UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

August 09, 2022

Mr. John Ferrick, Site Vice President
Entergy Operations, Inc
17265 River Road
Killona, LA 70057

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 – INTEGRATED INSPECTION REPORT 05000382/2022002

Dear Mr. Ferrick:

On June 30, 2022, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Waterford Steam Electric Station, Unit 3. On July 19, 2022, the NRC inspectors discussed the results of this inspection with Mr. Matthew Lewis, General Manager of Plant Operations, and other members of your staff. The results of this inspection are documented in the enclosed report.

Eight findings of very low safety significance (Green) are documented in this report. Eight 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.

If you contest the violations or the significance or severity 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 Waterford Steam Electric Station, Unit 3.

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 Waterford Steam Electric Station, Unit 3.

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,

Signed by Dixon, John
on 08/09/22

John L. Dixon, Jr., Chief
Projects Branch D
Division of Operating Reactor Safety

Docket No. 05000382
License No. NPF-38

Enclosure:
As stated

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Number:	05000382
License Number:	NPF-38
Report Number:	05000382/2022002
Enterprise Identifier:	I-2022-002-0007
Licensee:	Entergy Operations, Inc
Facility:	Waterford Steam Electric Station, Unit 3
Location:	Killona, LA 70057
Inspection Dates:	April 1, 2022 to June 30, 2022
Inspectors:	D. Antonangeli, Health Physicist B. Baca, Health Physicist D. Childs, Resident Inspector L. Flores, Technical Assistant N. Greene, Senior Health Physicist R. Kopriva, Senior Reactor Inspector A. Patz, Senior Resident Inspector A. Sanchez, Senior Project Engineer E. Simpson, Health Physicist C. Stott, Resident Inspector J. Vera, Senior Resident Inspector
Approved By:	John L. Dixon, Jr, Chief Projects Branch D Division of Operating Reactor Safety

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at Waterford Steam Electric Station, Unit 3, 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 Adequately Plan and Control Worker Exposures As Low As (is) Reasonably Achievable (ALARA) During the Removal of Pressurizer Heaters Resulting in Worker Uptakes.			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Occupational Radiation Safety	Green NCV 05000382/2022002-02 Open/Closed	[P.5] - Operating Experience	71124.01
The inspectors identified a finding of very low safety significance (Green) for the licensee having unplanned and unintended occupational internal radiation exposure because of deficiencies in the licensee's work planning and work control program. Specifically, the licensee failed to appropriately implement aspects of EN-RP-105, "Radiological Work Permits (RWP)," to maintain doses ALARA. Four workers (two radiation protection technicians and two contract workers) received an uptake of airborne radioactive material during the removal of pressurizer heaters. The highest internal uptake was 13 mrem committed effective dose equivalent (CEDE).			

Failure to Follow Procedures with an Improper Entry into a High Radiation Area			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Occupational Radiation Safety	Green NCV 05000382/2022002-01 Open/Closed	[H.11] - Challenge the Unknown	71124.01
The inspectors reviewed a self-revealed Green non-cited violation of Technical Specification 6.8.1(a) for a worker's failure to follow procedures resulting in an improper entry to a high radiation area. Specifically, on April 8, 2022, an operator worker received a dose rate alarm as he entered into a high radiation area that he had not been made aware of the radiological conditions and was not briefed for prior to entry.			

Failure to Follow Procedures Regarding the Use of Lapel Air Sample Results			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Occupational Radiation Safety	Green NCV 05000382/2022002-03 Open/Closed	[H.13] - Consistent Process	71124.03
The inspectors identified a Green, non-cited violation of Technical Specification 6.8.1(a) for the licensee's failure to follow written radiation procedure, EN-RP-131, "Air Sampling," revision 17. Specifically, the licensee failed to follow section 5.1.12 for a lapel air sample which indicated an intake could occur greater than four derived air concentration hours (DAC-hrs) in an area that was not posted and controlled as an airborne radioactivity area.			

This step required, in part, the licensee stop work; evacuate workers, collect grab samples, and identify the source; inform workers in the area without respiratory protection that airborne radioactivity was measured, and potential exposures would be evaluated; and if the conditions causing the airborne radioactivity may still exist or are unknown, then immediately post and control the area as an airborne radioactivity area.

Failure to Follow a Radiological Work Permit Requirement			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Occupational Radiation Safety	Green NCV 05000382/2022002-04 Open/Closed	[H.5] - Work Management	71124.03
The inspectors identified a Green, non-cited violation of Technical Specification 6.8.1(a) for the licensee's failure to follow radiation procedure, EN-RP-100, "Radiation Worker Expectations," revision 13, steps to follow the requirements set forth within a radiological work permit (RWP). Specifically, workers failed to follow RWP 2022-0615, task 2, "Removal of old pressurizer heaters (includes cutting/grinding and all supporting activities)," revision 2, which required a continuous air monitor be located within the pressurizer cubicle during work evolutions which have the potential for generating airborne activity.			

Failure to Survey for an Airborne Radioactivity Area			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Occupational Radiation Safety	Green NCV 05000382/2022002-05 Open/Closed	[H.14] - Conservative Bias	71124.03
The inspectors identified a Green, non-cited violation of 10 *Code of Federal Regulations* (CFR) 20.1501(a) for the licensee's failure to reasonably evaluate surveys under the circumstances to identify and post an airborne radioactivity area in accordance with 10 CFR 20.1902(d). Specifically, air sample survey WF3-AS-041722-0238, taken on April 17, 2022, was not evaluated under circumstances reasonable to determine the extent and magnitude of airborne radioactivity levels which resulted in a failure to post and control an airborne radioactivity area.			

Inadequate Radiological Work Permit Procedure to Address Respirator Controls During Work Activities.			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Occupational Radiation Safety	Green NCV 05000382/2022002-06 Open/Closed	[H.14] - Conservative Bias	71124.03
The inspectors identified a Green, non-cited violation of Technical Specification 6.8.1(a) for an inadequate radiological work permit (RWP) procedure to address respirator controls during work activities. Specifically, licensee procedure EN-RP-105, "Radiological Work Permits," revision 19, contained procedural steps outlining the process for removing respiratory controls while an attachment to this procedure bypassed completion of an RWP revision and a total effective dose equivalent (TEDE)/as low as (is) reasonably achievable (ALARA) evaluation when changing respiratory protection controls.			

Failure to Ensure Proper Phase Rotation for FLEX Equipment			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000382/2022002-07 Open/Closed	[H.13] - Consistent Process	71152A
A self-revealed Green finding and associated non-cited violation (NCV) of 10 CFR 50.155(c), “Mitigation of beyond-design-basis events,” was identified when the licensee failed to ensure equipment relied upon for the mitigation strategies for beyond-design basis external events had the capability to perform the required functions. Specifically, the licensee failed to ensure that required Diverse and Flexible Coping Strategies (FLEX) electrical receptacles had the same electrical phase rotation as the FLEX N and N+1 core cooling pump motors such that the core cooling pumps would operate as expected.			

Inadequate Design of Differential Pressure Sensor Ambient Sensing Line			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000382/2022002-08 Open/Closed	None (NPP)	71153
The inspectors reviewed a self-revealed Green finding and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” when the licensee failed to appropriately verify the adequacy of the shield building ventilation design. Specifically, a failed stroke time test for shield building ventilation valve 114B on October 18, 2021, showed that an ambient pressure sensing line failed to provide proper input since August 29, 2021. This discovery revealed that train B of the shield building ventilation system and train B of the controlled area ventilation system were inoperable for approximately 50 days. This condition is prohibited by technical specifications and resulted in the issuance of a licensee event report because the time these systems were inoperable exceeded the technical specification allowed outage time.			

Additional Tracking Items

None.

PLANT STATUS

Unit 3 entered the inspection period in power coast down at approximately 95 percent reactor power. On April 2, 2022, the unit was shut down for refueling outage 24. On June 18, 2022, the reactor was made critical following completion of the refueling outage and returned to full power on June 23, 2022. On June 24, 2022, the unit experienced an unplanned trip due to the automatic closing of main steam isolation valve 2. The plant was restarted on June 27, 2022, and returned to full power on June 29, 2022, where it remained 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 activities described in IMC 2515, Appendix D, "Plant Status," observed risk-significant activities, and completed onsite portions of IPs. 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 03.01) (1 Sample)

(1) The inspectors evaluated readiness for seasonal extreme weather conditions prior to the onset of seasonal extreme rain and wind for the following systems: component cooling water, auxiliary component cooling water, startup transformers, and emergency diesel generators on June 2, 2022.

71111.04 - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (1 Sample)

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

(1) emergency feedwater system following a valid actuation of the system on June 27, 2022

Complete Walkdown Sample (IP Section 03.02) (1 Sample)

(1) The inspectors evaluated system configurations during a complete walkdown of the safety injection system on May 6, 2022.

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (2 Samples)

The inspectors evaluated the implementation of the fire protection program by conducting a walkdown and performing a review to verify program compliance, equipment functionality, material condition, and operational readiness of the following fire areas:

(1) fire area RAB 19-001, elevation +21.00' component cooling water pump room A on April 20, 2022
(2) fire area RAB 18-001, elevation +21.00' component cooling water heat exchanger room A on May 14, 2022

71111.07A - Heat Exchanger/Sink Performance

Annual Review (IP Section 03.01) (1 Sample)

The inspectors evaluated readiness and performance of:

(1) component cooling water B heat exchanger on May 27, 2022.

71111.08P - Inservice Inspection Activities (PWR)

PWR Inservice Inspection Activities Sample (IP Section 03.01) (1 Sample)

(1) The inspectors verified that the reactor coolant system boundary, steam generator tubes, reactor vessel internals, risk-significant piping system boundaries, and containment boundary are appropriately monitored for degradation and that repairs and replacements were appropriately fabricated, examined and accepted by reviewing the following activities from April 7, 2022 to May 13, 2022:

03.01.a - Nondestructive Examination and Welding Activities.

- Dye Penetrant Test Examination, Report No.: BOP-PT-22-012. Field Weld FW-1 Seal Weld. Component ID: EFWMVAAA204A/B.
- Ultrasonic Test Examination, Report No.: BOP-UT-22-001. Pipe to Valve SI-512A. Component ID: SI-512A (ISI-V2507) FW-7. Safety Injection System.
- Ultrasonic Test Examination, Report No.: BOP-UT-22-002. Valve SI-512A to Pipe. Component ID: SI-512A (ISI-C2507) FW-8. Safety Injection System.
- Ultrasonic Test Examination, Report No.: W-ISI-UT-22-004. 4" Pip to Elbow Weld. Component ID: 25-026, Reactor Coolant System.
- Ultrasonic Test Examination, Report No.: W-ISI-UT-22-005. Elbow to 4: Pipe Weld. Component ID: 25-027, Reactor Coolant System.
- Ultrasonic Test Examination, Report No.: W-ISI-UT-22-001. Valve to 20" Pipe Weld. Component ID: 45-008, Feedwater System.
- Ultrasonic Test Examination, Report No.: W-ISI-UT-22-002. 20" Pipe to Valve Weld. Component ID: 45-010, Feedwater System.
- Ultrasonic Test Examination, Report No.: W-ISI-UT-22-003. Valve to 20" Pipe Weld. Component ID: 46-006, Feedwater System.

- Visual Test Examination - VT-1, Report No.: W-ISI-VT-22-028. Rigid Restraint Attachment Weld. Component ID: FWRR-0283A, Emergency Feedwater System.
- Visual Test Examination - VT-3, Report No.: W-ISI-VT-22-029. Rigid Restraint. Component ID: FWRR-0283, Emergency Feedwater System.
- Radiograph Test Examination, Report No.: BOP-RT-22-001. Field Weld FW-7 Pipe to Valve SI-512A. Component ID: SI-512A. Safety Injection System.
- Radiograph Test Examination, Report No.: BOP-RT-22-002. Field Weld FW-8 Valve SI-512A to Pipe. Component ID: SI-512A. Safety Injection System.
- Phased Array Ultrasonic Test Examination of Previously Identified relevant indications accepted for continued service. Report W-ISI-VE-22-001. 2" Drain Nozzle to Safe-End Weld. Component ID: 07-009-WOL. Reactor Coolant System.
- Phased Array Ultrasonic Test Examination of Previously Identified relevant indications accepted for continued service. Report W-ISI-VE-22-002. 2" Drain Nozzle to Safe-End Weld. Component ID: 11-007-WOL. Reactor Coolant System.
- Welding associated with full replacement of the Safety Injection valve SI-512 A (ISI-V2507). Gas Tungsten Arc Welding. Work Order No. 527322-01. Field Weld No. 7.
- Welding associated with full replacement of the Safety Injection valve SI-512 A (ISI-V2507). Gas Tungsten Arc Welding. Work Order No. 527322-01. Field Weld No. 8.

03.01.b - Pressurized-Water Reactor Vessel Upper Head Penetration Examination Activities.

- Visual Test Examination - Bare Metal Visual, Report No.: W-ISI-VT-22-042. Reactor Vessel Closure Head RVCH CEDM Nozzles 1-87. Component ID: 02-N-01X1 thru 02-N-87X1. Reactor Pressure Vessel.
- Visual Test Examination - Bare Metal Visual, Report No.: W-ISI-VT-22-043. Reactor Vessel Closure Head RVCH Vent Line. Component ID: 02-N2-01X1. Reactor Pressure Vessel.
- Visual Test Examination - Bare Metal Visual, Report No.: W-ISI-VT-22-044. Reactor Vessel Closure Head RVCH CEDM Nozzles 92-101. Component ID: 02-N-92X1 thru 02-N-101X1. Reactor Pressure Vessel.

03.01.c – Pressurized-Water Reactor Boric Acid Corrosion Control Activities.

- Boric Acid Evaluation No. 19-WF3-0004, Condition Report CR-WF3-2019-00140
- Boric Acid Evaluation No. 19-WF3-0012, Condition Report CR-WF3-2019-01063
- Boric Acid Evaluation No. 19-WF3-0019, Condition Report CR-WF3-2019-03032
- Boric Acid Evaluation No. 19-WF3-0020, Condition Report CR-WF3-2019-03053
- Boric Acid Evaluation No. 19-WF3-0021, Condition Report CR-WF3-2019-03302
- Boric Acid Evaluation No. 19-WF3-0022, Condition Report CR-WF3-2019-03311

- Boric Acid Evaluation No. 19-WF3-0023, Condition Report CR-WF3-2019-04894
- Boric Acid Evaluation No. 19-WF3-0025, Condition Report CR-WF3-2019-06358
- Boric Acid Evaluation No. 19-WF3-0026, Condition Report CR-WF3-2019-06379
- Boric Acid Evaluation No. 19-WF3-0028, Condition Report CR-WF3-2019-06373
- Boric Acid Evaluation No. 20-WF3-0001, Condition Report CR-WF3-2020-01131
- Boric Acid Evaluation No. 20-WF3-0016, Condition Report CR-WF3-2020-04595
- Boric Acid Evaluation No. 21-WF3-0001, Condition Report CR-WF3-2021-00085
- Boric Acid Evaluation No. 21-WF3-0020, Condition Report CR-WF3-2021-05655
- Boric Acid Evaluation No. 21-WF3-0022, Condition Report CR-WF3-2021-05516
- Boric Acid Evaluation No. 21-WF3-0026, Condition Report CR-WF3-2021-05559

03.01.d – Pressurized-Water Reactor Steam Generator Tube Examination Activities.

- Per the licensee's current requirement, they were not required to perform any Steam Generator tube inspections this outage.
- The licensee did install a modification to the Steam Generators feed rings to reduce harmonic vortexing that they have experienced since the installation of the replacement Steam Generators in 2013.

Problem Identification and Resolution. Review of Inservice Inspection items. (Inspection Procedure 71152 - Problem Identification and Resolution)

- The inspector evaluated a sample of 29 condition reports associated with inservice inspection activities. No findings or violations of more than minor significance were identified.

71111.11Q - Licensed Operator Requalification Program and Licensed Operator Performance

Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01) (1 Sample)

(1) The inspectors observed and evaluated licensed operator performance in the control room during plant startup following a refueling outage on June 18-19, 2022.

Licensed Operator Requalification Training/Examinations (IP Section 03.02) (1 Sample)

(1) The inspectors observed and evaluated licensee simulator-based just-in-time training for a reactor startup followed by training involving a rapid downpower with steam line break inside containment on June 27, 2022.

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (1 Sample)

The inspectors evaluated the accuracy and completeness of risk assessments for the following planned and emergent work activities to ensure configuration changes and appropriate work controls were addressed:

(1) elevated Green risk while restarting Unit 3 and bringing reactor to 100 percent power following unplanned main steam isolation valve closure from June 27 to 29, 2022

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (3 Samples)

The inspectors evaluated the licensee's justifications and actions associated with the following operability determinations and functionality assessments:

(1) shutdown cooling train operability following loss of auxiliary component cooling water pump B on May 9, 2022
(2) emergency feedwater pump AB operability following surveillance with less than allowed differential pressure on June 11, 2022
(3) auxiliary component cooling water pump B operability following identification of raised bearing temperatures on June 18, 2022

71111.18 - Plant Modifications

Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02) (2 Samples)

The inspectors evaluated the following temporary or permanent modifications:

(1) auxiliary component cooling water pump B motor was replaced with the component cooling water pump AB motor on June 5, 2022
(2) reactor coolant system 1B cold leg resistance temperature detector thermowell was plugged and existing core operating limit supervisory system detector used for safety-related inputs on June 19, 2022

71111.19 - Post-Maintenance Testing

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

The inspectors evaluated the following post-maintenance testing activities to verify system operability and/or functionality:

(1) component cooling water pump B testing after relay maintenance performed on May 19, 2022
(2) reactor coolant system integrity checks following leaks from core element drive vent valves on May 28, 2022
(3) auxiliary component cooling water pump B testing following replacement with component cooling water pump AB on June 5, 2022

(4) engineered safety features actuation system testing for steam generator isolation after relay replacement on June 27, 2022

71111.20 - Refueling and Other Outage Activities

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

(1) The inspectors evaluated refueling outage 24 activities from April 2 to June 20, 2022.

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance testing activities to verify system operability and/or functionality:

Surveillance Tests (other) (IP Section 03.01) (3 Samples)

(1) emergency diesel generator B surveillance test on May 12, 2022
(2) control elements drop testing on June 18, 2022
(3) main turbine electronic and physical trip testing on June 19, 2022

Inservice Testing (IP Section 03.01) (1 Sample)

(1) main steam isolation valves A and B inservice test on April 2, 2022

Containment Isolation Valve Testing (IP Section 03.01) (1 Sample)

(1) leak rate test containment isolation valve, LRT-109, at penetration 63 and blind flange on May 14, 2022

FLEX Testing (IP Section 03.02) (1 Sample)

(1) FLEX N+1 diesel generator 3-year preventative maintenance and 2 hour run loaded at 360 KW on May 11, 2022

RADIATION SAFETY

71124.01 - Radiological Hazard Assessment and Exposure Controls

Radiological Hazard Assessment (IP Section 03.01) (1 Sample)

(1) The inspectors evaluated how the licensee identifies the magnitude and extent of radiation levels and the concentrations and quantities of radioactive materials and how the licensee assesses radiological hazards.

Instructions to Workers (IP Section 03.02) (1 Sample)

(1) The inspectors evaluated how the licensee instructs workers on plant-related radiological hazards and the radiation protection requirements intended to protect workers from those hazards.

Contamination and Radioactive Material Control (IP Section 03.03) (3 Samples)

The inspectors observed/evaluated the following licensee processes for monitoring and controlling contamination and radioactive material:

(1) licensee surveys of potentially contaminated material leaving the radiological controlled area.
(2) workers exiting containment and the radiologically controlled area during the refueling outage.
(3) licensee surveys of potentially contaminated material leaving containment.

Radiological Hazards Control and Work Coverage (IP Section 03.04) (5 Samples)

The inspectors evaluated the licensee's control of radiological hazards for the following radiological work:

(1) radiation work permit (RWP) 2022-0606, Minor Maintenance Activities
(2) RWP 2022-0610, Erect/Dismantle Scaffolding in the Reactor Containment Building
(3) RWP 2022-0635, Radiography including Radiation Protection Boundary Guards
(4) RWP 2022-0805, Tours and Inspections Outside the Reactor Containment Building
(5) RWP 2022-0708, Remove and Replace InCore Instruments (ICIs)

High Radiation Area and Very High Radiation Area Controls (IP Section 03.05) (5 Samples)

The inspectors evaluated licensee controls of the following high radiation areas and very high radiation areas:

(1) spent resin tank room
(2) lock on cable for Tri-Nuke filter in the spent fuel building, +46' fuel handling building
(3) pre-concentrator filter cubicles
(4) fuel pool filter cubicle
(5) keys controlled at the access to the radiologically controlled areas by radiation protection for high radiation areas and locked high radiation areas

Radiation Worker Performance and Radiation Protection Technician Proficiency (IP Section 03.06) (1 Sample)

(1) The inspectors evaluated radiation worker and radiation protection technician performance as it pertains to radiation protection requirements.

71124.03 - In-Plant Airborne Radioactivity Control and Mitigation

Permanent Ventilation Systems (IP Section 03.01) (2 Samples)

The inspectors evaluated the configuration of the following permanently installed ventilation systems:

(1) control room ventilation system emergency filtration unit train A
(2) controlled ventilation areas filter unit train B

Temporary Ventilation Systems (IP Section 03.02) (1 Sample)

The inspectors evaluated the configuration of the following temporary ventilation systems:

(1) high efficiency particulate air filter setup for the cutting, grinding, and welding associated with RWP 2022-0627

Use of Respiratory Protection Devices (IP Section 03.03) (1 Sample)

(1) The inspectors evaluated the licensee's use of respiratory protection devices.

Self-Contained Breathing Apparatus for Emergency Use (IP Section 03.04) (1 Sample)

(1) The inspectors evaluated the licensee's use and maintenance of self-contained breathing apparatuses.

71124.06 - Radioactive Gaseous and Liquid Effluent Treatment

Walkdowns and Observations (IP Section 03.01) (4 Samples)

The inspectors evaluated the following radioactive effluent systems during walkdowns:

(1) reactor main condenser evacuation system
(2) turbine gland sealing system
(3) discharge structure to the Mississippi River
(4) reactor gaseous waste management system

Sampling and Analysis (IP Section 03.02) (3 Samples)

Inspectors evaluated the following effluent samples, sampling processes and compensatory samples:

(1) weekly liquid effluent sampling of the circulating water discharge outfall
(2) weekly sampling of dry cooling tower sump No. 2 outfall
(3) weekly turbine building/yard oil separator outfall

Dose Calculations (IP Section 03.03) (2 Samples)

The inspectors evaluated the following dose calculations:

(1) cumulative dose and dose rate summary for gaseous effluent release associated with gaseous effluent release permit No. W3GB2019-005
(2) cumulative doses details for liquid effluent release associated with liquid effluent release permit No. W3LB2019-009

Abnormal Discharges (IP Section 03.04) (1 Sample)

The inspectors evaluated the following abnormal discharges:

(1) There were no abnormal discharges identified during the inspection period.

71124.07 - Radiological Environmental Monitoring Program

Environmental Monitoring Equipment and Sampling (IP Section 03.01) (1 Sample)

(1) The inspectors evaluated environmental monitoring equipment and observed collection of environmental samples.

Radiological Environmental Monitoring Program (IP Section 03.02) (1 Sample)

(1) The inspectors evaluated the implementation of the licensee's radiological environmental monitoring program.

GPI Implementation (IP Section 03.03) (1 Sample)

(1) The inspectors evaluated the licensee's implementation of the Groundwater Protection Initiative program to identify incomplete or discontinued program elements. There were no incomplete or discontinued program elements identified.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

MS05: Safety System Functional Failures (SSFFs) Sample (IP Section 02.04) (1 Sample)

(1) Unit 3 (April 1, 2021, through March 30, 2022)

MS06: Emergency AC Power Systems (IP Section 02.05) (1 Sample)

(1) Unit 3 (April 1, 2021, through March 30, 2022)

MS07: High Pressure Injection Systems (IP Section 02.06) (1 Sample)

(1) Unit 3 (April 1, 2021, through March 30, 2022)

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

(1) Unit 3 (January 1, 2021, through March 31, 2022)

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) Unit 3 (January 1, 2021, through March 31, 2022)

71152A - Annual Follow-up Problem Identification and Resolution

Annual Follow-up of Selected Issues (Section 03.03) (1 Sample)

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

(1) phase rotation reversal of AB FLEX core cooling pump power receptacle on May 5, 2022

71153 - Follow Up of Events and Notices of Enforcement Discretion

Personnel Performance (IP Section 03.03) (1 Sample)

(1) The inspectors evaluated the licensee response to an unplanned closure of main steam isolation valve 2 and main feed isolation valve 2 and licensee's performance on June 24, 2022.

INSPECTION RESULTS

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<tr><td colspan="4">Failure to Adequately Plan and Control Worker Exposures As Low As (is) Reasonably Achievable (ALARA) During the Removal of Pressurizer Heaters Resulting in Worker Uptakes.</td></tr>
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Open/Closed</td><td>[P.5] - Operating Experience</td><td>71124.01</td></tr>
<tr><td colspan="4">The inspectors identified a finding of very low safety significance (Green) for the licensee having unplanned and unintended occupational internal radiation exposure because of deficiencies in the licensee's work planning and work control program. Specifically, the licensee failed to appropriately implement aspects of EN-RP-105, "Radiological Work Permits (RWP)," to maintain doses ALARA. Four workers (two radiation protection technicians and two contract workers) received an uptake of airborne radioactive material during the removal of pressurizer heaters. The highest internal uptake was 13 mrem committed effective dose equivalent (CEDE).</td></tr>
<tr><td colspan="4">Description: On April 18, 2022, two radiation protection technicians and two contract workers (laborers) received uptakes from airborne radioactive materials during the replacement of pressurizer heaters. The uptakes occurred as the pressurizer heaters were removed and transported from the pressurizer shroud, through the shroud openings (several windows and a door), and out through the pressurizer cubicle to a shielded storage container. During a previous shift of this work evolution, a survey of the pressurizer shroud and two removed heaters confirmed the Alpha Level 2, high contamination area conditions of the work area (WF3-2204-00608). Two of the four laborers, those inside the pressurizer shroud and removing the pressurizer heaters from the pressurizer, were wearing powered air purifying respirators. The other workers, those outside the shroud but inside the pressurizer cubicle, were not in powered air purifying respirators. The two laborers, outside pressurizer shroud, did not enter the shroud. A radiation protection technician, providing job coverage, partially entered the shroud as they surveyed the old pressurizer heaters being removed and were placed into transport sleeves. Another radiation protection technician entered the high</td></tr>
</table>

contamination area of the pressurizer cubicle to remove radioactive trash at the end of the job. These workers were identified with personnel contamination when exiting the radiologically controlled area. The workers were sent for a whole body count to determine if the workers received uptakes of radioactive material. The four workers working inside the cubicle, but outside the shroud, received unintended uptakes of unanticipated airborne radioactive material.

The licensee's procedures required the creation of plans to minimize the exposure to workers and to use radiological data and lessons learned from previous work.

Procedure EN-RP-105, "Radiological Work Permits (RWP)," revision 19, step 5.3.7 of the "RWP Planning Process" states, in part, the licensee is to perform more rigorous planning for work where contamination levels and the type of work to be performed results in a higher potential for workers to be exposed to airborne alpha radioactivity during the work by:

- Using relevant job history files
- Understanding the physical characteristics and limitations of the work area
- Planning for minimizing or eliminating spread of alpha contamination
- Planning for minimizing or eliminating generation of airborne radioactivity

The inspectors compared the ALARA plans and results for the 2015 and 2022 pressurizer heater replacement evolution and their associated radiological surveys. The inspectors were unable to identify in either ALARA plan a specific plan or controls for the workers outside of the shroud to minimize their exposures from the spread of alpha contamination when items were removed from the shroud and any unanticipated alpha airborne radioactivity area.

The prior work history in the 2015 ALARA post-job review identified the contamination inside of the shroud as an Alpha Level 2, high contamination area and an alpha airborne radiation area. The plan provided no additional protective measures to the workers not working directly inside the shroud, even though the removed pressurizer heaters were passed through the openings of the shroud for transport out of the cubicle. The air sampler for the pressurizer heater removal evolution was located near the work area inside the shroud. While a high efficiency particulate air (HEPA) unit provided an engineering control through one shroud opening to reduce the spread of airborne contamination, there were other large openings in the shroud to the pressurizer cubicle and other areas above and below the pressurizer shroud. These openings were present through which airborne radioactivity could spread. The RWP was planned with misting, wetting, decontamination, and wrapping as critical steps to reduce contamination levels and minimize the airborne hazard. In addition, the ALARA plan and RWP considered the dose rates from the old pressurizer heaters to have the largest impact on worker exposures. Dose rates on contact with the pressurizer heaters ranged from 80 millirem per hour (mR/hr) to 2,600 mR/hr and 30 mR/hr to 700 mR/hr at a foot. Therefore, RWP 2015-0615 specified the old pressurizer heaters were to be removed from the pressurizer cubicle as soon as practical while the additional measures to reduce exposure to contamination (wetting, wrapping, etc.), seen as increasing exposure time to the higher dose rates of the pressurizer heaters, were not used though planned.

The removed heaters were transported from under the shroud in capped polyvinyl chloride sleeves to reduce the spread of alpha contamination and function as a carrying tool to move the heaters to their storage location. The potential for contamination spread from the transport sleeves was considered low. On November 13, 2015, a worker was documented with facial contamination from transporting an old pressurizer heater in a transport sleeve and

the event was determined to not be attributed to poor radiation worker behavior (CR-WF3-2015-08222). In response to this facial contamination, face shields were instituted for the workers outside the shroud. No additional protective measures were considered for workers not directly interfacing with the reactor coolant system boundary.

The 2022 ALARA plan was similar to the 2015 ALARA plan and evaluated the exposures for the workers inside the shroud to the current and postulated radiological conditions as they interfaced directly with reactor coolant system components. As in the 2015 ALARA plan, the workers outside the shroud would not be interfacing with the reactor coolant system boundary and their risk to additional hazards, such as exposures to alpha contamination and alpha airborne radioactivity, was considered minimal. These workers had no specified protective measures to minimize their exposure to alpha contamination or alpha airborne radioactivity areas other than protective clothing for high contamination areas in the ALARA plan or RWP. Similarly, in the 2015 ALARA plan and RWP, it directed the use of a HEPA hose to contain radioactive material as the pressurizer heaters were removed from the pressurizer to minimize contamination and powered air purifying respirators for the workers inside the shroud. The air sampler for the pressurizer heater removal evolution was located near the work area inside the shroud and the continuous air monitor placed outside the pressurizer cubicle door.

For the current heater removal evolution, a survey of the first two removed heaters and shroud areas supported an Alpha Level 2, high contamination area posting (WF3-2204-00608) and the prior shift of pressurizer heater removals, air sample WF3-AS-041722-0238 indicated an airborne radioactivity area within the shroud at 0.518 derived air concentration (DAC). An airborne radioactivity area is designated at 0.3 DAC. During the heater removal which resulted in the four worker uptakes, air sample WF3-AS-041822-0303 indicated an airborne radioactivity area inside the shroud of 5.4 DAC (2.62 DAC-beta/gamma and 2.78 DAC-alpha).

In addition, the dose rates of the removed heaters were known to affect the continuous air monitor (an AMS-4) and challenge its ability to provide accurate air sample results. The current dose rates for the pressurizer heaters in 2022 ranged from 120 mR/hr on contact to 2,400 mR/hr on contact. This situation led to the continuous air monitor being placed outside the pressurizer cubicle door and created the inability to adequately assess or alert workers to the changing airborne conditions in the pressurizer cubicle so they could minimize their dose.

The operating experience and lessons learned from the 2015 facial contamination event and the resulting protective measures were not carried forward to the 2022 pressurizer heater replacement in RWP 2022-0615. Further, no assessment was made for the potential migration of airborne radioactivity from inside the shroud through the shroud openings into the pressurizer cubicle. In the 2015 or 2022 ALARA plans, the plans and control measures did not adequately inform or reduce the pressurizer cubicle workers' exposure to the spread of alpha contamination or airborne radioactivity. The licensee failed to learn from their previous experience and include this in the 2022 pressurizer heater replacement.

Corrective Actions: The licensee entered the issue into their corrective action program to evaluate the ALARA planning and control measures for the pressurizer replacement activities for all personnel involved.

Corrective Action References: CR-WF3-2022-02805 and CR-WF3-2022-04924

Performance Assessment:

Performance Deficiency: The failure to adequately plan to control worker exposures ALARA is a performance deficiency.

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 plan and control worker exposures ALARA during the pressurizer heater removal evolution resulted in unplanned internal dose with the highest CEDE of 13 mrem. In addition, *Inspection Manual Chapter* 0612, appendix E, example 6.h states a performance deficiency is more than minor if the performance deficiency resulted in inadequately controlled radiological conditions such that the worker received or was likely to receive greater than 10 mrem CEDE.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix C, "Occupational Radiation Safety SDP." The inspectors determined the finding to be of very low safety significance (Green) because it was: (1) not associated with as low as 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: P.5 - Operating Experience: The organization systematically and effectively collects, evaluates, and implements relevant internal and external operating experience in a timely manner. Operating experience is used to support daily work functions with emphasis on the possibility that it could happen here, or it could happen again. Specifically, the licensee failed to learn from their own history when planning this work and include the lessons learned from 2015 in the 2022 pressurizer heater replacement evolution.

Enforcement:

Violation: Technical Specification 6.8.1(a) requires, in part, that written procedures shall be established, implemented, and maintained covering applicable procedures recommended in NRC Regulatory Guide 1.33, revision 2, appendix A, dated February 1978. Section 7.e of Regulatory Guide 1.33, appendix A, requires radiation protection procedures for the implementation of an ALARA program. The licensee established procedure EN-RP-105, "Radiological Work Permits," revision 19, to implement the ALARA program.

Procedure EN-RP-105, step 5.3.7. states, in part, the licensee is to perform more rigorous planning for work where contamination levels and the type of work to be performed results in a higher potential for workers to be exposed to airborne alpha radioactivity.

Contrary to the above, on April 18, 2022, the licensee failed to implement procedure EN-RP-105 to perform more rigorous planning for work where contamination levels and the type of work to be performed results in a higher potential for workers to be exposed to airborne alpha radioactivity. Specifically, the ALARA planning and controls for the workers in the pressurizer cubicle were inadequate, which resulted in the uptakes to two laborers and two radiation protection technicians during the 2022 pressurizer heater replacement evolution.

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 Procedures with an Improper Entry into a High Radiation Area			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Occupational Radiation Safety	Green NCV 05000382/2022002-01 Open/Closed	[H.11] - Challenge the Unknown	71124.01
The inspectors reviewed a self-revealed Green non-cited violation of Technical Specification 6.8.1.a for a worker's failure to follow procedures resulting in an improper entry to a high radiation area. Specifically, on April 8, 2022, an operator worker received a dose rate alarm as he entered into a high radiation area that he had not been made aware of the radiological conditions and was not briefed for prior to entry.			
Description: On April 8, 2022, an operator worker entered a high radiation area (HRA) on the 4-foot elevation of the reactor containment building while logged onto radiation work permit (RWP) 2022-0702, "Reactor Disassembly Activities," task 5. The individual entered the reactor containment building tasked to secure the shutdown cooling vacuum priming when required. Instead, as the operator entered the area, he was called by another worker to observe the local reactor coolant system (RCS) level. Observing the RCS level required the worker to climb a ladder to the reactor containment building sump platform. This area was posted and controlled as an HRA, and the posting stated a requirement for a briefing by radiation protection (RP) prior to entry. The change in work scope was not discussed or authorized by RP prior to entry on the sump platform; thus, the worker was not briefed on the radiological dose rates for entry. Upon ducking beneath the HRA barrier and posting and traversing the ladder to the top of the sump platform, the operator received a dose rate alarm on the alarming self-reading dosimeter (SRD) of 355 millirem per hour. This alarm was based on a dose rate setpoint of 302 millirem per hour on his SRD. The dose rates the worker was briefed for by RP for his assigned job were less than HRA conditions, based on Survey WF3-2204-00087, dated April 3, 2022. Procedure EN-RP-100, "Radiation Worker Expectations," revision 13, section 5.3, requires, in part, that individuals with access to radiologically controlled areas (RCAs): [3] have no entry to areas above seven feet without prior permission from RP; [6] observe and obey radiological postings; [7] shall read, understand, and obey the RWP; and [9] know the radiological conditions in their planned work area AND travel paths. Section 5.5[15] of EN-RP-100 states, "If you receive an SRD dose rate alarm, THEN (a) back out of the affected area, (b) notify others in the work area, and (c) immediately contact RP for direction." RWP 2022-0702 instructed the worker to stop work if a dose rate alarm is received that is not anticipated/discussed in the job brief. It then instructs the worker to place the job in a safe condition, inform co-workers, exit the area, and notify RP. Discussions with RP while onsite, informed the NRC that RP instructed the worker to immediately leave the RCA once they were alerted to his dose rate alarm. However, the worker did not leave the RCA until approximately 3 hours later based on the SRD histogram reviewed. Additionally, attachment 8 to EN-RP-101, "Access Controls for Radiologically Controlled Areas," revision 16, requires, in part, workers entering a HRA to (1) be logged onto an RWP that allows access to the area, (2) be briefed and knowledgeable of radiological conditions in the work area and travel path, and (3) only enter areas they have been briefed on.			

Therefore, the NRC determined that the worker failed to comply with licensee procedures by failing to obey the HRA radiological posting, traversing a ladder and path to an area with radiological conditions he was not briefed for, not following the RWP he logged onto, and failing to leave the area and the RCA immediately as instructed by RP.

Corrective Actions: The licensee assessed this issue and implemented multiple immediate corrective actions, which included restricting the worker's access to the RCA, coaching, and requiring a reverse brief from radiation workers to include scope of work, radiological conditions, and travel paths to the work location.

Corrective Action References: CR-WF3-2022-02217

Performance Assessment:

Performance Deficiency: The failure to follow a licensee's procedural requirements for entry into an HRA was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Program & 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 worker's dose. The failure to follow procedural requirements by making an improper entry into an HRA for which the worker was not briefed resulted in an increase to worker exposure of radiation dose rates greater than the general area dose rates for which the worker was briefed.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix C, “Occupational Radiation Safety SDP.” The inspectors determined the finding to be of very low safety significance (Green) because it was: (1) not associated with as low as 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.11 - Challenge the Unknown: Individuals stop when faced with uncertain conditions. Risks are evaluated and managed before proceeding. Specifically, the worker failed to stop, contact RP, and assess the radiological conditions for the change in work scope, as required, prior to entry on the sump platform. The worker was not briefed for the dose rates in this area and was therefore unaware of the radiological hazard.

Enforcement:

Violation: Technical Specification 6.8.1(a) requires, in part, the written procedures be established, implemented, and maintained covering the applicable RP procedures recommended in appendix A to Regulatory Guide 1.33, section 7.e(1), for access control to radiation areas including a radiation work permit system. The licensee established procedure EN-RP-101, "Access Controls for Radiologically Controlled Areas," in part, to control access to radiation areas which includes requirements for following a radiation work permit system.

Attachment 8 to EN-RP-101, revision 16, requires, in part, workers entering a HRA to (1) be logged onto an RWP that allows access to the area, (2) be briefed and knowledgeable of radiological conditions in the work area and travel path, and (3) only enter areas they have

been briefed on.

Contrary to the above, on April 8, 2022, a worker failed to implement and follow procedure EN-RP-101 for entry into a HRA. Specifically, a worker failed to follow attachment 8, which required the worker to follow the RWP that allows access to the work area, be briefed and knowledgeable of radiological conditions in the work area and travel path, and only enter areas they have been briefed for. As a result, the worker received a dose rate alarm on the assigned SRD and failed to exit the RCA immediately as instructed by RP.

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 Procedures Regarding the Use of Lapel Air Sample Results			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Occupational Radiation Safety	Green NCV 05000382/2022002-03 Open/Closed	[H.13] - Consistent Process	71124.03

The inspectors identified a Green, non-cited violation of Technical Specification 6.8.1(a) for the licensee's failure to follow written radiation procedure, EN-RP-131, "Air Sampling," revision 17. Specifically, the licensee failed to follow section 5.1.12 for a lapel air sample which indicated an intake could occur greater than four derived air concentration hours (DAC-hrs) in an area that was not posted and controlled as an airborne radioactivity area. This step required, in part, the licensee stop work; evacuate workers, collect grab samples, and identify the source; inform workers in the area without respiratory protection that airborne radioactivity was measured, and potential exposures would be evaluated; and if the conditions causing the airborne radioactivity may still exist or are unknown, then immediately post and control the area as an airborne radioactivity area.

Description: On April 17, 2022, during refueling outage 24, workers were cutting welds in preparation for removing the pressurizer heaters from the bottom of the pressurizer. The work was conducted in the pressurizer shroud, inside the pressurizer cubicle, on the 21-foot elevation of containment. The workers were partially cutting the welds that connected the pressurizer heaters to the pressurizer heater sleeves. This allowed the heaters to be easily removed during the next portion of the work activity. As part of the radiological work permit requirements, the workers wore lapel air samplers to monitor potential internal exposures in the work area.

The NRC inspectors reviewed lapel air sample WF3-AS-041722-0246 taken on April 17, 2022. This lapel air sample was from a worker's breathing zone when they worked in the pressurizer cubicle. The lapel air sample was collected at 2:40 pm, analyzed, and initially assigned a dose of 13.94 mrem or 5.58 DAC-hrs. The lapel air sample was counted on an iSolo alpha/beta counting system at 9:06 pm which was a 6 hour and 26 minutes delay from the sample collection time. The sample was counted again after 13 hours post collection resulting in 12.78 mrem or 5.11 DAC-hrs. The sample was counted on an instrument (iSolo) that compensated for and corrected the results for radon daughters, i.e., performs radon discrimination.

According to the licensee's procedure, EN-RP-131, "Air Sampling," section 5.1.12, it stated, in part, if a lapel air sample results indicated an intake could occur at greater than 4 DAC-hrs, in

an area that is not posted and controlled as an airborne radioactivity area, and radon discriminating analysis was complete then:

- Stop work,
- Evacuate workers from the affected area, collect grab samples to determine if airborne concentrations are sustained, and to identify the source if unknown,
- Inform workers in the area without respiratory protection that airborne radioactivity was measured, and potential exposures will be evaluated, and
- If the conditions causing the airborne radioactivity may still exist or are unknown, then immediately post and control the area as an airborne radioactivity area.

Procedure EN-RP-131, attachment 4, was used to document the results of lapel air samples. For lapel air sample WF3-AS-041722-0246, the box was checked in attachment 4 stating that the "net activity was less than an activity corresponding to 10 mrem committed effective dose equivalent (CEDE), or 4 DAC-hrs, and no further action was required." However, the sample results indicated 13.94 mrem exposure at the initial count time with 6.5 hours delay post collection and 12.78 mrem after 13 hours post collection, which are both greater than 10 mrem CEDE.

In addition, procedure EN-RP-131, step 5.2.8 provided instructions on how to analyze a lapel air sample. The instructions focused strictly on the internal dose assessment to a worker based on the sample results. This step did not reference back or make note of step 5.1.12 to use the lapel air sample results to post and control an airborne radioactivity area. The separation of this information in the analysis and decision-making sections led workers to not recognize occurrences when lapel air sample results indicated an airborne radioactivity area and that additional actions were required.

The license failed to follow procedure steps to stop work; evacuate the workers, obtain grab samples, and identify the source; inform the workers in the area without respiratory protection that airborne radioactivity was measured, and potential exposures will be evaluated; and post and control the area as an airborne radioactivity area.

Corrective Actions: The licensee has entered the performance deficiency into their corrective action program to determine appropriate actions.

Corrective Action References: CR-WF3-2022-04922

Performance Assessment:

Performance Deficiency: The failure to follow procedures regarding the use of lapel air sample results was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Program & 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 licensee did not follow their procedure to stop work; evacuate the workers, obtain grab samples, and identify the source; inform the workers in the area without respiratory protection that airborne radioactivity was measured, and potential exposures will be evaluated; and post and control the area as an airborne radioactivity area. Additionally, the finding was similar to *Inspection*

Manual Chapter 0612, “Power Reactor Inspection Reports – Examples of Minor Issues,” appendix E, example 6(h). This example states a performance deficiency was more than minor if the performance deficiency results in a failure of radiological controls that could result or resulted in an exposure equal to or greater than 10 mrem CEDE. In this case, the failure to follow procedural steps after receiving lapel air sample results greater than 4 DAC-hrs (10 mrem CEDE), resulted in workers being in an unknown airborne radioactivity area with exposures greater than 10 mrem CEDE, specifically 13.94 mrem and 12.78 mrem CEDE.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix C, “Occupational Radiation Safety SDP.” The inspectors determined the finding had very low safety significance (Green) because: (1) it was not associated with ALARA planning and work controls, (2) it was not an overexposure, (3) there was no substantial potential for overexposure, and (4) the ability to assess dose was not compromised.

Cross-Cutting Aspect: H.13 - Consistent Process: Individuals use a consistent, systematic approach to make decisions. Risk insights are incorporated as appropriate. Specifically, the procedure had disjointed analysis and decision-making sections which did not allow a worker to consistently process lapel air samples which may require decisions for stopping work, evacuating workers, providing additional sampling, informing workers of the airborne radioactivity areas, and resulting exposures, and posting and controlling airborne radioactivity areas when the criteria was reached.

Enforcement:

Violation: Technical Specifications 6.8.1(a) requires, in part, that written procedures shall be established, implemented, and maintained covering the procedures recommended in Regulatory Guide 1.33, revision 2, appendix A, dated February 1978. Regulatory Guide 1.33, appendix A, section 7.e. requires procedures for “Airborne Radioactivity Monitoring.” The licensee established procedure EN-RP-131, “Air Sampling,” revision 17, to provide standard instructions for obtaining radiological air samples and for determining the concentration of airborne particulate, iodine, tritium, and noble gas radioactivity.

Procedure EN-RP-131, “Air Sampling,” revision 17, section 5.1.12 states, in part, that if lapel air sample results indicated an intake could occur at greater than 4 DAC-hrs, in an area that is not posted and controlled as an airborne radioactivity area, and radon discriminating analysis was complete, the licensee will: stop work; evacuate workers from the affected area, collect grab samples to determine if airborne concentrations are sustained and to identify the source if unknown; inform workers in the area without respiratory protection that airborne radioactivity was measured and potential exposures will be evaluated; and if the conditions causing the airborne radioactivity may still exist or are unknown, then immediately post and control the area as an airborne radioactivity area.

Contrary to the above, on April 17, 2022, the licensee failed to follow procedure EN-RP-131, “Air Sampling,” revision 17, section 5.1.12, when lapel air sample results indicated an intake could occur at greater than 4 DAC-hrs, in an area that is not posted and controlled as an airborne radioactivity area, and radon discrimination was complete. Specifically, the licensee did not stop work; evacuate workers from the affected area, collect grab samples to determine if airborne concentrations are sustained, and to identify the source if unknown; inform workers in the area without respiratory protection that airborne radioactivity was measured and potential exposures will be evaluated; and if the conditions causing the airborne radioactivity may still exist or are unknown, then immediately post and control the area as an airborne radioactivity area.

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 a Radiological Work Permit Requirement			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Occupational Radiation Safety	Green NCV 05000382/2022002-04 Open/Closed	[H.5] - Work Management	71124.03

The inspectors identified a Green, non-cited violation of Technical Specification 6.8.1(a) for the licensee's failure to follow radiation procedure, EN-RP-100, "Radiation Worker Expectations", revision 13, steps to follow the requirements set forth within a radiological work permit (RWP). Specifically, workers failed to follow RWP 2022-0615, task 2, "Removal of old pressurizer heaters (includes cutting/grinding and all supporting activities)," revision 2, which required a continuous air monitor be located within the pressurizer cubicle during work evolutions which have the potential for generating airborne activity.

Description: On April 18, 2022, during refueling outage 24, two pipefitters (laborers) and two radiation protection technicians were contaminated during the removal of pressurizer heaters. The primary pressurizer heater removal work took place inside the pressurizer shroud, in the pressurizer cubicle, on the 21-foot elevation of containment. This work was conducted under the requirements of RWP 0615, task 2. Two laborers, located inside the shroud, removed the pressurizer heaters, placed them in transport sleeves, then passed them through an opening in the shroud to two additional laborers inside the cubicle. These two laborers then passed the pressurizer heaters from the pressurizer cubicle to other workers for storage. The laborers inside the shroud wore powered air purifying respirators while the rest of the workers wore standard anticontamination apparel.

Upon removing the J-1 pressurizer heater from its location, a blackish sludge came out of the hole with some of the material landing on a laborer. Due to the remaining dose margin and the presence of the unknown sludge, the radiation protection technician decided to stop the job and have everyone exit the area.

When the workers attempted to exit the radiologically controlled area, the workers performing work in the pressurizer cubicle alarmed the personnel contamination monitors. The workers were sent for whole body counts to identify any intake of radioactive material to the workers. Unknown to the workers while they were removing the pressurizer heaters, airborne radioactivity levels had increased in the pressurizer cubicle. As a result, four workers, those working in the pressurizer cubicle, received intakes of airborne radioactive material.

NRC inspectors reviewed the event and identified an RWP 0615, task 2 requirement was not met. Specifically, the licensee did not implement the requirement that a continuous air monitor be in the pressurizer cubicle during work evolutions which have the potential for generating airborne activity. The location of the continuous air monitor during the activity was outside the pressurize cubicle near the entranceway to the cubicle. This location was not representative of the actual work area and did not allow the continuous air monitor to alert workers of changing airborne radioactivity levels within the cubicle.

Corrective Actions: The licensee entered the issue into the corrective action program to determine appropriate actions.

Corrective Action References: CR-WF3-2022-04924, CR-WF3-2022-03171

Performance Assessment:

Performance Deficiency: The failure to follow a radiological work permit requirement was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Human Performance 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, workers within the pressurizer cubicle received unintended internal exposures from unanticipated airborne radioactive material. Additionally, the finding was similar to *Inspection Manual Chapter* 0612, "Power Reactor Inspection Reports – Examples of Minor Issues," appendix E, example 6(h). This example states that a performance deficiency was more than minor if it results in a failure of radiological controls which could result or resulted in an exposure equal to or greater than 10 mrem committed effective dose equivalent (CEDE). In this case, the failure to have the continuous air monitor located in the work area resulted in a worker's unintended exposure of 13 mrem CEDE.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix C, "Occupational Radiation Safety SDP." The inspectors determined the finding had very low safety significance (Green) because: (1) it was not associated with ALARA planning and work controls, (2) it was not an overexposure, (3) there was no substantial potential for overexposure, and (4) the ability to assess dose was not compromised.

Cross-Cutting Aspect: H.5 - Work Management: The organization implements a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. The work process includes the identification and management of risk commensurate to the work and the need for coordination with different groups or job activities. Specifically, the possibility of generating airborne radioactivity was an identified risk for this work and a continuous air monitor in operation was required within the associated RWP to protect the workers within the cubicle and mitigate this risk. However, upon execution of the RWP, this requirement was not met.

Enforcement:

Violation: Technical Specifications 6.8.1(a) requires, in part, that written procedures shall be established, implemented, and maintained covering applicable procedures recommended in NRC Regulatory Guide 1.33, revision 2, appendix A, dated February 1978. Regulatory Guide 1.33, appendix A, section 7.e. requires procedures for "Access Control to Radiation Areas Including a Radiation Work Permit (RWP) System." The licensee established procedure EN-RP-100, "Radiation Worker Expectations," revision 12, which established basic radiation protection requirements and expectations for radiation workers engaged in radiological work that included the use of radiological work permits.

Procedure EN-RP-100, section 5.3 states, in part, the RWP shall be read, understood, and obeyed when workers are to enter a radiologically controlled area. The workers were assigned RWP 2022-0615, task 2, "Removal of old pressurizer heaters (includes cutting/grinding and all supporting activities)," revision 2, which required a continuous air monitor be located in the pressurizer cubicle during work evolutions that have the potential for

generating airborne activity.

Contrary to the above, on April 18, 2022, workers failed read, understand, and obey the RWP 2022-0615, task 2, revision 2 requirement to locate a continuous air monitor in the pressurizer cubicle during work evolutions that had the potential for generating airborne radioactivity. Specifically, there was no continuous air monitor in the cubicle to alert workers of a generated airborne radioactivity area when removing the pressurizer heaters from the pressurizer. This resulted in a worker receiving an unintended exposure of 13 mrem CEDE.

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

Failure to Survey for an Airborne Radioactivity Area.

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Occupational Radiation Safety	Green NCV 05000382/2022002-05 Open/Closed	[H.14] - Conservative Bias	71124.03

The inspectors identified a Green, non-cited violation of 10 CFR 20.1501(a) for the licensee's failure to reasonably evaluate surveys under the circumstances to identify and post an airborne radioactivity area in accordance with 10 CFR 20.1902(d). Specifically, air sample survey WF3-AS-041722-0238, taken on April 17, 2022, was not evaluated under circumstances reasonable to determine the extent and magnitude of airborne radioactivity levels which resulted in a failure to post and control an airborne radioactivity area.

Description: On April 17, 2022, during Waterford-3's refueling outage, pipefitters were conducting work to prepare for the removal of heaters from the bottom of the pressurizer. This work was taking place within the pressurizer shroud, inside the pressurizer cubicle, on the 21-foot elevation of containment. The workers were partially cutting the welds that connected the pressurizer heaters to their heater sleeves. This job allowed the welds to be broken in a later work activity so that the pressurizer heaters could be removed from the pressurizer.

In association with this job, the inspectors identified air sample survey WF3-AS-041722-0238, taken on April 17, 2022, was not evaluated in a reasonable time period to post the area as an airborne radioactivity area and inform workers of the conditions. The air sample was collected from 9:15 a.m. to 10:40 a.m. The sample was counted on an iSolo alpha/beta counting system at 12:16 p.m., an hour and 36 minutes after its collection. The resulting count determined a total derived air concentration (DAC) for beta/alpha airborne radioactivity of 0.8. This value is roughly 2.5 times over the threshold for posting an airborne radioactivity area at 0.3 DAC.

Licensee procedure EN-RP-131, "Air Sampling," revision 17, contained the requirements for posting of airborne radioactivity areas in accordance with 10 CFR 20.1902(d). Section 5.1.12 of this procedure stated, in part, that if air sample results indicate total airborne concentration greater than or equal to 0.3 DAC, in an area that is not posted and controlled as an airborne radioactivity area, the licensee will post and control the area as an airborne radioactivity area.

The sample was counted on an instrument (iSolo) that compensated and corrected the activity for radon daughter products, i.e., discriminated radon from the total activity. Procedure EN-RP-304, "Operation of Counting Equipment," revision 6, section 6.3.8, step 8,

stated if a sample count time is within six hours of the sample stop time, then the compensated value may be used. However, the licensee attributed the initial high count to radon daughter products with no documented justification or discussion for this conclusion.

The licensee decided to conduct follow-up counts to factor out the radon daughter products. They conducted additional counts at 7.3 hours and 17.3 hours post collection of the sample. The resulting counts were a total DAC of 0.657 and 0.518, respectively. Neither of these results are below the threshold for posting an airborne radioactivity area. The licensee attributed these results to radon daughter products and did not consider the counting equipment discriminated radon daughter from the resulting activity.

Because the licensee did not evaluate this survey in a timely manner, the area was not posted as an airborne radioactivity area in accordance with 10 CFR 20.1902(d), work continued within the location, and workers were not informed of the changing radiological conditions.

Corrective Actions: The licensee entered the performance deficiency into their corrective action program to determine appropriate actions.

Corrective Action References: CR-WF3-2022-03296, CR-WF3-2022-03297, CR-WF3-2022-04921

Performance Assessment:

Performance Deficiency: Failure to evaluate a survey as required by 10 CFR 20.1501(a) in the work area of the pressurizer cubicle to identify and post an airborne radioactivity area in accordance with 10 CFR 20.1902(d) was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Program & 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. This resulted in workers unknowingly being exposed to an unidentified airborne radioactivity area and receiving additional unintended exposures.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix C, “Occupational Radiation Safety SDP.” The inspectors determined the finding had very low safety significance (Green) because: (1) it was not associated with ALARA planning and work controls, (2) it was not an overexposure, (3) there was no substantial potential for overexposure, and (4) the ability to assess dose was not compromised.

Cross-Cutting Aspect: H.14 - Conservative Bias: Individuals use decision making-practices that emphasize prudent choices over those that are simply allowable. A proposed action is determined to be safe in order to proceed, rather than unsafe in order to stop. Specifically, individuals involved in the counting of the air sample assumed radon daughter products were contributing to the results instead of recognizing the equipment used compensated for radon daughters. This caused the licensee to not identify and post the area as an airborne radioactivity area.

Enforcement:

Violation: Title 10 CFR 20.1501(a), states in part, each licensee shall make or cause to be made surveys of areas that may be necessary for the licensee to comply with the regulations in this part and are reasonable under the circumstances to evaluate the magnitude and extent of radiation levels and the potential radiological hazards of the radiation levels and residual radioactivity detected.

Title 10 CFR 20.1902(d) states, in part, the licensee shall post each airborne radioactivity area with a conspicuous sign bearing the radiation symbol and the words "Caution, Airborne Radioactivity Area." The licensee implemented 10 CFR 20.1902(d) requirements through procedure EN-RP-131, “Air Sampling,” revision 17. Section 5.1.12 stated, in part, that if air sample results indicate total airborne concentration greater than or equal to 0.3 DAC, in an area that is not posted and controlled as an airborne radioactivity area, the licensee will post and control the area as an airborne radioactivity area.

Contrary to the above, on April 17, 2022, the licensee failed to make or cause to be made surveys of areas that may be necessary for the licensee to comply with the regulations in this part and are reasonable under the circumstances to evaluate the magnitude and extent of radiation levels and the potential radiological hazards of the radiation levels and residual radioactivity detected. Consequently, the licensee failed to post and control an airborne radioactivity area when air sample results indicated a total airborne concentration of greater than or equal to 0.3 DAC.

Specifically, air sample survey WF3-AS-041722-0238 was taken and the counting of the sample was delayed such that the results were not evaluated for over 58 hours while work continued within the area. This resulted in a failure to post and control this area as an airborne radioactivity area.

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

Inadequate Radiological Work Permit Procedure to Address Respirator Controls During Work Activities.

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Occupational Radiation Safety	Green NCV 05000382/2022002-06 Open/Closed	[H.14] - Conservative Bias	71124.03

The inspectors identified a Green, non-cited violation of Technical Specification 6.8.1(a) for an inadequate radiological work permit (RWP) procedure to address respirator controls during work activities. Specifically, licensee procedure EN-RP-105, “Radiological Work Permits,” revision 19, contained procedural steps outlining the process for removing respiratory controls while an attachment to this procedure bypassed completion of an RWP revision and a total effective dose equivalent (TEDE)/as low as (is) reasonably achievable (ALARA) evaluation when changing respiratory protection controls.

Description: On April 17, 2022, during the refueling outage, workers were performing preparatory work for the removal of the pressurizer heaters from the bottom of the pressurizer. This job was performed in the pressurizer shroud, inside the pressurizer cubicle, on the 21-foot elevation of containment. The workers were to partially cut the welds that connected the heaters to their heater sleeves.

The inspectors reviewed RWP 2022-0615, task 2, “Removal of Old Pressurizer Heaters (includes cutting/grinding and all supporting activities),” revision 2, and its supporting documentation, such as surveys and TEDE/ALARA evaluations. TEDE/ALARA evaluation number 2022-0615-02, “Removal of Old Pressurizer Heater,” required the use of powered air purifying respirators (PAPRs) during the work performed on this task with potential airborne radioactivity levels approaching 0.38 derived air concentrations. However, documentation showed that during the weld cutting for this job, the workers did not wear PAPRs. The licensee used procedure EN-RP-105, attachments 5, “RWP Field Change,” to document their in-field change decision to remove respirator use for this job.

Procedure EN-RP-105, step 5.7.1, described the scope of RWP field changes and stated, in part, that an RWP field change may be used to change protective requirements on a case-by-case basis for a particular entry or specific evolution within the job (for example, allowing scaffold builders to wear double gloves instead of double protective clothing when supporting a valve rebuild). Inspectors reviewed the in-field change document and noted that the respiratory protection requirement was removed for the entire length of the weld cutting job and was not changed for a specific portion of the job., e.g., setting up the cutting equipment at the cut location.

Procedure EN-RP-105, attachment 5, was internally inconsistent with section 5.7 of the procedure which described the scope of in-field changes. Specifically, attachment 5 included language that stated “ALARA/Supervisor approval is required for field changes involving: changing respiratory protection requirements and changing the TEDE/ALARA evaluations.” This specific language in attachment 5 created a new criterion, new allowance, to the in-field change process which was not contained in section 5.7.1 of the procedure.

In addition, procedure EN-RP-105, step 5.8.1, “RWP Revision,” stated, in part, the licensee was to revise RWPs for conditions involving changes in work scope which make the RWP controls insufficient and which do not meet the criteria for a field change as described in section 5.7, and for changes in radiological protective requirements for the duration of the job. These two criteria indicated a revision to the RWP was required for a change in respiratory protection requirements; specifically relaxing the requirement to wear PAPRs for the duration of the cutting job.

Further, step 5.8.2.d, stated, “if respiratory protection requirements are changed, then perform a TEDE/ALARA evaluation according to procedure EN-RP-503, “Selection, Issue and Use of Respiratory Protection Equipment.”” This procedural step was to ensure workers were adequately protected for changes of respirator requirements within a work area. The in-field change did not reflect a reevaluated TEDE/ALARA evaluation to relax the respiratory requirement for workers to use PAPRs.

After reviewing procedure EN-RP-105, “Radiological Work Permit,” the inspectors determined the procedural steps 5.7.1, 5.8.1, and 5.8.2.d conflicted with attachment 5. The language in attachment 5 of the procedure allowed workers to understand the relaxing of respiratory requirements was an acceptable action that could be performed in the field without additional required actions. Due to this inconsistency, a worker did not adhere to the other procedural steps, such as performing an RWP revision and a TEDE/ALARA evaluation, when removing respiratory protection controls for a job. These steps are important to ensure workers are adequately protected while maintaining their doses ALARA within the work area.

Corrective Actions: The licensee has entered the performance deficiency into their corrective action program to determine appropriate actions.

Corrective Action References: CR-WF3-2022-04923

Performance Assessment:

Performance Deficiency: Inadequate RWP procedure to address respirator controls during work activities was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Program & 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. The inconsistent process within procedure EN-RP-105 created performance gaps when evaluating, assessing, and controlling worker exposures from unintended and unanticipated sources and maintaining doses ALARA.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix C, "Occupational Radiation Safety SDP." The inspectors determined the finding had very low safety significance (Green) because: (1) the performance deficiency was associated with ALARA planning or work controls and (2) the average collective dose was less than 135 person-rem for the pressurized-water reactor.

Cross-Cutting Aspect: H.14 - Conservative Bias: Individuals use decision making-practices that emphasize prudent choices over those that are simply allowable. A proposed action is determined to be safe in order to proceed, rather than unsafe in order to stop. Specifically, field changes were made to radiological controls for a job via an in-field change form with multiple levels of supervisory approval that did not question if the decision to remove respiratory protection might require a more rigorous process or if other procedural steps applied to this decision (RWP revision and TEDE/ALARA evaluation).

Enforcement:

Violation: Technical Specifications 6.8.1(a), requires, in part, that written procedures shall be established, implemented, and maintained covering applicable procedures recommended in NRC Regulatory Guide 1.33, revision 2, appendix A, dated February 1978. Appendix A, section 7.e. requires procedures for "Access Control to Radiation Areas Including a Radiation Work Permit (RWP) System." The licensee established procedure EN-RP-105, "Radiological Work Permits," revision 19, to implement a radiological work permit system.

Procedure EN-RP-105, step 5.8.1, "RWP Revision," stated, in part, the licensee was to revise RWPs for conditions involving changes in work scope which make the RWP controls insufficient and which do not meet the criteria for a field change as described in section 5.7, and for changes in radiological protective requirements for the duration of the job. In addition, step 5.8.2.d, stated, "if respiratory protection requirements are changed, then perform a TEDE/ALARA evaluation according to procedure EN-RP-503, "Selection, Issue and Use of Respiratory Protection Equipment."

Procedure EN-RP-105, attachment 5, stated, in part, "ALARA/Supervisor approval is required for field changes involving: changing respiratory protection requirements and changing the TEDE/ALARA evaluations."

Contrary to the above, on April 17, 2022, the use of procedure EN-RP-105, attachment 5, which was internally inconsistent, resulted in the licensee's failure to follow the requirements in procedure EN-RP-105, step 5.8.1, "RWP Revision," for a revision to RWPs for conditions involving changes in work scope which make the RWP controls insufficient and which do not meet the criteria for a field change as described in section 5.7, and for changes in radiological protective requirements for the duration of the job. In addition, step 5.8.2.d, required that "if respiratory protection requirements are changed, then perform a TEDE/ALARA evaluation according to procedure EN-RP-503, "Selection, Issue and Use of Respiratory Protection Equipment." Specifically, workers used attachment 5 to change respiratory protection requirements in the field without adhering to additional requirements within the procedure such as performing an RWP revision and reassessing the associated TEDE/ALARA evaluation.

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

Failure to Ensure Proper Phase Rotation for FLEX Equipment			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000382/2022002-07 Open/Closed	[H.13] - Consistent Process	71152A

A self-revealed Green finding and associated non-cited violation (NCV) of 10 CFR 50.155(c), "Mitigation of beyond-design-basis events," was identified when the licensee failed to ensure equipment relied upon for the mitigation strategies for beyond-design basis external events had the capability to perform the required functions. Specifically, the licensee failed to ensure that required Diverse and Flexible Coping Strategies (FLEX) electrical receptacles had the same electrical phase rotation as the FLEX N and N+1 core cooling pump motors such that the core cooling pumps would operate as expected.

Description: As part of the licensee's Phase 2 strategies as required by NRC Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," the licensee committed to the guidance described in NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," revision 0. NRC Order EA-12-049 has since been codified by 10 CFR 50.155(c), "Mitigation of beyond-design-basis events."

Specifically for FLEX core cooling capabilities, the licensee developed strategies that incorporate the use of the permanently installed charging pumps along with FLEX N and N+1 core cooling pumps. The FLEX N core cooling pump is permanently mounted on the -35' elevation of the reactor auxiliaries building. The FLEX N+1 core cooling pump is stored in the FLEX N+1 building in the owner-controlled area of the site. Either pump can be implemented to provide water to either the reactor coolant system (RCS) or to a steam generator.

One of the licensee's strategies for core cooling includes powering one FLEX core cooling pump and one charging pump using a FLEX diesel generator through a permanently installed charging pump circuit. One of the two FLEX diesel generators would provide power into an existing 480V safety-related bus. The AB swing bus would be aligned to the powered bus. The two busses would then separately power the charging pump and the FLEX core cooling pump. In this situation, the FLEX core cooling pump would not have worked because the AB

receptacle was wired incorrectly and provided electricity with a reverse phase rotation.

During installation of FLEX equipment in 2015, the licensee tested the FLEX electrical receptacles that are routed from the charging pump breakers. One individual tested FLEX receptacles A and B while another individual tested the AB receptacle. All receptacles were signed off as passing the phase rotation test, but when the FLEX N core cooling pump was energized by the B FLEX receptacle the pump turned counterclockwise, or backwards from the required direction for the pump to work properly. The licensee then swapped leads on the FLEX N core cooling pump which then passed the rotation test on November 25, 2015.

On March 29, 2020, the licensee performed a rotation check of the FLEX N+1 core cooling pump when also powered from the B receptacle; the pump rotated in the wrong direction. The licensee then swapped the leads for the FLEX N+1 core cooling pump ensuring that it would also rotate in the correct direction when plugged into the B FLEX receptacle, exactly like the FLEX N core cooling pump.

On June 1, 2021, the licensee powered the FLEX N core cooling pump from the AB receptacle and again the pump spun in the reverse direction. The licensee found through troubleshooting that the FLEX A and B electrical receptacles as well as the FLEX N and N+1 core cooling pumps were all wired opposite from the initial installation requirements; however, they all worked correctly when used together. The FLEX AB electrical receptacle was still installed in accordance with initial installation requirements and would therefore cause reverse rotation. On June 2, 2021, the licensee swapped the leads for the FLEX AB receptacle to bring all the FLEX receptacles and FLEX core cooling pumps in alignment so they would all work properly when used together.

Per the licensee's FLEX strategy requirements for FLEX fluid and electrical connections found in Technical Requirements Manual (TRM) 3.13.3, Table 3.13-2, "FLEX Connections that Directly Perform a FLEX Mitigation Strategy for the Key Safety Functions," the FLEX AB electrical receptacle, FLEXEDSC31AB-4C1, is required in Modes 1 through 4 along with either the FLEX B receptacle for the primary connection point or the FLEX A receptacle for the secondary connection point. Note 2 of Table 3.13-2 states that FLEX AB electrical receptacle "is required to be operable to support the core cooling strategy and is not dependent upon which FLEX core cooling pump power source has been selected for FLEX implementation."

From November 25, 2015, until March 29, 2020, only the FLEX N core cooling pump would have rotated correctly when powered by the FLEX A or B electrical receptacles from the charging pump breakers. For this period, the FLEX N+1 core cooling pump would only have rotated correctly if using the FLEX AB receptacle. From March 29, 2020, until June 2, 2021, FLEX N and N+1 core cooling pumps would have rotated correctly and performed their function when powered by the FLEX A and B receptacles, but not when powered by the AB receptacle.

Corrective Actions: The licensee swapped the leads for FLEX electrical receptacle AB so the phase rotation matched FLEX receptacles A and B as well as FLEX N and N+1 core cooling pump motors. The licensee updated drawings to reflect the new phase rotation of the receptacles and pump motors that matched what was installed. The licensee also performed an extent of condition to verify the phase rotation of all three FLEX electrical receptacles from the charging pump electrical junction boxes as well as the phase rotation of the FLEX N and

N+1 core cooling pump motors to ensure they would work together. The licensee also verified the phase rotation of the FLEX N and N+1 diesel generators.

Corrective Action References: CR-WF3-2021-02879

Performance Assessment:

Performance Deficiency: The licensee failed to ensure equipment relied upon for the mitigation strategies for beyond-design basis external events had sufficient capability to perform the required functions.

Screening: The inspectors determined the performance deficiency was more-than-minor because it was associated with the design control attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee failed to ensure that required FLEX electrical receptacles had the same electrical phase rotation as the FLEX N and N+1 core cooling pump motors such that the core cooling pumps would operate as expected.

Significance: The inspectors assessed the significance of the finding using NRC Inspection Manual Chapter 0609 Appendix A, “The Significance Determination Process (SDP) for Findings At-Power.” Using Exhibit 2, “Mitigating Systems Screening Questions,” Section E, the inspectors determined the finding to be of very low safety significance (Green), because the performance deficiency was associated with equipment not solely purposed for spent fuel pool instrumentation or for containment venting, but it was associated with equipment credited in a Phase 2 FLEX strategy such that all FLEX functions could still be completed in accordance with existing plant procedures within the time allotted.

Cross-Cutting Aspect: H.13 - Consistent Process: Individuals use a consistent, systematic approach to make decisions. Risk insights are incorporated as appropriate. Specifically, the leads for FLEX N core cooling pump were swapped after it spun backwards during the initial bump check in 2015. The licensee did not ensure the use of a systematic process was used during installation of equipment or during troubleshooting unexpected as-found conditions.

Enforcement:

Violation: Title 10 CFR 50.155(b)(1), states, in part, strategies and guidelines to mitigate beyond-design-basis events from natural phenomena must be capable of being implemented site-wide and must include maintaining or restoring core cooling capabilities.

Title 10 CFR 50.155(c), states, in part, equipment relied on for the mitigation strategies and guidelines required by paragraph (b)(1) of this section must have sufficient capability to perform the functions to perform the functions required by paragraph (b)(1).

Contrary to the above, from November 25, 2015, until June 2, 2021, the licensee failed to ensure equipment relied upon for restoring core cooling capabilities had sufficient capability to perform the required functions. Specifically, the licensee failed to ensure that required FLEX electrical receptacles had the same electrical phase rotation as the FLEX N and N+1 core cooling pump motors such that the core cooling pumps would operate as expected.

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

Inadequate Design of Differential Pressure Sensor Ambient Sensing Line			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000382/2022002-08 Open/Closed	None (NPP)	71153

The inspectors reviewed a self-revealed Green finding and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” when the licensee failed to appropriately verify the adequacy of the shield building ventilation design. Specifically, a failed stroke time test for shield building ventilation valve 114B on October 18, 2021, discovered that an ambient pressure sensing line failed to provide proper input since August 29, 2021. This discovery revealed that train B of the shield building ventilation system and train B of the controlled area ventilation system were inoperable for approximately 50 days. This condition is prohibited by technical specifications and resulted in the issuance of a licensee event report because the time these systems were inoperable exceeded the technical specification allowed outage time.

Description: The shield building ventilation system is an engineered safety feature charcoal filtration system and is not normally in operation. It is designed to maintain the shield building to reactor building annulus in a -8.0 INWC (inches water column) negative pressure and preclude any contaminated air leakage through the shield building during a design basis accident that causes a safety injection actuation signal. Shield building ventilation system air is filtered through high efficiency particulate air filters and charcoal beds to reduce the radiological dose to the general public. The shield building ventilation system has two basic flow paths used for two phases of operation: the exhaust phase and the recirculation phase. The shield building ventilation system shifts between the exhaust and recirculation phases of operation to maintain vacuum using input from the ambient pressure sensing line until the safety injection actuation signal is removed.

The controlled area ventilation system is an engineered safety feature charcoal filtration system, and it is designed to maintain select rooms in the reactor auxiliary building at a negative pressure. Select rooms include the A and B safeguards rooms, the -4 and -35 wing areas, the shutdown heat exchanger rooms, the A and B valve galleries, and the -4 reactor auxiliary building pipe penetration area. Controlled area ventilation system air is filtered through high efficiency particulate air filters and charcoal beds to reduce the radiological dose to the general public during a design basis accident. The controlled area ventilation system uses ambient differential pressure to control damper positions to regulate the amount of makeup air allowed into the suction of the air handling units.

On August 29, 2021, high winds and rain during Hurricane Ida allowed water intrusion into an ambient pressure sensing line that provides input into differential pressure sensors SBVIDPT5054B (shield building ventilation annulus to ambient differential pressure) and HVRIDPT5272B (-4 reactor auxiliary building pipe penetration to ambient differential pressure). Although not identified at the time, past plant computer data point trends indicate that the erratic pressure readings began the day Hurricane Ida passed over Waterford 3. This condition was only discovered on October 18, 2021, when the licensee was troubleshooting a failed valve stroke time test. These differential pressure data points are not observed on a regular basis.

After this condition was discovered, the licensee declared the shield building ventilation

system inoperable and entered technical specification 3.7.7 on October 18, 2021, at 0200. Later the next day, it was discovered the suspect ambient sensing line also provides ambient pressure input to HVRIDPT5272B and the controlled area ventilation system was declared inoperable at 1000 on October 19, 2021. The sensing line was purged with air to remove the water and post-maintenance testing was performed on both systems. Operability was restored to the controlled area ventilation system at 2128 on October 19, 2021, and operability was restored to the shield building ventilation system at 0316 on October 21, 2021. Shield building ventilation system train B and controlled area ventilation system train B were inoperable for approximately 50 days; this period of inoperability exceeded their 7-day allowed outage time in technical specification 3.7.7. Licensee Event Report 50-382/2021-003-00, Non-Compliance with Technical Specifications due to Failed Ambient Pressure Input, was submitted to the NRC on December 16, 2021.

Corrective Actions: The licensee plans to modify the subject sensing line to eliminate the potential for water intrusion. The licensee also plans to generate a new calculated computer point that compares the opposite train differential pressure transmitter SBVIDPT5054A with SBVIDPT5054B values which will alarm in the control room when the error between these two points exceeds a reasonable value continuously for a selected period of time. Additionally, preventive maintenance will be revised to include draining the ambient sensing line.

Corrective Action References: CR-WF3-2021-5760

Performance Assessment:

Performance Deficiency: The inspectors determined that the licensee failed to appropriately verify the adequacy of a pressure sensing line design that impacts shield building and controlled area ventilation was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor, and therefore a finding, because it was associated with the Design Control attribute of the Barrier Integrity cornerstone and 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 licensee failed to recognize that the design of the ambient sensing line allowed it to fill with water and prevent train B of the shield building ventilation system and train B of the controlled area ventilation system from being able to perform their designed functions.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix A, “The Significance Determination Process (SDP) for Findings At-Power.” Specifically, using Exhibit 3, “Barrier Integrity Screening Questions,” the inspectors determined that this finding is of very low safety significance (Green), because the finding only represented a degradation of the radiological barrier function provided for the control room, auxiliary building, reactor building, or spent fuel pool.

Cross-Cutting Aspect: Not Present Performance. No cross-cutting aspect was assigned to this finding because the inspectors determined the finding did not reflect present licensee performance.

Enforcement:

Violation: Title 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” requires, in part, that design control measures shall be established to assure that applicable regulatory

requirements and the design bases are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, prior to October 19, 2021, the licensee failed to ensure that the ambient pressure sensing line in question was adequately designed to assure that applicable regulatory requirements and the design bases are correctly translated into specifications, drawings, procedures, and instructions to ensure that the installed equipment was protected from inclement weather within the design bases. Specifically, the licensee failed to ensure that the sensing line was protected against water intrusion and retention during periods of severe inclement weather. This failure resulted in a condition prohibited by technical specifications and an associated licensee event report because the time these systems were inoperable exceeded the technical specification allowed outage time.

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

EXIT MEETINGS AND DEBRIEFS

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

- On June 16, 2022, the inspectors presented the radiation safety inspection results to Mr. J. Ferrick, Site Vice President, and other members of the licensee staff.
- On June 23, 2022, the inspectors presented the inservice inspection results to Mr. J. Ferrick, Site Vice President and other members of the licensee staff.
- On June 24, 2022, the inspectors presented the radiation safety inspection results to Mr. J. Ferrick, Site Vice President, and other members of the licensee staff.
- On July 19, 2022, the inspectors presented the integrated inspection results to Mr. M. Lewis, General Manager of Plant Operations, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.01	Procedures	EN-FAP-EP-010	Severe Weather Response	9
71111.01	Procedures	OP-901-521	Severe Weather and Flooding	338
71111.04	Miscellaneous	SD-SI	Safety Injection	19
71111.04	Procedures	OP-009-003	Emergency Feedwater	312
71111.04	Procedures	OP-009-008	Safety Injection System	47
71111.05	Fire Plans	RAB 18-001	Component Cooling Water Heat Exchanger A	9
71111.05	Fire Plans	RAB 19-001	Component Cooling Water Pump A	8
71111.05	Procedures	EN-DC-161	Control of Combustibles	24
71111.07A	Miscellaneous	W3-DBD-004	Component Cooling Water Auxiliary Component Cooling Water	306
71111.07A	Work Orders		52944799	
71111.08P	Corrective Action Documents	Condition Reports	CR-WF3-2022-02400, CR-WF3-2022-02459, CR-WF3-2022-02468, CR-WF3-2022-02472, CR-WF3-2022-02644, CR-WF3-2022-02658, CR-WF3-2022-02665, CR-WF3-2022-02682, CR-WF3-2022-01929, CR-WF3-2022-01949, CR-WF3-2022-01977, CR-WF3-2022-01978, CR-WF3-2022-01979, CR-WF3-2022-01993, CR-WF3-2022-02011, CR-WF3-2022-02012, CR-WF3-2022-02013, CR-WF3-2022-02014, CR-WF3-2022-02015, CR-WF3-2022-02016, CR-WF3-2022-02017, CR-WF3-2022-02030, CR-WF3-2022-02057, CR-WF3-2022-02755, CR-WF3-2022-02768, CR-WF3-2022-02823, CR-WF3-2022-02444, CR-WF3-2022-02633, CR-WF3-2022-02801	
71111.08P	Drawings	E-2803, IC-1130	Safety Injection, Dravo Corporation, Pipe Fabrication Division	7
71111.08P	Drawings	E-3029LW3CC43	Essential Cooling Water, Dravo Corporation, Pipe Fabrication Department	6
71111.08P	Drawings	E-3029LW3CC51	Essential Cooling Water, Dravo Corporation, Pipe Fabrication Division	6

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.08P	Engineering Changes	DECP 0000083354	REPLACE SI-512A WITH A SWING CHECK VALVE	0
71111.08P	Engineering Changes	EC 0000081552	Disposition of Active Leak Indications Found on Reactor	000
71111.08P	Engineering Changes	EC 000073452	Steam Generator Feedring Modification (Child SG1 - Feedring)	0
71111.08P	Engineering Changes	EC 000073453	Steam Generator Feedring Modification (Child SG2 - Feedring)	0
71111.08P	Engineering Changes	EC-0000083354	Replace SI-512A with a Swing Check Valve	0
71111.08P	Miscellaneous	CEP-PT-001	ASME Section XI Pressure Test (PT) Program, Entergy Nuclear Engineering Programs	311
71111.08P	Miscellaneous	Code Case N-729-6	Alternative Examination Requirements for PWR Reactor Vessel Upper Heads with Nozzles having Pressure-Retaining Partial-Penetration Welds, Section XI, Division 1	03/03/2016
71111.08P	Miscellaneous	EN-DC-319	Boric Acid Corrosion Control Program (BACCP)	12
71111.08P	Miscellaneous	EPID L-2018-LLR-0025	WATERFORD STEAM ELECTRIC STATION, UNIT 3-PROPOSED ALTERNATIVE TO ASME CODE, SECTION XI, REGARDING CHARGING PIPE VISUAL INSPECTION (EPID L-2018-LLR-0025)	10/18/2018
71111.08P	Miscellaneous	Purchase Order: 10323632	Certified Material Test Report, Welding Rods, ER308/308L, GTAW, 3/32 inch diameter, Austenitic Steel Rod.	06/05/2012
71111.08P	Miscellaneous	Purchase Order: 10323632	Certified Material Test Report - Welding Rod, ER308/308L, GTAW, 1/8 inch diameter, Austenitic Steel	10/17/2017
71111.08P	Miscellaneous	SEP-BAC-WF3-001	Waterford 3 Boric Acid Corrosion Control Program (BACC) Program Section	003
71111.08P	Miscellaneous	SEP-CISI-104	Program Section for ASME Section XI, Division 1 WF3 Containment Inservice Inspection Program	5
71111.08P	Miscellaneous	SEP-ISI-104	Program Section for ASME Section XI, Division 1 WF3 Inservice Inspection Program	11
71111.08P	Miscellaneous	SEP-PT-WF3-001	Waterford 3 Inservice Inspection Pressure Testing (PT) Program Section	000
71111.08P	Miscellaneous	W3F1-2008-0060	Request for Alternative W3-\SI-006, Proposed Alternative to Extend the Second 10-Year Inservice Inspection Interval for	09/18/2008

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Reactor Vessel Internal Weld Examinations Waterford Steam Electric Station, Unit 3, Docket No. 50-382, License No. NPF-38	
71111.08P	Miscellaneous	W3F1-2009-0006	RAJ Response to Request for Alternative W3-ISI-006 To Extend the Second 10 Year AMSE Code ISI and License Amendment Request, NPF-38-280 To Support Request for Alternative W3-ISI-006, Waterford Steam Electric Station, Unit 3 (Waterford 3), Docket No. 50-382, License No. NPF-38	03/19/2009
71111.08P	Miscellaneous	W3F1-2010-0002	Request for NRC Alternative to ASME IWE-5521 Regarding Post Repair Testing of Waterford 3's Steel Containment Vessel Opening Waterford Steam, Electric Station, Unit 3, Docket No. 50-382, License No. NPF-38	02/09/2010
71111.08P	Miscellaneous	W3F1-2011-0041	Request for Alternative to ASME IWE-5221 Regarding Post Repair Testing of Waterford 3's Steel Containment Vessel Opening Waterford Steam Electric Station, Unit 3, Docket No. 50-382	07/27/2011
71111.08P	Miscellaneous	W3F1-2013-0044	Waterford 3 Request for Alternative W3-ISI-023, ASME Code Case N-770-1 Successive Examinations, Waterford Steam Electric Station, Unit 3/ Docket No. 50-382, License No. NPF-38	09/26/2013
71111.08P	Miscellaneous	W3F1-2018-0008	Request for NRC Alternative to ASME IWA-5211 Regarding Charging Pipe Visual Inspection, Relief Request W3-ISI-030, Waterford Steam Electric Station, Unit 3 (Waterford 3), Docket No. 50-382, License No. NPF-38	02/20/2018
71111.08P	Miscellaneous	W3F1-2018-0067	Response to NRC Request for Additional Information Regarding Request for Alternative to ASME Code Case N-770-2, Successive Examinations, Relief Request W3-ISI-031	11/19/2018
71111.08P	Miscellaneous	W3F1-2019-0017	Closure of Commitment Associated with Inservice Inspection Program Alternative WF3-RR-19-1 for Application of Dissimilar Metal Weld Full Structural Weld Overlay – Reactor Coolant System Cold Leg Drain Nozzles	02/14/2019
71111.08P	Miscellaneous	Work Order:	Single Weld Datasheet (Weld Traveler) for Valve SI-512A	04/20/2022

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		528322-01, Map No. WF3-528322-01-01	(ISI-V2507), Field Weld FW-7, EC 83354	
71111.08P	Miscellaneous	Work Order: 528322-01, Map No. WF3-5273220-01-01	Single Weld Datasheet (Weld Traveler) for Valve SI-512A (ISI-V2507), Field Weld FW-8	04/20/2022
71111.08P	NDE Reports	BOP-VE-19-002	Nozzle to Safe-End Circumferential Weld - Weld Overlay	02/07/2019
71111.08P	NDE Reports	BOP-VE-19-003	Nozzle to Safe-End Circumferential Weld - Weld Overlay	02/07/2019
71111.08P	NDE Reports	BOP-VE-19-004	Safe End to 2" Pipe Weld - Weld Overlay	02/07/2019
71111.08P	NDE Reports	BOP-VE-19-005	Safe-End to 2" Pipe Weld - Weld Overlay	02/07/2019
71111.08P	NDE Reports	BOP-VT-19-005	Reactor Vessel Closure Head Control Element Drive Mechanism Nozzles	02/02/2019
71111.08P	NDE Reports	BOP-VT-21-004	Socket Weld CCW Line 3CC1 1/2-46	09/14/2021
71111.08P	NDE Reports	ISI-VT-17-132	Reactor Vessel Closure Head Control Element Drive Mechanism Nozzles 1-87	05/15/2017
71111.08P	Procedures	CEP-BAC-001	Boric Acid Corrosion Control (BACC) Program Plan	2
71111.08P	Procedures	CEP-NDE-0100	Administration and Control of NDE, Entergy Nuclear Engineering Programs	16
71111.08P	Procedures	CEP-NDE-0404	Manual Ultrasonic Examination of Ferritic Piping Welds (ASME XI)	9
71111.08P	Procedures	CEP-NDE-0423	Manual Ultrasonic Examination of Austenitic Piping Welds (ASME XI)	9
71111.08P	Procedures	CEP-NDE-0493	Manual Ultrasonic Examination of Reactor Coolant Pump Flywheel	4
71111.08P	Procedures	CEP-NDE-0641	Liquid Penetrant Examination (PT) for ASME Section XI	9
71111.08P	Procedures	CEP-NDE-0901	VT-1 Examination, Entergy Nuclear Engineering Programs	6
71111.08P	Procedures	CEP-NDE-0902	VT-2 Examination, Entergy Nuclear Engineering Programs	10
71111.08P	Procedures	CEP-NDE-0903	VT-3 Examination, Entergy Nuclear Engineering Programs	6
71111.08P	Procedures	CEP-NDE-0955	Visual Examination (VE) of Bare-Metal Surfaces, Entergy Nuclear Engineering Programs	308
71111.08P	Procedures	CEP-WP-002,	Welding Procedure, Specification WPS-SS-8/8-B, Manual Gas Tungsten Arc Welding (GTAW) of P-No. 8 stainless steels	0

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.08P	Procedures	CEP-WP-GWS-1	General Welding Standard, ASME/ANSI	6
71111.08P	Procedures	CEP-WP-IGP-1	Internal Gas Purging	1
71111.08P	Procedures	EPRI-WOL-PA-1	Procedure for Manual Phased Array Ultrasonic Examination of Weld Overlaid Similar and Dissimilar Metal Welds	4
71111.08P	Procedures	EPRI-WOL-PA-1, Table 1	Procedure for Manual Phased Array Ultrasonic Examination of Weld Overlaid Similar and Dissimilar Metal Welds	09/12/2014
71111.08P	Procedures	EPRI-WOL-PA-1, Table 2	Procedure for Manual Phased Array Ultrasonic Examination of Weld Overlaid Similar and Dissimilar Metal Welds	09/12/2014
71111.08P	Procedures	LMT-07-PAUT-005	Performance of Phased Array Instrument Screen Height and Amplitude Control Linearity Checks	1
71111.08P	Procedures	LMT-08-EPRI-WOL-1	Procedure for Manual Phased Array Ultrasonic Examination of Weld Overlaid Similar and Dissimilar Metal Welds	0
71111.08P	Procedures	LMT-08-PAUT- 5	Performance of Phased Array Instrument Screen Height and Amplitude Control Linearity Checks	0
71111.08P	Procedures	LMT-21-PAUT-029	Encoded Phased Array Ultrasonic Examination of Small Bore Austenitic and Ferritic Socket Welds (= 2.0” OD NPS)	0
71111.08P	Procedures	PQR 107	Procedure Qualification Record - Manual Gas Tungsten & Shielded Metal Arc Welding	1
71111.08P	Procedures	PQR-170	Procedure Qualification Record - Manual Gas Tungsten & Shielded Metal Arc Welding	1
71111.08P	Self-Assessments	LO-HQNLO-2021-19	2022 Welding Program Assessment	02/17/2022
71111.08P	Self-Assessments	LO-WLO-2021-0033 CA-2	Pre-NRC RF24 ISI Activities Self-Assessment Report	10/14/2021
71111.08P	Work Orders	527322	EC 83354 - REPLACE VALVE SI-512A	04/08/2022
71111.11Q	Procedures	EN-TQ-100	Operations Training Program Description	1
71111.11Q	Procedures	OP-010-003	Plant Startup	360
71111.11Q	Procedures	OP-010-003	Power Operations	341
71111.11Q	Procedures	OP-901-220	Loss of Condenser Vacuum	305
71111.11Q	Procedures	OP-901-221	Secondary System Transient	11
71111.11Q	Procedures	OP-902-000	Standard Post Trip Actions	17
71111.13	Corrective Action Documents Resulting from	CR-WF3-YYYY-NNNN	2022-04969	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Inspection			
71111.13	Procedures	OP-010-003	Plant Startup	361
71111.13	Procedures	OP-010-004	Power Operations	341
71111.15	Corrective Action Documents	CR-WF3-YYYY-NNNN	2022-03704, 2022-04112, 2022-04542, 2022-04759	
71111.15	Engineering Changes	EC 93200	Input for Emergency Feedwater Pump AB Differential Pressure	06/11/2022
71111.15	Engineering Changes	EC-92951	Availability of Shutdown Cooling in Modes 5 & 6	05/11/2022
71111.18	Corrective Action Documents	CR-WF3-YYYY-NNNN	2022-3704, 2022-4283, 2022-4299, 2022-4314	
71111.18	Engineering Changes	EC 91881	Substitute Core Protection Calculator D RTD Input	03/02/2022
71111.18	Engineering Changes	EC 92952	Temporary Plug for Thermowell	05/17/2022
71111.18	Engineering Changes	EC 93024	Extend EC-91881 until Refuel 25	06/16/2022
71111.18	Engineering Changes	EC 93139	ACCEMTR3B-6 Motor Comparison and Evaluation	06/05/2022
71111.18	Work Orders		580731	
71111.19	Procedures	OP-903-033	Cold Shutdown IST Valve Tests	060
71111.19	Procedures	OP-903-050	Component Cooling Water and Auxiliary Component Cooling Water Pump and Valve Operability Test	44
71111.19	Procedures	OP-903-092	Main Steam Isolation Actuation Signal Test	302
71111.19	Procedures	OP-903-095	ESFAS Subgroup Relay Test - Shutdown	016
71111.19	Work Orders		581904, 581916, 580585	
71111.20	Procedures	EN-OP-119	Protected Equipment Postings	16
71111.20	Procedures	EN-OU-108	Shutdown Safety Management Program (SSMP)	11
71111.20	Procedures	OP-010-005	Plant Shutdown	341
71111.20	Procedures	OP-010-006	Outage Operations	340
71111.20	Work Orders		52945451, 52962777, 572188	
71111.22	Corrective Action Documents	CR-WF3-YYYY-NNNN	2022-03491, 2022-03799, 2022-1852	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.22	Procedures	OP-903-033	Cold Shutdown IST Valve Tests	59
71111.22	Procedures	OP-903-092	Main Steam Isolation Actuation Signal Test	302
71111.22	Procedures	OP-903-116	Train B Integrated Emergency Diesel Generator/Engineering Safety Features Test	56
71111.22	Procedures	SEP-APJ-005	Waterford 3 Primary Containment Leakage Rate Testing	10
71111.22	Procedures	STA-001-004	Local Leak Rate Test (LLRT)	319
71111.22	Procedures	STA-001-006	Leak Rate Testing	305
71111.22	Work Orders		52952716, 52951975	
71124.01	Corrective Action Documents	CR-WF3-YYYY-XXXX	2021-00608, 2021-00636, 2021-01493, 2021-03064, 2021-04681, 2021-04685, 2021-04952, 2021-05400, 2021-06456	
71124.01	Corrective Action Documents	CR-WF3-YYYY-XXXX	2022-00556, 2022-01496, 2022-01953, 2022-02217, 2022-02542	
71124.01	Corrective Action Documents Resulting from Inspection	CR-WF3-YYYY-XXXX	2022-03170, 2022-03171, 2022-03174, 2022-03226, 2022-03290, 2022-03293, 2022-03295, 2022-03296, 2022-03297, 2022-03298, 2022-04917, 2022-04918, 2022-04920, 2022-04921, 2022-04922, 2022-04923, 2022-04924	
71124.01	Miscellaneous		Nuclear Daily Report	04/12/2022
71124.01	Miscellaneous		Hot Spot Tracking Log	04/13/2022
71124.01	Miscellaneous	Attachment 5 to EN-RP-101	LHRA/VHRA Key Log	04/12/2022
71124.01	Miscellaneous	HP-SM-076	+46 Fuel Handling Building Spent Fuel Pool Inventory	03/24/2022
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-104	Personnel Contamination Events	11
71124.01	Procedures	EN-RP-105	Radiological Work Permits	19
71124.01	Procedures	EN-RP-106	Radiological Survey Documentation	7
71124.01	Procedures	EN-RP-110	ALARA Program	14
71124.01	Procedures	EN-RP-121	Radioactive Material Control	17
71124.01	Procedures	EN-RP-123	Radiological Controls for Highly Radioactive Objects	1
71124.01	Procedures	EN-RP-143	Source Control	14

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71124.01	Radiation Surveys	WF3-2203-00161	+15 OA - Low Level Radwaste Storage Building	03/22/2022
71124.01	Radiation Surveys	WF3-2204-00087	-4 Reactor Containment Building	04/03/2022
71124.01	Radiation Surveys	WF3-2204-00206	Refuel 24 RP Bi-Weekly Survey +21 Reactor Containment Building	04/06/2022
71124.01	Radiation Surveys	WF3-2204-00209	Bi-Weekly -4 Reactor Containment Building	04/06/2022
71124.01	Radiation Surveys	WF3-2204-00234	-11 Reactor Containment Building Overhead Scaffold Support	04/07/2022
71124.01	Radiation Surveys	WF3-2204-00367	-4 Reactor Containment Building	04/11/2022
71124.01	Radiation Surveys	WF3-2204-00385	+21 Reactor Containment Building Pressurizer	04/11/2022
71124.01	Radiation Work Permits (RWPs)	RWP 2021-0002	Operations Personnel to Perform Various Activities in Radiologically Controlled Areas	1
71124.01	Radiation Work Permits (RWPs)	RWP 2021-0054	Safety Injection Tank Sampling, Personnel/Escape Interlock Door Tests, Minor Maintenance, Inspections and Valve-Line Ups, Radiation Protection Job Coverage into posted Locked High Radiation Areas	1
71124.01	Radiation Work Permits (RWPs)	RWP 2022-0610	Erect/Dismantle Scaffolding in the Reactor Containment Building	0
71124.01	Radiation Work Permits (RWPs)	RWP 2022-0627	Maintenance Valve Work Inside the Reactor Containment Building	0
71124.01	Radiation Work Permits (RWPs)	RWP 2022-0635	Radiography including Radiation Protection Boundary Guards	0
71124.01	Radiation Work Permits (RWPs)	RWP 2022-0702	Reactor Disassembly Activities	0
71124.01	Radiation Work Permits (RWPs)	RWP 2022-0708	Remove and Replace ICIs	0
71124.01	Radiation Work Permits (RWPs)	RWP 2022-0805	Tours and Inspections Outside the Reactor Containment Building	0
71124.01	Self-Assessments	LO-WLO-2021-00019	Radiological Hazard Assessment and Exposure Controls (IP 71124.01)	11/29/2021

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71124.03	Corrective Action Documents	CR-WF3-YYYY-XXXX	2021-00537, 2021-00657, 2021-02666, 2021-04975, 2021-05769, 2021-05898, 2021-06399, 2021-07131	
71124.03	Corrective Action Documents	CR-WF3-YYYY-XXXX	2022-00421	
71124.03	Miscellaneous		Inspection and Maintenance of Respiratory Protection Equipment - March 2021	03/10/2021
71124.03	Miscellaneous		Inspection and Maintenance of Respiratory Protection Equipment - January 2022	01/27/2022
71124.03	Miscellaneous		Inspection and Maintenance of Respiratory Protection Equipment - December 2021	12/30/2021
71124.03	Miscellaneous		Watford 3 Personnel- FireHawk Respirator Qualifications	03/23/2022
71124.03	Miscellaneous	EN-RP-502, Attachment 9.5	Annual Respiratory Protection Equipment Inventory & Inspection - 2021	12/12/2021
71124.03	Miscellaneous	EN-RP-503, Attachment 9.11	Total Effective Dose Equivalent/ALARA Evaluation for RWP 2022-0615	12/31/2021
71124.03	Miscellaneous	EN-RP-503, Attachment 9.12	Total Effective Dose Equivalent/ALARA Evaluation for RWP 2022-0627	12/31/2021
71124.03	Miscellaneous	EN-RP-503, Attachment 9.5	Annual Respiratory Protection Equipment Inventory & Inspection - Security 2021	12/12/2021
71124.03	Procedures	EN-RP-131	Air Sampling	17
71124.03	Procedures	EN-RP-203	Dose Assessment	10
71124.03	Procedures	EN-RP-501	Respiratory Protection Program	7
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-502-03	AirHawk II SCBA	0
71124.03	Procedures	EN-RP-503	Selection, Issue and Use of Respiratory Protection Equipment	8
71124.03	Procedures	EN-RP-504	Breathing Air	4
71124.03	Procedures	EN-RP-505	PortaCount Respirator Fit Testing	9
71124.03	Procedures	HP-002-603	Inspection and Use of Control Room EBA Filtration Panel	12
71124.03	Procedures	MM-003-045	Control Room Air Conditioning System Surveillance	316
71124.03	Procedures	MM-003-046	Controlled Ventilation Area System Surveillance	311
71124.03	Procedures	MM-007-034	RAB Normal Ventilation System Exhaust Filter Test	4

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71124.03	Radiation Surveys	WF3-2204-00447	+46 foot elevation- Reactor Containment Building - survey performed for welders to grind out and remove RCSV-3184, RCSV-1017, RCSV-1014, & RCSV-1015	04/13/2022
71124.03	Radiation Surveys	WF3-2204-00468	+46 foot elevation- Reactor Containment Building- survey of pipe tent on south west wall of cavity	04/13/2022
71124.03	Radiation Surveys	WF3-2204-00481	+46 foot elevation- Reactor Containment Building - survey performed to down post fire protection tent	04/13/2022
71124.03	Radiation Surveys	WF3-2204-00489	+46 foot elevation - Reactor Containment Building - survey performed for completion of grinding before weld of new valves for RCS line takes place	04/13/2022
71124.03	Radiation Surveys	WF3-AS-041322-0103	Air sample for RWP 2022-0627 during the removal & grind out valve: RCISV 1014, RCISV 1015, RCISV 1017	04/13/2022
71124.03	Radiation Surveys	WF3-AS-041322-0105	Air sample for RWP 2022-0627 during grind out valves: RC-1014, RC-1015, RC-1017, RC-3184	04/13/2022
71124.03	Radiation Surveys	WF3-AS-041322-0110	Air sample for RWP 2022-0627 during removal/replace RC valves	04/13/2022
71124.03	Radiation Surveys	WF3-AS-041722-0238	Pzr Room - cut out heaters	04/17/2022
71124.03	Radiation Surveys	WF3-AS-041722-0246	Lapel air sample data	04/17/2022
71124.03	Radiation Surveys	WF3-AS-042222-0581	Validation of A/S PZR Cut out heater	04/22/2022
71124.03	Radiation Work Permits (RWPs)	RWP 2022-0615	Refuel 24 - Remove/Replace Pressurizer Heaters	0, 1, 2, 3, 4, 5
71124.03	Radiation Work Permits (RWPs)	RWP 2022-0627	Refuel 24 - Maintenance Valve Work inside the Reactor Containment Building	0
71124.04	Calculations		Internal Dose Assessment Models for 2 worker uptakes	04/27/2022
71124.04	Calculations		Internal Dose Assessment Model for 2 worker uptakes	04/21/2022
71124.04	Miscellaneous		Whole Body Counts for 8 workers	04/19/2022
71124.04	Miscellaneous		Whole Body Counts for 5 workers	04/20/2022
71124.04	Miscellaneous		Whole Body Counts for 4 workers	04/21/2022
71124.04	Miscellaneous		Whole Body Counts for 3 workers	04/22/2022
71124.04	Miscellaneous		Whole Body Counts for 1 worker	04/23/2022
71124.04	Miscellaneous		Whole Body Counts for 2 workers	04/24/2022

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71124.04	Miscellaneous		Apex-InVivo Nuclide Library Report: STDNPPNA.NLB - Basic NaI NPP and PeakSearch.NLB (STDNPPGE.NLB) - Basic GE NPP	
71124.04	Miscellaneous		Whole Body Counts for 8 workers	04/18/2022
71124.04	Miscellaneous	LIMS L95908	Teledyne Brown Engineering - Environmental Services: Report of Analysis	05/05/2022
71124.06	Calculations	EN-RW-104, Attachment 9.1	10 CFR Part 61 Waste Stream Screening and Evaluation	03/22/2021
71124.06	Corrective Action Documents	Condition Report (CR-WF3-XXXX-XXXXX)	2019-07276, 2019-08771, 2020-00424, 2020-01397, 2020-01459, 2020-01747, 2020-01806, 2020-02513, 2020-03066, 2020-03450, 2020-05459, 2020-05891, 2020-06860, 2021-01378, 2021-02435, 2021-03399, 2021-03399, 2021-04183, 2021-04525, 2021-05562, 2021-05563, 2021-06329, 2021-06506, 2022-00374, 2022-01581, 2022-02066, 2022-02145	
71124.06	Miscellaneous		Annual Dose Summary for 2019, 2020, and 2021	N/A
71124.06	Miscellaneous		Annual Release Summary for 2019, 2020, and 2021	N/A
71124.06	Procedures	CE-002-016	Maintaining Gaseous Waste Management System	310
71124.06	Procedures	CE-002-018	Monitoring Liquid Waste Management	007
71124.06	Procedures	CE-003-300	Preparation of Liquid Samples for Radiological Chemical Analysis	013
71124.06	Procedures	CE-003-509	Routine Filter Replacement and Grab Sampling on Particulate Iodine Gas Monitors and Wide Range Gas Monitors	309
71124.06	Procedures	CE-003-510	Technical Specification Action Statement Compliance	014
71124.06	Procedures	CE-003-512	Liquid Radioactive Waste Release Permit (Manual)	002
71124.06	Procedures	CE-003-513	Gaseous Radioactive Waste Release Permit (Manual)	304
71124.06	Procedures	CE-003-514	Liquid Radioactive Waste Release Permit	304
71124.06	Procedures	CE-003-515	Gaseous Radioactive Waste Release Permit	305
71124.06	Procedures	CE-003-700	General Grab Sampling Techniques	319
71124.06	Procedures	UNT-005-014	Offsite Dose Calculation Manual	308
71124.06	Self-Assessments	QA-2/6-2021-W3-1	Quality Assurance Audit Report: Combined Chemistry, Effluents, and Environmental Monitoring	10/05/2021
71124.07	Corrective Action	Condition Report	2019-07315, 2019-07322, 2019-08536, 2019-08995,	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Documents	(CR-WF3-XXXX-XXXXX)	2020-00249, 2020-01272, 2020-02019, 2020-03175, 2020-04335, 2020-06097, 2020-06639, 2020-07123, 2021-00851, 2021-00958, 2021-02095, 2021-03665, 2021-03668, 2021-04115, 2021-04534, 2022-00086, 2022-00306, 2022-03045, 2022-04529	
71124.07	Miscellaneous		Energy Nuclear / Waterford-3 Station Groundwater Protection Plan	06/12/2019
71124.07	Miscellaneous		2020 Land Use Census Data	10/12/2020
71124.07	Miscellaneous		Annual Quality Assurance Status Report	03/16/2022
71124.07	Miscellaneous	CR-WF3-2020-06097	10 CFR 50.75(g)(1) Leak/Spill Record - West Side of Service Building Warehouse	10/24/2020
71124.07	Miscellaneous	CR-WF3-2021-03668	10 CFR 50.75(g)(1) Leak/Spill Record - Fire Protection Pit 17	07/08/2021
71124.07	Miscellaneous	W3F1-2020-0025	2019 Annual Radiological Environmental Operating Report	04/27/2020
71124.07	Miscellaneous	W3F1-2020-0026	2019 Annual Radioactive Effluent Release Report	04/27/2020
71124.07	Miscellaneous	W3F1-2021-0036	2020 Annual Radiological Environmental Operating Report	04/29/2021
71124.07	Miscellaneous	W3F1-2021-0037	2020 Annual Radioactive Effluent Release Report	04/29/2021
71124.07	Miscellaneous	W3F1-2022-0027	2021 Annual Radioactive Effluent Release Report	04/26/2022
71124.07	Miscellaneous	W3F1-2022-0028	2021 Annual Radiological Environmental Operating Report	04/28/2022
71124.07	Procedures	CE-003-522	Meteorological Data Collection and Processing	7
71124.07	Procedures	CE-003-523	Meteorological Monitoring Program	2
71124.07	Procedures	EN-CY-108	Monitoring of Nonradioactive Systems	7
71124.07	Procedures	EN-CY-111	Radiological Groundwater Protection Program	12
71124.07	Procedures	EN-CY-127	Land Use Census	2
71124.07	Procedures	EN-CY-130	Radiological Environmental Monitoring Program	0
71124.07	Procedures	EN-CY-132	Annual Radiological Environmental Operating Report	1
71124.07	Procedures	EN-RP-113	Response to Contaminated Spills/Leaks	11
71124.07	Procedures	OP-903-001	Technical Specification Surveillance Logs	98
71124.07	Procedures	UNT-005-014	Offsite Dose Calculation Manual	309
71124.07	Procedures	UNT-005-014	Offsite Dose Calculation Manual	308
71124.07	Self-Assessments	LO-HQNLO-2021-00024	Groundwater Protection Program Self-Assessment	10/27/2021
71124.07	Self-Assessments	LO-WLO-2021-	Pre-NRC Assessment of Radiation Safety Inspection Criteria	11/03/2021

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		00018		
71124.07	Work Orders	WF3-398323-01	EM MTWR0001-A, Primary Met Tower	09292015
71124.07	Work Orders	WF3-52977514-01/02	Calibrate Primary Met Tower IAW MI-003-395	01/27/2022
71151	Procedures	EN-LI-114	Regulatory Performance Indicator Process	19
71152A	Corrective Action Documents	CR-WF3-YYYY-NNNN	2021-02879	
71152A	Drawings	G309	Phasing and Voltage Vector Diagram	4
71152A	Engineering Changes	EC 41846	Isolated Phase Bus Transition	02/07/2013
71152A	Work Orders		52910298, 563568, 563628, 563629, 563631	