



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

February 13, 2020

Mr. Eric Larson, Site Vice President
Entergy Operations, Inc.
Grand Gulf Nuclear Station
P.O. Box 756
Port Gibson, MS 39150

**SUBJECT: GRAND GULF NUCLEAR STATION – INTEGRATED INSPECTION
REPORT 05000416/2019004 AND INDEPENDENT SPENT FUEL STORAGE
INSTALLATION INSPECTION REPORT 07200050/2019001**

Dear Mr. Larson:

On December 31, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Grand Gulf Nuclear Station. On January 9, 2020, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

Five findings of very low safety significance (Green) are documented in this report. All of these findings involved violations of NRC requirements. We are treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy.

A licensee-identified violation which was determined to be Severity Level IV is also documented in this report. We are treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violations or the significance of the violations documented in this inspection report, 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; and the NRC Resident Inspector at Grand Gulf 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 U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; and the NRC Resident Inspector at Grand Gulf Nuclear Station.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Jason W. Kozal, Chief
Reactor Projects Branch C
Division of Reactor Projects

Docket Nos. 05000416 and 07200050
License No. NPF-29

Enclosure:
As stated

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GRAND GULF NUCLEAR STATION – INTEGRATED INSPECTION
 REPORT 05000416/2019004 AND INDEPENDENT SPENT FUEL STORAGE
 INSTALLATION INSPECTION REPORT 07200050/2019001 – February 13, 2020

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Number: 05000416 and 07200050

License Number: NPF-29

Report Number: 05000416/2019004 and 07200050/2019001

Enterprise Identifier: I-2019-004-0008 and I-2019-001-0087

Licensee: Entergy Operations, Inc.

Facility: Grand Gulf Nuclear Station

Location: Port Gibson, MS

Inspection Dates: October 1, 2019, to December 31, 2019

Inspectors: L. Carson, Senior Health Physicist
N. Greene, Senior Health Physicist
J. O'Donnell, Health Physicist
N. Okonkwo, Reactor Inspector
E. Simpson, Health Physicist
T. Steadham, Senior Resident Inspector
M. Thomas, Resident Inspector

Approved By: Jason W. Kozal, Chief
Reactor Projects Branch C
Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at Grand Gulf Nuclear Station, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

List of Findings and Violations

Failure to Identify and Correct Degradation of the Division 1 Diesel Generator Jacket Water Heat Exchanger			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000416/2019004-01 Open/Closed	[H.4] - Teamwork	71111.13
An NRC-identified, Green finding and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified when the licensee failed to follow station procedures. Specifically, the licensee failed to adequately implement its NRC Generic Letter 89-13, "Service Water Program," Procedure EN-DC-184, Revision 6, which required degradation in service water systems to be identified, trended, and managed in a controlled fashion. As a result, degradation in the Division 1 emergency diesel generator jacket water heat exchanger was neither identified nor managed until the inspectors identified a pressure boundary leak in the heat exchanger. The licensee's failure to adequately implement Procedure EN-DC-184 led to the failure to identify and correct the conditions that were causing degradation in the heat exchanger that resulted in the leak.			

Worker Entered Overhead High Radiation Area without Radiation Protection Brief			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Occupational Radiation Safety	Green NCV 05000416/2019004-02 Open/Closed	[H.8] - Procedure Adherence	71124.01
The inspectors reviewed a self-revealed, Green non-cited violation of Technical Specification 5.7.1 for an individual entering a high radiation area without the dose rates in the area being known and the worker being briefed to ensure awareness of the dose rates. Specifically, on June 2, 2018, a non-licensed operator received a dose rate alarm after entering a high radiation area in an overhead area without contacting a radiation protection representative or receiving a briefing to be aware of the dose rates in the area as required by the radiation work permit.			

Failure to Follow Technical Specification 5.4.1 Procedures for Process Radiation Monitor Calibrations			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Occupational Radiation Safety	Green NCV 05000416/2019004-03 Open/Closed	[H.11] - Challenge the Unknown	71124.03
An NRC-identified Green finding and associated non-cited violation of Technical Specification 5.4.1(a) was identified when the licensee failed to properly calibrate containment and drywell ventilation exhaust, fuel handling area pool sweep, and fuel handling area ventilation exhaust radiation monitors in accordance with established procedures. Specifically, the inspectors identified nine examples from October 20, 2018, to June 11, 2019, when radiation monitors were not calibrated as established in written procedures.			

Failure to Correct a Condition Adverse to Quality			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000416/2019004-04 Open/Closed	[P.2] - Evaluation	71152
An NRC-identified Green finding and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified when the licensee failed to ensure that conditions adverse to quality were promptly identified and corrected. Deficiencies with the operation of a containment airlock inner door were allowed to remain uncorrected. This resulted in a failure to maintain primary containment operable on September 26, 2019, when the outer airlock door was opened with the inner airlock door not fully closed and secured.			

Failure to Promptly Identify and Correct Degraded Standby Gas Treatment Charcoal			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000416/2019004-05 Open/Closed	[H.1] - Resources	71153
An NRC-identified Green finding and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified when the licensee failed to promptly identify and correct a condition adverse to quality. The results of a failed charcoal efficiency test that was sampled on September 4, 2019, were not evaluated until September 20, 2019, which resulted in a condition prohibited by technical specifications and an associated licensee event report because the charcoal was not replaced within the technical specification allowed outage time.			

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
LER	05000416/2016-007-01	Technical Specification Shutdown because of the Loss of the Residual Heat Removal Pump	71153	Closed

Type	Issue Number	Title	Report Section	Status
LER	05000416/2017-003-02	Reactor Shutdown Because of Condensate System Inventory Depletion and a Manual Reactor Core Isolation Cooling (RCIC) Initiation Because of Feedwater System Shutdown	71153	Closed
LER	05000416/2017-006-01	Completion of Grand Gulf Nuclear Station Shutdown Required by Technical Specifications because of an Inoperable A Residual Heat Removal Pump	71153	Closed
LER	05000416/2018-001-01	Reactor Manual Shutdown Due to Turbine Pressure Control Valve Position Changes	71153	Closed
LER	05000416/2018-007-00	Potential Loss of Safety Function (Residual Heat Removal) and System Actuation Caused by Inadvertent Valve Opening	71153	Closed
LER	05000416/2019-001-01	Automatic Reactor Shutdown Due To Activation Of Generator Lockout	71153	Closed
LER	05000416/2019-003-00	Secondary Containment Personnel Door Failure Due to Broken Hinges	71153	Closed
LER	05000416/2019-004-00	Loss of High Pressure Core Spray Due to Instrument Inverter Failure	71153	Closed
LER	05000416/2019-005-00	Primary Containment Personnel Airlock Potential Loss of Safety Function Due to Inadequate Door Closure	71153	Closed
LER	05000416/2019-006-00	Failure to meet Technical Specification 5.5.7 for Division 2 Standby Gas Charcoal Filter Media Efficiency	71153	Closed

PLANT STATUS

Grand Gulf Nuclear Station, Unit 1, began the inspection period at rated thermal power. On October 8, 2019, the unit was down-powered to 60 percent for a control rod sequence exchange. The unit was returned to rated thermal power on October 20, 2019. On November 15, 2019, the unit was shut down to repair a condenser tube leak. Unit 1 startup commenced on November 25, 2019. On November 27, 2019, startup was halted at 18 percent power and operators shut the unit down due to a feedwater heater tube leak. The unit was restarted on December 2, 2019, following repairs on the feedwater heater. The unit returned to rated thermal power on December 11, 2019, where it remained at or near for the remainder of the inspection period.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors performed plant status activities described in IMC 2515, Appendix D, "Plant Status," and conducted routine reviews using IP 71152, "Problem Identification and Resolution." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

Seasonal Extreme Weather Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated readiness for seasonal extreme weather conditions prior to the onset of seasonal cold temperatures for the following systems:
 - Standby service water
 - Standby diesel generators
 - Fire protection

71111.04Q - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (3 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) Standby gas treatment accident range monitor on October 18, 2019
- (2) Reactor core isolation cooling on October 25, 2019
- (3) Division 2 standby service water system while Division 1 standby diesel generator inoperable on November 8, 2019

71111.05Q - Fire Protection

Quarterly Inspection (IP Section 03.01) (2 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

- (1) Division 1 standby service water pump room, Fire Zone 1M110, on October 18, 2019
- (2) Upper cable spreading room, Fire Zone OC702, on December 26, 2019

71111.07A - Heat Sink Performance

Annual Review (IP Section 02.01) (1 Sample)

The inspectors evaluated readiness and performance of:

- (1) Division 1 standby diesel generator jacket cooling heat exchanger on October 31, 2019

71111.11Q - Licensed Operator Regualification Program and Licensed Operator Performance

Licensed Operator Regualification Training/Examinations (IP Section 03.02) (2 Samples)

- (1) The inspectors observed and evaluated operator performance during a simulator static examination on October 22, 2019.
- (2) The inspectors observed and evaluated an operator simulator training evolution during a Green team drill on October 23, 2019.

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness Inspection (IP Section 02.01) (5 Samples)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

- (1) Standby gas treatment accident range radiation monitors on October 18, 2019
- (2) Safety-related power supplies on October 25, 2019
- (3) Standby gas treatment charcoal filter efficiency on November 15, 2019
- (4) 208 feet elevation containment airlock on November 19, 2019
- (5) Leak in Division 1 standby diesel generator jacket coolant heat exchanger on December 16, 2019

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (4 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

- (1) Protected system lineup while high pressure core spray inoperable on October 2, 2019
- (2) Troubleshooting bypass valve A failure to open on October 22, 2019

- (3) Fuel channel clip sample boring on November 1, 2019
- (4) Division 1 and 2 standby diesel generator readiness during Division 3 diesel maintenance on November 15, 2019

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 02.02) (3 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) Suppression pool operability during suppression pool cleanup on October 17, 2019
- (2) Division 1 standby diesel generator jacket water cooler leak, Condition Report CR-GGN-2019-09069, on November 21, 2019
- (3) Standby service water basin operability with degraded supports, Condition Reports CR-GGN-2019-08559 and CR-GGN-2019-08609, on November 21, 2019

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (4 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) Replace high pressure core spray jockey pump, Work Order 00531844, on October 15, 2019
- (2) Standby liquid control A valve 1C41-F001A post maintenance test following maintenance, Work Order 50293210, on November 22, 2019
- (3) Division 1 emergency diesel generator jacket coolant heat exchanger eddy current testing, Work Order 52766831, on November 21, 2019
- (4) Test of the Division 1 standby diesel generator jacket water heat exchanger following leak repair, Work Order 00501781, on November 22, 2019

71111.20 - Refueling and Other Outage Activities

Refueling/Other Outage Sample (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated the forced outage to repair condenser tube leak activities from November 15, 2019, to December 4, 2019.

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Surveillance Tests (other) (IP Section 03.01) (5 Samples)

- (1) Turbine bypass stop and control valve test on October 22, 2019
- (2) Standby gas treatment effluent radiation monitor calibration on October 25, 2019
- (3) Safety-related power supply testing on October 25, 2019
- (4) Division 1 standby diesel generator 24-hour functional test on October 31, 2019
- (5) Main turbine bypass valve testing on October 31, 2019

Inservice Testing (IP Section 03.01) (1 Sample)

- (1) High pressure core spray pump quarterly functional test on November 22, 2019

FLEX Testing (IP Section 03.02) (1 Sample)

- (1) Flex strategy walkdown on October 2, 2019

71114.06 - Drill Evaluation

Drill/Training Evolution Observation (IP Section 03.02) (1 Sample)

The inspectors evaluated:

- (1) 2019 Green team quarterly drill on October 23, 2019

RADIATION SAFETY

71124.01 - Radiological Hazard Assessment and Exposure Controls

Radiological Hazard Assessment (IP Section 02.01) (1 Sample)

The inspectors evaluated radiological hazards assessments and controls.

- (1) The inspectors reviewed the following:

Radiological Surveys

- 100 feet Drywell Entire Elevation
- 119 feet Auxiliary Reactor Water Cleanup B Pump Room
- 133 feet Turbine Building Precoat Filter and Pump Room
- 139 feet Auxiliary Building Residual Heat Removal B Piping Penetration Room
- 93 feet Auxiliary Building Reactor Core Isolation Cooling Pump Room
- 93 feet Reactor Water Spent Resin Tank and Pump Rooms

Risk Significant Radiological Work Activities

- Precoat Filter to Cask
- Reactor Water Cleanup Pump Replacement
- Diving

Air Sample Survey Records

- Reactor Water Cleanup Valve Cut Out
- Grinding Weld for Valve Replacement
- Cut Out of Piping

Instructions to Workers (IP Section 02.02) (1 Sample)

The inspectors evaluated instructions to workers including radiation work permits used to access high radiation areas.

- (1) The inspectors reviewed the following:

Radiation Work Packages

- 2019-1058 Maintenance, Tours, and Inspections
- 2019-1068 Reactor Water Cleanup B Pump Replacement
- 2019-1074 N22 Precoat A Septa Filter Replacement

Electronic Alarming Dosimeter Alarm Condition Reports

- CR-GGN-2018-04512
- CR-GGN-2018-05234
- CR-GGN-2018-05997
- CR-GGN-2018-06442

Labeling of Containers

- White Box – 185 feet Auxiliary
- Sea Van – Outside Storage (GG-RW-11)
- Barrels
- Yellow Bags

Contamination and Radioactive Material Control (IP Section 02.03) (1 Sample)

The inspectors evaluated licensee processes for monitoring and controlling contamination and radioactive material.

- (1) The inspectors verified the following sealed sources are accounted for and are intact:

- 97-001
- 19-012E
- 98-003 (7010)

Radiological Hazards Control and Work Coverage (IP Section 02.04) (1 Sample)

The inspectors evaluated in-plant radiological conditions during facility walkdowns and observation of radiological work activities.

- (1) The inspectors also reviewed the following radiological work package for areas with airborne radioactivity:

No work packages were available for review during this inspection.

High Radiation Area and Very High Radiation Area Controls (IP Section 02.05) (1 Sample)

- (1) The inspectors evaluated risk-significant high radiation area and very high radiation area controls.

Radiation Worker Performance and Radiation Protection Technician Proficiency
(IP Section 02.06) (1 Sample)

- (1) The inspectors evaluated radiation worker performance and radiation protection technician proficiency.

71124.03 - In-Plant Airborne Radioactivity Control and Mitigation

Engineering Controls (IP Section 02.01) (1 Sample)

The inspectors evaluated airborne controls and radioactive monitoring.

- (1) The inspectors reviewed the following:

Installed Ventilation Systems

- Fuel Handling Area Ventilation Exhaust
- Fuel Handling Area Pool Sweep Exhaust
- Control Room Ventilation
- Standby Gas Treatment and Ventilation System

Temporary Ventilation System Setups

- There were none available during this inspection.

Portable or Installed Monitoring Systems

- Containment and Drywell Ventilation Exhaust High Radiation Calibration, Channel B
- Containment and Drywell Ventilation Exhaust High Radiation Calibration, Channel C
- Containment and Drywell Ventilation Exhaust High Radiation Calibration, Channel D
- Fuel Handling Area Ventilation Exhaust Radiation Monitor Calibration, Channel A
- Fuel Handling Area Ventilation Exhaust Radiation Monitor Calibration, Channel C
- Fuel Handling Area Ventilation Exhaust Radiation Monitor Calibration, Channel D
- Fuel Handling Area Pool Sweep Radiation Monitor Calibration, Channel A
- Fuel Handling Area Pool Sweep Radiation Monitor Calibration, Channel B
- Fuel Handling Area Pool Sweep Radiation Monitor Calibration, Channel D
- AMS-4 - Spent Fuel Pool Area
- AMS-4 CHP-AMS-0059 - 136 Radioactive Waste Truck Bay
- AMS-4 CHP-AMS-025 - 133 Turbine Truck Bay

Use of Respiratory Protection Devices (IP Section 02.02) (1 Sample)

The inspectors evaluated the licensee's use of respiratory protection devices by:

- (1) Observing infield applications; verifying the licensee validated the level of protection provided by the devices; inspecting the material condition of devices; reviewing records and certification of devices issued for use; reviewing the qualifications of workers that use the devices; and observing workers' donning, doffing, and testing devices.

The inspectors observed three operations personnel and three radiation protection technicians adequately don and doff self-contained breathing apparatus (SCBA).

The inspectors observed and inspected the material condition of SCBAs stored and staged near the control room, the technical support center, and operation support center for emergencies. The material conditions were determined to be adequate.

From 2018 through September 2019, there was only one job in an airborne area where the licensee validated the level of protection provided by the devices. The inspectors reviewed radiation work permit (RWP) 2018-1508 for the under-vessel maintenance which involved workers using Delta Suites and the plant breathing air system. The inspectors verified that the plant breathing met or exceeded Grade-D air specifications.

The inspectors reviewed records and certification of devices issued for use and reviewed the qualifications of workers that use the devices.

Self-Contained Breathing Apparatus for Emergency Use (IP Section 02.03) (1 Sample)

The inspectors evaluated self-contained breathing apparatus program implementation.

- (1) The inspectors reviewed the following:

Status and Surveillance Records for Self-Contained Breathing Apparatus

- MSA Air Hawk II 4500 No. R-301, September 4, 2019
- MSA Air Hawk II 4500 No. R-327, September 4, 2019
- MSA Air Hawk II 4500 No. R-330, September 4, 2019

Self-Contained Breathing Apparatus Fit for On-Shift Operators

- Nuclear Licensed Operator, October 2, 2019
- Senior Reactor Operator, October 2, 2019
- Reactor Operator, October 2, 2019

Self-Contained Breathing Apparatus Maintenance Check

- MSA Air Hawk II 4500 No. R-331, December 11, 2018
- MSA Air Hawk II 4500 No. R-322, December 11, 2018
- MSA Air Hawk II 4500 No. R-307, November 5, 2018
- MSA Air Hawk II 4500 No. R-307, December 11, 2018

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

MS09: Residual Heat Removal Systems (IP Section 02.08) (1 Sample)

- (1) October 1, 2018 – September 30, 2019

MS10: Cooling Water Support Systems (IP Section 02.09) (1 Sample)

- (1) October 1, 2018 – September 30, 2019

OR01: Occupational Exposure Control Effectiveness Sample (IP Section 02.15) (1 Sample)

- (1) April 1, 2018 – June 30, 2019

PR01: Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual Radiological Effluent Occurrences (RETS/ODCM) Radiological Effluent Occurrences Sample (IP Section 02.16) (1 Sample)

- (1) April 1, 2018 – June 30, 2019

71152 - Problem Identification and Resolution

Semiannual Trend Review (IP Section 02.02) (1 Sample)

- (1) The inspectors reviewed the licensee's corrective action program for potential adverse trends in inadequate system trending that might be indicative of a more significant safety issue.

Annual Follow-up of Selected Issues (IP Section 02.03) (2 Samples)

The inspectors reviewed the licensee's implementation of its corrective action program related to the following issues:

- (1) Safety-related power supply failures on October 18, 2019
- (2) 208 feet elevation containment airlock door malfunction on December 19, 2019

71153 – Follow-up of Events and Notices of Enforcement Discretion

Event Report (IP Section 03.02) (10 Samples)

The inspectors evaluated the following licensee event reports (LER):

- (1) LER 05000416/2016-007-01, Technical Specification Shutdown because of the Loss of the Residual Heat Removal Pump (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17180A316). The circumstances surrounding this LER are documented in the Inspection Results section of this report.
- (2) LER 05000416/2017-003-02, Reactor Shutdown Because of Condensate System Inventory Depletion and a Manual Reactor Core Isolation Cooling (RCIC) Initiation

Because of Feedwater System Shutdown (ADAMS Accession No. ML18275A416). The inspectors determined that it was not reasonable to foresee or correct the cause discussed in the LER; therefore, no performance deficiency was identified. The inspectors also concluded that no violation of NRC requirements occurred.

- (3) LER 05000416/2017-006-01, Completion of Grand Gulf Nuclear Station Shutdown Required By Technical Specifications Because of an Inoperable A Residual Heat Removal Pump (ADAMS Accession No. ML18320A190). The inspectors determined that it was not reasonable to foresee or correct the cause discussed in the LER; therefore, no performance deficiency was identified. The inspectors also concluded that no violation of NRC requirements occurred.
- (4) LER 05000416/2018-001-01, Reactor Manual Shutdown Due to Turbine Pressure Control Valve Position Changes (ADAMS Accession No. ML19219B328). The inspectors reviewed the updated LER submittal. The previous LER submittal was reviewed in Inspection Report 05000416/2018002 (ADAMS Accession No. ML18215A026).
- (5) LER 05000416/2018-007-00, Potential Loss of Safety Function (Residual Heat Removal) and System Actuation Caused by Inadvertent Valve Opening (ADAMS Accession No. ML18177A329). The inspectors determined that it was not reasonable to foresee or correct the cause discussed in the LER; therefore, no performance deficiency was identified. The inspectors also concluded that no violation of NRC requirements occurred.
- (6) LER 05000416/2019-001-01, Automatic Reactor Shutdown Due to Activation of Generator Lockout (ADAMS Accession No. ML19234A071). The inspectors reviewed the updated LER submittal. The circumstances surrounding this LER are documented in the Inspection Results section of Inspection Report 05000416/2019002 (ADAMS Accession No. ML19226A236).
- (7) LER 05000416/2019-003-00, Secondary Containment Personnel Door Failure Due to Broken Hinges (ADAMS Accession No. ML19274C684). The inspectors determined that it was not reasonable to foresee or correct the cause discussed in the LER; therefore, no performance deficiency was identified. The inspectors also concluded that no violation of NRC requirements occurred.
- (8) LER 05000416/2019-004-00, Loss of High Pressure Core Spray Due to Instrument Inverter Failure (ADAMS Accession No. ML19297H202). The inspectors determined that it was not reasonable to foresee or correct the cause discussed in the LER; therefore, no performance deficiency was identified. The inspectors also concluded that no violation of NRC requirements occurred.
- (9) LER 05000416/2019-005-00, Primary Containment Personnel Airlock Potential Loss of Safety Function Due to Inadequate Door Closure (ADAMS Accession No. ML19311C250). The circumstances surrounding this LER and an associated non-cited violation are documented in the Inspection Report section of this report.
- (10) LER 05000416/2019-006-00, Failure to meet Technical Specifications 5.5.7 for Division 2 Standby Gas Charcoal Filter Media Efficiency (ADAMS Accession No. ML19322C805). The circumstances surrounding this LER and an associated non-cited violation are documented in the Inspection Report section of this report.

Personnel Performance (IP Section 03.03) (1 Sample)

- (1) The inspectors evaluated personnel performance during the loss of bus 12BE1 and the licensee's response on December 26, 2019.

OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

60855 - Operation of an Independent Spent Fuel Storage Installation (ISFSI)

Operation of an ISFSI (1 Sample)

- (1) The Grand Gulf Nuclear Station ISFSI consisted of a single 11,956 square foot (196 feet by 61 feet) concrete pad designed for the storage of up to 48 Holtec International HI-STORM 100 spent fuel storage casks. At the time of the routine inspection, the Grand Gulf Nuclear Station ISFSI pad contained a total of 36 HI-STORM 100 overpacks. Canister No. 37 remained in the auxiliary building after the discovery, during the fall 2019 dry cask storage campaign, that the cask handling crane did not fully meet NRC's single-failure-proof criteria as specified in NRC guidance document NUREG-0554, "Single-Failure-Proof Cranes at Nuclear Power Plants." Canister No. 37 was dried, sealed, and backfilled with helium and is currently situated in the Grand Gulf Nuclear Station auxiliary building in the transfer cask. An MPC-68M spent fuel storage canister residing in the transfer cask is an analyzed condition. It can remain in the transfer cask indefinitely. It is planned to move canister No. 37 out onto the ISFSI pad during the next dry cask storage campaign in 2021. The licensee loaded canisters to the Holtec Certificate of Compliance No. 1014, Amendment 9, Revision 1, and HI-STORM 100 Final Safety Analysis Report (FSAR), Revision 13.

The inspectors performed a walk-down of the ISFSI and completed an independent radiation survey of the radiologically controlled area (RCA). The inspectors also performed a walk-down of the spent fuel floor of the Grand Gulf Nuclear Station auxiliary building and observed the condition of canister No. 37, as it was secured in the cask washdown area.

The inspectors evaluated the following:

- Spent fuel selection records for the current (suspended) dry cask storage campaign at Grand Gulf Nuclear Station
- Compliance with the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) 72.104 for calendar years 2018 and 2019
- Control of combustibles for ISFSI operations
- Selected radiological surveys of the ISFSI and dry fuel storage casks
- Selected ISFSI related condition reports
- Quality assurance (QA) program implementation, including recent QA audits, surveillances, receipt inspection, and quality control activities related to ISFSI operations
- Compliance to technical specifications for operational surveillance activities and FSAR required annual maintenance activities
- Documentation of annual maintenance activities for heavy lifting components, including special lifting devices, the site's cask handling crane, and the site's vertical cask transporter

60857 - Review of 10 CFR 72.48 Evaluations

Review of 10 CFR 72.48 Evaluations (1 Sample)

- (1) The inspectors reviewed a list of Title 10 CFR 72.48 screenings and evaluations performed by the licensee since November 2017. The inspectors evaluated the following:
- Selected licensee 10 CFR 72.48 screenings and associated changes, tests, or experiments
 - The process by which the licensee evaluates 10 CFR 72.48 screenings and evaluations performed by the Certificate of Compliance (CoC) holder
 - Changes made to the licensee's 10 CFR 72.212 Report since November 2017 (from Revision 11 to Revision 12)

INSPECTION RESULTS

Licensee-Identified Non-Cited Violation	60855
This violation of very low safety significance was identified by the licensee and has been entered into the licensee corrective action program and is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.	
Violation: Title 10 CFR 72.212(b)(3), requires, in part, that the general licensee shall ensure that each cask used conforms to the terms, conditions, and specifications of a Certificate of Compliance as listed in 10 CFR 72.214.	
Title 10 CFR 72.214 states, in part, that Certificate No. 1014 [Docket Number 072-01014] Amendment Nos. 2, 5, and 9, Revision 1, with effective dates of June 7, 2005; July 14, 2008; and March 21, 2016, respectively, are approved casks for storage of spent fuel under the conditions specified in the Certificate of Compliance for the Holtec HI-STORM 100 Cask System.	
Certificate of Compliance 072-01014, Amendment 5, Condition 5, Heavy Loads Requirements, states that each lift of a multi-purpose canister, a HI-TRAC transfer cask, or any HI-STORM overpack must be made in accordance to the existing heavy loads requirements and procedures of the licensed facility at which the lift is made. At Grand Gulf Nuclear Station, the Heavy Loads Program is described in Appendix 9D of the site's Updated Final Safety Analysis Report (UFSAR). Section 9.1.4.2.2.3 of the Grand Gulf Nuclear Station UFSAR states that the auxiliary building cask handling crane's (CHC) design and operation comply with the requirements of Regulatory Guide 1.13, 29 CFR 1910.179, and NUREG 0554, "Single-Failure-Proof Cranes for Nuclear Power Plants."	
Contrary to the above, from February 2009 to September 2019, the licensee failed to operate the CHC in accordance to the existing heavy loads requirements and procedures of the licensed facility at which the lifts were made. Specifically, the licensee operated the CHC with a wire rope that did not meet the single-failure-proof safety factor of 10:1, as specified in NUREG 0554, Section 4.1.	
Significance/Severity: No Performance Deficiency. Severity Level IV.	
The violation of 10 CFR 72.212(b)(3) was determined to be more than minor because if left uncorrected, the violation could lead to a more significant safety concern. Consistent with the guidance in Section 1.2.6.D of the NRC Enforcement Manual, if a violation does not fit an	

example in the Enforcement Policy Violation Examples, it should be assigned a severity level: (1) commensurate with its safety significance and (2) informed by similar violations addressed in the Violation Examples. The violation was evaluated to be similar to a Severity Level IV violation in Enforcement Policy Section 6.2.d.2.

Corrective Action References: Condition Report CR-GGN-2019-07704

Failure to Identify and Correct Degradation of the Division 1 Diesel Generator Jacket Water Heat Exchanger

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000416/2019004-01 Open/Closed	[H.4] - Teamwork	71111.13

An NRC-identified, Green finding and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified when the licensee failed to follow station procedures. Specifically, the licensee failed to adequately implement its NRC Generic Letter 89-13, "Service Water Program," Procedure EN-DC-184, Revision 6, which required degradation in service water systems to be identified, trended, and managed in a controlled fashion. As a result, degradation in the Division 1 emergency diesel generator jacket water heat exchanger was neither identified nor managed until the inspectors identified a pressure boundary leak in the heat exchanger. The licensee's failure to adequately implement Procedure EN-DC-184 led to the failure to identify and correct the conditions that were causing degradation in the heat exchanger that resulted in the leak.

Description: On November 4, 2019, operators removed the Division 3 emergency diesel generator (EDG) from service for a 4-day planned maintenance outage. As part of a maintenance risk assessment and emergent work control inspection, the inspectors toured the Division 1 EDG room to assure redundant component availability. In doing so, the inspectors identified a leak in the Division 1 EDG jacket water heat exchanger outlet end bell drain line.

The licensee immediately declared the system operable because the leakage rate was not significant enough to affect either the heat exchanger cooling capacity or the standby service water inventory, and the previous component inspections/evaluations assured structural integrity of the component. However, per the licensee's operability determination process, the licensee initiated an engineering operability evaluation to confirm or deny the immediate declaration of operability.

In the following days, the licensee restored the Division 3 EDG and removed the Division 1 EDG from service to further evaluate and repair the identified through-wall leak. Based on initial nondestructive examination results of an apparent linear indication, the licensee could not assure compliance with the American Society of Mechanical Engineers (ASME) Code for the heat exchanger. Therefore, the licensee declared the component inoperable and submitted a 10 CFR 50.72 notification for an event or condition that could have prevented the fulfillment of a safety function (i.e., having two EDGs inoperable for longer than the outage time allowed by technical specifications).

After additional evaluations, inspections, and examinations of the original flaw, the licensee concluded that the through-wall leak was caused by a pinhole flaw and not a linear flaw (i.e., the flaw was not a crack). The licensee further determined that the Division 1 EDG remained operable the entire time because an approved ASME Code case could have been

applied, which would have demonstrated adequate structural integrity. The licensee subsequently retracted the applicable 10 CFR 50.72 notification.

On November 8, 2019, the Division 1 EDG was returned to service following repairs on the heat exchanger, which included replacing the drain line and coupling.

The inspectors conducted interviews with licensee personnel to establish why degradation in this system got to the point where system operability was called into question. Procedure EN-DC-184, Revision 6, "NRC Generic Letter 89-13 Service Water Program," Section 5.0, "Details," subsection [3], "SW Program Goals," step (b) requires that "SW Program activities must ensure that degradation due to mud, silt, microbiologically influenced corrosion (MIC), general corrosion, erosion, protective coating failure, and macroscopic biological fouling species is identified, trended, and managed in a controlled fashion." As part of the licensee's service water program, the licensee manages its Division 1 EDG jacket water heat exchanger in accordance with Procedure EN-DC-316, "Heat Exchanger Performance and Condition Monitoring," Revision 11. Furthermore, the licensee manages MIC in accordance with Procedure EN-DC-340, "Microbiologically Influenced Corrosion (MIC) Monitoring Program," Revision 5.

The last time the licensee performed an EN-DC-316 inspection of this heat exchanger was in April 2019. From this inspection, the licensee failed to identify degradation occurring in the drain line coupling as required by Procedure EN-DC-316, Attachment 9.1.

The last time the licensee conducted an EN-DC-340 inspection was in May 2018. From this inspection, the licensee identified wall thinning in the drain line, but did not find any evidence of MIC in the end bell where the drain line connects to the heat exchanger. Procedure EN-DC-340, step 5.3.1.j, describes that crevices (e.g., socket welds) are susceptible to MIC; however, it is understood in industry that it is difficult to perform ultrasonic testing of such areas to determine if MIC exists.

Over the past 2 years, the licensee has not been able to drain the Division 1 EDG jacket water heat exchanger from its normal drain location due to clogging of the drain line, which was apparent during the April 2019 inspection. Despite the drainage issues, the licensee did not generate any condition reports on the clogged drain line, and the issue went undetected by the system/component engineers.

Procedure EN-DC-340, step 5.8, "Communications," requires that anytime the EDG jacket water heat exchanger is opened for inspection, information is to be shared between departments; however, the licensee concluded that information regarding the clogging, the corrosion/degradation, and MIC were not shared between departments when the heat exchanger was opened in April 2019.

As a result of the issues with the heat exchanger identified above (clogging of the line, MIC susceptible area, corrosion in the end bell), the inspectors concluded that the licensee was unsuccessful in implementing its Generic Letter 89-13, "Service Water Program." Successful implementation would have provided the opportunity to identify and correct the degradation prior to a through-wall leak developing.

Corrective Actions: Licensee corrective actions included immediately replacing the section of piping and restoring the system to service, planning to replace the entire heat exchanger end bell, performing an equipment failure evaluation, reviewing extent of condition for other drain

lines/end bells in other standby service water heat exchangers, developing redundant system checklists to ensure operability of a component when the redundant component is out of service for maintenance, improving coordination and communication of activities between organizations such as the MIC program organization and the heat exchanger organization, and briefing operations, maintenance, and systems engineering personnel on the operating experience related to MIC symptoms and consequences.

Corrective Action References: The licensee entered the issue into their corrective action program as Condition Report CR-GGN-2019-09069.

Performance Assessment:

Performance Deficiency: The failure to ensure that degradation due to mud, silt, MIC, general corrosion, erosion, protective coating failure, and macroscopic biological fouling species was identified, trended, and managed in a controlled fashion, as required by Procedure EN-DC-184, Revision 6, is a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the equipment performance 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, the licensee did not adequately identify and manage degradation occurring in the Division 1 EDG jacket water heat exchanger caused by corrosion and MIC, which subsequently led to a leak developing in the component that called into question the system's operability.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Specifically, in accordance with Exhibit 2, "Mitigating Systems Screening Questions," Section A, "Mitigating SSCs and Functionality," the finding screened as having very low safety significance (Green) because "No" was answered to all four questions.

Cross-Cutting Aspect: H.4 - Teamwork: Individuals, and work groups communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety is maintained. Specifically, multiple groups (operations, maintenance, system engineering, component engineering) who conduct work, inspections, evaluations, trending, etc., on the Division 1 EDG jacket water heat exchanger did not adequately communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety was maintained. If these groups had coordinated and communicated their findings, issues, and concerns with the heat exchanger across their organizational boundaries, the station could have understood at an earlier date that the heat exchanger was degrading due to corrosion and MIC and could have prevented this through-wall leak from occurring.

Enforcement:

Violation: As required, in part, by 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," activities affecting quality shall be prescribed by...procedures...of a type appropriate to the circumstances and shall be accomplished in accordance with these...procedures. Procedure EN-DC-184, Revision 6, a quality-related procedure, required that degradation due to mud, silt, MIC, general corrosion, erosion, protective coating failure, and macroscopic biological fouling species was identified, trended, and managed in a controlled fashion.

Contrary to the above, from April 24, 2019, to November 4, 2019, the licensee failed to accomplish activities affecting quality in accordance with licensee Procedure EN-DC-184, Revision 6. Specifically, the licensee failed to perform inspections and examinations of the Division 1 emergency diesel generator jacket water heat exchanger in accordance with Procedure EN-DC-184 and failed to identify, trend, and manage degradation due to MIC that was occurring in the heat exchanger. This degradation eventually led to a leak developing in the component that called into question the system's operability.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

Worker Entered Overhead High Radiation Area without Radiation Protection Brief			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Occupational Radiation Safety	Green NCV 05000416/2019004-02 Open/Closed	[H.8] - Procedure Adherence	71124.01
<p>The inspectors reviewed a self-revealed, Green non-cited violation of Technical Specification 5.7.1 for an individual entering a high radiation area without the dose rates in the area being known and the worker being briefed to ensure awareness of the dose rates. Specifically, on June 2, 2018, a non-licensed operator received a dose rate alarm after entering a high radiation area in an overhead area without contacting a radiation protection representative or receiving a briefing to be aware of the dose rates in the area as required by the RWP.</p> <p><u>Description:</u></p> <p>On June 2, 2018, a non-licensed operator climbed into the normally inaccessible overhead piping of the containment 166 feet level to identify two valves. This caused his self-reading dosimeter (SRD) to alarm unexpectedly. His SRD recorded a dose rate of 370 mrem/hr; the alarm set-point was 300 mrem/hr. The individual was signed on to RWP 2018-1902 using a high radiation area (HRA) Task 2, but he had not been briefed for this area. After hearing the alarm, the individual climbed down from the overhead, gathered his materials, and exited the radiologically controlled area (RCA).</p> <p>The RAD Worker Instructions section of RWP 2018-1902, Task 2, included the following statements:</p> <ul style="list-style-type: none"> • Contact RP [radiation protection] for High Radiation Area entry requirements • Contact RP prior to work in normally inaccessible area for current radiological conditions and protective requirements <p>Procedure EN-RP-101, "Access Control for Radiologically Controlled Areas," Revision 14, Section 5.4, required a brief of personnel entering HRAs on the radiological conditions, and access was allowed only after dose rates in the area were determined and entry personnel were made aware of them.</p> <p>Procedure EN-RP-100, "Radiation Worker Expectations," Revision 12, Section 5.3 [4], stated that no entry to areas above 7 feet was permitted without prior permission from radiation protection (RP). The overhead piping area entered was above 7 feet from the floor level and</p>			

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Occupational Radiation Safety	Green NCV 05000416/2019004-02 Open/Closed	[H.8] - Procedure Adherence	71124.01

The inspectors reviewed a self-revealed, Green non-cited violation of Technical Specification 5.7.1 for an individual entering a high radiation area without the dose rates in the area being known and the worker being briefed to ensure awareness of the dose rates. Specifically, on June 2, 2018, a non-licensed operator received a dose rate alarm after entering a high radiation area in an overhead area without contacting a radiation protection representative or receiving a briefing to be aware of the dose rates in the area as required by the RWP.

Description:

On June 2, 2018, a non-licensed operator climbed into the normally inaccessible overhead piping of the containment 166 feet level to identify two valves. This caused his self-reading dosimeter (SRD) to alarm unexpectedly. His SRD recorded a dose rate of 370 mrem/hr; the alarm set-point was 300 mrem/hr. The individual was signed on to RWP 2018-1902 using a high radiation area (HRA) Task 2, but he had not been briefed for this area. After hearing the alarm, the individual climbed down from the overhead, gathered his materials, and exited the radiologically controlled area (RCA).

The RAD Worker Instructions section of RWP 2018-1902, Task 2, included the following statements:

- Contact RP [radiation protection] for High Radiation Area entry requirements
- Contact RP prior to work in normally inaccessible area for current radiological conditions and protective requirements

Procedure EN-RP-101, "Access Control for Radiologically Controlled Areas," Revision 14, Section 5.4, required a brief of personnel entering HRAs on the radiological conditions, and access was allowed only after dose rates in the area were determined and entry personnel were made aware of them.

Procedure EN-RP-100, "Radiation Worker Expectations," Revision 12, Section 5.3 [4], stated that no entry to areas above 7 feet was permitted without prior permission from radiation protection (RP). The overhead piping area entered was above 7 feet from the floor level and

was normally inaccessible and not typically surveyed. Also, in this procedure, Section 5.3 [19] stated, in part, that to enter a high radiation area, the radiation worker must be briefed and sign on the appropriate RWP.

The overhead area the non-licensed operator entered had not been surveyed or posted by RP, as there were no work plans for this area. A follow-up survey identified dose rates in the general area of the valves of 400 to 600 mrem/hr. The radiation protection staff then posted the overhead area previously described as an HRA.

Corrective Actions: The licensee conducted an apparent cause assessment of this issue with multiple corrective actions being taken.

Some of the actions taken included:

- The individual was restricted from the RCA and placed in the licensee's performance management process.
- All operations personnel participated in a stand down to discuss radiation protection briefing requirements, RCA entry requirements, and RWP implementation.

Corrective Action References: This issue was placed into the corrective action program as Condition Report CR-GGN-2018-06442.

Performance Assessment:

Performance Deficiency: A radiation worker entered an HRA without being briefed to be aware of the dose rates in the area.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the program and process attribute of the Occupational Radiation Safety Cornerstone and adversely affected the cornerstone objective to ensure the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Specifically, the failure to follow requirements involving radiological controls had the potential to increase the individual's dose.

Significance: The inspectors assessed the significance of the finding using Appendix C, "Occupational Radiation Safety SDP." The inspectors determined the finding to be of very low safety significance (Green) because: (1) it was not associated with as low as is reasonably achievable (ALARA) planning or work controls; (2) there was no overexposure; (3) there was no substantial potential for an overexposure; and (4) the ability to assess dose was not compromised.

Cross-Cutting Aspect: H.8 - Procedure Adherence: Individuals follow processes, procedures, and work instructions. Specifically, the non-licensed operator failed to comply with established procedures for accessing HRAs. Licensee procedures require radiation workers to adhere to RWP requirements. Also, radiation workers are required to receive permission from radiation protection prior to entering the overhead. This is to allow radiation protection to establish area dose rates and controls, as overhead areas are not routinely surveyed.

Enforcement:

Violation: Technical Specification 5.7.1 states, in part, that an individual permitted to enter a high radiation area shall be provided with one or more of the following: (b) Entry into such areas may be made after the dose rates in the area have been established and personnel are aware of them.

Contrary to the above, on June 2, 2018, an individual entered a high radiation area prior to the dose rate levels in the area being established and personnel made aware of them. Specifically, a non-licensed operator entered a high radiation area in the overhead without receiving a high radiation area briefing to make the individual aware of the dose rates in the area as required.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

Failure to Follow Technical Specification 5.4.1 Procedures for Process Radiation Monitor Calibrations

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Occupational Radiation Safety	Green NCV 05000416/2019004-03 Open/Closed	[H.11] - Challenge the Unknown	71124.03

An NRC-identified Green finding and associated non-cited violation of Technical Specification 5.4.1(a) was identified when the licensee failed to properly calibrate containment and drywell ventilation exhaust, fuel handling area pool sweep, and fuel handling area ventilation exhaust radiation monitors in accordance with established procedures. Specifically, the inspectors identified nine examples from October 20, 2018, to June 11, 2019, when radiation monitors were not calibrated as established in written procedures.

Description: During a review of calibrations for radiation monitors that provide signals associated with the operation of the containment and drywell ventilation exhaust, fuel handling area pool sweep, and fuel handling area ventilation exhaust systems, the inspectors identified nine examples from October 20, 2018, to June 11, 2019, when radiation monitors were not calibrated as established in written procedures. The inspectors reviewed the following procedures for installed plant air monitoring system calibrations (D17 process radiation monitors):

- 06-IC-1D17-A-0008 Containment and Drywell Ventilation Exhaust High Radiation Calibration, Channel B, Revision 106, Section 5.120
- 06-IC-1D17-A-0008 Containment and Drywell Ventilation Exhaust High Radiation Calibration, Channel C, Revision 106, Section 5.120
- 06-IC-1D17-A-0008 Containment and Drywell Ventilation Exhaust High Radiation Calibration, Channel D, Revision 106, Section 5.120
- 06-IC-1D17-A-1001 Fuel Handling Area Ventilation Exhaust Radiation Monitor Calibration, Channel C*, Revision 101, Section 5.1.4.1(a)

- 06-IC-1D17-A-1001 Fuel Handling Area Ventilation Exhaust Radiation Monitor Calibration, Channel B*, Revision 101, Section 5.1.4.1.(a)
- 06-IC-1D17-A-1001 Fuel Handling Area Ventilation Exhaust Radiation Monitor Calibration, Channel A*, Revision 102, Section 5.1.4.1(a)
- 06-IC-1D17-A-1003 Fuel Handling Area Pool Sweep Radiation Monitor Calibration, Channel A, Revision 106, Section 5.121
- 06-IC-1D17-A-1003 Fuel Handling Area Pool Sweep Radiation Monitor Calibration, Channel B, Revision 106, Section 5.121
- 06-IC-1D17-A-1003 Fuel Handling Area Pool Sweep Radiation Monitor Calibration, Channel D, Revision 106, Section 5.121

Each procedure stated, in the respective section above, to list two radiation values from the source decay curve with the high radiation value not exceeding 100 milliRoentgen/hour (mR/hr), but be as close to 100 mR/hr as possible. Each procedure recorded from 35.67 mR/hr to 36.19 mR/hr, which was not as close to 100 mR/hr as possible. The original intensity of the higher Cs-137 radiation source when it was acquired by the licensee in December 1993 was only 64 mR/hr. The licensee did not have an explanation for the discrepancies. The inspectors further noted in the prerequisite Section 4.1.2.3 of the Fuel Handling Area Ventilation Exhaust Radiation Monitor Calibration procedures for Channels A, B, and C, that the low radiation source was required to have a minimum radiation intensity of at least 4 mR/hr. However, the licensee had recorded 0.78 mR/hr during these calibrations. The other procedures did not have the 'at least 4 mR/hr' prerequisite specified; however, each procedure had used the 0.78 mR/hr radiation source during respective calibrations. The original intensity of the lower Cs-137 radiation source when it was acquired by the licensee in December 1993 was only 1.4 mR/hr. The inspectors determined that using radiation sources with improper intensity levels affected the quality of the overall calibrations. Specifically, the improper source intensity values were used in several steps in the calibration procedures to establish the optimal operating voltages for the respective radiation monitors. Consequently, the operating voltage for the respective radiation monitors were set lower than intended by the calibration procedures.

Corrective Actions: The licensee was unable to identify a condition report to justify the use of radiation sources with such low radiation levels, and therefore initiated Condition Report CR-GGN-2019-08140 to evaluate the calibration concerns in the corrective action program.

Corrective Action References: This issue was placed into the corrective action program as Condition Report CR-GGN-2019-08140.

Performance Assessment:

Performance Deficiency: The failure to properly calibrate radiation monitors as required by established procedures was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the plant facilities/equipment and instrumentation attribute of

the Occupational Radiation Safety Cornerstone and adversely affected the cornerstone objective to ensure the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Specifically, the failure to properly calibrate radiation monitors impacts the ventilation systems' ability to mitigate radiation dose to workers and the public.

Significance: The inspectors assessed the significance of the finding using Appendix C, "Occupational Radiation Safety SDP." The inspectors determined the finding to be of very low safety significance (Green) because it was not as low as reasonably achievable (ALARA) issue, there was no overexposure or substantial potential for overexposure, and the licensee's ability to assess dose was not compromised.

Cross-Cutting Aspect: H.11 - Challenge the Unknown: Individuals stop when faced with uncertain conditions. Risks are evaluated and managed before proceeding. Specifically, individuals did not stop when faced with the fact that the calibration source dose rate was not close to 100 mR/hr.

Enforcement:

Violation: Technical Specification 5.4.1.a states, in part, written procedures shall be established and implemented in accordance with Regulatory Guide 1.33, "Quality Assurance Program requirements (Operation)," Revision 2, Appendix A. Appendix A, Section 8.b, "Procedures for Control of Measuring and Test Equipment and for Surveillance Tests, Procedures, and Calibrations," requires that specific procedures for surveillance tests, inspections, and calibrations should be written to include area, portable, airborne, and process radiation monitor calibrations.

Installed plant air monitoring system calibration procedures for D17 Process Radiation Monitors; Procedure 06-IC-1D17-A-0008, "Containment and Drywell Ventilation Exhaust High Radiation Calibration," Revision 106, Section 5.120, Procedure 06-IC-1D17-A-1001-01, "Fuel Handling Area Ventilation Exhaust Radiation Monitor Calibration," Revision 102, Section 5.1.4.1.(a), and Procedure 06-IC-1D17-A-1003, "Fuel Handling Area Pool Sweep Radiation Monitor Calibration," Revision 106, Section 5.121, state, in part, to list two radiation values from the source decay curve with the high radiation value not exceeding 100 mR/hr, but be as close to 100 mR/hr as possible.

Contrary to the above, from October 20, 2018, to June 11, 2019, the licensee failed to implement written procedures as established for calibration of nine installed plant air radiation monitoring systems associated with containment and drywell ventilation exhaust, fuel handling area pool sweep, and fuel handling area ventilation exhaust. Specifically, when calibrations were performed on nine radiation monitors associated with the three procedures listed above, the highest radiation values recorded ranged from 35.67 mR/hr to 36.19 mR/hr. This was not close to 100 mR/hr as specified in the calibration procedures.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

Failure to Correct a Condition Adverse to Quality			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000416/2019004-04 Open/Closed	[P.2] - Evaluation	71152
<p>An NRC-identified, Green finding and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified when the licensee failed to ensure that conditions adverse to quality were promptly identified and corrected. Deficiencies with the operation of a containment airlock inner door were allowed to remain uncorrected, which resulted in a failure to maintain primary containment operable on September 26, 2019, when the outer airlock door was opened with the inner airlock door not fully closed and secured.</p> <p><u>Description:</u> On September 26, 2019, a radiation protection technician was exiting containment via the airlock at the 208 feet elevation. While operating the door as per the instructions included in the airlock, the technician noticed air movement between the auxiliary building and containment when the outer door was opened. At the time, the inner door was assumed to be closed, secured, and sealed because the available indicating lights indicated as such. However, maintenance technicians also attempting to leave containment through the same airlock approached the inner door from within containment and noticed that the door was not fully secure as the radiation protection technician was exiting the airlock.</p> <p>The airlock consists of two doors with interlocks to prevent both doors from being open at the same time, thereby ensuring containment integrity. Both doors contain locking pins that engage with the door frame and are designed to keep the door closed while the door seals provide the sealing function. These locking pins are only visible from the drywell side of each door; therefore, plant personnel must rely on the indicating lights to know the status of the door interlock. The interlock was based on door seal inflation pressure only and did not take into account whether the door was actually secure. The seals then inflate after the door locking pins actuate, and the locking pins actuate after the door position limit switch determines that the door was closed.</p> <p>On September 26, 2019, a known issue with the inner door closing mechanism allowed the door to bounce against the door frame after the limit switch indicated that the door was closed. When the door locking pins were activated, the door was in the process of opening after it bounced off the door frame. When the pins were activated, they were not aligned with the matching pin locking holes on the door frame. Consequently, the pins did not properly engage with the door frame and did not allow the door to be properly secured. Because the seal inflation logic was not based on whether the door pins were fully engaged with the door frame, the seals were allowed to inflate. After the seals reached their full inflation pressure, the door operation interlock was made up, which allowed operation of the outer door. Because of the configuration of the door, the lack of full locking pin engagement was not possible to be seen by the radiation protection technician in the airlock. When the outer door was opened, the inner door not being properly secured allowed for an open pathway between containment and the auxiliary building despite the door seals being fully inflated.</p> <p>The licensee entered this issue into their corrective action program as Condition Report CR-GGN-2019-07477 and performed a root cause analysis. The licensee identified design changes to ensure the airlock functioned as required and administratively blocked routine access through the door until interim corrective actions were implemented.</p>			

The inspectors performed a condition report search on this airlock. The inspectors identified the following condition reports documenting issues with the locking pins not properly engaging: CR-GGN-2016-03721, CR-GGN-2018-02927, CR-GGN-2018-03251, and CR-GGN-2019-03108. In addition, the inspectors identified the following CRs documenting the inability of the door to close without assistance and/or the door bouncing while closing: CR-GGN-2018-03251, CR-GGN-2018-07849, CR-GGN-2018-08613, CR-GGN-2018-09784, CR-GGN-2018-10008, CR-GGN-2019-00476, CR-GGN-2019-01100, and CR-GGN-2019-03109.

As documented in Condition Report CR-GGN-2019-02676, on April 3, 2019, the inspectors experienced significant air movement through the airlock past the inner door seal when they opened the outer door during a routine inspection inside containment. The inspectors immediately reported this concern to the main control room.

The inspectors reviewed the corrective actions for all of these condition reports and determined that, in general, the work performed as a result of the individually identified issues was inadequate to correct the identified concern. For example, CRs CR-GGN-2016-03721, CR-GGN-2018-03251, CR-GGN-2018-03261, CR-GGN-2018-07849, and CR-GGN-2018-08613 were all closed with no corrective maintenance performed. Condition Report CR-GGN-2018-03251 documented a concern with difficulty in closing the door, having to manually assist it closing, and the locking pins not engaging properly, and was closed to Work Order 498878. Work Order 498878 performed an interlock test on the airlock and verified that with each door open, the other door could not be opened. No part of this work order addressed the deficiency with either the door closing mechanism or the locking pins not properly engaging.

Condition Report CR-GGN-2018-02927, written on March 30, 2018, and Condition Report CR-GGN-2019-03109, written on April 18, 2019, were both closed to Work Order 00498504, which was worked on December 13, 2019. The remaining condition reports were all closed to Work Order 508252, which determined that the door closing limit switch was loose and required adjustment, which neither addressed nor corrected the deficiency with the door closing mechanism nor the door bouncing while attempting to close.

The inspectors determined that while deficiencies were identified with the 208-foot elevation containment airlock, the licensee failed to properly evaluate the issues, and therefore failed to take timely corrective actions until the September 26, 2019, event.

Corrective Actions: The licensee entered this issue into their corrective action program as Condition Report CR-GGN-2019-07477 and performed a root cause analysis. The licensee identified design changes to ensure the airlock functioned as required and administratively blocked routine access through the door until interim corrective actions were implemented. Routine operator rounds confirm the door remains closed and appropriately secure.

Corrective Action References: The licensee entered the issue into their corrective action program as Condition Report CR-GGN-2019-07477.

Performance Assessment:

Performance Deficiency: The failure to correct conditions adverse to quality is a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the configuration control attribute of the Barrier Integrity Cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the failure of the inner door to remain secure while the outer door was opened created a loss of safety function of containment.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Because the finding represented an actual open pathway in the physical integrity of reactor containment, the inspectors utilized Appendix H to further assess the finding. The inspectors determined that this issue represented a Type B finding at power which affected containment penetration seals thus requiring a Phase 2 review. The inspectors determined that while the performance deficiency existed for several years, the actual open pathway only existed for a very short amount of time when the outer door was opened coincident with the inner door not being fully secure. The inspectors could locate only two instances of this occurring with a combined time period of 1-2 minutes. As such, the inspectors assigned a risk exposure time period to this finding of <3 days. Using Table 7.2, the inspectors determined that because this performance deficiency only adversely affected the leakage from wetwell to environment and the cumulative exposure time was <3 days, this issue screened as having very low safety significance (Green).

Cross-Cutting Aspect: P.2 - Evaluation: The organization thoroughly evaluates issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. The licensee did not thoroughly evaluate containment airlock issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance.

Enforcement:

Violation: As required by 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," conditions adverse to quality shall be promptly identified and corrected.

Contrary to the above, from April 3, 2019, through September 26, 2019, the licensee failed to promptly identify and correct conditions adverse to quality associated with the 208-foot elevation containment airlock door. Specifically, conditions adverse to quality remained uncorrected until a failure of the airlock to maintain containment integrity during personnel ingress/egress occurred.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

Observation: Semiannual Trend Review	71152
<p>Through a review of recent findings entered into the corrective action system, the inspectors were concerned that a lack of rigorous monitoring and trending of site programs and systems could be a common theme with many of the findings. The inspectors were concerned that the level of system/program monitoring, if not improved, could continue to result in failures to identify deficiencies that would otherwise be identified and corrected at a low threshold.</p> <p>Recent examples that the inspectors identified which relate to this concern include the following issues:</p> <ul style="list-style-type: none"> • Generator protection SCRAM: As documented in Condition Report CR-GGN-2019-01504, a main generator protection trip occurred due to a phase imbalance due to normal grid fluctuations. A recent design change modified the trip setpoint to a value that was routinely exceeded, but routine monitoring of the system failed to identify the risk of changing the setpoint to a value that would be routinely challenged. The licensee determined that more robust monitoring of the system would have identified a potential issue that would have allowed further monitoring of the situation prior to the events that caused the generator trip and subsequent reactor scram. This issue was documented as FIN 05000416/2019002-02 (ADAMS Accession No. ML19226A236). • Transient combustibles: As documented in Condition Report CR-GGN-2019-06019, the licensee failed to ensure that certain aspects of their fire protection program were being adequately monitored to ensure that transient combustibles in and around the plant were controlled in accordance with licensee procedures. A contributing factor to this issue was that personnel responsible for the fire protection program were not ensuring that site personnel were complying with all requirements of the control of combustibles procedure. This issue was documented as NCV 05000416/2019003-01 (ADAMS Accession No. ML19310D791). • Division 1 standby service water leak: As documented in Condition Report CR-GGN-2019-00096, a pencil-sized leak developed in the service water piping associated with the Division 1 standby diesel generator. A contributing factor to the leak was that the licensee failed to ensure that the microbiologically induced corrosion (MIC) program had a defined owner. The lack of a clear owner contributed to the failure to monitor the overall erosion/corrosion program to ensure that service water activities adequately monitored and controlled service water pipe degradation. This issue was documented as NCV 05000416/2019001-01 (ADAMS Accession No. ML19130A223). • Division 1 standby diesel generator jacket coolant leak: As documented in Condition Report CR-GGN-2019-09069 and in the Inspection Results section of this report, the licensee failed to ensure that a known degraded condition in the drain line of the Division 1 standby diesel generator jacket coolant water heat exchanger was communicated to heat exchanger testing personnel for incorporation into the inspection plan for the heat exchanger. In addition, routine walkdowns and system monitoring by plant personnel failed to identify the leak. • Division 2 standby gas treatment charcoal efficiency: As documented in Condition Report CR-GGN-2019-07766 and in the Inspection Results section of this report, the 	

licensee determined that the degrading trend was predictable, but was not detected beforehand because of inadequate monitoring and inadequate identification of adverse trends.

- 208-foot elevation airlock: As documented in Condition Report CR-GGN-2019-07477 and in the Inspection Results section of this report, known degraded conditions were allowed to continue, which cumulated in a loss of containment when the outer door was opened while the inner door was confirmed to be unsecure. However, because the overall health of the airlock doors was not appropriately assessed, monitored, and controlled, the loss of containment safety function was allowed to occur.
- Level A storage ambient monitoring: As documented in Condition Report CR-GGN-2019-07871, the temperature and humidity in the Level A storage in the warehouse was not being properly monitored and controlled. Despite several previous instances of the parameters being found out of allowable ranges, appropriate corrective actions were not being taken partly because of the lack of effective system monitoring and trending. This issue was documented as NCV 05000416/2019010-03 (ADAMS Accession No. ML19310D784).

Failure to Promptly Identify and Correct Degraded Standby Gas Treatment Charcoal			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000416/2019004-05 Open/Closed	[H.1] - Resources	71153
<p>An NRC-identified Green finding and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," was identified when the licensee failed to promptly identify and correct a condition adverse to quality. The results of a failed charcoal efficiency test that was sampled on September 4, 2019, was not evaluated until September 20, 2019, which resulted in a condition prohibited by technical specifications and an associated licensee event report because the charcoal was not replaced within the technical specification allowed outage time.</p>			
<p><u>Description:</u> On September 4, 2019, the licensee performed a routine surveillance test on the Division 2 standby gas treatment charcoal filter. The surveillance requirement was to perform a charcoal absorber chemical analysis per Technical Specification 5.5.7.c. The surveillance requirement acceptance criteria, in part, was to demonstrate that a laboratory test of a sample of the charcoal absorber shows the methyl iodide penetration less than 0.5 percent. This test was performed in accordance with licensee Procedure 06-ME-1000-0007, "Charcoal Absorber Chemical Analysis," Revision 106.</p> <p>On September 20, 2019, the licensee received the results of this test from the vendor who performed the test. The measured efficiency of 98.9 percent failed to meet the acceptance criteria, which required the Division 2 standby gas treatment unit to be declared inoperable from the date that the sample was obtained, September 4, 2019. Technical Specification 3.6.4.3 required that the unit be returned to operable status within 7 days or be in Mode 3 within 12 hours. Because the Division 2 standby gas treatment system was inoperable for 16 days, this constituted a condition prohibited by technical specifications.</p> <p>The licensee replaced the charcoal, performed an efficiency test on a sample of the new charcoal, and returned the system to operable status on September 22, 2019. The licensee</p>			

entered this issue into their corrective action program as Condition Report CR-GGN-2019-07766 and performed an equipment failure evaluation. The licensee determined that results of previous tests demonstrated a degrading trend in charcoal efficiency that should have been used to predict impending efficiency failure. Consequently, the licensee determined that the failure was not detected beforehand because of inadequate monitoring and inadequate identification of adverse trends.

Procedure EN-DC-159, "System and Component Monitoring," Revision 164, required system and component monitoring to promote the early detection of equipment issues through trending. Specifically, key parameters which could have been trended, but were not, included the vendor-recommended alert limit of 5 percent penetration at 2 inches. Test results from 2011, 2013, and 2015 showed an increasing trend in this parameter with a result of 4.12 percent from the sample taken on August 28, 2015. The 2-inch penetration result nearing the limit was neither recognized nor trended because the system engineer was unaware that the 5 percent limit was a critical parameter. Further, the acceptance criteria in the procedure was set only to identify failure and did not include a lower level (e.g., an Alert level) to initiate and enter a potential degrading trend into the corrective action program for further evaluation and resolution. The results from the September 4, 2019, test were over 25 percent penetration at 2 inches.

The inspectors reviewed the procedure used to control the charcoal efficiency testing. Step 5.7 of Procedure 06-ME-1000-R-0007 required, "within 31 days after removal of sample, verify that efficiency of charcoal meets Acceptance Criteria of 99.5 percent...". Additionally, the stated purpose of the procedure was to verify "within 31 days after removal that the sample meets the...testing criteria..." The inspectors determined that because the procedure allowed up to 3 weeks beyond the expiration of the technical specification allowed outage time, and normal non-expedited laboratory testing has a demonstrated turn-around time of over 2 weeks, a failed charcoal efficiency test would result in the licensee operating in a condition prohibited by technical specifications while still remaining compliant with the testing procedure. Therefore, the inspectors concluded that the 31-day time period to review the test results, as allowed by the procedure, was inadequate to ensure that a failed charcoal test would be promptly identified and corrected, and that the surveillance testing would be conducted in a manner that would result in compliance with technical specification requirements.

The inspectors reviewed the corrective actions taken as a result of this event and noted that, although Condition Report CR-GGN-2019-07766 remained open at the time of this inspection, no corrective actions were either identified or put in place to revise the procedure to ensure that the test results were evaluated in a timelier manner. Therefore, the inspectors considered this issue to be NRC-identified.

Corrective Actions: The licensee replaced the degraded charcoal, implemented changes to the system monitoring plan to include trending in the system performance monitoring plan, and identified procedure enhancements to include creating alert limits to detect early charcoal degradation and requirements for each system engineer to ensure that appropriate critical system parameters are being monitored and trended.

Corrective Action References: The licensee entered the issue into their corrective action program as Condition Report CR-GGN-2019-07766.

Performance Assessment:

Performance Deficiency: The failure to monitor and trend critical parameters associated with the standby gas treatment system is contrary to licensee Procedure EN-DC-159 and is a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the procedure quality 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, Procedure 06-ME-1000-R-0007 failed to include appropriate acceptance criteria to identify a degrading trend and failed to include appropriate time limits to review the results of the charcoal efficiency testing.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Since the finding only represents a degradation of the radiological barrier function of standby gas treatment, the finding screens to a Green significance.

Cross-Cutting Aspect: H.1 - Resources: Leaders ensure that personnel, equipment, procedures, and other resources are available and adequate to support nuclear safety. Specifically, licensee management failed to ensure that personnel, procedures, and other resources were available and adequate.

Enforcement:

Violation: As required by 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," measures shall be established to assure that conditions adverse to quality are promptly identified and corrected.

Contrary to the above, from September 4, 2012, through December 20, 2019, the licensee failed to establish measures to assure that a condition adverse to quality was promptly identified and corrected. Specifically, the licensee failed to establish measures to assure that degraded charcoal efficiency associated with the Division 2 standby gas treatment filter unit was promptly identified and corrected. Failures to both trend critical system parameters and to ensure timely evaluation of test results contributed to the failure to restore the Division 2 standby gas treatment system to operable status prior to the expiration of the technical specification allowed outage time. Both of these failures resulted in the plant operating in a condition prohibited by technical specifications.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

Observation: LER 05000416/2016-007-01, Technical Specification Shutdown Because of the Loss of the Residual Heat Removal Pump	71153
The inspectors reviewed LER 05000416/2016-007-01, "Technical Specification Shutdown Because of the Loss of the Residual Heat Removal Pump" (ADAMS Accession No. ML17180A316), in which the licensee reported that the residual heat removal pump A was discovered to be in an inoperable condition when it failed to meet technical specification surveillance requirements for flow and differential pressure. The inspectors reviewed the licensee's corrective actions associated with this issue. In the LER, the licensee reported that	

corrective actions were put in place to “incorporate more rigorous measures to preclude misalignment during the manufacturing and installation processes for safety-related vertical pumps.” These corrective actions, as detailed in Condition Report CR-GGN-2016-06798, included the development of a critical parameter guideline document to be applied for assembly of safety-related vertical pumps in the residual heat removal, high pressure core spray (HPCS), and low pressure core spray (LPCS) systems, and to incorporate this guidance into fleet purchase specifications for these components. The inspectors noted that these corrective actions were closed based on the development of a document entitled, “Residual Heat Removal Pump Inspection and Repair Specification,” which was designated as being applicable for only the residual heat removal system vertical pumps. In response to this observation that the intent of the corrective actions was not met, the licensee issued an action to develop additional documentation to incorporate the applicable critical parameter guidelines into corresponding design basis specifications for the HPCS and LPCS system vertical pumps.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On October 3, 2019, the inspectors presented the radiation protection inspection results to Mr. E. Larson, Site Vice President, and other members of the licensee staff.
- On January 9, 2020, the inspectors presented the integrated inspection results to Mr. E. Larson, Site Vice President, and other members of the licensee staff.
- On January 29, 2020, the inspectors presented the Independent spent fuel storage installation inspection results to Mr. E. Larson, Site Vice President, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
60855	Calibration Records	DFS-015	Report of Calibration	07/26/2019
	Corrective Action Documents	CR-GGN-	2018-02678, 2019-07704, 2018-12770, 2019-04627	
		CR-HQN-	2018-00568	
		SQ-SQHQN-	2018-00143, 2018-00158, 2018-00277, 2018-00310, 2019-00090, 2019-00141	
	Engineering Changes	12920	Adoption of NUREG-0554 as Bases for Spent Fuel Cask Crane	02/26/2009
	Engineering Evaluations	ER-GG-2003-0018-024	ISFSI Operational Sequence #3 and 4 – Loading Operations	03/26/2004
		ER-GG-2003-0018-049	Cold Proof Test of Spent Fuel Cask Crane	10/25/2006
	NDE Reports	1T31E001	Magnetic Particle Examination	03/13/2019
		BOP-MT-19-010	Magnetic Particle Examination	04/25/2019
		BOP-MT-19-011	Magnetic Particle Examination	05/15/2019
		BOP-MT-19-012	Magnetic Particle Examination	05/16/2019
		BOP-PT-19-0005	Liquid Penetrant Examination	04/25/2019
	Procedures	06-OP-1000-D-0001	Surveillance Procedure Data Package Cover Sheet	Numerous
		EN-LI-102	Corrective Action Program	36
	Radiation Surveys	GG-1904-0229	ISFSI Pad	06/30/2019
		GG171	Environmental Dosimetry Report	Numerous
	Self-Assessments	QA-20-2018-GGNS-1	Quality Assurance Audit Report	08/21/2018
	Work Orders	WO	00204609, 00452062, 00514140, 00514142, 00514143, 00514145, 00514155, 52701612, 52773260, 52847863	
60857	Engineering Evaluations	1115	72.48 Evaluation	
		1236	72.48 Evaluation	
		1298	72.48 Evaluation	
		1306	72.48 Screening	
		1311	72.48 Evaluation	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		1347	72.48 Evaluation	
		1354	72.48 Evaluation	
		1368	72.48 Screening	
		1388	72.48 Evaluation	
		1398	72.48 Evaluation	
	Procedures	EN-LI-112	10 CFR 72.48 Evaluations	13
71111.01	Corrective Action Documents	CR-GGN-	1996-00553, 2001-00008	
71111.01	Procedures	04-1-01-P41-1	Standby Service Water System Operating Instruction	150
71111.01	Procedures	04-1-03-A30-1	Cold Weather Protection	23
71111.01	Work Orders	WO	52850014	
71111.04Q	Corrective Action Documents	CR-GGN-	2019-09214	
71111.04Q	Drawings	M-1061A	P & I Diagram Standby Service Water System Unit 1	68
71111.04Q	Drawings	M-1061B	P & I Diagram Standby Service Water System Unit 1	53
71111.04Q	Procedures	04-1-01-P41-1	Standby Service Water System	150
71111.12	Corrective Action Documents	CR-GGN-	2018-06552, 2018-07611, 2018-11055, 2019-00014, 2019-02582, 2019-05366, 2019-07766, 2019-08035, 2019-09069, 2019-09182	
71111.12	Miscellaneous		Selected Volatile Organic Compound Logs for Third Quarter 2019	
71111.12	Procedures	EN-DC-205	Maintenance Rule Monitoring	7
71111.12	Work Orders	WO	360772, 530545, 52643994, 52719450	
71111.13	Corrective Action Documents	CR-GGN-	2019-08595, 2019-09069, 2019-09182	
71111.13	Drawings	9645-M-003.0	Automatic Turbine Tester	2
71111.13	Miscellaneous		Troubleshooting Control Form	10/22/2019
71111.13	Miscellaneous		Division I Standby Diesel Generator Walkdown Plan	09/27/2019
71111.13	Procedures	EN-DC-184	NRC Generic Letter 89-13 Service Water Program	6
71111.13	Procedures	EN-DC-316	Heat Exchanger Performance and Condition Monitoring	11
71111.13	Procedures	EN-DC-340	Microbiologically Influenced Corrosion (MIC) Monitoring Program	5
71111.13	Work Orders	WO	00501781, 52766058	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.15	Corrective Action Documents	CR-GGN-	2019-08559, 2019-08609	
71111.15	Work Orders	WO	00533109, 52850969	
71111.19	Drawings	M-1061B	Standby Service Water System	53
71111.19	Miscellaneous		ASME IX Welder Performance Qualification Record	
71111.19	Procedures	06-OP-1C41-Q-0001	Standby Liquid Control Functional Test	131
71111.19	Procedures	CEP-RR-001	ASME Section XI Repair/Replacement Program	314
71111.19	Procedures	CEP-WP-002	Qualification, Development, and Control of Welding Procedure Specifications	3
71111.19	Procedures	CEP-WP-003	Qualification and Control of Welders	6
71111.19	Work Orders	WO	501781, 531844, 50293210, 52766831	
71111.22	Corrective Action Documents	CR-GGN-	2019-08595, 2019-08757	
71111.22	Drawings	169C9489, Sheet 1	GE Purchase Part Relay	11
71111.22	Drawings	169C9490, Sheet 1	Selected Part Switch (Type CRC2940)	15
71111.22	Drawings	169C9490, Sheet 2	Selected Part Relay (Type CRC2940)	12
71111.22	Drawings	184C4571	Power Supply Switch	9
71111.22	Drawings	865E542-001	Assembly High Pressure Core Spray Relay VB 1H13-P625, Unit 1	15
71111.22	Drawings	865E542-002	Electrical Device List and Parts List, High Pressure Core Spray Relay VB, 1H13-P625, Unit 1	4
71111.22	Drawings	865E897-001	Division 1 MSIV Leakage Control Cabinet, 1H13-P655	18
71111.22	Drawings	C1500	Diesel Generator Building Area 12, Reinforced Concrete Plan Foundation Mat at Elevation 133'0"	15
71111.22	Drawings	C1510	Diesel Generator Building Area 12, Miscellaneous Steel Platforms and Stairs	7
71111.22	Drawings	E-1183-020	Schematic Diagram, E32 MSIV Leakage Control System Power Distribution	10
71111.22	Drawings	E-1183-021	E22 High Pressure Core Spray System, Testability Card File and Pwr. Supplies	8

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.22	Engineering Changes	EC 0000069420	1C82K701D – Replace Topaz 5352-40 Inverter with Majorsine 2000-125-2U Inverter	0
71111.22	Engineering Changes	EC 0000081959	Update Setpoint Notes for Inverters Impacted by ER-GG-2001-0339 Reference CR-GGN-2018-12196	0
71111.22	Engineering Changes	EC 50275	Flex Basis EC	2
71111.22	Procedures	06-OP-1P75-R-003	SDG 11 Functional Test - Test No. 1 - 24 Hour Load Test/Hot Restart Test	10/24/2019
71111.22	Procedures	06-OP-1P75-R-003	SDG 11 Functional Test - Test No. 2 - 1 Hour Load Test/Hot Restart Test	10/24/2019
71111.22	Procedures	07-S-13-61	Power Supply/Inverter Conditioning/Capacitor Reforming	6, 7
71111.22	Procedures	EN-MP-120	Material Receipt	14
71111.22	Procedures	EN-WM-107	Post Maintenance Testing	5
71111.22	Work Orders	WO	529773, 52894399	
71124.01	Corrective Action Documents	CR-GGN-	2018-04548, 2018-04984, 2018-05136, 2018-05174, 2018-05234, 2018-05997, 2018-06224, 2018-06442, 2018-08263, 2018-08898, 2018-09979, 2018-10816, 2018-13075, 2019-02693, 2019-03912, 2019-04130, 2019-06413, 2019-07285	
71124.01	Miscellaneous	2Q2019	NRC Perf Indicator Technique/Data Sheet	07/11/2019
71124.01	Miscellaneous	GIN-2019-00012	2019 National Source Tracking System Annual Inventory Reconciliation	01/09/2019
71124.01	Procedures	EN-RP-100	Radiation Worker Expectations	12
71124.01	Procedures	EN-RP-101	Access Control for Radiologically Controlled Areas	15
71124.01	Procedures	EN-RP-102	Radiological Control	7
71124.01	Procedures	EN-RP-105	Radiological Work Permits	18
71124.01	Procedures	EN-RP-106-01	Radiological Survey Guidelines	5
71124.01	Procedures	EN-RP-108	Radiation Protection Posting	22
71124.01	Procedures	EN-RP-109	Hot Spot Program	5
71124.01	Procedures	EN-RP-121	Radioactive Material Control	16
71124.01	Procedures	EN-RP-121-01	Receipt of Radioactive Material	6
71124.01	Procedures	EN-RP-122	Alpha Monitoring	9
71124.01	Procedures	EN-RP-123	Radiological Controls for Highly Radioactive Objects	1
71124.01	Procedures	EN-RP-131	Air Sampling	17

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71124.01	Procedures	EN-RW-102	Radioactive Shipping Procedure	17
71124.01	Radiation Surveys	Air Samples (AS-GG-)	2018-06049, 2019-07555, 2019-07556	
71124.01	Radiation Surveys	GG-	1804-0658, 1901-0255, 1902-0115, 1902-0118, 1902-0157, 1902-0158, 1903-0065, 1903-0098, 1903-0202, 1903-0257, 1903-0262, 1903-0263, 1905-0156, 1905-0339, 1905-0439, 1906-0253, 1906-0255, 1907-0056, 1908-0089, 1908-0195, 1908-0388, 1909-0108, 1909-0136, 1909-0139, 1909-0296, 1909-0311, 1909-0312, 1910-0014	
71124.01	Radiation Work Permits (RWPs)	2018-1531	RF-21 Diving	1
71124.01	Radiation Work Permits (RWPs)	2019-1054	2019-1054 - Locked High Radiation Area Entries for Plant/System Investigations, Valve Manipulations, Tagouts, and Misc. Activities	0
71124.01	Radiation Work Permits (RWPs)	2019-1058	Maintenance, Tours, and Inspections	0
71124.01	Radiation Work Permits (RWPs)	2019-1068	RWCU 'B' Pump Replacement	0
71124.01	Radiation Work Permits (RWPs)	2019-1074	N22 Precoat "A" Septa Filter Replacement	2
71124.01	Self-Assessments	LO-GLO-2018-000172	Pre-NRC Radiological Hazard Assessment and Exposure Controls	06/07/2019
71124.03	Corrective Action Documents	CR-GGN-	2017-03142, 2018-04104, 2018-05263, 2018-06018, 2018-07380, 2018-10942, 2018-11631, 2019-03625	
71124.03	Corrective Action Documents	CR-HQN-	2018-01428,	
71124.03	Miscellaneous	HEPA 71-38	DOP Challenge Test	10/14/17
71124.03	Miscellaneous	HEPA 71-38	DOP Challenge Test	03/29/18
71124.03	Miscellaneous	HEPA V-065	DOP Challenge Test	03/29/18
71124.03	Miscellaneous	HEPA V18-05	DOP Challenge Test	03/28/18
71124.03	Miscellaneous	HEPA V18-10	DOP Challenge Test	03/28/18
71124.03	Miscellaneous	HEPA V18-13	DOP Challenge Test	03/29/18
71124.03	Miscellaneous	HEPA V18-14	DOP Challenge Test	03/29/18
71124.03	Procedures	06-IC-1D17-A-	Containment and Drywell Ventilation Exhaust High Radiation	106

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		0008	Calibration, Channel B	
71124.03	Procedures	06-IC-1D17-A-0008	Containment and Drywell Ventilation Exhaust High Radiation Calibration, Channel C	106
71124.03	Procedures	06-IC-1D17-A-1001-01	Fuel Handling Area Ventilation Exhaust Radiation Monitor Calibration, Channel A	102
71124.03	Procedures	06-IC-1D17-A-1001-01	Fuel Handling Area Ventilation Exhaust Radiation Monitor Calibration, Channel D	101
71124.03	Procedures	06-IC-1D17-A-1001-03	Fuel Handling Area Pool Sweep Radiation Monitor Calibration, Channel A	106
71124.03	Procedures	06-IC-1D17-A-1001-04	Fuel Handling Area Ventilation Exhaust Radiation Monitor Calibration, Channel A	103
71124.03	Procedures	EN-RP-310	Operation and Initial Setup of the Eberline AMS-4 Continuous Air Monitor	4
71124.03	Procedures	EN-RP-402	DOP Challenge Testing of HEPA Vacuums and Portable Ventilation Units	4
71124.03	Procedures	EN-RP-404	Operation and Maintenance of HEPA Vacuum Cleaners and HEPA Ventilation Units	8
71124.03	Procedures	EN-RP-501	Respiratory Protection Program	6
71124.03	Procedures	EN-RP-502	Inspection and Maintenance of Respiratory Protection Equipment	10
71124.03	Procedures	EN-RP-502-01	Firehawk M7 SCBA	3
71124.03	Procedures	EN-RP-502-02	Flow Testing MSA Breathing Apparatus	0
71124.03	Procedures	EN-RP-502-03	Airhawk II SCBA	0
71124.03	Procedures	EN-RP-503	Selection, Issue and use of Respiratory Protection Equipment	7
71124.03	Procedures	EN-RP-504	Breathing Air	4
71124.03	Procedures	EN-RP-504-01	Unicus II Operating Instructions	0
71124.03	Procedures	EN-RP-504-03	Operating and Maintenance of the Baron II SCBA Fill System	0
71124.03	Procedures	EN-RP-505	Portacount Respirator Fit Testing	7
71124.03	Self-Assessments	LO-GLO-2018-173 CA 2	Pre NRC Inspection Assessment: In-Plant Airborne Radioactivity Control and Mitigation	06/20/2019
71124.03	Work Orders	WO	00465517, 52706814, 52707012, 52707015, 52707017, 52716326, 52716996, 52718243, 52730663, 52756014, 52766303, 52766305, 52766915, 52771385, 52773258, 52774278, 52776990, 52779921, 52785789, 52785926,	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			52785927, 52786062, 52787228, 52791316, 52802693, 52805476, 52805477, 52808811, 52808812	
71152	Corrective Action Documents	CR-GGN-	2016-03721, 2017-07783, 2017-10416, 2018-02927, 2018-03251, 2018-03610, 2018-03621, 2018-07538, 2018-07591, 2018-07849, 2018-08613, 2018-09649, 2018-09784, 2018-10008, 2019-00459, 2019-00476, 2019-01100, 2019-02676, 2019-03108, 2019-03109, 2019-03183, 2019-03398, 2019-05731, 2019-07084, 2019-07477, 2019-07872	
71152	Miscellaneous	00390050	Work Request	
71152	Work Orders	WO	497577, 498878, 508252	
71153	Corrective Action Documents	CR-GGN-	2016-06798, 2017-03333, 2017-08434, 2018-00918, 2018-04934, 2018-06677, 2018-06678, 2018-06679, 2019-01504, 2019-06295, 2019-07477, 2019-07766, 2019-10477	
71153	Miscellaneous		Standby Gas Charcoal Filter Media Efficiency	11/18/2019
71153	Procedures	06-ME-1000-R-0007	Charcoal Absorber Chemical Analysis	106
71153	Procedures	EN-DC-184		6