the licensee's program for in-vitro monitoring (i.e., urinalysis and fecal analysis) of radionuclides (tritium, fission products, and activation products), including collection and storage of samples.

The inspectors reviewed the vendor laboratory Quality Assurance Program and verified that the laboratory participated in an industry recognized cross-check program including whether out-of-tolerance results were resolved appropriately.

b. Findings

No findings were identified.

- (3) Internal Dose Assessment Airborne Monitoring
- a. Inspection Scope

The licensee had not performed dose assessments using airborne/derived air concentration monitoring since the last inspection.

b. Findings

## (4) Internal Dose Assessment – Whole Body Count Analyses

#### a. Inspection Scope

The inspectors reviewed several recent dose assessments performed by the licensee using the results of whole body count analyses. The inspectors determined whether affected personnel were properly monitored with calibrated equipment and that internal exposures were assessed consistent with the licensee's procedures.

b. Findings

No findings were identified.

- .4 <u>Special Dosimetric Situations</u> (02.04)
- (1) Declared Pregnant Workers
- a. Inspection Scope

The inspectors assessed whether the licensee informs workers, as appropriate, of the risks of radiation exposure to the embryo/fetus, the regulatory aspects of declaring a pregnancy, and the specific process to be used for (voluntarily) declaring a pregnancy.

The inspectors selected individuals who declared pregnancy during the current assessment period and evaluated whether the licensee's Radiological Monitoring Program (internal and external) for declared pregnant workers is technically adequate to assess the dose to the embryo/fetus. The inspectors reviewed exposure results and monitoring controls employed by the licensee and with respect to the requirements of 10 CFR Part 20.

b. Findings

No findings were identified.

- (2) <u>Dosimeter Placement and Assessment of Effective Dose Equivalent for External</u> <u>Exposures</u>
- a. Inspection Scope

The inspectors reviewed the licensee's methodology for monitoring external dose in non-uniform radiation fields or where large dose gradients exist. The inspectors evaluated the licensee's criteria for determining when alternate monitoring, such as use of multi-badging, was to be implemented.

The inspectors reviewed dose assessments performed using multi-badging to evaluate whether the assessment was performed consistently with the licensee's procedures and dosimetric standards.

b. Findings

## (3) Shallow Dose Equivalent

#### a. Inspection Scope

The inspectors reviewed shallow dose equivalent dose assessments for adequacy. The inspectors evaluated the licensee's method (e.g., VARSKIN or similar code) for calculating shallow dose equivalent from distributed skin contamination or discrete radioactive particles.

b. Findings

No findings were identified.

- (4) Neutron Dose Assessment
- a. Inspection Scope

The inspectors evaluated the licensee's Neutron Dosimetry Program, including dosimeter types and/or survey instrumentation.

The inspectors reviewed neutron exposure situations (e.g., independent spent fuel storage installation operations or at-power containment entries) and assessed whether (a) dosimetry and/or instrumentation was appropriate for the expected neutron spectra; (b) there was sufficient sensitivity for low dose and/or dose rate measurement; and (c) neutron dosimetry was properly calibrated. The inspectors also assessed whether interference by gamma radiation had been accounted for in the calibration and whether time and motion evaluations were representative of actual neutron exposure events, as applicable.

b. Findings

No findings were identified.

- (5) Assigning Dose of Record
- a. Inspection Scope

For the special dosimetric situations reviewed in this section, the inspectors assessed how the licensee assigns dose of record for total effective dose equivalent, shallow dose equivalent, and lens dose equivalent. This included an assessment of external and internal monitoring results, supplementary information on individual exposures (e.g., radiation incident investigation reports and skin contamination reports), and radiation surveys and/or air monitoring results when dosimetry was based on these techniques.

b. Findings

## .5 <u>Problem Identification and Resolution</u> (02.05)

#### a. Inspection Scope

The inspectors reviewed corrective actions documents, self-assessments and audit reports generated during the twelve month period that preceded the inspection. The inspectors determined whether problems associated with internal dose assessment were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the corrective action program.

b. Findings

No findings were identified.

- 2RS5 Radiation Monitoring Instrumentation (71124.05)
  - .1 Post-Accident Monitoring Instrumentation
  - a. Inspection Scope

The inspectors selected containment high-range monitors and reviewed the calibration documentation since the last inspection. The inspectors assessed whether an electronic calibration was completed for all range decades above 10 rem/hour and whether at least one decade at or below 10 rem/hour were calibrated using an appropriate radiation source. The calibration acceptance criteria were reasonable; accounting for the large measuring range and the intended purpose of the instruments. The inspectors selected effluent/process monitors that were relied on by the licensee in its emergency operating procedures as a basis for triggering emergency action levels and subsequent emergency classifications or to make protective action recommendations during an accident. The inspectors evaluated the calibration and availability of these instruments. The inspectors reviewed the licensee's capability to collect high-range, post-accident iodine effluent samples. As available, the inspectors observed electronic and radiation calibration of these instruments to assess conformity with the licensee's calibration and test protocols.

b. <u>Findings</u>

No findings were identified.

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

This inspection constituted one complete sample as defined in IP 71124.06-05.

- .1 Inspection Planning and Program Reviews (02.01)
- (1) Event Report and Effluent Report Reviews
- a. Inspection Scope

The inspectors reviewed the Radiological Effluent Release Reports issued since the last inspection to determine if the reports were submitted as required by the Offsite Dose

Calculation Manual (ODCM)/TSs. The inspectors reviewed anomalous results, unexpected trends, or abnormal releases identified by the licensee for further inspection to determine if they were evaluated, were entered in the CAP, and were adequately resolved.

The inspectors identified radioactive effluent monitor operability issues reported by the licensee as provided in effluent release reports, to review these issues during the onsite inspection, as warranted, given their relative significance and determine if the issues were entered into the corrective action program and adequately resolved.

b. Findings

No findings were identified.

- (2) Offsite Dose Calculation Manual and Final Safety Analysis Report Review
- a. Inspection Scope

The inspectors reviewed Final Safety Analysis Report (FSAR) descriptions of the radioactive effluent monitoring systems, treatment systems, and effluent flow paths so they could be evaluated during inspection walkdowns. The inspectors reviewed changes to the ODCM made by the licensee since the last inspection against the guidance in NUREG-1301, 1302, and 0133, and Regulatory Guides 1.109, 1.21, and 4.1. When differences were identified, the inspectors reviewed the technical basis or evaluations of the change during the onsite inspection to determine whether they were technically justified and maintain effluent releases ALARA.

The inspectors reviewed licensee documentation to determine if the licensee has identified any non-radioactive systems that have become contaminated as disclosed either through an event report or the ODCM since the last inspection. This review provided an intelligent sample list for the onsite inspection of any 10 CFR 50.59 evaluations and allowed a determination if any newly contaminated systems have an unmonitored effluent discharge path to the environment, whether any required ODCM revisions were made to incorporate these new pathways, and whether the associated effluents were reported in accordance with Regulatory Guide 1.21.

b. Findings

No findings were identified.

- (3) Groundwater Protection Initiative Program
- a. Inspection Scope

The inspectors reviewed reported groundwater monitoring results and changes to the licensee's written program for identifying and controlling contaminated spills/leaks to groundwater.

b. Findings

## (4) Procedures, Special Reports, and Other Documents

#### a. Inspection Scope

The inspectors reviewed Licensee Event Reports (LER), event reports and/or special reports related to the effluent program issued since the previous inspection to identify any additional focus areas for the inspection based on the scope/breadth of problems described in these reports. The review included effluent program implementing procedures, particularly those associated with effluent sampling, effluent monitor set-point determinations, and dose calculations. The inspectors reviewed copies of licensee and third party (independent) evaluation reports of the Effluent Monitoring Program since the last inspection to gather insights into the licensee's program and aid in selecting areas for inspection review (smart sampling).

#### b. Findings

No findings were identified.

#### .2 <u>Walkdowns and Observations</u> (02.02)

#### a. Inspection Scope

The inspectors walked down selected components of the gaseous and liquid discharge systems to evaluate whether equipment configuration and flow paths align with the documents reviewed in 02.01 above and to assess equipment material condition. Special attention was made to identify potential unmonitored release points (such as open roof vents in boiling water reactor turbine decks, temporary structures butted against turbine, auxiliary or containment buildings), building alterations which could impact airborne, or liquid effluent controls, and ventilation system leakage that communicates directly with the environment.

For equipment or areas associated with the systems selected for review, which were not readily accessible due to radiological conditions, the inspectors reviewed the licensee's material condition surveillance records as applicable.

The inspectors walked down filtered ventilation systems to assess for conditions such as degraded HEPA/charcoal banks, improper alignment, or system installation issues that would impact the performance or the effluent monitoring capability of the effluent system.

As available, the inspectors observed selected portions of the routine processing and discharge of radioactive gaseous effluent (including sample collection and analysis) to evaluate whether appropriate treatment equipment was used and the processing activities align with discharge permits.

The inspectors determined if the licensee has made significant changes to their effluent release points, (e.g., changes subject to a 10 CFR 50.59 review or require NRC approval of alternate discharge points).

As available, the inspectors observed selected portions of the routine processing and discharge liquid waste (including sample collection and analysis) to determine if appropriate effluent treatment equipment is being used and that radioactive liquid waste

is being processed and discharged in accordance with procedure requirements and aligns with discharge permits.

b. Findings

No findings were identified.

- .3 <u>Sampling and Analyses</u> (02.03)
- a. Inspection Scope

The inspectors selected effluent sampling activities, consistent with smart sampling, and assessed whether adequate controls have been implemented to ensure representative samples were obtained (e.g. provisions for sample line flushing, vessel recirculation, composite samplers, etc.).

The inspectors selected effluent discharges made with inoperable (declared out-of-service) effluent radiation monitors to assess whether controls were in place to ensure compensatory sampling was performed consistent with the radiological effluent Technical Specifications (RETS)/ODCM and that those controls were adequate to prevent the release of unmonitored liquid and gaseous effluents.

The inspectors determined whether the facility was routinely relying on the use of compensatory sampling in lieu of adequate system maintenance, based on the frequency of compensatory sampling since the last inspection.

The inspectors reviewed the results of the Inter-Laboratory Comparison Program to evaluate the quality of the radioactive effluent sample analyses and assessed whether the Inter-Laboratory Comparison Program includes hard-to-detect isotopes as appropriate.

b. Findings

No findings were identified.

- .4 <u>Instrumentation and Equipment</u> (02.04)
  - (3) Effluent Flow Measuring Instruments
  - a. Inspection Scope

The inspectors reviewed the methodology the licensee uses to determine the effluent stack and vent flow rates to determine if the flow rates were consistent with RETS/ODCM or USAR values, and that differences between assumed and actual stack and vent flow rates did not affect the results of the projected public doses.

b. Findings

## (2) Air Cleaning Systems

#### a. Inspection Scope

The inspectors assessed whether surveillance test results since the previous inspection for TS required ventilation effluent discharge systems (HEPA and charcoal filtration), such as the Standby Gas Treatment System and the Containment/Auxiliary Building Ventilation System, met TS acceptance criteria.

b. Findings

No findings were identified.

- .4 Dose Calculations (02.05)
- a. Inspection Scope

The inspectors reviewed all significant changes in reported dose values compared to the previous Radiological Effluent Release Report (e.g., a factor of 5, or increases that approach Appendix I criteria) to evaluate the factors which may have resulted in the change.

The inspectors reviewed radioactive liquid and gaseous waste discharge permits to assess whether the projected doses to members of the public were accurate and based on representative samples of the discharge path.

The inspectors evaluated the methods used to determine the isotopes that are included in the source term to ensure all applicable radionuclides are included within detectability standards. The review included the current Part 61 analyses to ensure hard-to-detect radionuclides are included in the source term.

The inspectors reviewed changes in the licensee's offsite dose calculations since the last inspection to evaluate whether changes were consistent with the ODCM and Regulatory Guide 1.109. Inspectors reviewed meteorological dispersion and deposition factors used in the ODCM and effluent dose calculations to evaluate whether appropriate factors were being used for public dose calculations.

The inspectors reviewed the latest Land Use Census to assess whether changes (e.g., significant increases or decreases to population in the plant environs, changes in critical exposure pathways, the location of nearest member of the public or critical receptor, etc.) have been factored into the dose calculations.

For the releases reviewed above, the inspectors evaluated whether the calculated doses (monthly, quarterly, and annual dose) are within the 10 CFR Part 50, Appendix I, and TS dose criteria.

The inspectors reviewed, as available, records of any abnormal gaseous or liquid tank discharges (e.g., discharges resulting from misaligned valves, valve leak-by, etc.) to ensure the abnormal discharge was monitored by the discharge point effluent monitor. Discharges made with inoperable effluent radiation monitors, or unmonitored leakages,

were reviewed to ensure that an evaluation was made of the discharge to satisfy 10 CFR 20.1501 so as to account for the source term and projected doses to the public.

b. Findings

No findings were identified.

## .5 <u>Groundwater Protection Initiative Implementation</u> (02.06)

#### a. Inspection Scope

The inspectors verified that the licensee is continuing to implement the Voluntary NEI/Industry Ground Water Protection Initiative (GPI) since the last inspection. The inspectors reviewed:

- monitoring results of the GPI to determine if the licensee has implemented its program as intended, and to identify any anomalous results; (Anomalous results or missed samples were reviewed to determine if the licensee has identified and addressed deficiencies through its corrective action program.);
- identified leakage or spill events and entries made into 10 CFR 50.75 (g) records to assess any remediation actions taken for effectiveness and onsite contamination events involving contamination of ground water to assess whether the source of the leak or spill was identified and mitigated; and
- unmonitored spills, leaks, or unexpected liquid or gaseous discharges, ensure that an evaluation was performed to determine the type and amount of radioactive material that was discharged, assess whether sufficient radiological surveys were performed to evaluate the extent of the contamination and the radiological source term and verify that a survey/evaluation had been performed to include consideration of hard-to-detect radionuclides.

The inspectors reviewed whether the licensee completed offsite notifications (State, local, and if appropriate, the NRC), as provided in its GPI implementing procedures.

The inspectors reviewed the evaluation of discharges from onsite surface water bodies (ponds, retention basins, lakes) that contain or potentially contain radioactivity, and the potential for ground water leakage from these onsite surface water bodies to determine if licensees are properly accounting for discharges from these surface water bodies as part of their effluent release reports.

The inspectors verified that on-site ground water sample results and a description of any significant on-site leaks/spills into ground water for each calendar year was documented in the Annual Radiological Environmental Operating Report (AREOR) for REMP or the Annual Radiological Effluent Release Report (ARERR) for the RETS. For significant, new effluent discharge points (such as significant or continuing leakage to ground water that continues to impact the environment if not remediated), the inspectors determined if the ODCM was updated to include the new release point.

## b. Findings

## .6 <u>Problem Identification and Resolution</u> (02.07)

#### a. Inspection Scope

Inspectors verified that problems associated with the Effluent Monitoring and Control Program were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee's CAP. In addition, they verified appropriateness of the corrective actions for a selected sample of problems documented by the licensee involving radiation monitoring and exposure controls.

b. Findings

No findings were identified.

## 4. OTHER ACTIVITIES

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

- 4OA1 Performance Indicator Verification (71151)
  - .1 Mitigating Systems Performance Index Residual Heat Removal System
  - a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index (MSPI) - Residual Heat Removal System performance indicator (PI) for Units 1 and 2 for the period from the third quarter of 2012 through the second quarter of 2013. To determine the accuracy of the 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, was used. The inspectors reviewed the licensee's operator narrative logs, corrective action documents, MSPI derivation reports, event reports and NRC Integrated 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 corrective action 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

## .2 <u>Mitigating Systems Performance Index - Cooling Water Systems</u>

#### a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Cooling Water Systems PI for the period from the third quarter of 2012 through the second quarter of 2013. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, was used. The inspectors reviewed the licensee's operator narrative logs, corrective action reports, MSPI derivation reports, event reports and NRC Integrated Inspection Reports for the period listed above 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.

- .3 Reactor Coolant System Specific Activity
- a. Inspection Scope

The inspectors sampled licensee submittals for the reactor coolant system (RCS) specific activity PI for Prairie Island Nuclear Generating Plant, Units 1 and 2, for the period from the second quarter 2012 through the second quarter 2013. The inspectors used PI definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revisions 6 and 7, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's reactor coolant system chemistry samples, TS requirements, issue reports, event reports and NRC Integrated Inspection Reports to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems were identified with the PI data collected or transmitted for this indicator. In addition to record reviews, the inspectors observed a chemistry technician obtain and analyze a RCS sample. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two RCS specific activity samples as defined in IP 71151-05.

b. Findings

## .4 Drill/Exercise Performance

#### a. Inspection Scope

The inspectors sampled licensee submittals for the Drill/Exercise (DEP) PI for the period from the second quarter 2012 through the first quarter 2013. 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 records and processes, including procedural guidance on assessing opportunities for the PI; assessments of PI opportunities during pre-designated control room simulator training sessions; performance during the 2012 Biennial Exercise; and performance during other drills associated with the PI to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems were 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 one DEP sample as defined in IP 71151-05.

b. Findings

No findings were identified.

- .5 <u>Emergency Response Organization Readiness</u>
- a. Inspection Scope

The inspectors sampled licensee submittals for the Emergency Response Organization Readiness (ERO) PI for the period from the second quarter 2012 through the first quarter 2013. 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 PI data reported during those periods. The inspectors reviewed the licensee's records and processes, including procedural guidance on assessing opportunities for the PI; performance during the 2012 Biennial Exercise and other drills and revisions of the roster of personnel assigned to key ERO positions, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems were 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 one ERO readiness sample as defined in IP 71151-05.

b. Findings

## .6 <u>Alert and Notification System Reliability</u>

#### a. Inspection Scope

The inspectors sampled licensee submittals for the Alert and Notification System Reliability (ANS) PI for the period from the second quarter 2012 through the first quarter 2013. 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 records and processes, including procedural guidance on assessing opportunities for the PI and results of periodic ANS operability tests, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine whether any problems were 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 one ANS reliability 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 second guarter 2012 through the second quarter 2013. The inspectors used PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revisions 6 and 7, 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

## .8 <u>Radiological Effluent Technical Specification/Offsite Dose Calculation Manual</u> <u>Radiological Effluent Occurrences</u>

a. Inspection Scope

The inspectors sampled licensee submittals for the RETS/ODCM radiological effluent occurrences PI for the period from the second quarter 2012 through the second quarter 2013. The inspectors used PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revisions 6 and 7, 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 to determine if 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.

4OA2 Identification and Resolution of Problems (71152)

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

- .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 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 follow-up, 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 Annual Sample: Review of Operator Workarounds
- a. Inspection Scope

The inspectors evaluated the licensee's implementation of their process used to identify, document, track, and resolve operational challenges. Inspection activities included, but were not limited to, a review of the cumulative effects of the operator workarounds (OWAs) on system availability and the potential for improper operation of the system, for potential impacts on multiple systems, and on the ability of operators to respond to plant transients or accidents.

The inspectors performed a review of the cumulative effects of OWAs. Documents listed in the Attachment to this report were reviewed to accomplish the objectives of the inspection procedure. The inspectors reviewed both current and historical operational challenge records to determine whether the licensee was identifying operator challenges at an appropriate threshold, had entered them into their CAP and proposed or implemented appropriate and timely corrective actions which addressed each issue. Reviews were conducted to determine if any operator challenge could increase the possibility of an Initiating Event, if the challenge was contrary to training, required a change from long-standing operational practices, or created the potential for inappropriate compensatory actions. Additionally, all temporary modifications were reviewed to identify any potential effect on the functionality of Mitigating Systems, impaired access to equipment, or required equipment uses for which the equipment was not designed. Daily plant and equipment status logs, degraded instrument logs, and operator aids or tools being used to compensate for material deficiencies were also assessed to identify any potential sources of unidentified operator workarounds.

This review constituted one operator workaround annual inspection sample as defined in IP 71152-05.

b. Findings

No findings were identified.

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

## .1 (Closed) Licensee Event Report 05000282/2012-002-01: Unit 1 Diesel Generators Inoperable due to Exhaust Fire

On July 25, 2013, the licensee submitted a supplement to Licensee Event Report (LER) 05000282/2012-002-00 to inform the NRC that the EDG exhaust fires which occurred in August 2012 would not have resulted in the inability of the EDGs to perform their safety function in an emergency. The inspectors reviewed the basis for the information provided in the supplemental LER as part of the inspection documented in NRC Integrated Inspection Report 05000282/2013002; 05000306/2013002. A finding of very low safety significance (Green) and a violation of NRC requirements was documented during the inspection. Documents reviewed are listed in the Attachment to this report. This LER is closed.

This event follow-up review constituted one sample as defined in IP 71153-05.

40A5 Other Activities

## .1 (Closed) Unresolved Item 05000282/2012007-03; 05000306/2012007-03: Lack of Design Basis Information for Steam Exclusion Dampers

During the 2012 Problem Identification and Resolution Inspection, the inspectors identified an unresolved item after reviewing multiple documents which stated that a design basis leakage specification for the installed steam exclusion dampers did not exist. The inspectors were concerned that surveillance procedures and active OPRs written to address the continued operability of safety-related equipment may not have been adequate since the procedure and OPRs were based upon USAR information which specified a damper leakage rate of 50 cubic feet per minute (cfm) at a pressure of 0.5 pounds per square inch (psi).

The licensee reviewed historical documents and agreed that the design basis leakage rate for the steam exclusion dampers was 50 cfm at 0.5 psi. The USAR was revised to clearly specify this design basis leakage rate as directed by CAP 1394987. No findings or violations were identified since the leakage rate provided in the USAR matched the assumptions used in the development of the surveillance procedures and the OPRs. This item is closed.

## .2 (Closed) Unresolved Item 05000282/2012002-02; 05000306/2012002-02: Review of Steam Exclusion Damper Maintenance

As part of NRC Integrated Inspection Report 05000282/2012002; 05000306/2012002, the inspectors documented a concern regarding whether the repeated failures of auxiliary building steam exclusion dampers CD-34187 and CD-34188 were caused by inadequate work practices within the maintenance department. In addition, the inspectors were also concerned that the licensee may not have identified potential common mode failure issues that may be contributing to the repetitive damper failures. The inspectors reviewed the licensee's maintenance work history, including maintenance work practices, and determined that the damper issues were likely occurring due to age related degradation and a lack of damper preventative maintenance. The inspectors also reviewed the results of numerous monthly damper tests and found no other similar issues were the same dampers had failed repeatedly. As a result, no findings or violations were identified. At the conclusion of the inspection period, the licensee was installing new, more robust, dampers in the ductwork housing CD-34187 and CD-34188. This item is closed.

.3 <u>Correction to Input for Temporary Instructions -2515/182 - Review of the Industry</u> <u>Initiative to Control Degradation of Underground Piping and Tanks</u>

The Temporary Instructions (TI)-2515/182 inspection completion, documented in Prairie Island Inspection Report 2013002 (ML13134A360), contained a link to the specific questions the inspection focused on. The link provided in the report was incorrect; the following is the correct link:

http://www.nrc.gov/reactors/operating/ops-experience/buried-pipe-ti-phase-2-insp-req-2011-11-16.pdf

- .4 Unit 2 Steam Generator Replacement Project (50001)
- a. Inspection Scope

The inspectors conducted Steam Generator planning inspections by performing selective inspections, consistent with the safety significance and inspection resources, of the following areas:

Review Radiation Protection Program controls, planning, and preparation in the following areas utilizing applicable portions of the baseline inspection procedures 71124.02, 71124.03, 71124.04, and 71124.06 as guidance. Specifically, the inspectors reviewed:

- ALARA planning;
- Dose estimates and dose tracking;
- Exposure controls including temporary shielding;
- Contamination controls;
- Radioactive material management;
- Radiological work plans and controls;
- Emergency contingencies;
- Project staffing; and
- Airborne radioactivity effluent controls.

#### b. Findings

No findings were identified.

#### 4OA6 Management Meetings

## .1 Exit Meeting Summary

On October 10, 2013, the inspectors presented the inspection results to Mr. J. Lynch and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

#### .2 Interim Exit Meetings

Interim exits were conducted for:

- The results of the EP Program inspection were discussed with Mr. J. Lynch on August 2, 2013.
- The inspection results from the biennial licensed operator requalification program area assessment with J. Lynch, Site Vice President, on September 13, 2013.
- The inspection results for the areas of occupational ALARA planning and controls; in-plant airborne radioactivity control and mitigation; occupational dose assessment; radioactive gaseous and liquid effluent treatment; and RCS specific activity, occupational exposure control effectiveness, and RETS/ODCM radiological effluent occurrences performance indicator verification with Mr. K. Davison, Director of Site Operations, on September 20, 2013.

The inspectors confirmed that none of the potential report input discussed was considered to be proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## SUPPLEMENTAL INFORMATION

## **KEY POINTS OF CONTACT**

#### <u>Licensee</u>

- J. Lynch, Site Vice President
- K. Davison, Director Site Operations
- J. Hallenbeck, Site Engineering Director
- S. Sharp, Plant Manager
- T. Allen, Assistant Plant Manager
- J. Anderson, Regulatory Affairs Manager
- E. Baker, Plant Chemist
- J. Boesch, Maintenance Manager
- T. Borgen, Training Manager
- B. Boyer, Radiation Protection Manager
- H. Butterworth, Nuclear Oversight Manager
- F. Calia, Business Support Manager
- D. Dancer, Supply Chain Manager
- K. DeFusco, Emergency Preparedness Manager
- D. Gauger, Chemistry/Environmental Manager
- J. Hamilton, Security Manager
- S. Lappegaard, Production Planning Manager
- J. Loesch, Procedures Manager
- B. Meek, Safety and Human Performance Manager
- J. Ruttar, Operations Manager
- P. Wildenborg, Radiation Protection Manager

## Nuclear Regulatory Commission

- K. Riemer, Chief, Reactor Projects Branch 2
- T. Wengert, Project Mananger, Office of Nuclear Reactor Regulation

# LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

# <u>Opened</u>

05000282/2013004-01; 05000306/2013004-01	NCV	Improper Work Instructions Rendered 2R-49 Inoperable (Section 1R12)
05000282/2013004-02; 05000306/2013004-02	NCV	Improper Work Instructions Rendered Reactor Protection Instrument AC Inverter 13 Inoperable (Section 1R12)
05000306/2013004-03	NCV	Failure to Properly Assess D6 EDG Operability (Section 1R15)
05000282/2013004-04	NCV	Inappropriate Removal of Diesel Lube Oil Valve Mounting Causes Vibration and Fretting (Section 1R19)
<u>Closed</u>		
05000282/2013004-01; 05000306/2013004-01	NCV	Improper Work Instructions Rendered 2R-49 Inoperable (Section 1R12)
05000282/2013004-02; 05000306/2013004-02	NCV	Improper Work Instructions Rendered Reactor Protection Instrument AC Inverter 13 Inoperable (Section 1R12)
05000306/2013004-03	NCV	Failure to Properly Assess D6 EDG Operability (Section 1R15)
05000282/2013004-04	NCV	Inappropriate Removal of Diesel Lube Oil Valve Mounting Causes Vibration and Fretting (Section 1R19)
05000282/2012-002-01	LER	Unit 1 Diesel Generators Inoperable due to Exhaust Fire
05000282/2012007-03; 05000306/2012007-03	URI	Lack of Design Basis Information for Steam Exclusion Dampers
05000282/2012002-02; 05000306/2012002-02	URI	Review of Steam Exclusion Damper Maintenance
<u>Discussed</u>		
2515/182	ТІ	Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks

## 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.

## 1R04 Equipment Alignment

- 1E-0; Reactor Trip or Safety Injection; Revision 31
- 2C14; Component Cooling System Unit 2; Revision 36
- 2C20.8; Instrument AC Distribution System; Revision 20
- 2M-IP-27; INV 27 Inverter Isolation and Restoration; Revision 0
- C1.1.18-1; SI, CS, CA & HC System Checklist Unit 1; Revision 53
- C1.1.18-2; SI, CS, CA & HC System Checklist Unit 2; Revision 47
- C11; Radiation Monitoring System; Revision 52
- Drawing NF-39237; Containment Internal Spray System Units 1 and 2; Revision 79
- Drawing NF-39252; Caustic Addition System Units 1 and 2; Revision 81
- Drawing XH-1-44; Safety Injection System Unit 1; Revision 77
- NF 39245; Component Cooling System, Unit 1; Revision 80
- NF 39246; Component Cooling System, Unit 2; Revision 80
- NF-40285-1; External Wiring Diagram, Radiation Monitoring System; Revision 77
- Prairie Island Updated Safety Analysis Report (USAR); 10.4.2 Component Cooling Water; Revision 32
- USAR Section 6.2; Safety Injection System; Revision 32
- USAR Section 6.4; Containment Vessel Internal Spray System; Revision 32
- XH-2561-14; Instrument Inverters; Revision 4

## 1R05 Fire Protection

- 10 CFR 50.72 Report; Potential Unanalyzed Condition- Carbon Dioxide Fire Suppression System Does Not Meet Design Requirements; June 17, 2013
- 5AWI 3.13.2, Fire Prevention, Revision 22
- 5AWI 8.5.0, Housekeeping and Material Condition, Revision 11
- Calculation ENG-ME-804; Carbon Dioxide Concentration in the Relay and Cable Spreading Room; Revision 0
- Calculation ENG-ME-804; CO2 Concentration in the Relay and Cable Spreading Room; July 5, 2013
- CAP 01386878; Cardox System Does Not Meet Design/Licensing Requirements; June 17; 2013
- CAP 1386878; Cardox System Does Not Meet Design/Licensing Requirements; June 17, 2013
- CE 01386878-09; Past Functionality Assessment of Cardox Fire Suppression System; July 10, 2013
- Condition Evaluation 1386878-09; Past Functionality Assessment of Cardox Fire Suppression System; Revision 0
- F5, Appendix A, Fire Protection Zones, Revision 28
- F5, Appendix F, Fire Hazard Analysis, Revision 28
- Fire Protection Engineering Evaluation FPEE 13-004; Alternate Compensatory Measures for Relay Room Carbon Dioxide Suppression System; Revision 0

- FPEE 13-004; Alternate Compensatory Measure for Relay Room Carbon Dioxide Suppression System, Revision 0
- H62, Site Doors, Revision 3
- Procedure F5 Appendix A; Fire Zone Plans and Maps; Revision 29
- Procedure F5 Appendix K; Fire Protection Systems Functional Requirements; Revision 17

#### 1R11 Licensed Operator Requalification

- 2013 Annual Operating Test; 1 Dynamic Simulator Scenario; Week 2
- 2013 Annual Operating Test; 1 Dynamic Simulator Scenario; Week 3
- 2013 Annual Operating Test; 1 Dynamic Simulator Scenario; Week 4
- 2013 Annual Operating Test; 1 Dynamic Simulator Scenario; Week 5
- 2013 Annual Operating Test; 2 Dynamic Simulator Scenarios; Week 6
- 2013 Annual Operating Test; 4 JPMs, Staff Week
- 2013 Annual Operating Test; 6 JPMs, Week 6
- Apparent Cause Evaluation for AR01307004; October 20, 2011
- CAP 1307004; Red Path on RCS Decay Heat Removal; October 5, 2011
- CAP 1313389; 2011 LOR Exam Issue PINGP 577 Issue; November 16, 2011
- CAP 1322144; Unplanned Reactivity Event; January 25, 2012
- CAP 1334933; Stop Work Issued Due to Entry Into Orange SSA Path; April 23, 2012
- CAP 1341930; 121 CVCS Monitor Tank Overflowed During Processing; June 15, 2012
- CAP 1355481; Potential Exam Security Concern; October 17, 2012
- CAP 1356861; Effectiveness Measures Did Not Meet Established Goal; October 29, 2012
- CAP 1371053; Adverse Trend in DEP Failures; February 20, 2013
- CAP 1388227; SAR Did Not Assess NRC Inspection Procedure Item; June 27, 2013
- CAP 1393529; Shift Supervisor Stood Duty With Respirator Qualification Expired; October 14, 2013
- CAP 1395432; One SRO Will Not Complete NRC Biennial Exam; September 3, 2013
- CRC [Curriculum Review Committee] LOR Minutes; April 12, 2013
- CRC [Curriculum Review Committee] LOR Minutes; February 19, 2013
- CRC [Curriculum Review Committee] LOR Minutes; July 25, 2013
- FL-LOR-TPD; Fleet Licensed Operator Requalification (Training Program Description); Revision 8
- FP-OP-COO-01; Conduct of Operations; Revision 12
- FP-OP-COO-02: Operations Crew 4.0 Critique; Revision 1
- FP-OP-COO-11; Alarm Response; Revision 0
- FP-OP-COO-13; Command and Control; Revision 0
- FP-OP-COO-15; Conservative Decision Making; Revision 0
- FP-OP-COO-16; Control Room Conduct; Revision 0
- FP-OP-COO-17; Conduct of Operation: Equipment Manipulations and Status Control; Revision 2
- FP-OP-COO-21; Reactivity Control; Revision 0
- FP-OP-COO-24; Training; Revision 1
- FP-OP-COO-26; Watch Standing Practices; Revision 0
- FP-OP-RM-01; Reactivity Management Program; Revision 9
- FP-T-SAT-71; NRC Exam Security Requirements; Revision 8
- FP-T-SAT-73; Licensed Operator Requalification Program Examinations; Revision 9
- FP-T-SAT-74; NRC Operator License Application and Renewal Requirements; Revision 10
- FP-T-SAT-80; Simulator Configuration Management; Revision 6
- FP-T-SAT-81; Simulator Testing and Documentation; Revision 7

- Lesson Plan PI-LDP-CNT-010L; SOER 10-2 Engaged Thinking Organization OE Review; Revision 0
- Operations Crew 4.0 Critique of CAP 1322144
- PITC-3.16; Prairie Island License Requalification Training; Revision 3
- SAR 1365875; PINGP NRC IP-71111.11B Self-Assessment; April 15 19, 2013
- SWI O-10; Operations Manual Usage; Revision 51
- SWI O-200.4; EP Classification Expectations; Revision 0
- SWI O-35; Emergency Operating Procedure Verification, Validation and Maintenance; Revision 15
- SWI O-43; Operator Qualification Program; Revision 13
- Transient Test T-02; Simultaneous Trip of Both Main Feed Pumps; June 30, 2012
- Transient Test T-06; Main Turbine Trip from Maximum Power Without Scram; October 14, 2012

## 1R13 Maintenance Risk Assessment and Emergent Work

- Alarm Response Procedure C47507-0401; Generator or Exciter Cold Gas or Hot Gas High Temperature; Revision 36
- C22.6; 1[2] Generator and Generator Transformer; Revision 30
- CAP 1385522; Generator Fiber Optic Vibration High on Channels 7 and 8; June 5, 2013
- Figure C1-1A; Generator Stator Coil Discharge Gas Differential Temperature Limit; Revision 2
- Generator Condition Monitor Evolution and Capability; June 2007
- Item No. 208D6514; Wood Group Turbine Control Services; Revision D
- Operating Information 13-41; Information Regarding High Vibration on the Unit 2 Generator Stator Winding End Turns; July 23, 2013
- Probabilistic Risk Assessment with AMSAC unavailable; September 13, 2013
- Risk Assessment for Work Week 1333; August 23, 2013
- Daily Log; August 19, 2013, from 0100 to 2359
- H24.1, Appendix A; Phase 1 Risk Assessment Preparation; Revision 6
- Risk Assessment for Proposed Work for Week of 1333, Units 1 and 2; August 9, 2013
- SP 1780; AMSAC Quarterly Functional Test; Revision 14
- TCR 016A; H24.1, Assessment and Management of Risk Associated with Maintenance Activities, Revision 16; July 25, 2013
- TCR 016B; H24.1, Assessment and Management of Risk Associated with Maintenance Activities, Revision 16; August 15, 2013

## 1R15 Operability Evaluations

- Alarm Response Procedure C47012-0503; 1/2 RTD Bypass Line Flows Low; Revision 44
- CAP 1298576; 1FC-458 Found OOT During SP 1042; August 9, 2011
- CAP 1318156; SP 1449 Tracer Gas CR Test RCE 1297439 review; December 21, 2011
- CAP 1363570; D6 Engine 1 Fan 2 Stopped during SP 23505; December 17, 2012
- CAP 1364450; Adjust Bistable That Was Found Out of Tolerance; December 25, 2012
- CAP 1371613; D2 Diesel Generator RPM Indication Cycling during SP 1305; February 25, 2013
- CAP 1376141; High RPM/Frequency on D2 during SP 1307; March 25, 2013
- CAP 1389231; Potential pas preconditioning, SP 1449 Air in leakage test; July 8, 2013
- CAP 1391029; TE 15695 for Bus 111/121 Steam Exclusion failed low; July 23, 2013
- CAP 1391118; Question on TLCO 3.3.2.B for SE temp detector reading low; July 23, 2013
- CAP 1392548; Unacceptable preconditioning used to meet TS 5.5.16; August 6, 2013

- CAP 1392583; Perform a Review for Non-conforming Condition in CAP 1363570; August 6, 2013
- CAP 1392805; SP 1042/RTD Bypass Flowmeter Functional for CH 458 was OOT; August 7, 2013
- CAP 1393687; Control Room Habitability Program may not Meet Intent of Technical Specification Bases 3.7.10.B.2; August 16, 2013
- CAP 1394184; NRC Question Regarding OPR 1392583 D6 Fan MOLRs; August 21, 2013
- CAP 547945; Control Room Envelope Vulnerabilities to Unfiltered Inleakage; November 10, 2003
- CAP Evaluation Downgrade Request for CAP 01363570-07 and 01363570-05; D6 Eng 1 Fan 2 Stopped During SP 2305; December 22, 2012
- DBD SUS-38A; Design Bases Document for the Emergency Diesel Generator System; Revision 3
- Engineering Change Evaluation 22555; Verify Adequacy of Mitigating Actions Performed in Order to Meet the Requirements of Tech Spec 3.7.10 Action Statement B.2
- Engineering Evaluation EC 22684; Verification of Mitigating Actions for T.S. 3.7.10 Condition B.2 to Ensure CRE Occupants are Protected From Chemical and Smoke Hazards
- Engineering Evaluation EC 22714; Verification of Mitigating Actions for T.S. 3.7.10 Condition B.2 to Ensure CRE Occupant Radiological Exposures will Not Exceed Limits
- ENG-ME-374; Tracer Gas Inleakage Testing of the Control Room Envelope; Revision 0
- ENG-ME-429; Calculation for Breathing Air Required fo Control Room Toxic Gas Habitability Project; Revision 0
- Equipment Cause Evaluation for CAP 01363570; During Performance of SP 2305 D6 DG Monthly Slow Start Test, D6 Engine 1 Fan 2 stopped; February 14, 2013
- FP-OP-COO-15; Conservative Decision Making; Revision 0
- FP-OP-OL-01; Operability/Functionality Determination; Revision 11
- FP-OP-OL-01; Operability/Functionality Determination; Revision 12
- H28; Control Room Habitability Program; Revision 8
- H28; Control Room Habitability Program; Revision 9
- Human Performance Event Evaluation 1376141-03; March 2013
- Maintenance Rule Evaluation 1376141-01; April 3, 2013
- MSPI Causal Evaluation 1376141-01; April 3, 2013
- NF 39248; Flow Diagram Unit 1 and 2 Aux and Reactor Building Floor and Equipment Drain Systems; Revision 82
- NF 39603-1; Administration Building, Screen House and Control Room Flow Diagram; Revision 78
- NRC Question No. 20130724-01; Submit Copies of OP Evals from December 2012 Through current on D6 Radiator Fan; Completed August 26, 2013
- OPR 01 for CAP 1392583; D5 and D6 Radiator Fans Experienced Three Trips Associated With Winter Operation; August 12, 2013
- Past Operability Evaluation 1392583-03; no date provided
- PINGP 97; Unit 1 Control Room Logs; various dates
- Prairie Island Nuclear Generating Plant Design Basis Document STR-02; Pages 61, 70-74, 88; Revision 5
- Prairie Island Technical Specification Bases; 3.7.10 Control Room special Ventilation System; Amendment 205 (Unit 1) 205 (Unit 2)
- Prairie Island Technical Specification; 3.7.10 Control Room special Ventilation System; Amendment 195 (Unit 1) 184 (Unit 2)
- Prairie Island Updated Safety Analysis Report (USAR); 10.3.3 Control Room Ventilation System; Revision 32

- Product Manual 03040; Installation and Operation Manual for Woodward UG Dial Governor; Revision E
- SP 1042; RTD Bypass Flowmeter Functional Test; Revision 25
- SP 1290; Steam Exclusion System Instrument Check Weekly; Revision 21
- SP 1307; D2 Diesel Generator 6 Month Fast Start Test; Revision 41
- SP 1449; Tracer Gas Test of Control Room; Revision 0
- SP 1449; Tracer Gas Test of Control Room; Revision 1
- WO 433718-01; PM 3001-2-D2 Diesel Generator 24 Month Inspection; August 31, 2012
- WO 440207-01; Perform SP 1302 D2 Diesel Generator 6 Month Fast Start; September 22, 2012
- WO 452261-01; Perform SP 1305 D2 Diesel Generator Monthly Slow Start; February 22, 2013
- WO 474479-04; 11-14 Elec: Megger D2 Tech Generator and Power Cables; February 27, 2013
- WO 474479-11; D2 Diesel Generator RPM Indication Cycling Bench Test Replacement Tach Generator; February 27, 2013

## 1R18 Modifications

- 10 CFR 50.59 Screening 4315; Review EC 21916; July 30, 2013
- EC 21916; Replace CD-34187 and CD-34188; July 30, 2013
- EC 22746; Install Blank Flanges on ductwork in place of Control Damper CD-34177, 122 CONT RM 0A Roof ISOL CD
- NF 39603-01; Admin Building, Screenhouse, and Control Room Flow Diagram; Revision 78
- NF 39609-22; Auxiliary Building HVAC Mechanical Equipment Room; Revision 76
- NF-39600; Flow Diagram Aux Building HVAC Unit 1 and 2; Revision 81
- WO 464014-01; Install New Damper Assemblies; July 31, 2013

## 1R19 Post Maintenance Testing

- CAP 1130614; D6 EDG Injection Pump Supply Lines Are Rubbing On Covers; March 10, 2008
- CAP 1394672; Missing Restraints for Root Isolation Valves 1DG-54 and 2DG-54; August 26, 2013
- CAP 1394672; Missing Restraints For Root Isolation valves 1DG-54 and 2DG-54
- EC 17270; Imperial Brass Model 118-HD-04 and Whitey Series 60 Valves; Revisions 0 and 1; Closed March 20, 2013
- FP-E-EQV-01; Equivalency Evaluations and Changes; Revision 9
- FP-NO-QC-02; Inspection Planning; Revision 8
- ML071760544; NRC IN 2007-27; Recurring Events Involving Emergency Diesel Generator Operability; August 6, 2007
- ML8901180357; NRC IN 89-07; Failures of Small-Diameter Tubing in Control Air, Fuel Oil, and Lube Oil Systems Which Render Emergency Diesel Generators Inoperable; January 25, 1989
- NEI 99-02; Mitigating System Performance Index; Revision 6
- NRC Question No. 09182013-01; Supply Signed Review Sheet for SP 1305 from Revision 46 to 47; Completed September 19, 2013
- NRC Question No. 09182013-02; Based on Review of EC17270, What Conclusions Were Made as to Why a Mechanical Engineering Analysis Was Not Performed; Completed September 20, 2013
- NSPM-1 QATR; Quality Assurance Topical Report; Revision 6, August 16, 2012
- Reactor Operations, Chapter 7
- SP 1095; Bus 16 Load Sequencer Test; Revision 34
- SP 1305; D2 Diesel Generator Monthly Slow Start Test; Revision 47

- Station Log; September 12 to 16, 2013
- USAR Section 8; Plant Electrical Systems; Revision 33P
- WO 443440; Replace Power Supplies on D2 Due to SS Noise
- WO 450362; B16/LD Seq Cab, Perform PLC Maintenance
- WO Package 00440258; PMRQ 7153-01: D2 Diesel Gen (034-021) 6-Mnth Inspection; October 31, 2012
- WO 471688; SP 1305 D2 Diesel Generator Monthly Slow Start; August 26, 2013
- WO 476666; PMRQ 7153-01: D2 Diesel Gen (034-021) 6-Mnth Inspection; August 26, 2013

## 1R20 Refueling and Outage

- 2C1.3-M2; Unit 2 Shutdown to Mode 2; Revision 1
- 2C1.3-M3; Unit 2 Shutdown to Mode 3; Revision 1
- 2C1.4; Unit 2 Power Operation; Revision 51
- Unit 2 Refueling Outage September 2013 Shutdown Safety Assessment; August 13, 2013

## 1R22 Surveillance Test

- H28; Control Room Habitability Program; Revision 9
- NUCON International, Inc. Calibration Certificate; August 9, 2013
- NUCON Procedure 12-356; Envelope Inleakage Testing Using The Concentration Decay Test Method; Revision 1
- SP 1073A; Monthly Train A Shield Building Ventilation System Test; Revision 9
- SP 1155B; Component Cooling Water System Quarterly Test Train B; Revision 26
- SP 1449; Tracer Gas Test of Control Room; Revision 1
- ST 1449; Tracer Gas Test of Control Room No Loop Seal; Revision 0TMOD

## 1EP2 Alert and Notification System Evaluation

- CAP 1373077; Siren P-6 Failure
- CAP 1376477; Siren P-6 Failure
- CAP 1381395; 34 Sirens Lost AC Power During Snowstorm
- CAP 1388877; Siren R-6 Failure
- Federal Emergency Management Agency PINGP Plant Public ANS Upgrade Approval Letter; April 10, 2003
- Federal Emergency Management Agency Public ANS Approval Letter; October 1, 1985
- Selected Documentation of ANS Repair and Annual Preventative Maintenance;
- SP 1397; Emergency Plan Fixed Siren Test; Revision 21
- SWI EP-600; Public Alert and Notification System (PANS) Program, Revision 11

## 1EP3 Emergency Response Organization Staffing and Augmentation System

- CAP 1219975; Insufficient Action Taken to Correct ERO Augmentation Times
- CAP 1319857; 3 members of Team A Late to Respond
- CAP 1388435; LMS and ERO Track Discrepancies
- Emergency Response Organization Off-hours, Unannounced, Augmentation Response Test Records; August 2011 – June 2013
- F3-1.1; On Shift Staffing Analysis; Revision 0
- F3-1; Onsite Emergency Organization; Revision 26
- F3-5; Emergency Notifications; Revision 30
- F3-6; Activation and Operation of Technical Support Center; Revision 25

- F3-7; Activation and Operation of Operational Support Center; Revision 23
- F8-3; Activation and Operation of the EOF; Revision 12
- P7400; Emergency Plan Training Program; Revision 24
- PINGP 1385; ERO Activation for Security Event; Revision 16

#### <u>1EP5</u> Maintenance of Emergency Preparedness

- 10 CFR 50.54(q) Screening PI-2012-119; Impact of Temporary Trailer in Warehouse
- 10 CFR 50.54(q) Screening PI-2012-121; Impact of Security Access Change to ERO Response
- 10 CFR 50.54(q) Screening PI-2013-12; Addition of Satellite Phones to ERFs
- Action Request 1369534; NRC Inspection Pre-Assessment Results
- ALERT Event Summary of January 5, 2012
- Biennial Exercise Report; July 10, 2012
- CAP 1344351; KI Distribution Problems
- CAP 1344373; DEP Notification Failure
- CAP 1381399; MET Tower Vulnerabilities
- CAP 1388320; Foreign Material Found in TSC Diesel
- CAP 1389173; TSC HVAC Found Not Running
- Emergency Plan Drill Critique Report; March 5, 2013
- Emergency Plan Tabletop Drill; January 22, 2013
- FP-EP-EQP-01; Equipment Important to Emergency Response; Revision 2
- FP-R-EP-02; 10 CFR 50.54(Q) Review Process; Revision 8
- Full-Scale Drill Critique Report; May 14, 2013
- Medical Drill Report; September 5, 2012
- NOS Observation Report 2012-01-021; Emergency Planning Annual Assessment
- NOS Observation Report 2012-01-024; Emergency Preparedness-State and Local Interface
- NOS Observation Report 2013-01-003; Emergency Preparedness Annual Assessment
- NOS Observation Report 2013-01-004; Emergency Preparedness-State and Local Interface;
- NOUE Event Summary of March 6, 2012
- NOUE Event Summary of October 31, 2012
- PINGP Emergency Plan; Revision 48
- 2RS2 Occupational ALARA Planning and Controls
- 1R28 Radiation Protection Outage; dated January 25, 2013
- 2R28 Radiation Protection Department Outage Manual; dated September 12, 2013
- CY-PLNT-004; Peroxide Addition to the Cavity; Revision 00
- Prairie Island Nuclear Generating Station 2013-2017 Dose Excellence Plan; Revision 00

## 2RS3 In-Plant Airborne Radioactivity Control and Mitigation

- 1C19.2 Containment System Ventilation Unit 1; Revision 25
- 2C19.2 Containment System Ventilation Unit 2; Revision 2
- 5AWI 10.1.2; Respirator Qualification Program; Revision 05
- AR 01393501; Snap Shot Self-Assessment; In-Plant Radioactivity Control and Mitigation, Occupational Dose Assessment; dated August 8, 2013
- C40.5; Control Room Breathing Air System; Revision 02
- H 26; Respiratory Protection Program; Revision 09
- ENG-ME-429; Calculation for Breathing Air Required for Control Room Toxic Gas Habitability Project; dated March 8, 2000

- NOS Observation Report 2013-01-013; Radiological Protection; Respiratory Protection; dated February 2013
- PING 1027; Breathing Air System Air Quality Tests; Selected Records; various dates 2012 and 2013
- PING 1028; PSI Visual Cylinder Inspection Evaluations; Selected Records; various dates 2012 and 2013
- PING 1037; Quarterly Update of Emergency Response Organization; Revision 30
- Respiratory Protection Equipment Maintenance Records; Selected Records; various dates 2012 and 2013
- Respiratory Protection Equipment NIOSH Certifications; Selected Records; various dates 2013
- Respiratory Protection Qualification Records; Selected Records; various dates 2013
- RPIP-1204; Evaluation of Airborne Radioactivity; Revision 18
- RPIP 1210; Charging SCBA Air Cylinders; Revision 13
- RPIP-1214; Respiratory Protection Equipment Testing; Revision 18
- RPIP-1215; Respiratory Equipment Control; Revision 07
- RPIP-1219; Respirator Use; Revision 19
- RPIP-1226; Control Room Breathing Air System Testing; Revision 04
- RPIP-2016; Max Air 2000-800 Respiratory Protection; Revision 00
- NSPM Calculation 12400604-UR(B)-004; Dose Consequences at the Site Boundary, Control Room, and Technical Support Center Following a Loss of Coolant; dated September 16, 2009
- Scott PosiChek3 Test Results; Selected Records; various dates 2012 and 2013
- SWI O-43; Operator Qualification Program; Revision 14
- TP-1514; Quarterly Emergency Plan Equipment Test; Revision 28

## 2RS4 Occupational Dose Assessment

- Declared Pregnant Worker Documentation; dated 2011 and 2012
- FG-RP-BSR-01; Bioassay Sample Report; Revision 01
- FP-RP-AM-01; Alpha Monitoring Program; Revision 03
- FP-RP-BP-01; Bioassay Program; Revision 05
- FP-RP-SD-01; Special Dosimetry; Revision 08
- FP-RP-WBC-01; Whole Body Counter Use and Functional Check; Revision 01
- NVLAP Scope of Accreditation; effective dates July 2012 through June 2013
- NVLAP Scope of Accreditation; effective dates July 2013 through June 2014
- Personnel Contamination Logs; dated 2012 and 2013
- Positive Whole Body Count Documentation; dated 2011 and 2012
- Radiation Occurrence Reports; various dates 2012
- RPIP-1123; Alpha Characterization Smears; Revision 01
- RPIP 1107; Fetal Protection Program; Revision 10
- RPIP 1126; Contamination Monitor Alarm Response and Personnel Decontamination; Revision 24

## 2RS5 Radiation Monitoring Instrumentation

- CAP 1395119; FSAR Not Congruent with Usable Calibrated Range of Installed Radiation Monitors (R18, R25, 1nd R35) dated August 29, 2013
- Calibration of the Canberra Fastscan WBC System at the Excel Energy Prairie Island Nuclear Generating Plant; Draft; dated September 10, 2013

## 2RS6 Radioactive Gaseous and Liquid Effluent Treatment

- 2011; Prairie Island; Land Use Census
- 2012; Prairie Island; Land Use Census
- 2011 Prairie Island Annual Radiological Effluent Report; dated May 12, 2012
- 2012 Prairie Island Annual Radiological Effluent Report; dated May 12, 2013
- AR 01362338; Snap Shot Self-Assessment; Radioactive Gaseous and Liquid Effluent Treatment and Performance Indicator Verification; dated August 30, 2013
- CY-ENVR-401; Liquid Waste Tank Release Report; Revision 00
- CY-ENVR-502; Containment Release Instruction; Revision 00
- CY-ENVR-512; Gas Decay Tank Release Instruction; Revision 01
- CY-ENVR-513; Effluent Surveillance Sample Collection; Revision 00
- CY-ENVR-623; Effluent Release Offsite Dose Report; Revision 00
- Xcel Energy; AST Related Modifications No. 00046438; Laundry Vent System Potential Release Path Option Study; Revision 00; dated July 3, 2013
- FP-WM-W01-01; Work Identification, Screening, Validation and Cancellation; Revision 17
- H4; Offsite Dose Calculation Manual (ODCM); Revision 27
- H4.2; Offsite Dose Calculation Manual (ODCM) Supporting Data; Revision 01
- Radioactive Release Permit PILB2013-181; dated September 4, 2013
- Radioactive Release Permit PIGC2013-079; dated March 28,, 2013
- Radioactive Release Permit PILC2013-142; dated August 15, 2013
- Radioactive Release Permit PILC2013-179; dated September 10, 2013
- RPIP 1124; Evaluation of Isotopic Mix; Revision 01
- Title 10 CFR 50.75.g File Index and Selected Records; dated September 2013
- Title 10 CFR 61 Analytical Data from Teledyne Brown Engineering Inc. Report; Various Waste Streams (Low Level Filters; Bead Resin, Filters, Steam Generator Blowdown Resin, Dray Active Waste,) various dates 2012 and 2013
- Work Order 00433173; Main Control Room 121 Ventilation Filter Testing; April 2012
- Work Order 00433174; Main Control Room 121 Ventilation Flow Testing; April 2012
- Work Order 00433256; Technical Support Center Ventilation Filter Testing; June 3013
- Work Order 00457490; Main Control Room 122 Ventilation Flow Testing; May 2013
- Work Order 00457491; Main Control Room 122 Ventilation Filter Testing; June 2013

## 4OA1 Performance Indicator Verification

- DEP Opportunities; April 2012 June 2013
- ERO Personnel Participation; April 2012 June 2013
- FG-EP-WI-18; Emergency Preparedness Performance Indicator Guidance; Revision 0
- MSPI Derivation Reports for Unit 1 and Unit 2 Cooling Water Systems; July 2012 June 2013
- MSPI Derivation Reports for Unit 1 and Unit 2 Residual Heat Removal Systems; July 2012 June 2013
- Siren System Availability Test Records; April 2012 June 2013
- CY-ADMN-201; Chemistry Performance Indicator Reporting; Revision 01
- FP-CY-GSA-01; Operation of the Gamma Spectral Analysis Instrumentation; Revision 03
- FP-PA-PI-02; NRC/INPO/WANO Performance Indicator Reporting; Revision 06
- Gaseous and Liquid Effluent Release Packages; Selected Records, various dates in 2012 and 2013
- H33; Performance Indicator Reporting; Revision 13
- Monthly Effluent Release Off-Site Dose Calculations; various dates 2012 and 2013
- NEI 99-02; Regulatory Assessment Performance Indicator Guideline; Revisions 6 and 7
- RPIP 1013; Occupational Radiation Safety Performance Indicators; Revision 05

- RPIP 3380; Iodine Ratio; Revision 07
- RPIP 3382; Reactor Coolant Sample Preparation and Analysis; Revision 13
- RPIP 3603; Sampling Unit-1 CVCS Demineralizers; Revision 10

4OA5 Other Activities (Unit 2 Steam Generator Replacement Project)

- CY-ENVR-503; Outage Control of Containment Openings; Revision 01
- CY-ENVR-504; Satellite RCA Effluent Control; Revision 00
- GG-FO-WI-001; OSGLP Preparation for Offsite Transport; Advance Copy; Undated
- GG-FO-WI-002; OSGUP Preparation for Offsite Transport; dated May 6, 2013
- Old Steam Generator (OSG) Removal Schedule; dated September 17, 2013
- Radiation Work Permit 1747-01; Outage Satellite RCA Work; dated September 17, 2013
- Radiological Work Control Planning Packages for Reactor Cavity Decontamination and Work Inside the RSG Channel Head; various dates 2013
- Radiation Work Permit 1758-00; Work in OSGLA on the Lower Part of OSG; dated September 17, 2013
- Radiological Work Assessment Form CRPC Instructions for WO 455951; dated September 17, 2013
- RPIP-1404; CAM Alarm Response; Revision 10
- Unit-2 Steam Generator Replacement Project Removal and Transport Plan; dated September 15, 2013

# LIST OF ACRONYMS USED

AC	Alternating Current
ADAMS	Agencywide Document Access Management System
ALARA	As Low As Reasonably Achievable
AMSAC	Anticipatory Mitigating System Actuation Circuitry
AOP	Abnormal Operating Procedure
ANS	Alert and Notification System
AREOR	Annual Radiological Environmental Operating Report
ARERR	Annual Radiological Effluent Release Report
CAP	Corrective Action Program
cfm	Cubic Feet per Minute
CFR	Code of Federal Regulations
CRSVS	Control Room Special Ventilation System
DAC	Derived Air Concentration
DEP	Drill and Exercise Performance
EC	Engineering Change
ED	Electronic Dosimeter
EDG	Emergency Diesel Generator
EP	Emergency Preparedness
ERO	Emergency Response Organization
GPI	Groundwater Protection Initiative
HEPA	High-efficiency Particulate Air
I&C	Instrumentation and Controls
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
JPM	Job Performance Measure
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LORT	Licensed Operator Regualification Training
MSHA	Mine Safety and Health Administration
MSPI	Mitigating Systems Performance Index
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NIOSH	National Institute for Occupational Safety and Health
NRC	U.S. Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OPR	Operability Recommendation
OSP	Outage Safety Plan
OWA	Operator Workaround
PARS	Publicly Available Records System
PI	Performance Indicator
psi	Pounds per Square Inch
QA	Quality Assurance
RCS	Reactor Coolant System
REMP	Radiological Environmental Monitoring Program
RETS	Radiological Effluent Technical Specifications
RFO	Refueling Outage
RHR	Residual Heat Removal
SAT	Systems Approach to Training

Self-contained Breathing Apparatus
Significance Determination Process
Steam Generator
Systems, Structures, and Components
Simulator Work Request
Temporary Instruction
Technical Specification
Updated Safety Analysis Report
Work Order

K. Davision

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Sincerely,

## /**RA**/

Kenneth Riemer Branch 2 Division of Reactor Projects

Docket Nos. 50-282; 50-306; 72-010 License Nos. DPR-42; DPR-60; SNM-2506

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Letter to Kevin Davison from Kenneth Riemer dated November 18, 2013

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2 NRC INTEGRATED INSPECTION REPORT 05000282/2013004; 05000306/2013004

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