**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
REGION IV
1600 E. LAMAR BLVD
ARLINGTON, TX 76011-4511

November 12, 2015

Mr. Oscar A. Limpias
Vice President-Nuclear and CNO
Nebraska Public Power District
Cooper Nuclear Station
72676 648A Avenue
P.O. Box 98
Brownville, NE 68321

SUBJECT: COOPER NUCLEAR STATION – NRC INTEGRATED INSPECTION REPORT 05000298/2015003

Dear Mr. Limpias:

On September 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Cooper Nuclear Station. On October 1, 2015, the NRC inspectors discussed the results of this inspection with you and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented five findings of very low safety significance (Green) in this report. All of these findings involved violations of NRC requirements. Additionally, NRC inspectors documented one Severity Level IV violation with no associated finding. Further, inspectors documented two licensee-identified violations which were determined to be of very low safety significance. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the NRC Enforcement Policy.

If you contest the violations or significance of these NCVs, 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 copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC resident inspector at the Cooper Nuclear Station.

If you disagree with a cross-cutting aspect assignment 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 IV; and the NRC resident inspector at the Cooper Nuclear Station.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Greg Warnick, Branch Chief
Project Branch C
Division of Reactor Projects

Docket No. 50-298
License No. DPR-46

Enclosure: Inspection Report 05000298/2015003
w/ Attachment:
1. Supplemental Information
2. Request for Information for the Public Radiation Safety Inspection

cc w/ encl: Electronic Distribution

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DISTRIBUTION:
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ADAMS ACCESSION NUMBER: ML15316A156

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| NAME | MHayes | CHenderson | TFarnholtz | GWerner | VGaddy | MSHaire | HGepford |
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| DATE | 11/12/15 | 11/4/15 | 11/9/15 | 11/9/15 | 11/9/15 | 11/10/15 | 11/9/15 |
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Letter to Oscar A. Limpias from Greg Warnick dated November 12, 2015

SUBJECT: COOPER NUCLEAR STATION – NRC INTEGRATED INSPECTION REPORT 05000298/2015003

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

| | |
|---|---|
| Docket: | 05000298 |
| License: | DPR-46 |
| Report: | 05000298/2015003 |
| Licensee: | Nebraska Public Power District |
| Facility: | Cooper Nuclear Station |
| Location: | 72676 648A Ave<br>Brownville, NE |
| Dates: | July 1 through September 30, 2015 |
| Inspectors: | M. Hayes, Acting Senior Resident Inspector<br>J. Nance, Acting Senior Resident Inspector<br>D. Reinert, Acting Senior Resident Inspector<br>C. Henderson, Resident Inspector<br>J. Braisted, Reactor Inspector<br>L. Carson II, Senior Health Physicist<br>P. Hernandez, Health Physicist<br>J. O'Donnell, CHP, Health Physicist<br>M. Phalen, Senior Health Physicist<br>P. Elkmann, Senior Emergency Preparedness Inspector |
| Approved By: | Greg Warnick<br>Chief, Project Branch C<br>Division of Reactor Projects |

## SUMMARY

IR 05000298/2015003; 07/01/2015 – 09/30/2015; Cooper Nuclear Station; Integrated Resident & Regional Report; Equip. Align., Rad. Monitoring Instrum., Rad. Solid Waste Processing and Rad. Material Handling, Storage and Transport., PI&R, Follow-up of Events & NOED

The inspection activities described in this report were performed between July 1 and September 30, 2015, by the resident inspectors at the Cooper Nuclear Station and inspectors from the NRC's Region IV office. Five findings of very low safety significance (Green) are documented in this report. All of these findings involved violations of NRC requirements. Additionally, NRC inspectors documented in this report one Severity Level IV violation with no associated finding and two licensee identified violations of very low safety significance. The significance of inspection findings is indicated by their color (Green, White, Yellow, or Red), which is determined using Inspection Manual Chapter 0609, "Significance Determination Process." Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects within the Cross-Cutting Areas." Violations of NRC requirements are dispositioned in accordance with the NRC Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

**Cornerstone: Initiating Events**

- Green. The inspectors reviewed a self-revealing, non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," associated with the inadequate extent of condition and extent of cause evaluations to preclude repetition for a significant condition adverse to quality identified in a 2012 root cause evaluation documented CR-CNS-2012-07174 for the isolation of shutdown cooling system isolation in valves RHR-MOV-17 and RHR-MOV-18 due to localized pressure perturbations at the pressure sensors. Specifically, in 2012, the licensee failed to conduct an adequate extent of cause and condition evaluation to preclude repetition of this event from occurring on May 30, 2015 with the reactor plant in Mode 4. On May 30, 2015, isolation of shutdown cooling system isolation valves RHR-MOV-17 and RHR-MOV-18 due to localized pressure perturbations at the pressure sensors, led to the isolation of the shutdown cooling system for approximately 22 minutes. The station entered Station Procedure 2.4SDC, "Shutdown Cooling Abnormal," Revision 14, and restored shutdown cooling. The reactor coolant system temperature increased approximately 20 degrees Fahrenheit but did not exceed 212 degrees Fahrenheit, maintaining the reactor plant in Mode 4. The licensee entered this deficiency into the corrective action program as Condition Report CR-CNS-2015-03188.

  The licensee's failure to conduct an adequate extent of cause and condition evaluation to preclude repetition of a significant condition adverse to quality identified in a 2012 root cause evaluation documented in CR-CNS-2012-07174 was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the equipment performance attribute of the Initiating Events Cornerstone, and affected the associated cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown. Specifically, the failure to preclude repetition of the isolation of shutdown cooling system isolation valves RHR-MOV-17 and RHR-MOV-18 due to localized pressure perturbations at the pressure sensors led to the isolation of the shutdown cooling system for approximately 22 minutes when the reactor plant was in Mode 4 on May 30, 2015. Using Inspection Manual Chapter 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Process

Phase 1 Initial Screening and Characterization of Findings," dated May 9, 2014, inspectors determined that the finding did not require a quantitative assessment because adequate mitigating equipment remained available, and the finding did not constitute a loss of control, as defined in Appendix G. Therefore, the finding screened as a very low safety significance (Green). The inspectors determined that the finding did not have a cross-cutting aspect because the most significant contributor of this finding occurred in 2012, and does not reflect current licensee performance. (Section 4OA3)

**Cornerstone: Mitigating Systems**

- Green. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which states, in part, "Measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in § 50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions." Specifically, prior to September 29, 2015, the licensee prepared Calculation NEDC 13-028, "Ultimate Internal Pressure of Turbine Building Blowout Panels and Metal Wall System," Revision 1, in accordance with Engineering Procedure 3.4.7, to ensure pressure relief in the turbine building due to a main steam line break would occur at less than or equal to 0.5 pounds per square inch differential pressure as stated in Amendment 25 to the Cooper Nuclear Station Final Safety Analysis Report. However, the inspectors determined that the methodology and assumptions employed in Calculation NEDC 13-028 were not adequate and could not conclude that it ensured siding failure as required. In response to this issue, the licensee performed an operability determination to ensure that safety-related structures, systems, and components and the control room were not adversely affected by a main steam line break. The licensee entered this deficiency into the corrective action program as Condition Report CR-CNS-2015-05705.

  The licensee's failure to ensure that a turbine building design calculation was correct and justified was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the design control attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, Calculation NEDC 13-028 did not ensure that safety-related structures, systems, and components and the control room, which are necessary for responding to initiating events, would not be adversely affected by a main steam line break in the turbine building. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Question," dated June 19, 2012, inspectors determined that the finding was of very low safety significance (Green) because it: (1) was not a deficiency affecting the design or qualification of a mitigating structure, system, or component, and did not result in a loss of operability or functionality; (2) did not represent a loss of system and/or function; (3) did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time, or two separate safety systems out-of-service for longer than their technical specification allowed outage time; and (4) did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program. This finding had a crosscutting aspect in the area of human performance associated with conservative bias because individuals failed to use decision making practices that emphasize prudent choices over those that are simply allowed. [H.14]. (Section 1R04)

- Green. The inspectors reviewed a self-revealing, non-cited violation of Technical Specification 5.4.1.a for the licensee's failure to appropriately implement a procedure required by Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Specifically, on June 2, 2015, a chemistry technician failed to implement Station Procedure 8.8.12, "Primary Containment Oxygen or Noble Gas Activity Grab Sample Analysis," Revision 14. This resulted in the incorrect primary containment isolation sample valve being operated, which resulted in both divisions of primary containment H2O2 analyzers tripping on low pressure/flow. Operations personnel declared both divisions of primary containment H2O2 analyzers inoperable and entered Limiting Condition for Operation 3.3.3.1, "Post Accident Monitoring Instrumentation," Conditions A and C, and restored them to an operable status in accordance with station procedures. The licensee entered this deficiency into the corrective action program as Condition Reports CR-CNS-2015-03292.

  The licensee's failure to operate the correct primary containment isolation sample valve, in support of primary containment atmosphere sampling, in violation of Station Procedure 8.8.12, was a performance deficiency. The performance deficiency was determined to be more than minor, and therefore a finding, because it was associated with the human performance attribute of the Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Question," dated June 19, 2012, inspectors determined that the finding was of very low safety significance (Green) because it: (1) was not a deficiency affecting the design or qualification of a mitigating structure, system, or component, and did not result in a loss of operability or functionality; (2) did not represent a loss of system and/or function; (3) did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time, or two separate safety systems out-of-service for longer than their technical specification allowed outage time; and (4) did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program. The finding has a human performance cross-cutting aspect within the avoid complacency area because the licensee failed to recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes, which resulted in individuals not implementing appropriate error reduction tools [H.12]. (Section 4OA2)

**Cornerstone: Public Radiation Safety**

- Green. The inspectors identified a non-cited violation of 10 CFR 20.1501(c) for the failure to ensure measurement conditions were consistent with instrument calibration parameters for the elevated release point monitor, compromising the ability to accurately determine the concentration of radioactive effluents released. Specifically, water intrusion/condensation in the elevated release point Kaman normal range effluent monitor noble gas sample chamber introduced discrepancies relative to the calibration geometry and water in the particulate filter and iodine cartridge adversely affected the sample media collection efficiencies. Immediate corrective actions included the licensee performing a functionality assessment of the monitor. The licensee entered this deficiency into the corrective action program as Condition Reports CR-CNS-2015-05051 and CR-CNS-2015-05067.

The failure to ensure measurement conditions were consistent with instrument calibration parameters for the elevated release point monitor was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the Public Radiation Safety Cornerstone attribute of plant equipment/process radiation monitoring and adversely affected the cornerstone objective of ensuring adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian nuclear reactor operation. The inspectors used IMC 0609, "Significance Determination Process," Attachment D, "Public Radiation Safety Significance Determination Process," February 12, 2008, and determined the finding to be of very low safety significance (Green) because it was associated with the effluent program; however, it was not a substantial failure to implement the effluents program and it did not result in a public dose greater than an Appendix I criterion or 10 CFR 20.1301(e). The finding has a cross-cutting aspect in the area of problem identification and resolution associated with identification, because the organization failed to implement the corrective action program with a low threshold for identifying issues. Specifically, plant personnel failed to initiate condition reports, as required by procedure, on 89 occasions since the discovery on March 24, 2015 [P.1]. (Section 2RS5)

- Green. The inspectors reviewed a self-revealing non-cited violation of 10 CFR 20.1802 for the failure to control licensed material not in storage when the licensee sent 14 bags of radioactively contaminated dirt and debris to an off-site landfill for disposal. Immediate corrective actions included the licensee retrieving the contaminated material and returning it to site. The licensee entered this deficiency into the corrective action program as Condition Report CR-CNS-2013-03392.

  The failure to control licensed material that was not in storage was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the human performance attribute of the Public Radiation Safety Cornerstone and adversely affected the cornerstone objective of assuring adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian nuclear reactor operation. The inspectors used IMC 0609, "Significance Determination Process," Attachment D, "Public Radiation Safety Significance Determination Process," February 12, 2008. The inspectors determined the finding to be of very low safety significance (Green) because the finding involved radioactive material control but it did not result in an exposure to the public in excess of five millirem. The finding has a cross-cutting aspect in the area of human performance, associated with work management, because the licensee did not implement a process of planning, controlling, and executing work activities such that safety was the priority. Specifically, the licensee did not control work activities involving multiple organizations such that radioactive material remained controlled on site [H.5]. (Section 2RS8)

**Cornerstone: Miscellaneous**

- Severity Level IV. The inspectors identified a non-cited violation of 10 CFR 50.72(b)(2)(xi) because the NRC Operations Center was not notified within four hours of a reportable event related to the health and safety of the public for which notification to other government agencies had been made. Specifically, in May 2013, the licensee did not notify the NRC of its notification to the State of Nebraska about an inadvertent release of 14 bags of radioactively contaminated dirt and debris to a public landfill. To correct this condition, the licensee notified the NRC Operations Center of this event on August 26, 2015.

This violation was evaluated using traditional enforcement because the failure to make a required report could adversely impact the NRC's regulatory process. Using the criteria contained in Section 6.9(d)(9) of the NRC's Enforcement Policy, this violation was determined to be Severity Level IV. The licensee entered this deficiency into the corrective action program as Condition Report CR-CNS-2015-0544. Cross-cutting aspects are not assigned to traditional enforcement violations. (Section 2RS8)

**Licensee-Identified Violations**

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

## PLANT STATUS

The Cooper Nuclear Station began the inspection period at full power, where it remained for the rest of the reporting period, except for minor reductions in power to support scheduled surveillances and rod pattern adjustments.

## REPORT DETAILS

### 1. REACTOR SAFETY

**Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

### 1R01 Adverse Weather Protection (71111.01)

.1 Summer Readiness for Offsite and Alternate AC Power Systems

a. Inspection Scope

On July 14, 2015, the inspectors completed an inspection of the station's off-site and alternate-ac power systems associated with the station startup service transformer and the 161kV line. The inspectors inspected the material condition of these systems, including transformers and other switchyard equipment to verify that plant features and procedures were appropriate for operation and continued availability of off-site and alternate-ac power systems. The inspectors reviewed outstanding work orders and open condition reports for these systems. The inspectors walked down the switchyard to observe the material condition of equipment providing off-site power sources. The inspectors assessed corrective actions for identified degraded conditions and verified that the licensee had considered the degraded conditions in its risk evaluations and had established appropriate compensatory measures.

The inspectors verified that the licensee's procedures included appropriate measures to monitor and maintain availability and reliability of the off-site and alternate-ac power systems.

These activities constitute one sample of summer readiness of off-site and alternate-ac power systems, as defined in Inspection Procedure 71111.01.

b. Findings

No findings were identified.

.2 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

On July 14, 2015, the inspectors completed an inspection of the station's readiness for seasonal extreme weather conditions. The inspectors reviewed the licensee's adverse weather procedures for seasonal high temperatures and evaluated the licensee's implementation of these procedures. The inspectors verified that prior to the onset of hot weather, the licensee had corrected weather-related equipment deficiencies identified during the previous high temperature season.

The inspectors selected one risk-significant system that was required to be protected from high temperatures:

- Diesel generator 2 room heating and ventilation system

The inspectors reviewed the licensee's procedures and design information to ensure the system would remain functional when challenged by seasonal high temperatures. The inspectors verified that operator actions described in the licensee's procedures were adequate to maintain readiness of these systems. The inspectors walked down portions of these systems to verify the physical condition.

These activities constitute one sample of readiness for seasonal adverse weather, as defined in Inspection Procedure 71111.01.

b. Findings

No findings were identified.

.3 Readiness to Cope with External Flooding

a. Inspection Scope

On July, 22, 2015, the inspectors completed an inspection of the station's readiness to cope with external flooding. After reviewing the licensee's flooding analysis, the inspectors chose one plant area that was susceptible to flooding:

- High pressure coolant injection southwest quad roof plug

The inspectors reviewed plant design features and licensee procedures for coping with flooding. The inspectors walked down the selected areas to inspect the design features, including the material condition of seals, drains, and flood barriers. The inspectors evaluated whether credited operator actions could be successfully accomplished.

These activities constitute one sample of readiness to cope with external flooding, as defined in Inspection Procedure 71111.01.

b. Findings

No findings were identified.

## 1R04 Equipment Alignment (71111.04)

Partial Walkdown

a. Inspection Scope

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

- August 6, 2015, Core spray B

- August 6, 2015, Residual heat removal B

- August 13, 2015, Turbine building blowout panels

- September 4, 2015, Primary containment isolation valves and penetrations core spray and residual heat removal

The inspectors reviewed the licensee's procedures and system design information to determine the correct lineup for the systems. They visually verified that critical portions of the systems or trains were correctly aligned for the existing plant configuration.

These activities constitute four partial system walk-down samples, as defined in Inspection Procedure 71111.04.

b. Findings

Introduction. The inspectors identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the failure to ensure that a turbine building design calculation was correct and justified.

Description. The purpose of Engineering Procedure 3.4.7, "Design Calculations," Revision 42, is to establish guidelines for preparation, review, approval, control, and use of design calculations and applies to the preparation of all Non-Essential and Essential (safety-related) design calculations including those related to new design and design reviews. The procedure stated that a design calculation shall be reviewed to ensure that the purpose, design inputs, assumptions, methodology, and conclusions are correct and justified.

The purpose of Calculation NEDC 13-028, "Ultimate Internal Pressure of Turbine Building Blowout Panels and Metal Wall System," Revision 1, was to reconstitute the Cooper Nuclear Station Final Safety Analysis Report Amendment 25. This amendment addressed the turbine building siding blowout (failure) pressure of 0.5 pounds per square inch differential. A postulated main steam line break in the turbine building (or one that breaches the reactor building steam tunnel blowout panels) produces a differential pressure between the turbine building and the outside environment. The siding is required to fail and relieve pressure to ensure that safety-related structures, systems, and components (SSCs) (critical switchgear, emergency diesel generators, and vital batteries) and the control room are not adversely affected by the pressure rise in the turbine building due to the main steam line break.

Fundamentally, the turbine building consists of a superstructure with the siding system attached to it. The siding system consists of metal panels connected to horizontal beams connected to vertical columns, which are part of the superstructure. The horizontal beams are approximately 24 feet in length and spaced approximately 7 feet apart (vertically). The beam consists of two connection angles (one at each end) and one channel girt. The angles are welded to the columns and bolted to the girt. The panels are fastened to the girts by screws.

In the Method of Analysis section, Calculation NEDC 13-028 described that the design methodology used is plastic design. It explained that the flexural load and section geometry differences result in plastic deformation occurring at the connection angles and that no further flexural load may be carried by the angles at this point. The calculation then described that deflection of the beam will take place with no further load increases

and beam behavior will follow catenary action, which causes tension in the connection angles. Finally, the calculation explained that this tension shears the connecting bolts resulting in a "zipper-like" failure vertically along the columns and a release of the internal turbine building pressure.

The inspectors reviewed Calculation NEDC 13-028 with assistance from NRC staff in the Offices of Nuclear Reactor Regulation and Nuclear Regulatory Research. The inspectors and staff reviewed the calculation from the perspective that the turbine building siding is required to fail by a particular differential pressure from a main steam line break. The inspectors and staff determined that:

- There is no acceptable justification for assuming a fixed-fixed girt because the connection angle stiffness is relatively small in comparison to the channel girt (the horizontal leg of the angle is not attached to the column, and it would be difficult to develop a plastic hinge in the angle prior to failure by shear and or torsion in the angle).

- The use of plastic analysis is not appropriate because both the connection angles and channel girt have to be compact and be able to develop full plasticity across their respective sections, but they are not.

- Inelastic or elastic buckling will occur in the channel girt prior to the formation of plastic hinges in the girt.

- There is no acceptable explanation (or derivation) in the calculation for the use of the $F_{YC}$ factor in evaluating the maximum pressure.

- Due to the unsymmetrical nature of the connection between the channel girt and the column, the behavior of the angle connection under pressure loading is complex and would, therefore, be difficult to perform a set of hand calculations that could reasonably capture the failure modes and loads.

- Finally, while the calculation describes how the internal turbine building pressure would be relieved, it does not demonstrate by analysis that the zipper-like failure would occur.

As a result of their review and the performance of a Finite Element Analyses of the siding system by staff from the Office of Nuclear Regulatory Research, the inspectors and staff determined that the methodology and assumptions employed in the calculation were not adequate. Accordingly, the inspectors and staff were not able to conclude that the calculation ensured siding failure and pressure relief in the turbine building due to a main steam line break at less than or equal to 0.5 pounds per square inch differential pressure as stated in Amendment 25 to the Cooper Nuclear Station Final Safety Analysis Report. Therefore, the inspectors and staff determined that the licensee had failed to ensure that a turbine building design calculation was correct and justified.

Analysis. The licensee's failure to ensure that a turbine building design calculation was correct and justified was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the design control attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, Calculation NEDC 13-028 did not ensure that safety-related structures, systems, and components and the control room, which are necessary for responding to initiating events, would not be adversely affected by a main steam line break in the turbine building. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Question," dated June 19, 2012, inspectors determined that the finding was of very low safety significance (Green) because it: (1) was not a deficiency affecting the design or qualification of a mitigating structure, system, or component, and did not result in a loss of operability or functionality; (2) did not represent a loss of system and/or function; (3) did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time, or two separate safety systems out-of-service for longer than their technical specification allowed outage time; and (4) did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program. This finding had a crosscutting aspect in the area of human performance associated with conservative bias because individuals failed to use decision making practices that emphasize prudent choices over those that are simply allowed [H.14].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," states, in part, "Measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in § 50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions." Engineering Procedure 3.4.7, "Design Calculations," Revision 42, is a measure established to ensure that the design basis is correctly translated into specifications, drawings, procedures, and instructions. Contrary to the above, prior to September 29, 2015, the licensee failed to ensure that the design basis was correctly translated into specifications, drawings, procedures, and instructions. Specifically, the licensee prepared Calculation NEDC 13-028, "Ultimate Internal Pressure of Turbine Building Blowout Panels and Metal Wall System," Revision 1, in accordance with Engineering Procedure 3.4.7, to ensure pressure relief in the turbine building due to a main steam line break would occur at less than or equal to 0.5 pounds per square inch differential pressure as stated in Amendment 25 to the Cooper Nuclear Station Final Safety Analysis Report. However, the inspectors determined that the methodology and assumptions employed in Calculation NEDC 13-028 were not adequate and could not conclude that it ensured siding failure as required. In response to this issue, the licensee performed an operability determination to ensure that safety-related structures, systems, and components and the control room were not adversely affected by a main steam line break. This violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy, because it was very low safety significance (Green) and was entered into the licensee's corrective action program as Condition Report CR-CNS-2015-05705. (NCV 05000298/2015003-01, "Failure to Ensure Turbine Building Design Calculation was Correct and Justified")

## 1R05 Fire Protection (71111.05)

.1 Quarterly Inspection

a. Inspection Scope

The inspectors evaluated the licensee's fire protection program for operational status and material condition. The inspectors focused their inspection on four plant areas important to safety:

- July 22, 2015, Reactor building 931 fire impairment, Fire area I, Zone 3C
- August 14, 2015, Service water booster pump room, Fire area IV, Zone 7A
- August 25, 2015, Fire impairment for fire dampers DC switchgear room, 1B HV-AD-1550, Fire area VI, Zone 8G, and DC switchgear room 1A HV-AD-1551, Fire area IV(A), Zone 8H
- August 26, 2015, Fire pump E non-functional for maintenance and fire pump D non-functional for 12.5kV maintenance

For each area, the inspectors evaluated the fire plan against defined hazards and defense-in-depth features in the licensee's fire protection program. The inspectors evaluated control of transient combustibles and ignition sources, fire detection and suppression systems, manual firefighting equipment and capability, passive fire protection features, and compensatory measures for degraded conditions.

These activities constitute four quarterly inspection samples, as defined in Inspection Procedure 71111.05.

b. Findings

No findings were identified.

## 1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

On August 17, 2015, the inspectors completed an inspection of the station's ability to mitigate flooding due to internal causes. After reviewing the licensee's flooding analysis, the inspectors chose one plant area containing risk-significant SSCs that were susceptible to flooding:

- Reactor building 931

The inspectors reviewed plant design features and licensee procedures for coping with internal flooding. The inspectors walked down the selected area to inspect the design features, including the material condition of seals, drains, and flood barriers. The inspectors evaluated whether operator actions credited for flood mitigation could be successfully accomplished.

In addition, on August 31, 2015, the inspectors completed an inspection of underground bunkers susceptible to flooding. The inspectors selected one underground bunker that contained risk-significant or multiple-train cables whose failure could disable risk-significant equipment:

- Manhole 6A and 6B

The inspectors observed the material condition of the cables and splices contained in the bunker and looked for evidence of cable degradation due to water intrusion. The inspectors verified that the cables and vaults met design requirements.

These activities constitute completion of one flood protection measures sample and one bunker/manhole sample, as defined in Inspection Procedure 71111.06.

b. Findings

No findings were identified.

## 1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11)

.1 Review of Licensed Operator Requalification

a. Inspection Scope

On July 29, 2015, the inspectors observed a portion of an annual requalification exam for licensed operators. The inspectors assessed the performance of the operators and the evaluators' critique of their performance. The inspectors also assessed the modeling and performance of the simulator during the requalification activities.

These activities constitute completion of one quarterly licensed operator requalification program sample, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

.2 Review of Licensed Operator Performance

a. Inspection Scope

On July 22, 2015, the inspectors observed the performance of on-shift licensed operators in the plant's main control room. At the time of the observations, the plant was in a period of heightened activity due to turbine bypass valve surveillance testing.

In addition, the inspectors assessed the operators' adherence to plant procedures, including conduct of operations procedure and other operations department policies.

These activities constitute completion of one quarterly licensed operator performance sample, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

## 1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors reviewed two instances of degraded performance or condition of safety-related SSCs:

- August 6, 2015, Core spray valve CS-MO-12A failed to close during core spray loop flush and core spray system leakage
- August 26, 2015, Loss of MCC-Z and 30 percent down power 50.65(a)(1) evaluation

The inspectors reviewed the extent of condition of possible common cause SSC failures and evaluated the adequacy of the licensee's corrective actions. The inspectors reviewed the licensee's work practices to evaluate whether these may have played a role in the degradation of the SSCs. The inspectors assessed the licensee's characterization of the degradation in accordance with 10 CFR 50.65 (the Maintenance Rule), and verified that the licensee was appropriately tracking degraded performance and conditions in accordance with the Maintenance Rule.

These activities constitute completion of two maintenance effectiveness samples, as defined in Inspection Procedure 71111.12.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed five risk assessments performed by the licensee prior to changes in plant configuration and the risk management actions taken by the licensee in response to elevated risk:

- July 7, 2015, MCC-Z trip and unplanned 30 percent down power
- July 7, 2015, Station startup service transformer inoperable and unavailable due to low post event voltage
- July 14, 2015, Cooper 345k V sub-replacement 4160/480 V transformers
- July 15, 2015, Replacement circuit test switch on 4160 V breaker 1GS
- August 6, 2015, Core spray A maintenance window

The inspectors verified that these risk assessment were performed timely and in accordance with the requirements of 10 CFR 50.65 (the Maintenance Rule) and plant procedures. The inspectors reviewed the accuracy and completeness of the licensee's risk assessments and verified that the licensee implemented appropriate risk management actions based on the result of the assessments.

These activities constitute completion of five maintenance risk assessment samples, as defined in Inspection Procedure 71111.13.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed four operability determinations and functionality assessments that the licensee performed for degraded or nonconforming SSCs:

- July 7, 2015, Operability determination of control drive scram discharge volume vent and drain valve timing above operability time limit, CR-CNS-2015-03953
- July 16, 2015, Functionality assessment of high pressure coolant injection roof plug leaking water, CR-CNS-2015-04027
- July 30, 2015, Operability determination of calculation discrepancies for stem thread RHR-MOV-39B, CR-CNS-2015-04251
- August 31, 2015, Operability determination of high pressure coolant injection valve HPCI-MOV-14 and reactor core isolation cooling injection valve RCIC-MOV-21 minimum DC voltage for increased stroke times, CR-CNS-2015-05006

The inspectors reviewed the timeliness and technical adequacy of the licensee's evaluations. Where the licensee determined the degraded SSC to be operable or functional, the inspectors verified that the licensee's compensatory measures were appropriate to provide reasonable assurance of operability or functionality. The inspectors verified that the licensee had considered the effect of other degraded conditions on the operability or functionality of the degraded SSC.

On July 7, 2015, the inspectors completed their review of operator actions taken or planned to compensate for degraded or nonconforming conditions. The inspectors verified that the licensee effectively managed these operator workarounds to prevent adverse effects on the function of mitigating systems and to minimize their impact on the operators' ability to implement abnormal and emergency operating procedures.

These activities constitute completion of five operability and functionality review samples, which included one operator work-around sample, as defined in Inspection Procedure 71111.15.

b. Findings

No findings were identified.

## 1R18 Plant Modifications (71111.18)

Permanent Modifications

a. Inspection Scope

The inspectors reviewed three permanent plant modifications that affected risk-significant SSCs:

- July 15, 2015, Service water chemical injection
- August 6, 2015, RR-TR-165 replacement with a Yokogawa and changes to procedure governing technical specification monitoring for reactor coolant system heatup/cooldown rate
- August 13, 2015, Turbine building siding blowout panels evaluation for high energy line break

The inspectors reviewed the design and implementation of the modifications. The inspectors verified that work activities involved in implementing the modifications did not adversely impact operator actions that may be required in response to an emergency or other unplanned event. The inspectors verified that post-modification testing was adequate to establish the operability or functionality of the SSCs as modified.

These activities constitute completion of three samples of permanent modifications, as defined in Inspection Procedure 71111.18.

b. Findings

No findings were identified.

## 1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed six post-maintenance testing activities that affected risk-significant SSCs:

- July 7, 2015, Standby liquid control pump A boron crystal inspection and fuse holder replacement
- July 17, 2015, RR-TR-165 replacement with a Yokogawa recorder
- July 30, 2015, Core spray A maintenance window
- August 28, 2015, Fire pump E maintenance

- September 11, 2015, Spent fuel pool instrumentation modification cable pulls through secondary containment and control room envelope

- September 17, 2015, Reactor recirculation motor generator set B feedback potentiometer replacement

The inspectors reviewed licensing- and design-basis documents for the SSCs and the maintenance and post-maintenance test procedures. The inspectors observed the performance of the post-maintenance tests to verify that the licensee performed the tests in accordance with approved procedures, satisfied the established acceptance criteria, and restored the operability of the affected SSCs.

These activities constitute completion of six post-maintenance testing inspection samples, as defined in Inspection Procedure 71111.19.

b. Findings

No findings were identified.

## 1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed two risk-significant surveillance tests and reviewed test results to verify that these tests adequately demonstrated that the SSCs were capable of performing their safety functions:

In-service tests:

- August 6, 2015, Service water booster pump A and instrument uncertainty accounted for in surveillance acceptance criteria for technical specification required pumps

Other surveillance tests:

- August 24, 2015, Main turbine bypass valve functional test

The inspectors verified that these tests met technical specification requirements, that the licensee performed the tests in accordance with their procedures, and that the results of the tests satisfied appropriate acceptance criteria. The inspectors verified that the licensee restored the operability of the affected SSCs following testing.

These activities constitute completion of two surveillance testing inspection samples, as defined in Inspection Procedure 71111.22.

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

## 1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The inspectors performed an in-office review of Emergency Plan Implementing Procedure 5.7.1, "Emergency Classification," Revision 52, implemented June 29, 2015. This revision:

- Revised the narrow range reactor vessel level instrument designator in emergency action levels CU2.1, CU2.3, CU3.2, CS2.1, CS2.2, CS2.3, CG2.1, and CG2.2;
- added satellite telephones to the list of equipment considered on Tables C-2 and S-2, "Communications Systems," in evaluating a loss of communications capability; and
- replaced the seismic monitoring instrument MI-STR-ACS1 with a free field seismic sensor in emergency action levels HU1.1 and HA1.1.

This revision was compared to its previous revision, to the criteria of NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, to Nuclear Energy Institute Report 99-01, "Emergency Action Level Methodology," Revision 5, and to the standards in 10 CFR 50.47(b) to determine if the revision adequately implemented the requirements of 10 CFR 50.54(q)(3) and 50.54(q)(4). The inspectors verified that the revision did not decrease the effectiveness of the emergency plan. This review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection.

These activities constitute completion of one emergency action level and emergency plan changes sample, as defined in Inspection Procedure 71114.04.

b. Findings

No findings were identified.

## 1EP6 Drill Evaluation (71114.06)

Training Evolution Observation

a. Inspection Scope

On July 21, 2015, and September 15, 2015, the inspectors observed simulator-based licensed operator requalification training that included implementation of the licensee's emergency plan. The inspectors verified that the licensee's emergency classifications, off-site notifications, and protective action recommendations were appropriate and timely. The inspectors verified that any emergency preparedness weaknesses were appropriately identified by the evaluators and entered into the corrective action program for resolution.

These activities constitute completion of two training observation samples, as defined in Inspection Procedure 71114.06.

b. Findings

No findings were identified.

## 2. RADIATION SAFETY

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

### 2RS5 Radiation Monitoring Instrumentation (71124.05)

a. Inspection Scope

The inspectors evaluated the accuracy and operability of the radiation monitoring equipment used by the licensee (1) to monitor areas, materials, and workers to ensure a radiologically safe work environment, and (2) to detect and quantify radioactive process streams and effluent releases. The inspectors interviewed licensee personnel, walked down various portions of the plant, and reviewed licensee performance in the following areas:

- Selected plant configurations and alignments of process, post-accident, and effluent monitors with descriptions in the Final Safety Analysis Report and the off-site dose calculation manual

- Selected instrumentation, including effluent monitoring instrument, portable survey instruments, area radiation monitors, continuous air monitors, personnel contamination monitors, portal monitors, and small article monitors to examine their configurations and source checks

- Calibration and testing of process and effluent monitors, laboratory instrumentation, whole body counters, post-accident monitoring instrumentation, portal monitors, personnel contamination monitors, small article monitors, portable survey instruments, area radiation monitors, electronic dosimetry, air samplers, and continuous air monitors

- Audits, self-assessments, and corrective action documents related to radiation monitoring instrumentation since the last inspection

These activities constitute completion of one sample of radiation monitoring instrumentation, as defined in Inspection Procedure 71124.05.

b. Findings

Introduction. The inspectors identified a Green, non-cited violation of 10 CFR 20.1501(c) for the failure to ensure measurement conditions were consistent with instrument calibration parameters for the elevated release point (ERP) monitor, compromising the ability to accurately determine the concentration of radioactive effluents released. Specifically, water intrusion/condensation in the ERP Kaman normal

range effluent monitor noble gas sample chamber introduced discrepancies relative to the calibration geometry and water in the particulate filter and iodine cartridge adversely affected the sample media collection efficiencies. The licensee entered this issue into their corrective action program as Condition Reports CR-CNS-2015-05051 and CR-CNS-2015-05067.

Description. The Kaman effluent radiation monitor system for the licensee's ERP draws air samples from the plant's stack, one of the station's normal gaseous radioactive effluent release points. The Kaman system uses an in-line particulate air filter, an in-line iodine charcoal cartridge, and an on-line noble gas monitor consisting of a sample chamber and beta detector for noble gas monitoring. The particulate filter and iodine cartridge samples exchanged weekly from the Kaman system are used to calculate the quantity of radioactive particulate and iodine being released through the ERP to the environment. The on-line noble gas monitor is used to indicate the rate of radioactive noble gas releases during normal or planned operations. Additionally, at a predetermined threshold, the normal range system sends a signal to reposition a valve to redirect sample flow to the middle and high range detectors.

On August 25, 2015, NRC inspectors observed particulate filter and iodine charcoal cartridge change-out activities for the ERP Kaman normal range effluent radiation monitor system. During these observations the inspectors noted that plant staff drained a nominal 400 ml of water from the noble gas sample chamber and an additional 200 ml from a downstream moisture trap. The inspectors also observed that the particulate filter and iodine charcoal cartridge were wet when removed from the sampling system and condensation was present in the sample holder.

Interviews with plant staff revealed that draining water from the noble gas sample chamber was a common practice and had been written into Procedure 8.8.ERP, "Particulate and Iodine Sample Collection for ERP Effluent." This condition had occurred intermittently over the course of many years, but the amount and frequency of water intrusion in the sample chamber had increased significantly since March 24, 2015. The licensee measured and recorded the observed water level in the sample chamber during each change-out. Reviewing this data, the inspectors determined the quantity of water that accumulated in the sample chamber varied in volume up to 750 ml, but that no actions had been taken by the licensee to control or mitigate the quantity of water entering the chamber.

The general principles for obtaining valid samples of airborne radioactive material are contained in ANSI N13.1-1969, "Guide to Sampling Airborne Radioactive Material in Nuclear Facilities." This standard specifies that all possible interactions which may change the sample quality must be carefully considered. Because the Kaman system's noble gas monitor was calibrated with a dry chamber volume, the inspectors determined that the water intrusion impacted the noble gas sample under analysis, including sample size, sample geometry, detection capability, and wash out, and questioned the validity of the measurement results.

Although the licensee was aware that the on-line noble gas measurement conditions deviated from the conditions of the calibration, no evaluation had been performed or correction factor applied to account for the impact of water in the chamber. Additionally, the licensee failed to account for these parameters in their operability engineering evaluation, which detailed a detector response inversely proportional to the water level in

the sample chamber. The inspectors also determined that the licensee failed to demonstrate that the ERP normal range noble gas monitor would perform its function of realigning system sample flow to the ERP middle and high range detectors at the appropriate radiation levels in the event of elevated effluent release conditions.

ANSI N13.1-1969 also states that excessive moisture may destroy filter usefulness (particulate) and that high humidity may impair the efficiency of charcoal. The charcoal cartridge vendor manual stated that the adsorption of radioiodine compounds is dramatically reduced (exponentially) with relative humidity above ninety-five percent. The licensee had not evaluated the impact of, or determined a calibration correction factor to account for, the diminished efficiency of the filter and charcoal cartridge due to the media being wet.

Based on the above technical concerns, the inspectors concluded the measurement conditions for noble gases, radioiodine, and particulates were inconsistent with the instrument calibration parameters for the ERP monitor, and thereby compromised the ability to accurately determine the concentration of radioactive effluents released.

The inspectors also noted that Procedure 8.8.ERP, Step 4.17.1, stated that if more than 200 ml of moisture was collected from the noble gas chamber, a condition report was to be initiated and the system engineer notified. On March 24, 2015, a condition report was generated because approximately 600 ml of water was collected from the noble gas chamber. This condition report was closed on April 6, 2015, with no actions being taken. The licensee placed the radiation monitor on an increased collection frequency for the particulate and charcoal cartridge samples, and between March 24 and August 25, 2015, there were 89 instances where 200+ ml of water was collected from the ERP noble gas sample chamber. Contrary to procedural requirements, and although Engineering and Chemistry staff personnel were aware of degraded system performance, no additional condition reports were initiated by plant personnel.

Analysis. The failure to ensure measurement conditions were consistent with instrument calibration parameters for the ERP monitor was a performance deficiency. The performance deficiency was more than minor, and therefore and finding, because it was associated with the Public Radiation Safety cornerstone attribute of plant equipment/process radiation monitoring and adversely affected the cornerstone objective of ensuring adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian nuclear reactor operation. Specifically, water intrusion/condensation in the ERP Kaman normal range effluent monitor noble gas sample chamber introduced discrepancies relative to the calibration geometry and water in the particulate filter and iodine cartridge adversely affected the sample media collection efficiencies. The inspectors used IMC 0609, “Significance Determination Process,” Attachment D, “Public Radiation Safety Significance Determination Process,” February 12, 2008, and determined the finding to be of very low safety significance because it was associated with the effluent program; however, it was not a substantial failure to implement the effluents program and it did not result in a public dose greater than an Appendix I criterion or 10 CFR 20.1301(e). The finding has a cross-cutting aspect in the area of problem identification and resolution associated with identification because the organization failed to implement the corrective action program with a low threshold for identifying issues. Specifically, plant personnel failed to initiate condition reports as required by procedure, on 89 occasions of elevated

water intrusion in the ERP Kaman normal range noble gas monitor since March 24, 2015 [P.1].

Enforcement. Title 10 CFR 20.1501(c) states, in part, that licensees shall ensure that instruments and equipment used for quantitative radiation measurements (e.g., effluent monitoring) are calibrated periodically for the radiation measured. Contrary to the above, as of August 25, 2015, the licensee failed to ensure that equipment used for quantitative radiation measurements (e.g., effluent monitoring) was calibrated periodically for the radiation measured. Specifically, the licensee failed to demonstrate that the ERP gaseous effluent monitor and sample media were calibrated consistent with the conditions of use. Immediate corrective actions included the licensee performing a functionality assessment of the monitor. Because this issue was of very low safety significance and was entered into the licensee's corrective action program as Condition Reports CR-CNS-2015-05051 and CR-CNS-2015-05067, it is being treated as a non-cited violation, consistent with Section 2.3.2.a of the NRC Enforcement Policy. (NCV 05000298/2015003-02, "Failure to Ensure Measurement Conditions Were Consistent With Instrument Calibration.")

## 2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

a. Inspection Scope

The inspectors evaluated whether the licensee maintained gaseous and liquid effluent processing systems and properly mitigated, monitored, and evaluated radiological discharges with respect to public exposure. The inspectors verified that abnormal radioactive gaseous or liquid discharges and conditions, when effluent radiation monitors are out-of-service, were controlled in accordance with the applicable regulatory requirements and licensee procedures. The inspectors verified that the licensee's quality control program ensured radioactive effluent sampling and analysis adequately quantified and evaluated discharges of radioactive materials. The inspectors verified the adequacy of public dose projections resulting from radioactive effluent discharges. The inspectors interviewed licensee personnel and reviewed or observed the following items:

- Radiological effluent release reports since the previous inspection and reports related to the effluent program issued since the previous inspection
- Effluent program implementing procedures, including sampling, monitor setpoint determinations and dose calculations
- Equipment configuration and flow paths of selected gaseous and liquid discharge system components, filtered ventilation system material condition, and significant changes to their effluent release points, if any, and associated 10 CFR 50.59 reviews
- Selected portions of the routine processing and discharge of radioactive gaseous and liquid effluents (including sample collection and analysis)
- Controls used to ensure representative sampling and appropriate compensatory sampling
- Results of the inter-laboratory comparison program

- Effluent stack flow rates
- Surveillance test results of technical specification-required ventilation effluent discharge systems since the previous inspection
- Significant changes in reported dose values
- A selection of radioactive liquid and gaseous waste discharge permits
- Part 61 analyses and methods used to determine which isotopes are included in the source term
- Off-site dose calculation manual changes
- Meteorological dispersion and deposition factors
- Latest land use census
- Records of abnormal gaseous or liquid tank discharges
- Groundwater monitoring results
- Changes to the licensee's written program for identifying and controlling contaminated spills/leaks to groundwater
- Identified leakage or spill events and entries made into 10 CFR 50.75(g) records, if any, and associated evaluations of the extent of the contamination and the radiological source term
- Off-site notifications~~,~~ and reports of events associated with spills, leaks, and groundwater monitoring results
- Audits, self-assessments, reports, and corrective action documents related to radioactive gaseous and liquid effluent treatment since the last inspection

These activities constitute completion of one sample of radioactive gaseous and liquid effluent treatment, as defined in Inspection Procedure 71124.06.

b. Findings

No findings were identified.

## 2RS7 Radiological Environmental Monitoring Program (71124.07)

a. Inspection Scope

The inspectors evaluated whether the licensee's radiological environmental monitoring program quantified the impact of radioactive effluent releases to the environment and sufficiently validated the integrity of the radioactive gaseous and liquid effluent release program. The inspectors verified that the radiological environmental monitoring program was implemented consistent with the licensee's technical specifications and off-site dose calculation manual, and that the radioactive effluent release program met the design

objective in Appendix I to 10 CFR Part 50. The inspectors verified that the licensee's radiological environmental monitoring program monitored non-effluent exposure pathways, was based on sound principles and assumptions, and validated that doses to members of the public were within regulatory dose limits. The inspectors reviewed or observed the following items:

- Annual environmental monitoring reports and off-site dose calculation manual
- Selected air sampling and dosimeter monitoring stations
- Collection and preparation of environmental samples
- Operability, calibration, and maintenance of meteorological instruments
- Selected events documented in the annual environmental monitoring report which involved a missed sample, inoperable sampler, lost dosimeter, or anomalous measurement
- Selected structures, systems, or components that may contain licensed material and has a credible mechanism for licensed material to reach ground water
- Records required by 10 CFR 50.75(g)
- Significant changes made by the licensee to the off-site dose calculation manual as the result of changes to the land census or sampler station modifications since the last inspection
- Calibration and maintenance records for selected air samplers, composite water samplers, and environmental sample radiation measurement instrumentation
- Inter-laboratory comparison program results
- Audits, self-assessments, reports, and corrective action documents related to the radiological environmental monitoring program since the last inspection

These activities constitute completion of one sample of radiological environmental monitoring program, as defined in Inspection Procedure 71124.07.

b. Findings

No findings were identified.

**2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (71124.08)**

a. Inspection Scope

The inspectors evaluated the effectiveness of the licensee's programs for processing, handling, storage, and transportation of radioactive material. The inspectors interviewed licensee personnel and reviewed the following items:

- The solid radioactive waste system description, process control program, and the scope of the licensee's audit program

- Control of radioactive waste storage areas including container labeling/marking and monitoring containers for deformation or signs of waste decomposition

- Changes to the liquid and solid waste processing system configuration including a review of waste processing equipment that is not operational or abandoned in place

- Radio-chemical sample analysis results for radioactive waste streams and use of scaling factors and calculations to account for difficult-to-measure radionuclides

- Processes for waste classification including use of scaling factors and 10 CFR Part 61 analysis

- Shipment packaging, surveying, labeling, marking, placarding, vehicle checking, driver instructing, and preparation of the disposal manifest

- Audits, self-assessments, reports, and corrective action reports radioactive solid waste processing, and radioactive material handling, storage, and transportation performed since the last inspection

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one sample of radioactive solid waste processing, and radioactive material handling, storage, and transportation, as defined in Inspection Procedure 71124.08.

b. Findings

(1) Introduction. The inspectors reviewed a self-revealing, Green non-cited violation of 10 CFR 20.1802 for the licensee's failure to control licensed material not in storage. Specifically, between May 24 and 28, 2013, the plant transferred 14 bags of radioactively contaminated dirt and debris from the administrative building roof to a dumpster in the owner-controlled area. The dumpster was then taken to a public landfill for disposal.

Description. On May 24, 2013, the radiation protection (RP) staff determined that bags of dirt and debris from the administrative building roof in the protected area would have to be surveyed before they could be released for disposal. On May 25, 2013, the survey results identified that the 14 bags of debris (a nominal 80 lbs. each) contained 0.219 microcuries of Co-60 and 0.0276 microcuries of Cs-137. These results were above release criteria. The shift RP technician determined that the debris was safe on the roof until after the holiday weekend when the RP supervisor would disposition them as radioactive waste on May 28, 2013. The administrative building roof, while in the protected area, was not a radiologically controlled area or a radioactive materials storage area; in addition, the 14 bags were not labelled as radioactive material.

On May 25, 2013, workers removed the 14 bags of contaminated dirt and debris from the administrative building roof and placed them in a dumpster in the owner-controlled

area for disposal. The bags appeared to be clean non-radioactive trash to the workers, so the radiation protection group was not contacted. On May 28, 2013, after the RP technical supervisor reviewed the debris survey data, it was discovered that the 14 bags of contaminated dirt and debris had been sent off-site for disposal without the radiation protection department's knowledge or permission.

On May 28, 2013, the licensee informed the landfill that the station needed to retrieve the 14 bags of radioactively contaminated debris. On May 29, 2013, the licensee informed the State of Nebraska Radiological Control Program Administrator that they had inadvertently released contaminated debris for disposal at a public landfill, and that they planned to recover the material. All 14 bags of debris were subsequently retrieved and placed in the licensee's multi-purpose facility for proper disposal as solid radioactive waste. Other corrective actions taken by the licensee included holding a radiation protection seminar on the required radio-analysis of volumetric material, and the requirement to label bags and not just drums of radioactive waste. The RP department's review of the event concluded that site communications between work groups relative to the off-site transportation of materials were not effectively controlled by specific procedural, work order, or other administrative requirements.

Analysis. The licensee's failure to control licensed material that was not in storage was a performance deficiency. The finding was more than minor, and therefore a finding, because it was associated with the human performance attribute of the Public Radiation Safety Cornerstone and adversely affected the cornerstone objective of assuring adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian nuclear reactor operation. Specifically, the loss of control of licensed material resulted in the release of contaminated items into the public domain and the potentially exposure to members of the public. Using IMC 0609, "Significance Determination Process," Attachment D, "Public Radiation Safety Significance Determination Process," February 12, 2008, the inspectors determined the finding to be of very low safety significance (Green) because the finding involved radioactive material control but it did not result in an exposure to the public in excess of five millirem. The finding has a cross-cutting aspect in the area of human performance, associated with work management, because the licensee did not implement a process of planning, controlling, and executing work activities such that safety was the priority. Specifically, the licensee did not control work activities involving multiple organizations such that radioactive material remained controlled on site [H.5].

Enforcement. Title 10 CFR 20.1802 requires, in part, that the licensee shall control and maintain constant surveillance of licensed material that is in a controlled or unrestricted area and that is not in storage. Contrary to the above, on May 25, 2013, the licensee did not control and maintain constant surveillance of licensed material that was in a controlled or unrestricted area and that was not in storage. Specifically, the licensee failed to control 14 bags of contaminated dirt and debris resulting in licensed radioactive material being inadvertently released from the site to a public landfill. Because the licensee entered this violation into its corrective action program as Condition Report CR CNS-2013-03992, it is being treated as a non-cited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy. (NCV 05000298/2015003-03, "Failure to Control Licensed Material.")

(2) Introduction. The inspectors identified a non-cited violation of 10 CFR 50.72(b)(2)(xi) because the NRC Operations Center was not notified within four hours of a reportable

event related to the health and safety of the public for which notification to other government agencies had been made. Specifically, in May 2013, the licensee did not notify the NRC of its notification to the State of Nebraska regarding an inadvertent release of 14 bags of radioactively contaminated dirt and debris to a public landfill.

Description. On May 29, 2013, the licensee informed the State of Nebraska Radiological Control Program administrator that they had inadvertently released contaminated debris for disposal at a public landfill, and that they planned to recover the material. However, the licensee did not notify the NRC Operations Center.

The licensee had determined that this event did not meet reportability requirements. However, licensee Procedure 2.0.5, "Reports to the NRC Operations Center," Revision 41, Attachment 2 stated, in part, that NUREG 1022 [Event Reporting Guidelines 10 CFR 50.72 and 50.73: Final Report, Revision 3] shall be referenced when making reportability decisions. Procedure 2.0.5 also required that all non-emergency events specified in 10 CFR 50.72(b) that occurred within 3 years from date of discovery were to be reported to the NRC Operations Center via the Emergency Notification System (ENS).

NUREG-1022, Section 3.2.12, "News Release or Notification of Other Government Agency" stated, in part, that, "The purpose of this criterion is to ensure that the NRC is made aware of issues that will cause heightened public or government concern related to the radiological health and safety of the public or on-site personnel or protection of the environment." NUREG-1022 further stated that "the following clarifications are intended to set a reporting threshold that ensures necessary reporting while minimizing unnecessary reporting. An example of an event likely to be reportable under this criterion includes the following: Release of radioactively contaminated tools or equipment to public areas."

The inspectors, in consultation with Office of Nuclear Reactor Regulation subject matter experts, determined that this notification met the threshold in 10 CFR 50.72(b)(2)(xi). This threshold is a specific requirement in station procedures or industry initiatives, in that, a notification to other government agencies was made on an event related to the health and safety of the public or protection of the environment.

The licensee notified the NRC Operations Center on August 26, 2015, when NRC inspectors identified that the license failed to meet the NRC's four-hour non-emergency report notification in accordance with 10 CFR Part 50.72(b)(2)(xi).

Analysis. This violation was evaluated using traditional enforcement because the failure to make a required report could adversely impact the NRC's regulatory process. Using the criteria contained in Section 6.9(d)(9) of the NRC's Enforcement Policy, this violation was determined to be Severity Level IV. The licensee entered this issue into their corrective action program as Condition Report CR-CNS-2015-0544. Traditional enforcement violations are not screened for cross-cutting aspects.

Enforcement. Title 10 CFR Part 50.72(b)(2)(xi) requires, in part, that the licensee shall notify the NRC as soon as practical and in all cases, within four hours of the occurrence of any event or situation related to the health and safety of the public for which notification to other government agencies has been or will be made. Such an event may include an inadvertent release of radioactively contaminated materials. Contrary to the

above, on May 29, 2013, the licensee did not notify the NRC within four hours of the notification to other government agencies of the inadvertent release of radioactively contaminated materials. Specifically, the NRC was not notified of the licensee's notification of the State of Nebraska of a release of 14 bags of radioactively contaminated dirt and debris to a public landfill. Because the licensee entered this violation into its corrective action program as Condition Report CR-CNS-2015-0544, the issue is being treated as a non-cited violation, consistent with Section 2.3.2.a of the NRC Enforcement Policy. (NCV 05000298/2015003-04, "Failure to Make a 10 CFR 50.72(b)(2)(xi) Notification.")

## 4. OTHER ACTIVITIES

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

### 4OA1 Performance Indicator Verification (71151)

Unplanned Scrams with Complications (IE04)

a. Inspection Scope

The inspectors reviewed the licensee's basis for including or excluding in this performance indicator each scram that occurred between July 1, 2014, and June 30, 2015. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the data reported.

These activities constitute verification of the unplanned scrams with complications performance indicator, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

### 4OA2 Problem Identification and Resolution (71152)

.1 Routine Review

a. Inspection Scope

Throughout the inspection period, the inspectors performed daily reviews of items entered into the licensee's corrective action program and periodically attended the licensee's condition report screening meetings. The inspectors verified that licensee personnel were identifying problems at an appropriate threshold and entering these problems into the corrective action program for resolution. The inspectors verified that the licensee developed and implemented corrective actions commensurate with the significance of the problems identified. The inspectors also reviewed the licensee's problem identification and resolution activities during the performance of the other inspection activities documented in this report.

b. Findings

No findings were identified.

.2 Annual Follow-up of Selected Issues

a. Inspection Scope

The inspectors selected three issues for an in-depth follow-up:

- On July 8, 2015, H2O2 analysis low flow trip and unplanned limited condition of operation entry, Division 1 and Division 2

  The inspectors assessed the licensee's problem identification threshold, cause analyses, extent of condition reviews and compensatory actions. The inspectors verified that the licensee appropriately prioritized the planned corrective actions and that these actions were adequate to correct the condition.

- On July 23, 2015, loss of shutdown cooling due to steam flashing in the residual heat removal or reactor recirculation systems

  The inspectors assessed the licensee's problem identification threshold, cause analyses, extent of condition reviews and compensatory actions. The inspectors verified that the licensee appropriately prioritized the planned corrective actions and that these actions were adequate to correct the condition.

- On September 2, 2015, main turbine bypass valve 2 failures to fully close

  The inspectors assessed the licensee's problem identification threshold, cause analyses, extent of condition reviews and compensatory actions. The inspectors verified that the licensee appropriately prioritized the planned corrective actions and that these actions were adequate to correct the condition.

These activities constitute completion of three annual follow-up samples, as defined in Inspection Procedure 71152.

b. Findings

Introduction. The inspectors reviewed a Green, self-revealing, non-cited violation of Technical Specification 5.4.1.a, associated with the licensee's failure to follow station procedures, which resulted in both divisions of primary containment H2O2 analyzers being inoperable.

Description. On June 2, 2015, a chemistry technician was sampling primary containment atmosphere in accordance with Station Procedure 8.8.12, "Primary Containment Oxygen or Noble Gas Activity Grab Sample Analysis," Revision 14, after completion of primary containment inerting. The primary containment atmosphere sample was conducted to confirm oxygen concentration was below the required 4 percent. After the primary containment atmosphere sample was completed the chemistry technician inadvertently closed primary containment sample isolation valve PC-V-337. This valve was not utilized by any step in Station Procedure 8.8.12.

The closure of PC-V-337 resulted in both divisions of primary containment H2O2 analyzers to trip on low pressure/flow. Operations personnel declared both divisions of primary containment H2O2 analyzers inoperable and entered Limited Condition of Operations 3.3.3.1, "Post Accident Monitoring Instrumentation," Conditions A and C, and restored them to an operable status in accordance with station procedures. The licensee entered this deficiency into their corrective action program as Condition Report CR-CNS-2015-03292.

The licensee performed an apparent cause evaluation for this issue, as documented in Condition Report CR-CNS-2015-03292. During their evaluation, the licensee determined that the chemistry technician mis-positioned PC-V-337 due to human error. The chemistry technician and supervisory personnel did not adequately assess and mitigate the risk present due to the combination of error precursors and multiple simultaneous requirements associated with sampling primary containment atmosphere.

Analysis. The licensee's failure to operate the correct primary containment isolation sample valve in support of primary containment atmosphere sampling, in violation of Station Procedure 8.8.12, was a performance deficiency. The performance deficiency was determined to be more than minor, and therefore a finding, because it was associated with the human performance attribute of the Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Question," dated June 19, 2012, inspectors determined that the finding was of very low safety significance (Green) because it: (1) was not a deficiency affecting the design or qualification of a mitigating structure, system, or component, and did not result in a loss of operability or functionality; (2) did not represent a loss of system and/or function; (3) did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time, or two separate safety systems out-of-service for longer than their technical specification allowed outage time; and (4) did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program. The finding has a human performance cross-cutting aspect within the avoid complacency area because the licensee failed to recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes, which resulted in individuals not implementing appropriate error reduction tools [H.12].

Enforcement. Technical Specification 5.4.1.a requires, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix A to Regulatory Guide 1.33, "Quality Assurance Program Requirements," of February 1978. Section 4.j of Regulatory Guide 1.33 recommends specific instructions (procedures) for energizing, filling, venting, draining, startup, shutdown, and changing modes of operation should be prepared, as appropriate for the following containment systems: (1) maintaining integrity; (2) containment ventilation system; and (3) inerting and deinerting. The licensee established Station Procedure 8.8.12, "Primary Containment Oxygen or Noble Gas Activity Grab Sample Analysis," Revision 14 to sample primary containment to confirm oxygen concentration after inerting was completed. Step 6.8 of station procedure 8.8.12 states the valves required for obtaining a primary containment sample are to be closed after completing the

sample. Contrary to the above, on June 2, 2015, the licensee failed to implement Station Procedure 8.8.12 and closed the wrong primary containment isolation sample valve not directed by procedure in support of a primary containment air sample after inerting was completed. This resulted in both divisions of primary containment H2O2 analyzers to trip on low pressure/low flow. Operations personnel declared both divisions of primary containment H2O2 analyzers inoperable and entered Limited Condition of Operations 3.3.3.1, "Post Accident Monitoring Instrumentation," Conditions A and C, and restored them to an operable status in accordance with station procedures. This violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy, because it was very low safety significance (Green) and was entered into the licensee's corrective action program as Condition Report CR-CNS-2015-03292. (NCV 05000298/2015003-05, "Failure to Follow Primary Containment Atmosphere Sampling Procedure")

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

These activities constitute completion of four event follow-up samples, as defined in Inspection Procedure 71153.

.1 (Closed) Licensee Event Report (LER) 05000298/2015001-00, "Valve Test Failures Result in a Condition Prohibited by Technical Specifications and a Loss of Safety Function"

a. Inspection Scope

On January 26, 2015, and February 11, 2015, five of the eight two-stage Target Rock safety relief valves pilot valve assemblies removed during Refueling Outage 28 failed to lift within the required lift setpoints of Surveillance Requirement 3.4.3.1 of Technical Specification 3.4.3, "Safety/Relief Valves and Safety Valves." Technical Specification 3.4.3 requires the safety function of seven safety relief valves and three safety valves to be operable. The nominal set pressure and tolerances for these valves are established in Surveillance Requirement 3.4.3.1.

The licensee demonstrated through an engineering analysis that reactor vessel integrity would not be challenged during an overpressure event. Additionally, the reactor safety limits would not have been challenged during an event of an anticipated operational occurrence.

The licensee determined the most probable cause was corrosion bonding and verified there was no binding of various kinds' present, foreign material inclusions, vibrations, and other mechanical effects.

The corrosion bonding occurs when the protective oxide layer of the seat and disc breaks down and allows a crevice corrosion process to develop between the seat and disc. The seat is machined and then lapped with the disc to create a tight fit with one another. The machining on both the seat and disc, the protective oxide layer that provides corrosion protection is removed. Because the safety relief valve pilot valves are then assembled, the oxide layer was not given time to re-establish itself naturally.

b. Findings

No findings were identified.

.2 (Closed) Licensee Event Report (LER) 05000298/2015002-00, "Failure of Main Steam Differential Pressure Indicating Switches Results in a Condition Prohibited by Technical Specifications and a Common Cause Inoperability of Independent Trains or Channels"

a. Inspection Scope

On February 19, 2015, during performance of surveillance procedures, three of the eight Division II main steam differential pressure indicating switches failed to trip prior to exceeding limits set in Technical Specification 3.3.6.1, "Primary Containment Isolation Instrumentation."

Prior to the failures, TSTF-493, "Clarify Application of Setpoint Methodology for Limiting Safety System Settings," was implemented concurrently with the station shifting from an 18-month to a 24-month refueling cycle. With the implementation of TSTF-493, the Technical Requirements Manual was revised to add a new section, T5.14, "Setpoint Control Program."

When the 24-month refueling cycle license amendment was implemented in 2012, all setpoint calculations and their related setpoint change requests were revised to make reference to Technical Requirements Manual T5.14. However, the main steam differential pressure indicating the switch's setpoint was inappropriately changed as the main steam differential pressure indicating switches are not in the Technical Requirements Manual.

The licensee's apparent cause evaluation revealed that prior to implementation of TSTF-493, the switches had an as-left tolerance of +/- 3.0 inches. When TSTF-493 was inappropriately applied, the as-left tolerance was adjusted to +/- 1.12 inches. This caused additional switch adjustments that normally would have been in tolerance in 2012 and 2014.

As part of the corrective actions, the calculations that did not require a setpoint change as part of TSTF-493 implementation were revised, new setpoint changes were generated, and surveillance procedures were revised to the pre-TSTF-493 values.

b. Findings

One licensee identified non-cited violation of NRC requirements was identified, documented in Section 4OA7 of this report.

.3 (Closed) Licensee Event Report (LER) 05000298/2015004-00, "Isolation of Shutdown Cooling Results in a Loss of Safety Function"

a. Inspection Scope

On May 30, 2015, the control room operators placed the Division II residual heat removal system in the shutdown cooling mode of operation in accordance with Station Procedure 2.2.69.2, "Residual Heat Removal Shutdown Operations," Revision 90, in support of Planned Outage 2015-01. The control room operators established an initial

cool down rate of 120 degrees Fahrenheit per hour for the first 20 minutes and lowered the cool down rate to approximately zero degrees Fahrenheit, to prevent exceeding the administrative cool down rate of 90 degrees Fahrenheit per hour. The high rate of cool down did not transfer the heat immediately to the shutdown cooling system due to thermal inertia time effects. Heat effects took time to affect the shutdown cooling system causing isolation of the shutdown cooling system isolation valves RHR-MOV-17 and RHR-MOV-18 due to localized pressure perturbations at the pressure sensors when the reactor plant was in Mode 4. The station entered Station Procedure 2.4SDC, "Shutdown Cooling Abnormal," Revision 14, and restored shutdown cooling in 22 minutes. The reactor coolant system temperature rose approximately 20 degrees Fahrenheit and did not exceed 212 degrees Fahrenheit, maintaining the reactor plant in Mode 4.

The licensee performed a root cause evaluation for this issue, as documented in Condition Report CR-CNS-2015-03188. During their evaluation, the licensee determined the loss of shutdown cooling was initiated by steam flashing in the shutdown cooling line. The flashing created a pressure transient, causing RHR-MOV-17 and RHR-MOV-18 to close. Specifically, the steam flashing occurred due to temperature along the shutdown cooling line being at or near saturation temperature, which caused localized boiling, then void collapse, creating the pressure perturbations. The pressure switches, RR-PS-128A and RR-PS-128B, actuated due to these pressure perturbations and caused the isolation of the shutdown cooling system. The licensee determined that the root cause was a design vulnerability associated with the location of the pressures switches near the reactor recirculation system. The contributing cause was incomplete procedural guidance with respect to the potential impacts of operating shutdown cooling with reactor coolant system temperatures are at or near saturation temperatures. Specifically, cautioning plant operators about the potential for creating pressure perturbation that could result in the isolation of the shutdown cooling system.

The licensee implemented the following corrective actions for the root cause and contributing cause: Corrective Action 1 - Root Cause - Develop procedural guidance that would allow plant operators to bypass the trip settings for Pressure Switches RR-PS-128A and RR-PS-128B, while the plant is in Modes 4 and 5. This is due to the fact that the pressure trips are only required in Modes 1, 2, and 3, since these are the only Modes in which the reactor is pressurized. These pressure trips isolate shutdown cooling to provide equipment protection, and to prevent an intersystem loss of coolant accident. Corrective Action 2 – Root Cause - (long term) Implements an engineering change request to move the location of the input pressure signals to address the system design vulnerability, while continuing to meet the requirements of Technical Specification 3.3.6.1, "Primary Containment Isolation Instrumentation." Corrective Action 3 – Contributing Cause - Implements a new methodology for achieving an appropriate cooldown rate, while placing the shutdown cooling system in operation. This methodology would optimize the cooldown, so that transition through saturation temperature (212 degrees Fahrenheit at atmospheric pressure) is achieved with minimum impact on system operation, and to mitigate the potential for isolation of the shutdown cooling system.

b. Findings

Introduction. The inspectors reviewed a Green, self-revealing, non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," associated with the inadequate extent of condition and extent of cause evaluations to preclude repetition for

a significant condition adverse to quality identified in a 2012 root cause evaluation documented CR-CNS-2012-07174 for the isolation of shutdown cooling system isolation valves RHR-MOV-17 and RHR-MOV-18 due to localized pressure perturbations at the pressure sensors.

Description. The inspectors reviewed the root cause evaluation for the loss of shutdown cooling that occurred on May 30, 2015, as documented in Condition Report CR-CNS-2015-03188. The inspectors noted a previous occurrence identified in a 2012 root cause evaluation documented in CR-CNS-2012-07174 for the isolation of shutdown cooling system isolation valves RHR-MOV-17 and RHR-MOV-18 due to localized pressure perturbations at the pressure sensors. The root cause evaluation conducted in 2012 resulted in the modification of Station Procedure 2.2.69.2, to add precautionary words concerning, approaching, or maintaining the temperature at or around 212 degrees Fahrenheit. However, the focus of the 2012 root cause evaluation and corrective actions, was on the initial heat up and flushing of the shutdown cooling system. It did not consider operations of shutdown cooling near or at 212 degrees Fahrenheit during shutdown operations. It did not address the potential for causing a similar pressure transient during these operational conditions outside of the initial heat up and flushing of the shutdown cooling system. In addition, the 2012 root cause made a determination that a modification to the system was not prudent, and that the modification to the operating procedure would be sufficient to preclude recurrence. This was also identified by the licensee during the organizational and programmatic weakness evaluation in the 2015 root cause evaluation, as documented in Condition Report 2015-03188 and associated corrective actions were developed. Additionally, the licensee's corrective actions associated with 2015 root cause evaluation for extent of condition and cause was not as narrowly focused as the root cause evaluation completed in 2012.

Analysis. The licensee's failure to conduct an adequate extent of cause and condition evaluation to preclude repetition of a significant condition adverse to quality identified in a 2012 root cause evaluation documented in CR-CNS-2012-07174 was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the equipment performance attribute of the Initiating Events Cornerstone, and affected the associated cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown. Specifically, the failure to preclude repetition of the isolation of shutdown cooling system isolation valves RHR-MOV-17 and RHR-MOV-18 due to localized pressure perturbations at the pressure sensors led to the isolation of the shutdown cooling system for approximately 22 minutes when the reactor plant was in Mode 4 on May 30, 2015. Using Inspection Manual Chapter 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Process Phase 1 Initial Screening and Characterization of Findings," dated May 9, 2014, inspectors determined that the finding did not require a quantitative assessment because adequate mitigating equipment remained available, and the finding did not constitute a loss of control, as defined in Appendix G. Therefore, the finding screened as a very low safety significance (Green). The inspectors determined that the finding did not have a cross-cutting aspect because the most significant contributor of this finding occurred in 2012, and does not reflect current licensee performance.

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," states, in part, that in the case of a significant condition adverse to quality, the measures shall assure that the cause of the condition is determined and corrective actions taken to

preclude repetition. Contrary to the above, on November 13, 2012, the licenses failed to establish measures to conduct an adequate extent of cause and condition evaluation to preclude repetition of significant condition adverse to quality identified in a 2012 root cause evaluation documented in CR-CNS-2012-07174. Specifically, in 2012, the licensee failed to conduct an adequate extent of cause and condition evaluation to preclude repetition of the isolation of shutdown cooling system isolation valves RHR-MOV-17 and RHR-MOV-18 due to localized pressure perturbations at the pressure sensors. This significant condition adverse to quality led to the isolation of the shutdown cooling system for approximately 22 minutes when the reactor plant was in Mode 4 on May 30, 2015. The station entered Station Procedure 2.4SDC, "Shutdown Cooling Abnormal," Revision 14, and restored shutdown cooling. The reactor coolant system temperature increased approximately 20 degrees Fahrenheit but did not exceed 212 degrees Fahrenheit, maintaining the reactor plant in Mode 4. This violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy, because it was very low safety significance (Green) and was entered into the licensee's corrective action program as Condition Report CR-CNS-2015-03188. (NCV 05000298/2015003-06, "Failure to Preclude Repetition for a Significant Condition Adverse to Quality")

.4 Event Notification 51240 Retraction

a. Inspection Scope

On August 18, 2015, the licensee retracted Event Notification 51240 reported on July 18, 2015, which stated that during surveillance testing of Z sump, Z2 pump run time was found to exceed its upper augmented inservice testing limit, rendering it non-functional. Operators continued with the surveillance, opening the power supply breaker to Z1 sump pump. The function of the Z sump is to limit condensation build up in the common standby gas treatment system discharge line to support standby gas treatment operability. One Z sump pump is required to be functional to support standby gas treatment operability. With both Z sump pumps non-functional, operability of both trains of standby gas treatment was not assured. The loss of both trains of standby gas treatment was a loss of safety function for control of radioactive release and accident mitigation in accordance with 10 CFR 50.72(b)(3)(v)(C) and 50.72(b)(3)(v)(D).

The inspectors reviewed the basis for the retraction and reviewed NUREG-1022, "Event Reporting Guidelines," Revision 3, to ensure licensee compliance. Specifically, the licensee determined the initial water insurge during a design basis accident was less than previously documented. Therefore, the actual upper augmented inservice testing limit was higher than previously documented maintaining functionality of Z2 pump and operability of both trains of standby gas treatment systems.

b. Findings

No findings were identified.

## 4OA6 Meetings, Including Exit

Exit Meeting Summary

On August 27, 2015, the inspectors presented the radiation safety inspection results to Mr. O. Limpias, Vice President-Nuclear and Chief Nuclear Officer, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed. Additionally, the inspectors conducted a telephonic exit meeting with Mr. R. Penfield, Director Nuclear Safety Assurance, and other members of the licensee staff on September 17, 2015.

On September 21, 2015, the inspector conducted a telephonic exit meeting to present the results of the in-office inspection of changes to the licensee's emergency plan and emergency action levels to Mr. J. Stow, Manager, Emergency Preparedness, and other members of the licensee staff. The licensee acknowledged the issues presented.

On September 28, 2014, the inspectors presented the inspection results to D. Buman, Director of Engineering, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On October 1, 2015, the inspectors presented the inspection results to Mr. O. Limpias, Vice President-Nuclear and Chief Nuclear Officer, and other members of the licensee staff. The licensee acknowledged the issues presented. Additionally, on October 5, 2015, the inspectors conducted a re-exit meeting with Mr. J. Shaw, Licensing Manager, and another member of the licensee staff, to describe a change to the basis of a performance deficiency. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

## 4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of the NRC Enforcement Policy for being dispositioned as non-cited violations.

- Technical Specification 3.3.6.1, "Primary Containment Isolation Instrumentation," Action A.1, requires that inoperable high main steam line flow isolation channel(s) be placed in trip in 12 hours. Contrary to the above, from November 21, 2014, to February 19, 2015, the licensee failed to place three inoperable Division II high main steam line flow isolation channels in trip within 12 hours, because the licensee failed to properly implement the requirements of TSTF-493, "Clarify Application of Setpoint Methodology for Limiting Safety System Settings," for main steam differential pressure indicating switches. The licensee recalibrated the main steam differential pressure indicating switches in question and re-stored the setpoints to the pre TSTF-493 values. The performance deficiency was more than minor, and therefore a finding, because it was associated with the design control attribute of the Barrier Integrity Cornerstone, and affected the associated cornerstone objective to ensure the containment functionality was maintained. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, inspectors determined that the finding screened as having very low safety significance (Green) because it did not represent an actual: (1) open pathway in the physical integrity of

reactor containment (valves, airlocks, etc.) containment isolation system (logic and instrumentation), and heat removal components; and (2) reduction in function of hydrogen igniters in the reactor containment. The license entered this deficiency into the corrective action program as Condition Report CR-CNS-2015-03315.

- Technical Specification 5.4.1.a requires, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix A to Regulatory Guide 1.33, "Quality Assurance Program Requirements," of February 1978. Section 8.b of Regulatory Guide 1.33 recommends that specific procedures for surveillance tests, inspections, and calibrations should be written (implementing procedures are required for each surveillance test, inspection, or calibration listed in the technical specification) for containment leak-rate and penetration leak-rate tests. The licensee maintains Station Procedure 6.PC.524, "Primary Containment Airlock Local Leak Rate Tests," Revision 21 for containment and penetration local leak-rate testing for the primary containment personnel airlock. Contrary to the above, until June 3, 2015, the licensee failed to maintain procedure 6.PC.524 to provide surveillance testing guidance to test the inner personnel airlock equalization valve in the accident direction. This condition resulted in surveillance tests not being performed within their specified frequency and questioned operability of the inner personnel airlock equalization valve. The station implemented the requirements of Surveillance Requirement 3.0.3 and conducted a risk evaluation to determine that integrated leak rate test conducted in Refueling Outage 27 tested the inner personnel airlock equalization valve in the accident condition providing reasonable expectation of operability. The performance deficiency was determined to be more than minor because it was associated with the procedure quality attribute of the Barrier Integrity Cornerstone, and affected the associated cornerstone objective to ensure the containment functionality was maintained. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, inspectors determined that the finding screened as having very low safety significance (Green) because it did not represent an actual: (1) open pathway in the physical integrity of reactor containment (valves, airlocks, etc.) containment isolation system (logic and instrumentation), and heat removal components; and (2) reduction in function of hydrogen igniters in the reactor containment. The license entered this deficiency into the corrective action program Condition Report CR-CNS-2015-00986.

## SUPPLEMENTAL INFORMATION

## KEY POINTS OF CONTACT

Licensee Personnel

A. Albe, Instrumentation and Controls Engineering Supervisor
D. Anderson, Radiological Operations Supervisor, Radiation Protection
T. Baker, Engineering Program and Components Manager
J. Bebb, Staff Health Physicist, Radiation Protection
J. Bednar, Technical Supervisor, Radiation Protection
L. Dewhirst, Corrective Action and Assessment Manager
K. Dia, System Engineering Manager
R. Estrada, Design Engineering Manager
J. Flaherty, Senior Licensing Engineer
K. Fike, Plant Chemist, Chemistry
T. Forland, Licensing Engineer
G. Gardner, NSSS Engineering Supervisor
D. Goodman, Operations Manager
O. Limpias, Vice President-Nuclear and Chief Nuclear Officer Nebraska Public Power District
E. Nelson, Component Programs Engineering Supervisor
S. Nelson, Risk/Fire Programs Engineering Supervisor
J. Olberding, Licensing Specialist, Regulatory Affairs
S. Oldfield, Technician, Chemistry
R. Penfield, Director Nuclear Safety Assurance
R. Racek, Superintendent, Instrument and Control
T. Robinson, Engineer
J. Shaw, Licensing Manager
C. Stipp, Corporate Environmental Coordinator
D. Stuhr, Engineer
T. Sutton, Engineering Technician
B. Swobada, Engineer
K. Tanner, Supervisor, Radiation Protection
J. Teten, Plant Chemist, Chemistry
D. Van Der Kamp, Manager, Licensing
B. Voss, Manager, Refueling Services/Refuel Floor
A. Walters, Chemistry Manager
C. Walters, Engineer
W. Williams, Specialist, Radiation Protection
M. Willmar, Engineer
K. Wood, Contractor - Design Engineering

NRC Personnel

R. Hsu, Senior Mechanical Engineer
S. Park, Structural Engineer
J. Pires, Senior Technical Advisor for Civil/Structural Engineering
F. Sock, Structural Engineer

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

| | | |
|---|---|---|
| 05000298/2015003-01 | NCV | Failure to Ensure Turbine Building Design Calculation was Correct and Justified (Section 1R04) |
| 05000298/2015003-02 | NCV | Failure to Ensure Measurement Conditions Were Consistent With Instrument Calibration (Section 2RS5) |
| 05000298/2015003-03 | NCV | Failure to Control Licensed Material (Section 2RS8) |
| 05000298/2015003-04 | NCV | Failure to Make a 10 CFR 50.72(b)(2)(xi) Notification (Section 2RS8) |
| 05000298/2015003-05 | NCV | Failure to Follow Primary Containment Atmosphere Sampling Procedure (Section 4OA2) |
| 05000298/2015003-06 | NCV | Failure to Preclude Repetition for a Significant Condition Adverse to Quality (Section 4OA3) |

Closed

| | | |
|---|---|---|
| 05000298/2015001-00 | LER | Valve Test Failures Result in a Condition Prohibited by Technical Specifications and a Loss of Safety Function (Section 4OA3) |
| 05000298/2015002-00 | LER | Failure of Main Steam Differential Pressure Indicating Switches Results in a Condition Prohibited by Technical Specifications and a Common Cause Inoperability of Independent Trains or Channels (Section 4OA3) |
| 05000298/2015004-00 | LER | Isolation of Shutdown Cooling Results in a Loss of Safety Function (Section 4OA3) |

## LIST OF DOCUMENTS REVIEWED

### Section 1R01: Adverse Weather Protection

Miscellaneous Documents

| Number | Title | Revision |
|---|---|---|
| 11-126 | NEDC, Reactor Building/Yard-HPCI Hatch | 0 |
| 012450 | SL, Cooper Nuclear Station Flood Hazard Reevaluation Report | 0 |
| 6033644 | Change Evaluation Document, External Flood Barriers | 0 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 2.2.39 | Operations Procedure, HVAC Diesel Generator Building | 29 |
| 5.3Grid | Emergency Procedure, Degraded Grid Voltage | 42 |
| 7.0.11 | Maintenance Procedure, Flood Control Barriers | 30 |

Condition Reports (CRs)

| | | | |
|---|---|---|---|
| CR-CNS-2012-10495 | CR-CNS-2013-03745 | CR-CNS-2013-08467 | CR-CNS-2014-02440 |
| CR-CNS-2015-04006 | CR-CNS-2015-04014 | CR-CNS-2015-04027 | |

**Section 1R04: Equipment Alignment**

Miscellaneous Documents

| Number | Title | Revision |
|---|---|---|
| 06-025 | Engineering Evaluation, Implementation of Alternative Source Term LOCA Analysis | 0 |
| 10-073 | Engineering Evaluation, Deletion of Type C Testing of One Barrier due to Closed Loop Analysis for 9 Pens | 0 |
| 13-028 | NEDC, Ultimate Internal Pressure of Turbine Building Blowout Panels and Metal Wall System | 1 |
| 13-041 | Engineering Evaluation, Turbine Building Blowout Panels/Metal Wall System | 2 |
| 94-142 | NEDC, Core Spray Flows with Minimum Flow Bypass Valve Open | 5 |
| 94-230 | NEDC, Vessel Head-Over-Drywell Capacity Curve for Input Into ECCS Analysis | 5 |
| 94-258 | NEDC, Technical Specification Acceptance Criteria for LPCI Pumps flowing at 7800 pgm | 3 |
| 2007-019 | Licesning Basis Design Change Request | |
| 2040 Sheet 1 | Burns and Roe, Cooper Nuclear Station Flow Diagram Residual Heat Removal System | N82 |
| 2040 Sheet 1 | Burns and Roe, Cooper Nuclear Station Flow Diagram Residual Heat Removal System Loop B | 19 |
| 2045 Sheet 1 | Burns and Roe, Cooper Nuclear Station Flow Diagram Core Spray System | N58 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 0.33 | Station Procedure, Personnel Safety Equipment | 35 |
| 3.40 | Engineering Procedure, Primary Containment Leakage Rate Testing Program | 11 |
| 6.PC.516 | Surveillance Procedure, Reactor Equipment Cooling Local Leak Rate Tests | 13 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 6.PC.524 | Surveillance Procedure, Primary Containment Airlock Local Leak Rate Tests | 21 |
| 13.1 | Performance Evaluation Procedure, ECCS Leakage Evaluation | 8 |

Condition Reports (CRs)

CR-CNS-2013-02068 CR-CNS-2015-02718 CR-CNS-2015-03315 CR-CNS-2015-03950
CR-CNS-2015-04733

**Section 1R05: Fire Protection**

Miscellaneous Documents

| Number | Title | Revision |
|---|---|---|
| FP15-FP-SD-23 | Fire Impairment | |
| FP15-HV-AD-AD1551 | Fire Impairment | |
| 2015-0425 | Barrier Control Permit | |
| 2016 Sheet 1A | Burns and Roe, Flow Diagram Fire Protection Service Buildings and Yard Cooper Nuclear Station | N08 |
| 2016 Sheet 7 | Burns and Roe, Cooper Nuclear Station Fire Protection System Site Plan Flow Diagram | |

Procedures

| Number | Title | Revision |
|---|---|---|
| 0.23 | Station Procedure, CNS Fire Protection Plan | 72 |
| 0.39.1 | Station Procedure, Fire Watches and fire Impairments | 13 |
| 6.FP.101 | Surveillance Procedure, Fire Pump Operability Test | 37 |
| 6.FP.204 | Surveillance Procedure, Fire Door Examination | 17 |
| 6.FP.603 | Surveillance Procedure, Fire Hose Station Examination | 12 |
| 6.FP.606 | Surveillance Procedure, Fire Barrier/Fire Wall Visual Examination | 24 |

Condition Reports (CRs)

CR-CNS-2015-04556 CR-CNS-2015-05002

Work Orders

| | | | | |
|---|---|---|---|---|
| 4933348 | 5001255 | 5012861 | 5013159 | 5042661 |
| 5089532 | | | | |

**Section 1R06: Flood Protection Measures**

Miscellaneous Documents

| Number | Title | Revision |
|---|---|---|
| 00-095D | NEDC, HELB EQ-Reactor Building Pressure/Temperature Response | 1 |
| 01-057 | Engineering Evaluation, Class I Restrained-Seismic Design Basis of Class IIS Piping | 0 |
| 09-102 | NEDC, Internal Flooding – HELB, MELB, and Feedwater Line Break | 1 |
| 13-030 | Engineering Evaluation, Internal Flooding – HELB, MELB, and Feedwater Line Break | 0 |
| 2031 Sheet 1 | Burns and Roe, Flow Diagram Reactor Building – Closed Cooling Water System Cooper Nuclear Station | |
| 2031 Sheet 2 | Burns and Roe, Flow Diagram Reactor Building – Closed Cooling Water System Cooper Nuclear Station | N65 |
| 2042 Sheet 1 | Burns and Roe, Cooper Nuclear Station Flow Diagram Reactor Water Clean-up System | N35 |
| 6034801 | Change Evaluation Document, NFPA 805 Cable Tray Radiant Energy Heat Shields | 0 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 2.3_M-1 | Operations Procedure, Panel M-Annunciator M-1 | 17 |
| 2.3_M-2 | Operations Procedure, Panel M-Annunciator M-2 | 16 |
| 5.2REC | Emergency Procedure, Loss of REC | 16 |

Condition Reports (CRs)

CR-CNS-2014-01203

Work Orders

| | |
|---|---|
| 5008439 | 5013120 |

**Section 1R11: Licensed Operator Requalification Program and Licensed Operator Performance**

Procedures

| Number | Title | Revision |
|---|---|---|
| 0.5OPS | Station Procedure, Operations Review of Condition Reports/Operability Determination | 53 |
| 2.0.3 | Operations Procedure, Conduct of Operations | 88 |
| 2.1.10 | Operations Procedure, Station Power Changes | 107 |

**Section 1R12: Maintenance Effectiveness**

Miscellaneous Documents

| Number | Title | Revision |
|---|---|---|
| 07-082 | NEDC, Radiological Dose Analysis for a Loss of Coolant Accident at Cooper Nuclear Station | 4 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 13.1 | Performance Evaluation Procedure, ECCS Leakage Evaluation | 8 |

Condition Reports (CRs)

| | | | |
|---|---|---|---|
| CR-CNS-2012-10201 | CR-CNS-2013-00646 | CR-CNS-2013-07364 | CR-CNS-2015-00531 |
| CR-CNS-2015-03008 | CR-CNS-2015-03022 | CR-CNS-2015-06054 | |

Work Orders

4946640 5069272

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

Procedures

| Number | Title | Revision |
|---|---|---|
| 0-CNS-WM-104 | Administrative Procedure, On-line Schedule Risk Assessment | 2 |
| 0-Protect-Eqp | Administrative Procedure, Protected Equipment Program | 34 |
| 2.2.19 | Operations Procedure, 480 VAC Auxiliary Power Distribution System | 47 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 5.3Grid | Emergency Procedure, Degraded Grid Voltage | 42 |

Condition Reports (CRs)

| | | | |
|---|---|---|---|
| CR-CNS-2015-03008 | CR-CNS-2015-04006 | CR-CNS-2015-04011 | CR-CNS-2015-04014 |
| CR-CNS-2015-04498 | | | |

Work Orders

| | | | | |
|---|---|---|---|---|
| 4918031 | 5002285 | 5002485 | 5004454 | 5012107 |
| 5012638 | 5012645 | 5013050 | 5022427 | 5022679 |

**Section 1R15: Operability Determinations and Functionality Assessments**

Procedures

| Number | Title | Revision |
|---|---|---|
| 0.26 | Station Procedure, Surveillance Program | 68 |
| 0.40 | Station Procedure, Work Control Program | 89 |
| 0.5OPS | Station Procedure, Operations Review of Condition Reports/Operability Determination | 53 |
| 2.0.12 | Operations Procedure, Operator Challenges | 10 |
| 6.CRD.201 | Surveillance Procedure, North and South SDV Vent and Drain Valve Cycling, Open Verification, and Timing Test | 22 |

Condition Reports (CRs)

| | | | |
|---|---|---|---|
| CR-CNS-2014-09014 | CR-CNS-2015-00458 | CR-CNS-2015-01019 | CR-CNS-2015-01046 |
| CR-CNS-2015-01903 | CR-CNS-2015-03038 | CR-CNS-2015-03953 | CR-CNS-2015-03958 |
| CR-CNS-2015-04027 | CR-CNS-2015-04251 | CR-CNS-2015-05006 | |

Work Orders

| | | | | |
|---|---|---|---|---|
| 4934145 | 4907476 | 5012257 | 5022677 | 5050088 |
| 5054927 | 5061642 | 5069272 | 5072488 | 5079458 |

**Section 1R18: Plant Modifications**

Miscellaneous Documents

| Number | Title | Revision |
|---|---|---|
| | ASCE-WRC, Plastic Design in Steel: A Guide and Commentary | 2nd Edition |
| 00-93 | NEDC, Review of MPR Report 1876, Part 6, EPRI PPM for RCIC-MOV-MO21 | 1 |
| 06-014 | Engineering Evaluation, Design Basis Stroke Time Requirements for Various Power Operated Valves | 1 |
| 13-028 | NEDC, Ultimate Internal Pressure of Turbine Building Blowout Panels and Metal Wall System | 1 |
| 13-041 | Engineering Evaluation, Turbine Building Blowout Panels/Metal Wall System | 2 |
| 13-048 | NEDC, Analysis of Service Water and Circulation Water Monitoring Tap Piping Connections | 0 |
| 13-050 | NEDC, Analysis of Service Water Coupon Holder and Chemical Injection Quill Piping Connections | 0 |
| Docket Number 50-298 | Nebraska Public Power District, Cooper Nuclear Station, Final Safety Analysis Report, Pipe Break Study | Amendment 25 |
| 90-039 | NEDC, DC Powered Motor Operator Valve Stroke Time and Capability Calculation | 7 |
| 5009584 | Engineering Change, Replacement of RR-TR-165 with a Yokogawa | 0 |
| 6034480 | Change Evaluation Document, CW/SW Chemical Injection Taps | 0 |
| 01-0840-1115 | EDS Report, Cooper Nuclear Station Environmental Effects Due to Pipe Rupture | 0 |
| 0840-002-3.0 | Calculation, IE Bulletin 79-01B T/H Analysis Environmental Analysis Outside Containment | 0 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 6.RCS.601 | Surveillance Procedure, Technical Specification Monitoring of RCS Heatup/Cooldown Rate | 21 |

Condition Reports (CRs)

CR-CNS-2015-03337 CR-CNS-2015-03794 CR-CNS-2015-05006

Work Orders

| | | | | |
|---|---|---|---|---|
| 4983493 | 4996535 | 4996536 | 4996537 | 5000279 |
| 5009015 | | | | |

**Section 1R19: Post-Maintenance Testing**

Miscellaneous Documents

| Number | Title | Revision |
|---|---|---|
| 1040 | Vendor Manual, Electrical Equipment | 21 |
| 5009584 | Engineering Change, Replacement of RR-TR-165 with a Yokogawa | 0 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 0-Barrier | Administrative Procedure, Barrier Control Program | 20 |
| 2.4RR | Operations Procedure, Reactor Recirculation Abnormal | 42 |
| 6.FP.101 | Surveillance Procedure, Fire Pump Operability Test | 37 |
| 6.FP.102 | Surveillance Procedure, Station Fire Pump Surveillance Testing | 34 |
| 6.MISC.401 | Surveillance Procedure, Position Indicator Inservice Testing (IST) | 17 |
| 6.RCS.601 | Surveillance Procedure, Technical Specification Monitoring of RCS Heatup/Cooldown Rate | 21 |
| 6.SLC.101 | Surveillance Procedure, SLC Pump Operability Test | 23 |
| 6.1CS.101 | Surveillance Procedure, Core Spray Test Mode Surveillance Operation | 28 |
| 6.1CS.201 | Surveillance Procedure, CS Motor Operated Valve Operability Test (IST)(DIV 1) | 17 |
| 7.2.77 | Maintenance Procedure, Concert Anchor Installation | 14 |
| 7.2.85 | Maintenance Procedure, Reactor Recirculation Motor Generator “B” Scoop Tube Clamping Procedure | 4 |
| 7.3.20.3 | Maintenance Procedure, Motor Analysis | 18 |
| 7.3.28 | Maintenance Procedure, Crimping Tool Calibration and Lug Selection | 21 |
| 7.3.28.1 | Maintenance Procedure, Lead Removal/Installation and Lug Installation | 30 |
| 7.3.55 | Maintenance Procedure, Raceway Installation | 13 |

Condition Reports (CRs)

CR-CNS-2015-03337

Work Orders

| | | | | |
|---|---|---|---|---|
| 4918031 | 4933348 | 4967748 | 4999493 | 5002285 |
| 5002485 | 5002491 | 5009015 | 5012107 | 5012638 |
| 5012645 | 5012861 | 5013050 | 5013159 | 5022427 |
| 5022679 | 5040403 | 5042661 | 5081822 | 5089532 |

**Section 1R22: Surveillance Testing**

Miscellaneous Documents

| Number | Title | Revision |
|---|---|---|
| 12-019 | NEDC, Service Water – LOCA Flow Test Revised Acceptance Criteria | 0 |
| 94-21 | NEDC, REC-HX-A and REC-HX-B Maximum Allowable Accident Case Fouling | 6C1 |
| 94-34C | NEDC, USAR Case E and F Containment Analysis | 4 |
| 94-142 | NEDC, Core Spray Flows with Minimum Flow Bypass Valve Open | 5 |
| 94-230 | NEDC, Vessel Head-Over-Drywell Capacity Curve for Input Into ECCS Analysis | 5 |
| 94-258 | NEDC, Technical Specification Acceptance Criteria for LPCI Pumps Flowing at 7800 pgm | 3 |
| 32973P | NEDC, Safety Analysis Evaluations Relative to Measurement Uncertainties for BWR/4 Improved Standard Technical Specifications | 0 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 6.PRS.302 | Surveillance Procedure, Main Turbine Stop Valve Closure and Stem Valve Functional Test | 52 |
| 6.1CS.101 | Surveillance Procedure, Core Spray Test Mode Surveillance Operation (IST)(DIV 1) | 28 |
| 6.1RHR.101 | Surveillance Procedure, RHR Test Mode Surveillance Operation (IST)(DIV 1) | 33 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 6.1SW.101 | Surveillance Procedure, Service Water Surveillance Operation (DIV 1)(IST) | 45 |
| 6.2CS.101 | Surveillance Procedure, Core Spray Test Mode Surveillance Operation (IST)(DIV 2) | 26 |
| 6.2REC.101 | Surveillance Procedure, REC Surveillance Operation (IST)(DIV 2) | 13 |

Condition Reports (CRs)

CR-CNS-2015-04384

**Section 1EP6: Drill Evaluation**

Miscellaneous Documents

| Number | Title | Revision |
|---|---|---|
| 5.7.1 | EPIP, Emergency Classification | 52 |
| 5.7.1 Attachment 4 | EPIP, Cooper Nuclear Station Emergency Action Level Matrix – Modes 1, 2, 3 | 11 and 12 |
| 6A | EOP, Failure to Scram | 16 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 5.1Quake | Emergency Procedure, Earthquake | 12 |

**Section 2RS05: Radiation Monitoring Instrumentation**

Audits and Self-Assessments

| Number | Title | Date |
|---|---|---|
| QA-Audit 14-04 | Radiological Controls | September 9, 2014 |
| LO-2013-0032-007 | Timeliness Restoration of TRM and ODAM Effluent Monitoring Instrumentation | November 7, 2013 |

Effluent Monitor Calibration Records

| Number | Title | Date |
|---|---|---|
| 4943965 | Off-Gas Flow Monitor Calibration Check | February 9, 2015 |
| 4946720 | Turbine Building Ventilation Backup Sampling System RMV-RM-5 Calibration and Functional Test | March 9, 2015 |

Effluent Monitor Calibration Records

| Number | Title | Date |
|---|---|---|
| 4946723 | Radwaste Building Ventilation Backup Sampling System RMV-RM-6 Calibration and Functional Test | March 25, 2015 |
| 4946796 | Liquid Radwaste Effluent System Channel Calibration | February 26, 2015 |
| 4996820 | ERP Kaman Monitor Channel Calibration | May 7, 2015 |

Installed Instrument Calibration Records

| Number | Title | Date |
|---|---|---|
| RMA-ES-53B | Reactor Building CS Pump Room Southeast, 859’ | August 24, 2015 |
| RMA-ES-53A | Reactor Building Fuel Pool Area, 1001’ | August 20, 2015 |

Miscellaneous Documents

| Title | Date |
|---|---|
| Certificate of Calibration – JL Shepherd 89 | September 10, 2014 |
| Cooper Nuclear Station Off-site Dose Assessment Manual | August 27, 2014 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 9.ALARA.3 | Operation of the CANBERRA FASTSCAN Whole Body Counter | 16 |
| 9.INST.10 | EBERLINE Model PM-7/PM-12 Portal Monitor | 7 |
| 9.INST.11 | Calibration/Verification of NIST Traceable Radioactive Sources | 2 |
| 9.INST.14 | TENNELEC ECLIPSE LB Operation | 3 |
| 9.INST.15 | REM 500 Neutron Survey Meter | 1 |
| 9.INST.16 | RMS-3 Criticality Monitor | 0 |
| 9.INST.27 | Dual Source Model 89 Gamma Calibration Range | 4 |
| 9.INST.37 | Constant Air Monitors | 13 |
| 9.INST.45 | Area Radiation Monitor EBERLINE Model EC4-X | 1 |
| 9.INST.53 | Ion Chamber Survey Instrument; EBERLINE Models RO-2, R0-2A, and RO-20 | 6 |
| 9.INST.56 | Portable Alpha Meter Ludlum Model 2 and Model 3 | 3 |
| 9.INST.61 | Merlin Gerin AMP-100/AMP-200 Underwater Survey Meter | 3 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 9.INST.64 | Thermo Electron Corporation Small Articles Monitor SAM | 2 |
| 9.INST.65 | Constant Air Monitor EBERLINE Model AMS-4 | 6 |
| 9.INST.67 | Thermo Fisher Personnel Contamination Monitor Model iPCM-12 | 1 |
| 15.ARM.301 | Area Radiation Monitors Functional Test | 11 |
| 9.EN-RP-311 | Electronic Alarming Dosimeters | 3 |
| 6.2PRM.305 | Off-Gas Radiation Monitor Channel Calibration | 18 |
| 6.PRM.309 | ERP Kaman Monitor Channel Functional Test | 13 |
| 6.PRM.310 | ERP Kaman Monitor Channel Calibration | 27 |
| 6.PRM.322 | Containment High Range Area Monitor Channel Calibration | 18 |
| 6.PRM.323 | High Range Containment Monitor Victoreen Model 875 Source Calibration Check | 7 |
| 6.PRM.326 | Drywell Air Sampling Calibration Known Source Calibration | 13 |
| 6.PRM.327 | Drywell Air Sampling System Electronic Channel Calibration | 18 |
| 4.15 | Elevated Release Point and Building Kaman Radiation Monitoring Systems | 50 |
| 8.8ERP | Particulate and Iodine Sample Collection for ERP Effluent | 12 |
| 8-CNS-CY-110 | Canberra APEX Gamma Spectroscopy System Operation | 1 |

Radiation Protection Instrument Calibration Records

| Number | Title | Date |
|---|---|---|
| | Calibration of the Canberra Fastscan Whole Body Counting System | May 28, 2015 |
| 12049 | Small Article Monitor 12 | December 8, 2014 |
| 1586 | RO20 | October 16, 2014 |
| 553 | Personnel Contamination Monitor | December 10, 2014 |
| 1207 | Portal Monitor | October 22, 2014 |
| 430 | REM 500 Neutron Survey Meter | March 30, 2015 |
| 10972 | Ludlum Model 3 Frisker | Augusts 10, 2014 |
| 12048 | JPCM 12 | October 22, 2014 |
| 1611 | AMS 4 | March 16, 2015 |
| 11227 | AMP 200 | October 17, 2014 |

Condition Reports (CRs)

| | | | |
|---|---|---|---|
| CR-CNS-2013-03992 | CR-CNS-2013-04997 | CR-CNS-2013-05733 | CR-CNS-2013-06125 |
| CR-CNS-2013-06300 | CR-CNS-2013-06453 | CR-CNS-2013-07540 | CR-CNS-2013-08192 |
| CR-CNS-2014-00819 | CR-CNS-2014-01991 | CR-CNS-2014-02218 | CR-CNS-2014-02220 |
| CR-CNS-2014-02453 | CR-CNS-2014-02580 | CR-CNS-2014-05325 | CR-CNS-2014-06098 |
| CR-CNS-2014-06112 | CR-CNS-2015-00065 | CR-CNS-2015-00076 | CR-CNS-2015-00425 |
| CR-CNS-2015-01648 | CR-CNS-2015-02324 | CR-CNS-2015-02412 | CR-CNS-2015-02748 |
| CR-CNS-2015-03916 | | | |

**Section 2RS6: Radioactive Gaseous and Liquid Effluent Treatment**

Liquid Radwaste Release Permits

| Number | Title | Date |
|---|---|---|
| 13-01 | Liquid Radioactive Waste Discharge | June 8, 2013 |
| 13-02 | Liquid Radioactive Waste Discharge | June 20, 2013 |

Miscellaneous Documents

| Number | Title | Date |
|---|---|---|
| | Off-site Dose Assessment Manual for Gaseous and Liquid Effluents | August 27, 2014 |
| | Results of Radiochemistry Cross Check Program | May 15, 2015 |
| | CNS System Health Report | June 2015 |
| 2013 | Radioactive Effluent Release Report January 1, 2013 through December 31, 2013 | April 2014 |
| 2014 | Radioactive Effluent Release Report January 1, 2014 through December 31, 2014 | April 2015 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 6.1SGT.501 | SGT A Carbon Sample, Carbon Adsorber And HEPA Filter In-Place Leak Test, And Components Leak Test (Div 1) | 13 |
| 6.2SGT.501 | SGT B Carbon Sample, Carbon Adsorber And HEPA Filter In-Place Leak Test, And Components Leak Test (Div 2) | 16 |
| 8.11.1 | Effects Program | 19 |
| 8.8.11 | Liquid Radioactive Waste Discharge Authorization | 32 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 8.8.15 | Noble Gas and Tritium Sample Collection for Effluent Monitors and Drywell Air Monitor | 9 |
| 8.8.4 | Off-Gas Grab Samples Isotopic Analysis | 25 |
| 8.8ERP | Particulate and Iodine Sample Collection for ERP Effluent | 12 |
| 8.8MPF | Particulate and Iodine Sample Collection for MPF Effluent | 7 |
| 8.8RW | Particulate and Iodine Sample Collection for Radwaste Building Effluent | 9 |
| 8.8TB | Particulate and Iodine Sample Collection for Turbine Building Effluent | 9 |

Standby Gas Treatment System Filter Leak Tests

| Number | Title | Date |
|---|---|---|
| 4943766 | SGT B Carbon Sample, Carbon Adsorber And HEPA Filter In-Place Leak Test, And Components Leak Test (Div 2) | June 2, 2014 |
| 4996763 | SGT A Carbon Sample, Carbon Adsorber And HEPA Filter In-Place Leak Test, And Components Leak Test (Div 1) | May 21, 2015 |

Condition Reports (CRs)

CR-CNS-2014-01991 CR-CNS-2014-06148 CR-CNS-2014-06548 CR-CNS-2015-00076

**Section 2RS7: Radiological Environmental Monitoring Program**

Miscellaneous Documents

| Number | Title | Revision/Date |
|---|---|---|
| | Off-site Dose Assessment Manual (ODAM) for Gaseous and Liquid Effluents | August 27, 2014 |
| | Nebraska Public Power District Annual ODAM Environmental Monitoring Requirements | July 28, 2015 |
| | White Paper – Determining the Source of the Groundwater Tritium Detected at CNS | 01 |
| 2013 | Cooper Nuclear Station Annual Radiological Environmental Report | May 2014 |
| 2014 | Cooper Nuclear Station Annual Radiological Environmental Report | May 2015 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 8.ENV.1 | CNS Radiological Environmental Monitoring Program Administration | 02 |
| 8.ENV.2 | Sampling Manual for the CNS Radiological Environmental Monitoring Program (REMP) | 03 |
| 8.ENV.3 | Action Levels for Environmental Samples | 02 |
| 8.ENV.4 | CNS Environmental Air Pump Calibration and Maintenance | 00 |
| 8.ENV.5 | Annual Review of Broadleaf Vegetation Sample Locations Procedure | 00 |
| 8.ENV.6 | Annual Land Use Census | 00 |
| 8.ENV.7 | CNS Temporary LLRW Storage Facility Sampling Program | 00 |
| 8.ENV.8 | Administering the CNS Meteorological Program | 02 |

Condition Reports (CRs)

| | | | |
|---|---|---|---|
| CR-CNS-2014-04380 | CR-CNS-2014-05480 | CR-CNS-2014-06191 | CR-CNS-2014-07971 |
| CR-CNS-2014-08579 | CR-CNS-2015-00483 | CR-CNS-2015-01265 | CR-CNS-2015-02353 |
| CR-CNS-2015-03443 | CR-CNS-2015-04229 | CR-CNS-2015-04491 | CR-CNS-2015-05071 |

**Section 2RS8: Radioactive Solid Waste Processing, and Radioactive Material Handling, Storage, and Transportation**

Miscellaneous Documents

| Number | Title | Date |
|---|---|---|
| | Final Safety Analysis Report – Chapter X, XII, XIII | December 3, 2013 |
| | 2015 Waste Stream Sample Results | April 14, 2015 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 9.ENN-RP-106-1 | Radiation and Contamination Surveys | 15 |
| 9.ENN-RP-106-01 | Radiation and Contamination Surveys | 15 |
| 9.RW.1 | Radioactive Shipments | 28 |
| 9.RW.2 | Condensate Resins, RWCU Resins, Spent Resins and Waste Sludge Classification and Listing | 11 |
| 9.RW.3 | Dry Radioactive Classification/Listing Radioactive Material Shipments | 3 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 9.RW.4 | Control of On-Site Storage of RWCU and Condensate Resins and Waste (Transfer into Storage) | 4 |
| 9.RW.5 | Control of On-Site Storage of RWCU and Condensate Resins and Waste (Transfer out of Storage) | 3 |
| 9.RW.6 | Control of On-Site Dry Active Waste Storage | 3 |
| 9.RW.7 | Waste Stream Sampling | 16 |
| 9.RW.8 | Inspection of On-site LLRW Storage | 2 |
| 9.RW.9 | Filling Containers with Waste/Radioactive Material | 16 |
| 2.0.5 | Reports to NRC Operations Center | 41 |
| 9.RADOP.2 | Radiation Safety Standard and Limits | 16 |
| 9.RADOP.14 | Off-site Radioactive Material Storage | 4 |
| 7.4.32 | Work Over, Near, or In the Reactor Vessel, Spent Fuel Pool, Dryer Separator Storage Pool | 12 |

Radioactive Surveys

| Number | Title | Date |
|---|---|---|
| CNS-1507-0014 | Sealand RAM Storage Area | July 8, 2015 |
| CNS-1211-0188 | Tri-Nuke 260 | November, 2012 |
| CNS-1204-0040 | Post CRB Punch Removal SFP | April 12, 2012 |

Condition Reports (CRs)

| | | | |
|---|---|---|---|
| CR-CNS-2013-03992 | CR-CNS-2014-01042 | CR-CNS-2014-02022 | CR-CNS-2014-03957 |
| CR-CNS-2014-04792 | CR-CNS-2015-04970 | CR-CNS-2015-00661 | CR-CNS-2015-02418 |
| CR-CNS-2015-04894 | CR-CNS-2015-04936 | CR-CNS-2015-05072 | |

Radioactive Material and Waste Shipments

| | | | |
|---|---|---|---|
| 13-009 | 13-010 | 13-013 | 14-003 |
| 14-004 | 14-005 | 14-015 | 14-046 |
| 14-052 | 15-003 | 15-011 | 15-055 |

**Section 4OA1: Performance Indicator Verification**

Procedures

| Number | Title | Revision |
|---|---|---|
| 0-EN-LI-114 | Entergy Procedure, Performance Indicator Process | 5C2 |

**Section 4OA2: Problem Identification and Resolution**

Procedures

| Number | Title | Revision |
|---|---|---|
| 0-EN-LI-119 | Entergy Procedure, Apparent Cause Evaluation (ACE) Process | 16C3 |
| 2.2.69.2 | Operations Procedure, RHR System Shutdown Operations | 90 |
| 2.3_H.1 | Operations Procedure, Panel H – Annunciator H-1 | 10 |
| 6.RCS.601 | Surveillance Procedure, Technical Specification Monitoring of RCS Heatup/Cooldown Rate | 21 |
| 8.8.12 | Chemistry Procedure, Primary Containment Oxygen or Noble Gas Activity Grab Sample Analysis | 14 |

Condition Reports (CRs)

| | | | |
|---|---|---|---|
| CR-CNS-2010-01848 | CR-CNS-2010-03578 | CR-CNS-2010-04273 | CR-CNS-2014-03709 |
| CR-CNS-2015-03188 | CR-CNS-2015-03236 | CR-CNS-2015-03292 | CR-CNS-2015-03319 |
| CR-CNS-2015-03337 | | | |

Work Orders

| | |
|---|---|
| 4744680 | 5021886 |

**Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion**

Miscellaneous Documents

| Number | Title | Revision |
|---|---|---|
| 15-037 | Engineering Change, Clarification of the Design Function of the Z Sumps | 0 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 0-Protect-Eqp | Administrative Procedure, Protected Equipment Program | 34 |

Procedures

| Number | Title | Revision |
|---|---|---|
| 2.0.5 | Operations Procedure, Reports to NRC Operations Center | 43 |
| 2.0.6 | Operations Procedure, Operational Event Response and Review | 34 |
| 2.0.11 | Operations Procedure, Entry and Exiting Technical Specification/TRM/ODAM LCO conditions | 40 |
| 2.2.69.2 | Operations Procedure, RHR System Shutdown Operations | 90 |
| 6.RCS.601 | Surveillance Procedure, Technical Specification Monitoring of RCS Heatup/Cooldown Rate | 21 |
| 6.Sump.101 | Surveillance Procedure, Z Sump and Air Ejector Holdup Line Drain Operability Test (IST) | 26 and 27 |
| 6.1PCIS.303 | Surveillance Procedure, PCIS Main Steam Line High Flow Channel Calibration (DIV 1) | 9 |
| 6.2PCIS.303 | Surveillance Procedure, PCIS Main Steam Line High Flow Channel Calibration (DIV 2) | 7 and 8 |

Condition Reports (CRs)

| | | | |
|---|---|---|---|
| CR-CNS-2015-00489 | CR-CNS-2015-00986 | CR-CNS-2015-00991 | CR-CNS-2015-02406 |
| CR-CNS-2015-03188 | CR-CNS-2015-04303 | | |

Work Orders

| | |
|---|---|
| 5074856 | 5074857 |

**The following items are requested for the**
**Public Radiation Safety Inspection**
**at Cooper**
**August 24-28, 2015**
**Integrated Report 2015003**

Inspection areas are listed in the attachments below.

Please provide the requested information on or before **August 7, 2015.**

Please submit this information using the same lettering system as below. For example, all contacts and phone numbers for Inspection Procedure 71124.0**1** should be in a file/folder titled "**1**- A," applicable organization charts in file/folder "**1**- B," etc.

If information is placed on *ims.certrec.com*, please ensure the inspection exit date entered is at least 30 days later than the on-site inspection dates, so the inspectors will have access to the information while writing the report.

In addition to the corrective action document lists provided for each inspection procedure listed below, please provide updated lists of corrective action documents at the entrance meeting. The dates for these lists should range from the end dates of the original lists to the day of the entrance meeting.

If more than one inspection procedure is to be conducted and the information requests appear to be redundant, there is no need to provide duplicate copies. Enter a note explaining in which file the information can be found.

If you have any questions or comments, please contact Martin Phalen at (817) 200-1158 or martin.phalen@nrc.gov.

**PAPERWORK REDUCTION ACT STATEMENT**

This letter does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, control number 3150-0011.

**1. Radiation Monitoring Instrumentation (71124.05)**
**Date of Last Inspection: May 3, 2013**

A. List of contacts and telephone numbers for the following areas:
   1. Effluent monitor calibration
   2. Radiation protection instrument calibration
   3. Installed instrument calibrations
   4. Count room and Laboratory instrument calibrations

B. Applicable organization charts

C. Copies of audits, self-assessments, vendor or NUPIC audits for contractor support and LERs, written since date of last inspection, related to:
   1. Area radiation monitors, continuous air monitors, criticality monitors, portable survey instruments, electronic dosimeters, teledosimetry, personnel contamination monitors, or whole body counters
   2. Installed radiation monitors

D. Procedure index for:
   1. Calibration, use and operation of continuous air monitors, criticality monitors, portable survey instruments, temporary area radiation monitors, electronic dosimeters, teledosimetry, personnel contamination monitors, and whole body counters
   2. Calibration of installed radiation monitors

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspectors review the procedure indexes
   1. Calibration of portable radiation detection instruments (for portable ion chambers)
   2. Whole body counter calibration
   3. Laboratory instrumentation quality control

F. A summary list of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, related to the following programs:
   1. Area radiation monitors, continuous air monitors, criticality monitors, portable survey instruments, electronic dosimeters, teledosimetry, personnel contamination monitors, whole body counters,
   2. Installed radiation monitors,
   3. Effluent radiation monitors
   4. Count room radiation instruments

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are “searchable” so that the inspector can perform word searches.

G. Off-site dose calculation manual, technical requirements manual, or licensee controlled specifications which lists the effluent monitors and calibration requirements

H. Current calibration data for the whole body counter’s

I. Primary to secondary source calibration correlation for effluent monitors

J. A list of the point of discharge effluent monitors with the two most recent calibration dates and the work order numbers associated with the calibrations

K. Radiation Monitoring System health report for the previous 12 months

**2. Radioactive Gaseous and Liquid Effluent Treatment (71124.06)**
**Date of Last Inspection: May 3, 2013**

A. List of contacts and telephone numbers for the following areas:
1. Radiological effluent control
2. Engineered safety feature air cleaning systems

B. Applicable organization charts

C. Audits, self-assessments, vendor or NUPIC audits of contractor support, and LERs written since date of last inspection, related to:
1. Radioactive effluents
2. Engineered Safety Feature Air cleaning systems

D. Procedure indexes for the following areas
1. Radiological effluent
2. Engineer Safety Feature Air cleaning systems

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes
1. Sampling of radioactive effluents
2. Sample analysis
3. Generating radioactive effluent release permits
4. Laboratory instrumentation quality control
5. In-place testing of HEPA filters and charcoal absorbers
6. New or applicable procedures for effluent programs (e.g., including ground water monitoring programs)

F. List of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, associated with:
1. Radioactive effluents
2. Effluent radiation monitors
3. Engineered Safety Feature Air cleaning systems

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are “searchable” so that the inspector can perform word searches.

G. 2013 and 2014 Annual Radioactive Effluent Release Report or the two most recent reports

H. Current Copy of the Off-site Dose Calculation Manual

I. Copy of the 2013 and 2014 inter-laboratory comparison results for laboratory quality control performance of effluent sample analysis, or the two most recent results

J. Effluent sampling schedule for the week of the inspection

K. New entries into 10 CFR 50.75(g) files since date of last inspection

L. Operations department (or other responsible dept.) log records for effluent monitors removed from service or out of service

M. Listing or log of liquid and gaseous release permits since date of last inspection

N. A list of the technical specification-required air cleaning systems with the two most recent surveillance test dates of in-place filter testing (of HEPA filters and charcoal absorbers) and laboratory testing (of charcoal efficiency) and the work order numbers associated with the surveillances

O. System Health Report for radiation monitoring instrumentation. Also, please provide a specific list of all effluent radiation monitors that were considered inoperable for 7 days or more since November 2011. If applicable, please provide the relative Special Report and condition report(s) moreover

P. A list of all radiation monitors that are considered §50.65/Maintenance Rule equipment

Q. A list of all significant changes made to the Gaseous and Liquid Effluent Process Monitoring System since the last inspection. If applicable, please provide the corresponding UFSAR section in which this change was documented

R. A list of any occurrences in which a non-radioactive system was contaminated by a radioactive system. Please include any relative condition report(s)

**3. Radiological Environmental Monitoring Program (71124.07)**
**Date of Last Inspection: May 3, 2013**

A. List of contacts and telephone numbers for the following areas:
1. Radiological environmental monitoring
2. Meteorological monitoring

B. Applicable organization charts

C. Audits, self-assessments, vendor or NUPIC audits of contractor support, and LERs written since date of last inspection, related to:
1. Radiological environmental monitoring program (including contractor environmental laboratory audits, if used to perform environmental program functions)
2. Environmental TLD processing facility
3. Meteorological monitoring program

D. Procedure index for the following areas:
1. Radiological environmental monitoring program
2. Meteorological monitoring program

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes
   1. Environmental Program Description
   2. Sampling, collection and preparation of environmental samples
   3. Sample analysis (if applicable)
   4. Laboratory instrumentation quality control
   5. Procedures associated with the Off-site Dose Calculation Manual
   6. Appropriate QA Audit and program procedures, and/or sections of the station's QA manual (which pertain to the REMP)

F. A summary list of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, related to the following programs:
   1. Radiological environmental monitoring
   2. Meteorological monitoring

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are "searchable" so that the inspector can perform word searches.

G. Wind Rose data and evaluations used for establishing environmental sampling locations

H. Copies of the 2 most recent calibration packages for the meteorological tower instruments

I. Copy of the 2013 and 2014 Annual Radiological Environmental Operating Report and Land Use Census, and current revision of the Off-site Dose Calculation Manual, or the two most recent reports

J. Copy of the environmental laboratory's inter-laboratory comparison program results for 2013 and 2014, or the two most recent results, if not included in the annual radiological environmental operating report

K. Data from the environmental laboratory documenting the analytical detection sensitivities for the various environmental sample media (i.e., air, water, soil, vegetation, and milk)

L. Quality Assurance audits (e.g., NUPIC) for contracted services

M. Current NEI Groundwater Initiative Plan and status

N. Technical requirements manual or licensee controlled specifications which lists the meteorological instruments calibration requirements

O. A list of Regulatory Guides and/or NUREGs that you are currently committed to relative to the *Radiological Environmental Monitoring Program*. Please include the revision and/or date for the committed item and where this can be located in your current licensing basis/UFSAR

P. If applicable, per NEI 07-07, provide any reports that document any spills/leaks to groundwater since the last inspection

**4. Radioactive Solid Waste Processing, and Radioactive Material Handling, Storage, and Transportation (71124.08)**
**Date of Last Inspection: May 3, 2013**

A. List of contacts and telephone numbers for the following areas:
   1. Solid Radioactive waste processing
   2. Transportation of radioactive material/waste

B. Applicable organization charts (and list of personnel involved in solid radwaste processing, transferring, and transportation of radioactive waste/materials)

C. Copies of audits, department self-assessments, and LERs written since date of last inspection related to:
   1. Solid radioactive waste management.
   2. Radioactive material/waste transportation program.

D. Procedure index for the following areas:
   1. Solid radioactive waste management
   2. Radioactive material/waste transportation

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes
   1. Process control program
   2. Solid and liquid radioactive waste processing
   3. Radioactive material/waste shipping
   4. Methodology used for waste concentration averaging, if applicable
   5. Waste stream sampling and analysis

F. A summary list of corrective action documents (including corporate and subtiered systems) written since date of last inspection related to:
   1. Solid radioactive waste
   2. Transportation of radioactive material/waste

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are “searchable” so that the inspector can perform word searches.

G. Copies of training lesson plans for 49CFR172 subpart H, for radwaste processing, packaging, and shipping

H. A summary of radioactive material and radioactive waste shipments made from date of last inspection to present

I. Waste stream sample analyses results and resulting scaling factors for 2013 and 2014, or the two most recent results

J. Waste classification reports if performed by vendors (such as for irradiated hardware)

K. A listing of all on-site radwaste storage facilities. Please include a summary *or* listing of the items stored in each facility, including the *total* amount of radioactivity and the *highest* general area dose rate

Although it is not necessary to compile the following information, the inspector will also review:

L. Training, and qualifications records of personnel responsible for the conduct of radioactive waste processing, package preparation, and shipping

**5. Radiation Monitoring Instrumentation (71124.05)**

Date of Last Inspection: **May 3, 2013**

A. List of contacts and telephone numbers for the following areas:
   1. Effluent monitor calibration
   2. Radiation protection instrument calibration
   3. Installed instrument calibrations
   4. Count room and Laboratory instrument calibrations

B. Applicable organization charts

C. Copies of audits, self-assessments, vendor or NUPIC audits for contractor support and LERs, written since date of last inspection, related to:
   1. Area radiation monitors, continuous air monitors, criticality monitors, portable survey instruments, electronic dosimeters, teledosimetry, personnel contamination monitors, or whole body counters
   2. Installed radiation monitors

D. Procedure index for:
   1. Calibration, use and operation of continuous air monitors, criticality monitors, portable survey instruments, temporary area radiation monitors, electronic dosimeters, teledosimetry, personnel contamination monitors, and whole body counters.
   2. Calibration of installed radiation monitors

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.
   1. Calibration of portable radiation detection instruments (for portable ion chambers)
   2. Whole body counter calibration
   3. Laboratory instrumentation quality control

F. A summary list of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, related to the following programs:
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   2. Installed radiation monitors,
   3. Effluent radiation monitors
   4. Count room radiation instruments

   NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are “searchable” so that the inspector can perform word searches.

G. Off-site dose calculation manual, technical requirements manual, or licensee controlled specifications which lists the effluent monitors and calibration requirements.

H. Current calibration data for the whole body counter's.

I. Primary to secondary source calibration correlation for effluent monitors.

J. A list of the point of discharge effluent monitors with the two most recent calibration dates and the work order numbers associated with the calibrations.

K. Radiation Monitoring System health report for the previous 12 months

**6. Radioactive Gaseous and Liquid Effluent Treatment (71124.06)**
Date of Last Inspection: **May 3, 2013**

A. List of contacts and telephone numbers for the following areas:
1. Radiological effluent control
2. Engineered safety feature air cleaning systems

B. Applicable organization charts

C. Audits, self-assessments, vendor or NUPIC audits of contractor support, and LERs written since date of last inspection, related to:
1. Radioactive effluents
2. Engineered Safety Feature Air cleaning systems

D. Procedure indexes for the following areas
1. Radioactive effluents
2. Engineered Safety Feature Air cleaning systems

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.
1. Sampling of radioactive effluents
2. Sample analysis
3. Generating radioactive effluent release permits
4. Laboratory instrumentation quality control
5. In-place testing of HEPA filters and charcoal adsorbers
6. New or applicable procedures for effluent programs (e.g., including ground water monitoring programs)

F. List of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, associated with:
1. Radioactive effluents
2. Effluent radiation monitors
3. Engineered Safety Feature Air cleaning systems

NOTE: The lists should indicate the <u>significance level</u> of each issue and the <u>search criteria</u> used. Please provide in document formats which are "searchable" so that the inspector can perform word searches.

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H. Current Copy of the Off-site Dose Calculation Manual

I. Copy of the 2013 and 2014 inter-laboratory comparison results for laboratory quality control performance of effluent sample analysis, or the two most recent results.

J. Effluent sampling schedule for the week of the inspection

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L. Operations department (or other responsible dept.) log records for effluent monitors removed from service or out of service

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**7. Radiological Environmental Monitoring Program (71124.07)**
Date of Last Inspection: **May 3, 2013**

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2. Meteorological monitoring

B. Applicable organization charts

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D. Procedure index for the following areas:
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K. Data from the environmental laboratory documenting the analytical detection sensitivities for the various environmental sample media (i.e., air, water, soil, vegetation, and milk)

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   4. Methodology used for waste concentration averaging, if applicable
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