UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200
ATLANTA, GEORGIA 30303-1200

February 14, 2022

Mr. Steven M. Snider
Site Vice President
Oconee Nuclear Station
Duke Energy Carolinas, LLC
7800 Rochester Highway
Seneca, SC 29672-0752

SUBJECT: OCONEE NUCLEAR STATION – INTEGRATED INSPECTION REPORT 05000269/2021004 AND 05000270/2021004 AND 05000287/2021004 AND APPARENT VIOLATION

Dear Mr. Snider:

On December 31, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Oconee Nuclear Station. On February 9, 2022, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

Section 71111.20 of the enclosed report discusses a finding with an associated apparent violation for which the NRC has not yet reached a preliminary significance determination. This finding involved an apparent failure to perform an adequate technical review of the procedure revision request for licensee procedure OP/0/A/1107/011 F, Revision 19, “Sharing Startup Transformers Between Units,” which led to simultaneous lockouts on startup transformers, CT-1 and CT-2.

We intend to issue our final safety significance determination and enforcement decision, in writing, within 90 days from the date of this letter. The NRC’s significance determination process (SDP) is designed to encourage an open dialogue between your staff and the NRC; however, neither the dialogue nor the written information you provide should affect the timeliness of our final determination. We ask that you promptly provide any relevant information that you would like us to consider in making our determination. We are currently evaluating the significance of this finding and will notify you in a separate correspondence once we have completed our preliminary significance review. You will be given an additional opportunity to provide additional information prior to our final significance determination unless our review concludes that the finding has very low safety significance (i.e., Green).

Two findings of very low safety significance (Green) are documented in this report. Two 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 II; the Director, Office of Enforcement; and the NRC Resident Inspector at Oconee Nuclear Station.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; and the NRC Resident Inspector at Oconee Nuclear Station.

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

Sincerely,

/RA/

Eric J. Stamm, Chief
Reactor Projects Branch 1
Division of Reactor Projects

Docket Nos. 05000269 and 05000270 and 05000287
License Nos. DPR-38 and DPR-47 and DPR-55

Enclosure:
As stated

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SUBJECT: OCONEE NUCLEAR STATION – INTEGRATED INSPECTION REPORT 05000269/2021004 AND 05000270/2021004 AND 05000287/2021004 AND APPARENT VIOLATION

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NAME	J. Nadel	A. Ruh	N. Smalley	N. Peterka	A. Rosebrook	D. Jackson	E. Stamm
DATE	2/10/2022	2/10/2022	2/7/2022	2/9/2022	2/8/2022	2/9/2022	2/ /2022

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Numbers:	05000269, 05000270 and 05000287
License Numbers:	DPR-38, DPR-47 and DPR-55
Report Numbers:	05000269/2021004, 05000270/2021004 and 05000287/2021004
Enterprise Identifier:	I-2021-004-0012
Licensee:	Duke Energy Carolinas, LLC
Facility:	Oconee Nuclear Station
Location:	Seneca, South Carolina
Inspection Dates:	October 1, 2021 to December 31, 2021
Inspectors:	J. Nadel, Senior Resident Inspector A. Ruh, Resident Inspector N. Smalley, Resident Inspector N. Peterka, Fuel Facility Inspector M. Meeks, Senior Operations Engineer P. Cooper, Senior Reactor Inspector R. Patterson, Senior Reactor Inspector T. Su, Reactor Inspector J. Diaz-Velez, Senior Health Physicist J. Rivera, Health Physicist A. Rosebrook, Senior Reactor Analyst
Approved By:	Eric J. Stamm, Chief Reactor Projects Branch 1 Division of Reactor Projects

Enclosure

SUMMARY

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

List of Findings and Violations

Failure to Assess the Risk Increase from Operations in Cold Mid-loop			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000270/2021004-01 Open/Closed	[H.3] - Change Management	71111.13
The inspectors identified a Green finding and associated non-cited violation (NCV) of 10 CFR 50.65(a)(4) when the licensee failed to adequately assess the risk associated with lowering the reactor coolant system (RCS) level to reduced inventory, also known as mid-loop, during a Unit 2 refueling outage on November 25, 2021.			

Failure to Use a Procedure Appropriate to the Circumstances While Changing Electrical Lineup of Startup Transformer CT-2			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Initiating Events	Pending AV 05000269,05000270/2021004-02 Open	[H.12] - Avoid Complacency	71111.20
A finding with its safety significance as yet to be determined (pending) and an associated apparent violation (AV) of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified when the licensee failed to use a procedure appropriate to the circumstances for an activity affecting quality. Specifically, the procedure for sharing startup transformers between units was inadequate, which led to simultaneous lockouts on CT-1 and CT-2 startup transformers while starting the 2B2 reactor coolant pump (RCP) motor for an uncoupled run.			

Prompt Corrective Actions Not Taken for Out-of-tolerance As-Found Data			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000269,05000270,05000287/ 2021004-03 Open/Closed	[H.8] - Procedure Adherence	71152
The inspectors identified a Green finding and associated non-cited violation (NCV) of 10 CFR Part 50, Appendix B, "Corrective Action," for the licensee's failure to ensure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. Specifically, the licensee failed to promptly identify and correct the out of allowable range values documented in work orders 20376561 and 20376768. The licensee performed the work orders to implement requirements as stated in licensee preventive maintenance			

procedure IP/0/A/3011/016, Motor Control Center, Distribution Center, revision 14.

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
NOV	05000270,05000287, 05000269/2020010-02	Inadequate Corrective Action - Control Voltage for 4160 Breaker's Closing Coil and 480V MCC control Circuits were not Assured	71152	Closed
LER	05000270/2021001-00	2B Motor Driven Emergency Feedwater Pump Past Inoperability Resulted In Condition Prohibited by Technical Specifications	71153	Closed

PLANT STATUS

Unit 1 operated at or near 100 percent rated thermal power (RTP) for the entire inspection period.

Unit 2 began the inspection period at or near 100 percent RTP. On October 21, 2021, the unit began lowering power for coast down to the refueling outage. On November 12, 2021, the power coast down had reached 88 percent RTP and the unit was shut down for the scheduled refueling outage. The unit was taken critical on December 6, 2021, and proceeded to shut down to Mode 3 on December 7, 2021, after completing zero power physics testing in order to address issues with control rods. The unit was taken critical again later on December 7, 2021, and began raising power, reaching 73 percent on December 8, 2021. On December 10, 2021, the unit tripped automatically from 73 percent power due to an invalid actuation of the reactor protection system due to a signal spike on a power range nuclear instrument. The unit was taken critical again on December 12, 2021, and began raising power, reaching 100 percent RTP on December 13, 2021. The unit remained at or near 100 percent RTP for the remainder of the inspection period.

Unit 3 operated at or near 100 percent RTP for the entire 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," conducted routine reviews using IP 71152, "Problem Identification and Resolution," observed risk significant activities, and completed on-site 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

71111.04 - Equipment Alignment

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

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

(1) Emergency power systems while both Keowee hydro units were out of service for repair on October 20, 2021
(2) Reactor coolant system (RCS) level instrumentation during lowered inventory operations, including 2LT-5A/B, permanently installed hot leg level instrumentation, hot leg and cold leg temporary ultrasonic level instruments, and backup steam generator tygon tubing manometers on November 15, 2021

(3) Unit 1 and 2 low pressure service water system while protected during the Unit 2 outage on November 16, 2021

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

(1) The inspectors evaluated system configurations during a complete walkdown of the Unit 2 low pressure injection (LPI) system in decay heat removal mode during reduced inventory operations and fuel movement on November 14, 2021.

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (5 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 zone 77: Unit 3 auxiliary building 200 level hallway on October 6, 2021
(2) Fire zone 103: Unit 2 east penetration room on November 4, 2021
(3) Fire zone 95: Unit 1 equipment room on November 15, 2021
(4) Fire zone 33: Unit 2 4160V switchgear on November 15, 2021
(5) Fire zone 123: Unit 2 containment on November 29, 2021

71111.06 - Flood Protection Measures

Inspection Activities - Internal Flooding (IP Section 03.01) (1 Sample)

The inspectors evaluated internal flooding mitigation protections in the:

(1) Unit 2 auxiliary building east penetration room

Cable Degradation (IP Section 03.02) (1 Sample)

The inspectors evaluated cable submergence protection in:

(1) Protected service water ductbank inspection, work order (WO) 20437679

71111.08P - Inservice Inspection Activities (PWR)

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

(1) The inspectors evaluated pressurized water reactor non-destructive testing by reviewing the following examinations from October 11, to October 28, 2021:
    1. Ultrasonic Examination
        a. Core Barrel Bolts, UCB-001 - UCB-120 (reviewed)
    2. Phased Array Ultrasonic Examination
        a. 42.75" RCS Hot Leg, RTE Pad No. A01, ASME Class 1 (reviewed)
    3. Visual Examination
        a. Bottom Mounted Instrument Nozzle Penetrations, 2-RPV-BMI-NOZZLES (All), ASME Class 1 (reviewed)

4. Eddy Current Testing (ECT)
    a. Steam Generator (SG) 2A, Tube R138C58, ASME Class 1 (observed)
    b. SG 2B, Tube R138C33 and R127C2, ASME Class 1 (observed)

The inspectors also evaluated the licensee's boric acid control program performance.

71111.11A - Licensed Operator Requalification Program and Licensed Operator Performance

Requalification Examination Results (IP Section 03.03) (1 Sample)

(1) Annual Review of Licensee Requalification Examination Results: On April 02, 2021, the facility licensee completed the comprehensive biennial requalification written examinations and the annual requalification operating examinations required to be administered to all licensed operators in accordance with Title 10 of the Code of Federal Regulations 55.59(a)(2), "Requalification Requirements," of the NRC's "Operator's Licenses." During the week of December 13, 2021, the inspectors performed an in-office review of the overall pass/fail results of the individual operating examinations and the crew simulator operating examinations in accordance with Inspection Procedure (IP) 71111.11, "Licensed Operator Requalification Program." These results were compared to the thresholds established in Section 03.03, "Requalification Examination Results," of IP 71111.11.

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 Unit 2 shutdown for refueling outage on November 12 and 13, 2021.

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

(1) The inspectors observed and evaluated simulator just-in-time training for unit shutdown casualties on November 10, 2021.

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (1 Sample)

The inspectors evaluated the effectiveness of maintenance to ensure the following structures, systems, and components (SSCs) remain capable of performing their intended function:

(1) Unit 1 turbine bypass valve 1MS-19 came open at 100% power, causing 3MWe transient on September 10, 2021 (nuclear condition reports (NCRs) 2397266, 2397267, 2401887, 2404422, 2404752)

71111.13 - Maintenance Risk Assessments and Emergent Work Control

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

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) Units 1, 2, and 3 elevated green risk on October 20 to 21, 2021, due to both Keowee hydrostation units out of service for emergent repair work on Keowee Unit 1
(2) Unit 2 protected equipment walkdown during yellow risk on November 14, 2021, due to reduced inventory operations
(3) Unit 2 yellow risk on November 15 and 16, 2021, during the high risk plant operating state due to lowered RCS inventory and high decay heat
(4) Unit 2 yellow risk on November 25, 2021, during operation at reduced inventory (cold mid-loop) in Mode 5

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (8 Samples)

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

(1) NCR 02403963, steam leak from Unit 1 main steam #2 safety relief valve
(2) NCR 02405392, 2A steam generator pedestal studs covered in boric acid
(3) NCRs 2405474, 2405634, 2405679, 2405898, 2406086, Alloy 600 weld remediation identified unacceptable flaws in the RCS base metal prior to installation of the weld pad
(4) NCRs 2405875 and 2407202, 3B low pressure service water pump acceptance criteria being outside a nominal 2 percent flow band and consideration of electrical frequency effects
(5) NCR 2405877, internal pits in Unit 2 safety related condenser circulating water intake piping near manway 2B1
(6) NCR 2406476, 2RC-219 did not meet 0.15 coefficient of friction acceptance criterion during diagnostic testing
(7) NCR 2406500, boric acid corrosion found on the 2B1 and 2A2 reactor coolant pump main flange studs
(8) NCR 2408618, operation in Mode 1 with two axial power shaping rods uncoupled from control rod drive mechanisms

71111.18 - Plant Modifications

Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02) (1 Sample)

The inspectors evaluated the following temporary or permanent modifications:

(1) Nuclear station modification ON-53015, Lee undervoltage and underfrequency permissive modification

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (3 Samples)

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

(1) PT/0/A/0620/009, Keowee Hydro Operation and OP/0/A/2000/041, KHS-Modes of Operation following relay replacements and preventive maintenance on Keowee Hydro Unit 1 on October 20 and 21, 2021
(2) PT/2/A/0201/005, High Point Vent Flow Test, following internal repairs to 2RC-155/156, steam generator vent valves, on December 6, 2021
(3) PT/2/A/0160/002, Reactor Building Cooling Unit Air Flow Test after fan replacement, WO 20450716

71111.20 - Refueling and Other Outage Activities

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

(1) The inspectors evaluated refueling outage U2R30 activities from November 12, 2021, to December 7, 2021.

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Surveillance Tests (other) (IP Section 03.01) (1 Sample)

(1) PT/3/A/0251/001, Low Pressure Service Water Pump Test, on November 5, 2021

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

(1) PT/2/A/0151/019, Penetration 19 Leak Rate Test, on November 26, 2021

71114.06 - Drill Evaluation

Select Emergency Preparedness Drills and/or Training for Observation (IP Section 03.01) (1 Sample)

(1) Emergency preparedness training tabletop drill 21TT-4 on October 18, 2021

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 radiologically controlled area (RCA)
(2) Workers exiting the RCA during Unit 2 refueling outage
(3) Workers exiting Unit 2 containment during Unit 2 refueling outage

Radiological Hazards Control and Work Coverage (IP Section 03.04) (3 Samples)

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

(1) Radiation Work Permit (RWP) no. 2158, Unit 2 Reactor Building Remove and Replace Reactor Vessel Head, Rev. 18
(2) RWP no. 2216, Unit 2 Reactor Building "A" and "B" Steam Generators Setup, Remove, and Replace Primary Manway and Handhole Covers, Rev. 30
(3) RWP no. 2121, Unit 2 Reactor Building Replace Valves 2HP3 and 2HP4 and Associated Activities, Rev. 1

High Radiation Area and Very High Radiation Area Controls (IP Section 03.05) (4 Samples)

The inspectors evaluated licensee controls of the following High Radiation Areas and Very High Radiation Areas:

(1) Unit 2 turbine building radioactive material area on the 5th floor, 822 foot elevation
(2) Radwaste Room 111, Liquid Waste Feed Pump "A"
(3) Radwaste Room 112, Liquid Waste Feed Pump "B"
(4) Units 1, 2, and 3 auxiliary building 200 foot elevation corridor

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.

71124.02 - Occupational ALARA Planning and Controls

Radiological Work Planning (IP Section 03.01) (5 Samples)

The inspectors evaluated the licensee’s radiological work planning by reviewing the following:

(1) Oconee Nuclear Station O1R31 RP Outage Report - Duration 10/17/2020-11/18/2020
(2) Oconee Nuclear Station O3R30 RP Outage Report - Duration 04/10/2020 - 05/9/2020
(3) Oconee Nuclear Station Long Range As Low as Reasonably Achievable (ALARA) Plan - 2021
(4) ALARA Plan Number 2020-ONS-1-O-001, Alloy 600 Repairs (completed package including in progress and post job reviews)
(5) ALARA Plan Number 2020-ONS-1-O-003, SSF-Letdown Line Replacement (completed package including in progress and post job reviews)

Verification of Dose Estimates and Exposure Tracking Systems (IP Section 03.02) (4 Samples)

The inspectors evaluated dose estimates and exposure tracking for the following activities:

(1) Daily Dose Reports from 11/15 to 11/19/2021 (outage daily dose accrual report, individual ALARA Plan dose accrual, significant radiological work complete/upcoming, etc.)
(2) ALARA Plan Number 2021-ONS-2-O-002, Alloy 600 Small Nozzle Repair, Revision 0
(3) ALARA Plan Number 2021-ONS-2-O-003, 2HP - 3&4 Replacement, Revision 0 (Letdown cooler outlet isolation valve and motor operator replacement)
(4) ALARA Plan Number 2021-ONS-2-O-006, Incore Instrumentation {High Radiological Risk, IER L2-11-41 (Highly Radioactive In-Core Components), Risk Code (HO)}

Implementation of ALARA and Radiological Work Controls (IP Section 03.03) (4 Samples)

The inspectors reviewed as low as reasonably achievable practices and radiological work controls.

(1) The inspectors reviewed ALARA and radiological work control requirements contained in the following RWPs:
    1. RWP # 2022 Rev: 08, U2 RX BLDG - Alloy 600 - Replacement / Repairs and Associated Activities
    2. RWP # 2026 Rev: 07, U2 RX BLDG - Annulus Inspections and Associated Work
    3. RWP # 2121 Rev: 01, U2 RX BLDG - Replace Valves 2HP3 / 2HP4 and Associated Activities
(2) The inspectors reviewed the following ALARA Plans:
    b. ALARA Plan Number 2021-ONS-2-O-002, Alloy 600 Small Nozzle Repair
    c. ALARA Plan Number 2021-ONS-2-O-003, 2HP - 3&4 Replacement
    d. ALARA Plan Number 2021-ONS-2-O-001, Annulus Inspections
(3) The inspectors reviewed Total Effective Dose Equivalent (TEDE)-ALARA evaluations for the following work activities:
    b. TEDE-ALARA Screening for PAPRs issued for Alloy 600 work, RWP 2022 Task 2, on 11/16/2021.
    c. TEDE-ALARA Screening for PAPRs issued for 2HP-3 & 4 welding activities, RWP 2121 Task 3, on 11/18/2021.
(4) The inspectors reviewed the following temporary shielding installation packages:
    b. Serial Number: U2RB-12, RO Incore Trench, 10/4/2021
    c. Serial Number: U2RB-04, RO Nozzles, 10/4/2021

Radiation Worker Performance (IP Section 03.04) (1 Sample)

The inspectors evaluated radiation worker and radiation protection technician performance during:

(1) The inspectors evaluated radiation worker and radiation protection technician performance during work activities.
    a. Reactor head lift
    b. 2HP-3 & 4 valve work

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) Units 1 and 2 control room ventilation system
(2) Unit 3 control room ventilation system

Temporary Ventilation Systems (IP Section 03.02) (2 Samples)

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

(1) Portable HEPA SG2010
(2) Portable HEPA SG2012

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.

71124.04 - Occupational Dose Assessment

Source Term Characterization (IP Section 03.01) (1 Sample)

(1) The inspectors evaluated licensee performance as it pertains to radioactive source term characterization.

External Dosimetry (IP Section 03.02) (1 Sample)

(1) The inspectors evaluated how the licensee processes, stores, and uses external dosimetry.

Internal Dosimetry (IP Section 03.03) (3 Samples)

The inspectors evaluated the following internal dose assessments:

(1) Internal dose assessment #20-003 was reviewed
(2) Internal dose assessment #20-015 was reviewed
(3) Internal dose assessment #20-021 was reviewed

Special Dosimetric Situations (IP Section 03.04) (3 Samples)

The inspectors evaluated the following special dosimetric situations:

(1) One declared pregnant worker record was reviewed
(2) One EDEX dose assessment for #V6077699 was reviewed
(3) One EDEX dose assessment for #V6077856 was reviewed

71124.05 - Radiation Monitoring Instrumentation

Walkdowns and Observations (IP Section 03.01) (6 Samples)

The inspectors evaluated the following radiation detection instrumentation during plant walkdowns:

(1) Installed plant radiation monitors (material condition and configuration):
    a. 1RIA-1 – Units 1 and 2 Control Room ARM
    b. 2RIA-43 through 46 – Unit 2 Vent Monitor, incl. High Range
    c. 1RIA-11 – Unit 1 and 2 Auxiliary Building Corridor ARM
    d. RIA-33 – Liquid Waste Disposal Monitor (Radwaste Building)
    e. RIA-45 – Radwaste Facility Vent Monitor
    f. Units 1 and 2 RIA-50 – Component Cooling Water Liquid Monitor
(2) Observed routine source response checks of the following portable radiation dose rate survey Instruments:
    a. EnRad # 07228 (Ludlum 19)
    b. EnRad # 02526 (Ludlum 3 – mR/hr)
    c. EnRad # 13377 (Ludlum 9-3)
    d. EnRad # 03847 (AMP-100)
    e. EnRad # 07509 (Telepole)
(3) Observed routine source response checks of the following semi-fixed personnel contamination monitors:
    a. EnRad # 03864 (Argos)
    b. EnRad # 13549 (GEM-5)
(4) Observed routine source response checks of the following semi-fixed tool/equipment contamination monitor:
    a. EnRad # 03868 (Cronos)
(5) Observed routine source response checks of the following portable neutron radiation dose rate survey Instruments:
    a. EnRad # 07511 (Ludlum 12-4 Remball)
(6) Observed routine source response checks of the following portable contamination survey instruments:
    a. EnRad # 07982 (Ludlum 177)
    b. EnRad # 12966 (Ludlum 3 - cpm)

Calibration and Testing Program (IP Section 03.02) (15 Samples)

The inspectors evaluated the calibration and testing of the following radiation detection instruments:

(1) 2021 Whole Body Counter Calibration (per AD-RP-ALL-7007), WBC ID #: ONFSF1, 06/23/2021
(2) Tri-Carb Liquid Scintillation System Calibration Verification, Detector Serial #: SGTC27140350, November 2021
(3) Gamma Spectroscopy system calibration package, Detector Serial #: 9661, Detector Shield #: 3, 09/16/2021
(4) Ludlum Model 9-3 Ion Chamber Survey Meter, Serial Number (S/N) 308363, EnRad ID # 07661 - Calibrated 08/26/2020 & 07/08/2021
(5) Ludlum Model 9-3 Ion Chamber Survey Meter, S/N 288795, EnRad ID # 11899 - Calibrated 03/27/2020 & 04/01/2021
(6) ROTEM Ind. Model AMP-100, S/N 5008-132, EnRad ID # 03847, Calibrated 02/12/2020 & 07/21/2021
(7) ROTEM Ind. Model AMP-100, S/N 5005-161, EnRad ID # 11217, Calibrated 02/12/2020 & 07/28/2021
(8) Ludlum Model 9-3 Ion Chamber Survey Meter, S/N 288562, EnRad ID # 12089 - Calibrated 03/06/2020 & 07/19/2021
(9) ROTEM Ind. Model Telepole, S/N 6604-132, EnRad ID # 02093, Calibrated 06/01/2020 & 08/24/2021
(10) ROTEM Ind. Model Telepole, S/N 0914-123, EnRad ID # 07596, Calibrated 08/22/2019 & 03/31/2021
(11) Canberra Model GEM5 Gamma Portal Monitor, S/N 2007-174-GE0500G, EnRad ID # 13550 - Calibrated 12/07/2020 & 10/31/2021
(12) Canberra Model Argos-5ABZ Contamination Monitor, S/N 1510-166-AR050AB, EnRad ID # 07806 - Calibrated 08/10/2020 & 08/03/2021
(13) RADOS Model Fibre XL Hand & Foot Contamination Monitor, S/N 373, EnRad ID # 12387 - Calibrated 03/03/2020 & 02/03/2021
(14) Canberra Model Cronos-1 Tool & Equipment Monitor, S/N 1312-360, EnRad ID # 03869 - Calibrated 05/20/2020
(15) Canberra Model Cronos-4 Tool & Equipment Monitor, S/N 1412-325-cr0400g, EnRad ID # 03867 - Calibrated 08/10/2020 & 08/03/2021

Effluent Monitoring Calibration and Testing Program Sample (IP Sample 03.03) (3 Samples)

The inspectors evaluated the calibration and maintenance of the following radioactive effluent monitoring and measurement instrumentation:

(1) Unit 2 RIA-57 and 58, Containment High Range (Post-Accident) Radiation Calibration Package, WO 20388011, 10/14/2021
(2) Unit 3 RIA-46, Main Stack Vent High Range Gaseous Radiation Monitor Calibration Package, WO 20146730, 08/15/2017 and WO 20275115, 2/18/2019
(3) RIA-0033, Liquid Effluent Release Radiation Monitor, WO 20301321, 12/17/2019 and WO 20372764, 03/11/2021

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

MS06: Emergency AC Power Systems (IP Section 02.05) (3 Samples)

(1) Unit 1 (July 1, 2020 - September 30, 2021)
(2) Unit 2 (July 1, 2020 - September 30, 2021)
(3) Unit 3 (July 1, 2020 - September 30, 2021)

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

(1) October 1, 2020 through November 29, 2021

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) July 1, 2020 through November 29, 2021

71152 - Problem Identification and Resolution (PI&R)

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

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

(1) CT-1 and CT-2 lockout event on November 27, 2021
(2) The team reviewed Oconee's response to Notice of Violation (NOV), EA-2021-004, and various documents associated with the actions taken by the licensee including calculations, breaker qualification, preventive action procedures, design changes and corrective action documents. With the exception of an NCV associated with the lack of promptness in addressing the out-of-tolerance as-found data as documented in Action Request (AR) 02411953, the team did not identify any additional more-than-minor deficiencies associated with the licensee's corrective action taken. The NCV was not directly related to the issues addressed in the NOV and may be addressed through the licensee's CAP independent of the NOV closure. The NOV is closed.

71153 - Follow Up of Events and Notices of Enforcement Discretion

Event Followup (IP Section 03.01) (1 Sample)

(1) The inspectors evaluated a Unit 2 reactor trip at 0049 and the licensee's response on December 10, 2021.

Event Report (IP Section 03.02) (1 Sample)

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

(1) LER 05000270/2021-001-00, 2B Motor Driven Emergency Feedwater Pump Past Inoperability Resulted in Condition Prohibited by Technical Specifications (ADAMS Accession No. ML21277A218). The inspection conclusions associated with this LER are documented in Inspection Report 05000269, 05000270, 05000287/2021003 (ADAMS Accession No. ML21301A125) under Inspection Results Section 71111.15.

INSPECTION RESULTS

<table>
<tr><td colspan="4">Failure to Adequately Assess the Risk Increase from Operations in Cold Mid-loop</td></tr>
<tr><td>Cornerstone</td><td>Significance</td><td>Cross-Cutting Aspect</td><td>Report Section</td></tr>
<tr><td>Mitigating Systems</td><td>Green
NCV 05000270/2021004-01
Open/Closed</td><td>[H.3] - Change Management</td><td>71111.13</td></tr>
<tr><td colspan="4">The inspectors identified a Green finding and associated non-cited violation (NCV) of 10 CFR 50.65(a)(4) when the licensee failed to adequately assess the risk associated with lowering the reactor coolant system (RCS) level to reduced inventory, also known as mid-loop, during a Unit 2 refueling outage on November 25, 2021.</td></tr>
<tr><td colspan="4">Description: On November 25, 2021, Oconee Unit 2 was in Mode 6 of a refueling outage and the core had been reloaded the previous day. The licensee planned to drain the RCS to below 50 inches, an operational state defined as reduced inventory, to remove steam generator nozzle dams. The planned evolution would ultimately drain the RCS with fuel present in the reactor to a level below the top of the hot leg piping, i.e., less than 18 inches, which is defined as cold mid-loop in the case where the draining occurs after core reload. This evolution had been pre-planned and identified as an infrequently performed test or evolution (IPTE), which required an associated elevated risk activity plan (ERAP) and associated risk mitigating actions.

On the morning of November 25, 2021, the residents identified that the licensee had not performed, approved, issued, or communicated a defense-in-depth (DID) status sheet for the change in risk color from Green to Yellow that occurred when the draining activity to reduced inventory had begun at 0651. Narrative log entries identifying the color change, which are required by AD-OP-ALL-0112, Operations Log Keeping and Chart Recorders, Revision 1, were also not made. No other significant operational issues were identified associated with the draining activity. The residents did not identify issues with the implementation of the ERAP for the drain to cold mid-loop. However, it was clear that the organization, in general, was unaware of the risk change at the time it occurred. The residents recognized that inadequate and untimely prior assessments of an increase in risk due to maintenance increases the likelihood of an error or risk management failure.

During periods of shutdown, the licensee manages and assesses risk through the requirements of AD-WC-ALL-0420, Shutdown Risk Management, which partially implements the requirements of 10 CFR 50.65, “Requirements for monitoring the effectiveness of maintenance at nuclear power plants.” The most current DID status sheet on the morning of November 25, 2021, had been completed at 0400 and showed risk was Green because the RCS had not yet begun the draining activity to reduced inventory. The residents noted that AD-WC-ALL-0420, Revision 7, step 5.2.2.e requires the licensee to document DID status at least once per shift and whenever overall risk color changes. Upon being questioned by the inspectors, the licensee prepared and issued an updated DID status sheet, backdated a log entry for the transition to yellow risk and wrote an NCR.</td></tr>
</table>

The residents reviewed the outage DID status sheets from earlier in the outage and identified that the first yellow risk condition of the outage, which occurred during the initial RCS drain to lowered inventory (reactor head flange level) on November 14, 2021, when the unit was in Mode 5, also was not adequately assessed for the increase in risk through the review, approval, issuance, and communication of an accurate DID status sheet prior to the planned activity.

It was noted that site specific procedure AD-WC-ONS-0420, ONS Shutdown Risk Management, Revision 1, has guidance that conflicts with step 5.2.2.e of the fleet procedure, AD-WC-ALL-0420. Specifically, AD-WC-ONS-0420, step 5.3.3.a, has an allowance where a new DID sheet is not required to be issued at the time the risk changes if the planned risk color change was previously included on a "12 hour look ahead" column from an earlier DID sheet. The 12-hour look ahead is a projection of the risk condition over the next 12 hours based on the outage schedule at the time the DID status sheet is issued. The inspectors concluded, for the above examples, that the 12-hour look ahead, combined with the lack of awareness and communication, did not constitute an adequate assessment of the risk increase. The licensee documented the conflicting procedural guidance in an NCR to determine appropriate corrective actions.

Corrective Actions: The licensee documented, reviewed, and issued an updated DID status sheet on November 25, 2021, and made a back-dated narrative log entry for the change in risk after being questioned by inspectors.

Corrective Action References: 2408452, 2411210

Performance Assessment:

Performance Deficiency: The licensee's failure to perform a risk assessment when required by licensee procedure AD-WC-ALL-0420 was a performance deficiency. Specifically, the licensee failed to adequately assess the risk associated with RCS draining activities on November 14, 2021, and November 25, 2021.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Human Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee failed to perform an adequate risk assessment for a risk color change from green to yellow on two occasions on November 14, 2021, and November 25, 2021.

Significance: The inspectors assessed the significance of the finding using Appendix K, "Maintenance Risk Assessment and Risk Management SDP." Using flowchart 1, "Assessment of Risk Deficit," inspectors are directed to determine the incremental core damage probability deficit (ICDPD). The senior risk analyst (SRA) conservatively used IMC 0609 Appendix G, Attachment 2, Phase 2 Significance Determination Process Template for PWR During Shutdown, to determine the actual core damage frequency. The SRA assumed the plant was shut down for eight days (first occurrence of the performance deficiency) and in POS -2E, thus, time to boil for mid-loop was 20 minutes and time to core damage was 297 minutes from IMC 609, Appendix G, Attachment 2, table 8. Definitions and Characterizations of Time Windows from NUREG/CR-6144, Table 5.4-20, assumed a vented RCS (RCS temperature initially 140F). The performance deficiency could contribute to the likelihood of a loss of level control (LOLC) while in mid-loop; therefore, Worksheet 2 SDP for

a PWR Plant - Loss Level Control in POS 2 (RCS Vented) was used to determine the risk for this plant condition. Nominal operator and equipment credits were used for baseline and operator credit was adjusted down by one for feed because 20 minutes was available for diagnosis. The performance deficiency affected initiating event likelihood (IEL) so the IEL for a LOLC event was changed from a nominal of 2 (table 5) to 0 (table 1 most conservative assumption.). Event duration for a drain down is assumed to be 48 hours. Greater than three risk management actions (RMAs) were in place despite an adequate risk assessment not being performed. This CDF baseline was 1.1E-6 events/yr and CDF actual was 1.1E-3 events/year (yr). Thus ICDFD= 48 hour/8760 hour/yr x (1.1E-3 – 1.1E-6) = 5.97e-6. Using this value in flowchart 1 of Appendix K, the finding is characterized as Green since ICDPD was between 1E-5 and 1E-6 and three or more RMAs were in place.

Cross-Cutting Aspect: H.3 - Change Management: Leaders use a systematic process for evaluating and implementing change so that nuclear safety remains the overriding priority. Specifically, deficiencies in site specific procedure AD-WC-ONS-0420 were not recognized when conflicting procedural guidance in fleet procedure AD-WC-ALL-0420 was issued.

Enforcement:

Violation: 10 CFR 50.65(a)(4) requires, in part, that before performing maintenance activities (including but not limited to surveillance, post-maintenance testing, and corrective and preventive maintenance), the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. Contrary to the above, on November 14, 2021, and November 25, 2021, the licensee failed to adequately assess an increase in risk from green to yellow that resulted from maintenance associated with RCS draining activities.

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

Failure to Use a Procedure Appropriate to the Circumstances While Changing Electrical Lineup of Startup Transformer CT-2			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Initiating Events	Pending AV 05000269,05000270/2021004-02 Open	[H.12] - Avoid Complacency	71111.20

A finding with its safety significance as yet to be determined (pending) and an associated apparent violation (AV) of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” was identified when the licensee failed to use a procedure appropriate to the circumstances for an activity affecting quality. Specifically, the procedure for sharing startup transformers between units was inadequate, which led to simultaneous lockouts on CT-1 and CT-2 startup transformers while starting the 2B2 reactor coolant pump (RCP) motor for an uncoupled run.

Description: On November 27, 2021, the licensee was performing outage maintenance activities in preparation for Unit 2 startup following a refueling outage. At the time, Unit 1 was in Mode 1 at 100 percent power with electrical loads being powered from its own main transformer, 1T. Unit 2 was in Mode 5 with loads being powered from its normal offsite power source, startup transformer CT-2. Unit 3 was in Mode 1 at 100 percent power and was unaffected by this event. While starting the 2B2 RCP for an uncoupled motor run, both Unit 1

and Unit 2 offsite power sources, CT-1 and CT-2, lost power. Unit 1 did not lose power since its electrical loads were being powered from its own main turbine transformer, 1T. Unit 2 lost power for approximately 31 seconds before regaining power from a different offsite power source, transformer CT-5. For Unit 2, this loss of offsite power (LOOP) caused a loss of decay heat removal (DHR) capability as well as a partial loss of spent fuel pool (SFP) cooling. Upon investigation, the cause of the loss of both offsite power sources was the activation of the lockout relays on each transformer. The licensee found that two switches in the startup transformer crossover scheme, switches "B" and "F", were not in their expected positions. The licensee investigated the lockout relay activations and determined that the "B" transfer switch being in the incorrect position was the cause of the LOOP. No reactor coolant system temperature changes were noted during the short period of time where DHR was lost. Units 1 and 2 shared SFP temperature increased 9.4 degrees over 18 hours and 53 minutes before full SFP cooling could be procedurally restored.

In planning for future electrical lineup changes during the Unit 2 refueling outage, the licensee approved a procedure revision request (PRR) for the procedure to share startup transformers between units, OP/0/A/1107/011 F, Revision 19, in October 2021. This revision was specifically requested to incorporate steps to allow the operators to completely isolate CT-2 while either Unit 1 or Unit 3 supplied Unit 2 electrical loads from their own startup transformer, CT-1 or CT-3, respectively. The goal of this revision was to eliminate confusion associated with how to get from a state of Unit 2 startup transformer being cross-tied with either Unit 1 or Unit 3 to isolating CT-2 completely after swapping the Unit 2 main feeder bus power supplies to CT-5, an alternate offsite power source. The PRR was processed in accordance with Duke Energy fleet-wide procedure AD-DC-ALL-0201, "Development and Maintenance of Controlled Procedure Manual Procedures, Revision 27." Part of this process includes requirements for technical reviews to be done to ensure that the procedure, with any changes or additions to it, is safe, technically accurate, achieves the intended purpose, and meets all standards and requirements for performance, as described in procedure section 5.9.2. However, this revision was improperly prepared and included an error which repositioned incorrect switches while restoring from Unit 2 sharing startup transformers with Unit 1. Specifically, in Enclosure 4.2 (Unit 2 Sharing CT-1 Removal and Restoration of CT-2), step 2.2.1.G has the operator position the switches for sharing Unit 3 to normal, instead of Unit 1. This allowed transfer relay switches "B" and "F" to be left in the incorrect position, thus causing the subsequent transformer lockout and LOOP event. There were at least three required review points in the PRR review process per AD-DC-ALL-0201 that could have caught this error, specifically the technical review in step 2, the cross-discipline review in step 3, and the validation review in step 11. Additionally, it was pointed out by several personnel involved that the "A, B, C" component identification scheme of the transfer relay switches contributed to the error because the function of each switch and which units are affected is less obvious.

Corrective Actions: Operations staff identified the mispositioned switches and returned them to the required positions. The licensee executed another PRR to fix the error in procedure OP/0/A/1107/011 F, Revision 19. The licensee also initiated a Corporate Functional Area Manager Escalation concerning procedure review quality due to several recent additional occurrences of procedural technical errors not being detected during the procedure technical or validation reviews.

Corrective Action References: NCR 2406969, PRR 2406977, NCR 2408602

Performance Assessment:

Performance Deficiency: The licensee's failure to perform an adequate technical review of

the PRR for the procedure, “Sharing Startup Transformers Between Units,” OP/0/A/1107/011 F, Revision 19, in accordance with procedure AD-DC-ALL-0201, “Development and Maintenance of Controlled Procedure Manual Procedures,” Revision 27, was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Procedure Quality attribute of the Initiating Events cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the failure to perform an adequate technical review caused a LOOP and subsequent loss of DHR and partial loss of SFP cooling while performing maintenance on 2B2 RCP on November 27, 2021.

Significance: The inspectors assessed the significance of the finding using Appendix G, “Shutdown Safety SDP.” The finding could not be screened to Green and is pending an initial significance characterization.

Cross-Cutting Aspect: H.12 - Avoid Complacency: Individuals recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes. Individuals implement appropriate error reduction tools. In this case, complacency through multiple levels of technical procedure review, a lack of recognition of the inherent risk associated with the transfer relay switches, and the failure to use adequate descriptive component identifications for the transfer switches all contributed to the event.

Enforcement:

Violation: 10 CFR Part 50, Appendix B, Criterion V, states, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above, on November 27, 2021, the licensee failed to use a procedure appropriate to the circumstances for an activity affecting quality. Specifically, the procedure for sharing startup transformers between units, OP/0/A/1107/011 F, Revision 19, contained an error that specified the incorrect position for two transfer relay switches.

Enforcement Action: This violation is being treated as an apparent violation pending a final significance (enforcement) determination.

Prompt Corrective Actions Not Taken for Out-of-tolerance As-Found Data			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000269,05000270,05000287/2021004-03 Open/Closed	[H.8] - Procedure Adherence	71152
The inspectors identified a Green finding and associated non-cited (NCV) of 10 CFR Part 50 Appendix B, “Corrective Action,” for the licensee’s failure to ensure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. Specifically, the licensee failed to promptly identify and correct the out of allowable range values documented			

in work orders 20376561 and 20376768. The licensee performed the work orders to implement requirements as stated in licensee preventive maintenance procedure IP/0/A/3011/016, Motor Control Center, Distribution Center, revision 14.

Description: The licensee performed work orders 20376561 and 20376768 to implement requirements as stated in licensee preventive maintenance (PM) procedure IP/0/A/3011/016, Motor Control Center, Distribution Center, revision 14. The as-found values for 1XSFA-F1C (1HP-3 SSF power supply) and 1XS1-R3C (spare) cubicles were found to be out-of-tolerance and an engineering evaluation was not performed as required per section 1.3 of Enclosure 9.14 of procedure IP/0/A/3011/016.

The work orders were performed in October 2020 and the deficiencies were not identified until November 4, 2021, when AR 02404429 was initiated after the inspector requested to review the performed PM work orders to verify the PM frequency.

Specifically, licensee preventive maintenance procedure, IP/0/A/3011/016, step 1.3 of Enclosure 9.14 states that "if any contactor failed to pick-up or dropout at required voltage listed below, notify Engineering for evaluation." Work orders 20376561 and 20376768, documented that the as-found pick-up voltages for 1XSFA-F1C (1HP-3 SSF power supply) and 1XS1-R3C (spare cubicle) to be 93.2 VAC and 82.6 VAC respectively and exceeded their allowable pick-up voltages of 88.6 VAC and 76.6 VAC respectively. Corrective Action Program procedure, AD-PI-ALL-0100, section 5.5.5 states, in part, that "this ensures that equipment and quality concerns are promptly addressed." Contrary to the procedural requirement, the issue was not identified until a year later.

AR 2404429 was initiated to document only the fact that the out-of-tolerance value issues were not forwarded to Engineering for evaluation and addressing the correction action but, the lack of promptness was not addressed. AR 02411953 was initiated to address the lack of promptness.

Corrective Actions: The licensee initiated ARs to have engineering evaluate the out-of-tolerance as-found data and take action.

Corrective Action References: AR 02404429, AR 02411953

Performance Assessment:

Performance Deficiency: The licensee's failure to promptly evaluate and correct the out-of-tolerance as-found pick-up voltages was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the SSC Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

Significance: The inspectors used inspection manual chapter (IMC) 0609, Attachment 4, "Initial Characterization of Findings," issued December 13, 2019, for mitigating systems, and IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," issued November 30, 2020, and determined the finding to be of very low safety significance (Green) because the finding was a deficiency affecting the design and qualification of a mitigating SSC, and the SSC maintained its operability.
Cross-Cutting Aspect: H.8 - Procedure Adherence: Individuals follow processes, procedures,

and work instructions. Procedure Adherence in the area of human performance because the licensee personnel did not follow the procedure instruction. (H.8)
Enforcement: Violation: 10 CFR Part 50, Appendix B, criterion XVI, Corrective Action, states, in part, that "conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected." Contrary to the above, since October 23, 2020, the licensee failed to promptly identify and correct the out-of-tolerance as-found values as documented in the referenced work orders. 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 February 9, 2022, the inspectors presented the integrated inspection results to Steve Snider, Site Vice President, and other members of the licensee staff.
- On January 19, 2022, the inspectors presented the RP inspection results to Steve Snider, Site Vice President, and other members of the licensee staff.
- On January 13, 2022, the inspectors presented the NOV closure inspection results to Laura Boyce, Regulatory Affairs.

THIRD PARTY REVIEWS

Inspectors reviewed the World Association of Nuclear Operators report that was issued during 2021.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.04	Corrective Action Documents		02406833	
	Drawings	O FD-102A-02-01	Flow Diagram of Low Pressure Injection System Borated Water Supply and LPI Pump Suction	62
		O FD-102A-02-02	Flow Diagram of Low Pressure Injection System (LPI Pump Discharge)	53
		O FD-124A-01-01	Flow Diagram of Low Pressure Service Water System	055
		O-702-A	Oneline Diagram 6900V & 4160V Auxiliary Sys.	38
	Procedures	OP/0/A/1107/003	100kV Power Supply	98
		OP/0/A/1107/003 B	Procedure for Furnishing Power to Oconee	16
		OP/2/A/1104/004	Low Pressure Injection System	174
		OP/2/A/1104/010	Low Pressure Service Water	071
71111.05	Fire Plans	CSD-ONS-PFP-1AB-0796	Pre-Fire Plan for U1 Auxiliary Building Elevation 796	0
		CSD-ONS-PFP-2AB-0783	Pre-Fire Plan for U2 Auxiliary Building Elevation 783	001
		CSD-ONS-PFP-2AB-0809	Pre-Fire Plan for U2 Auxiliary Building Elevation 809	0
		CSD-ONS-PFP-2RB	Unit 2 – Auxiliary Building & Reactor Building Elevation 777'-861'	0
		CSD-ONS-PFP-2TB-0796	Pre-Fire Plan for U1 Turbine Building Elevation 796	0
		CSD-ONS-PFP-3AB-0783	Pre-Fire Plan Auxiliary Building Unit 3 EL 783', 796'	001
		O-0310-FZ-008	Fire Zones Auxiliary Building Unit 3 EL 783'	003
		O-0310-FZ-013	Auxiliary Building – Units 2 Fire Protection Plan Fire Area and Fire Zone Boundaries Plan at EL 809+3	003
		O-0310-K-006	Fire Prot Aux Bldg Unit 3 EL 783+9	012
		O-0310-K-007	Auxiliary & Reactor Building – Unit 1 Fire Protection Plan & Fire Barrier Flood & Pressure Boundaries Plan at EL. 796+6 & EL. 797+6	16

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		O-0310-L-005	Turbine Building – Unit 2 Fire Protection Plan & Fire Barrier, Flood, & Pressure Boundaries Plan at Mezzanine El. 796+6	13
	Miscellaneous	OSS-0254.00-00-4008	(Mech) Design Basis Specification for Fire Protection	047
71111.06	Corrective Action Documents Resulting from Inspection		2406810	
	Miscellaneous		Clearance OPS-2 –21-HP –RCS INJ HDRS-1270	
	Procedures	AP/1-2/A/1700/030	Auxiliary Building Flood	24
		AP/2/A/1700/002	Excessive RCS Leakage	17
71111.11Q	Procedures	OP-OC-15JT-05	Night Shift Shutdown JITT	10
		OP/0/A/1108/001	Curves and General Information	117
		OP/2/A/1102/010	Controlling Procedure for Unit Shutdown	227
		OP/2/A/114/049	Low Temperature Overpressure Protection (LTOP)	53
71111.12	Corrective Action Documents		2397266, 2397267, 2401887, 2404422, 2404752	
	Procedures	AD-EG-ALL-1311	Failure Investigation Process (FIP)	2
71111.13	Miscellaneous		02R30 Drain to Mid Loop Infrequently Performed Tests or Evolutions Evaluation	10/29/2021
	Procedures	AD-OP-ALL-0201	Protected Equipment	09
71111.15	Calculations	OSC-11448	Oconee Generic Maneuvering Analysis Base Calculation	1
	Corrective Action Documents		02403963, 02405392, 02405877, 02408618, 0240861, 02405634	
	Drawings	O-1781	Nuclear Instrumentation and Reactor Protective System	16
		OFD-133A-02-01	Flow Diagram of Component Cooling Water System (CCW Intake Pumps Discharge)	037
	Miscellaneous		2A Steam Generator Pedestal Stud Evaluation	
			Boric Acid Evaluation #2406294	
		OSS-0254.00-00-3002	Design Basis Document CCW Structures System	9
	Procedures	AD-EG-PWR-1611	Boric Acid Corrosion Control Program – Implementation	04

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		AD-OP-ALL-0111	Operations Communications	4
		MP/0/A/1200/089	Valve – Main Steam Safety – Setpoint Test	054
	Work Orders		20375976, 20501802	
71111.18	Calculations	OSC-11581	U1/2/3, Keowee EPS and 100kV APS Voltage Adequacy Analyses	1
		OSC-4300	Protective Relay Settings	39
		OSC-7028	CYME Modeling of the January 1997 ESF Tests 2, 5, 6 and 3	1
	Miscellaneous	OSS-0254.00-00-2011	100kV Alternate Power System Design Basis Document	17
	Procedures	IP/1/A/4980/027 A	CV-2/CV-7 And CV-2/CV-7 Class 1E Relay Test	32
71111.19	Engineering Changes		414725	
	Procedures	IP/0/A/4980/040 A	KLF-1 Relay Test	15
		IP/0/A/4980/060 A	General Electric CFVB11A Relay Test	10
		IP/0/A/4980/087 A	General Electric PVD21 Differential Voltage Relay Test	25
		IP/0/A/4980/087 J	SSC-T Differential Relay Test	4
		PT/2/A/0201/005	High Point Vent Flow Test	14
	Work Orders		2119696, 20397282, 20397283	
71111.20	Calculations	OSC-1594	NUREG-0612 Control of Heavy Loads – Load Drop Analysis	2
	Corrective Action Documents		2405634, 2405326, 2405392	
	Drawings	O-1464C-SLP	Reactor Building – Unit 2 Floor Plan Elev. 861+6 Safe Load Paths	1
		ONEI-0400-564	O2C31 Final Core Load Map	0
	Miscellaneous		Elevated Risk Activity Plan, dated November 2, 2021 – Removal of Unit 2 Main Feeder Bus 1	
			Clearance PRT-2-21-U-2 MFB1 OOS-0041	
			Clearance PRT-2-21-EL CLD MLOOP-0273	
	Procedures	AD-OP-ALL-0210	Operational Risk Management	2
		AD-WC-ALL-0420	Shutdown Risk Assessment	7
		MP/0/A/1150/002	Reactor Vessel – Closure Head - Removal	66
		MP/0/A/3005/012	Containment Inspection/Close Out Procedure	18
		OP/0/A/1102/026	Operations IPTE Pre-Job Briefings	32

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		OP/2/A/1103/011	Draining and Nitrogen Purging RCS	102
		PT/2/A/0115/012	Unborated Water Source Isolation Verification	005
71111.22	Drawings	OFD-116A-2.1	Flow Diagram of Reactor Building Purge System	13
	Procedures	AD-EG-ALL-1705	Containment Leak Test (Appendix J) Program Implementation	2
		MP/0/A/1200/088	Valves – Henry Pratt – Reactor Building Purge Isolation – Preventive Maintenance	28
	Work Orders		20450799	
71114.06	Miscellaneous		TSC Tabletop drill (DEP), 21TT-4	10/12/2021
71124.01	Corrective Action Documents	AR 02353210	Received unanticipated SRD dose rate alarm	10/14/2020
		AR 02406378	Unanticipated Dose Rate Alarm	11/19/2021
	Miscellaneous	OP/2/A/1102/010	Signed procedure, "Controlling Procedure for Unit Shutdown", Enclosure 4.13, step 3 , "Pressurizer Cooldown Prep And 2HP-42 Flush".	11/13/2021
	Procedures	AD-RP-ALL-0002	Radiation and Contamination Surveys	2
	Radiation Surveys	Survey ONS-M-20211115-18	Room 63 LPI & RB Spray Pumps	11/14/2021
		Survey ONS-M-20211119-18	Room 63 LPI & RB Spray Pumps (follow-up)	11/19/2021
	Radiation Work Permits (RWPs)	RWP 2999	U2 Aux Bldg Outage Related RCA Entry Using Self-Brief Process Per AD-RP-ALL-2011	2
71124.02	Corrective Action Documents		AR's: 02305678, 02326570, 02347744, 02352559, 02355847, 02368843, 02369730, 02378889, and 02387852	Various
	Miscellaneous		Oconee Site ALARA Committee (SAC) Meeting Minutes – 10/6/2021 (discussion and approval of the O2R30 outage exposure estimate and major ALARA plans)	10/6/2021
71124.03	Corrective Action Documents	ARs 02312446, 02357582	ARs 02312446, 02357582	Various
	Corrective Action Documents Resulting from Inspection	AR 02408897		12/11/2021
71124.04	Corrective Action Documents	AR 02351307	AR 02351307	09/30/2020
71124.05	Calibration	S/N 8207	Shepherd Irradiator Model 89 Calibrator Calibration	05/12/2021

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Records		Verification Documentation, Source ID: ONS# 732 & ONS# 733	
	Corrective Action Documents		AR's 02306211, 02323708, 02355869, 02368224, 02368688, 02382130, 02382974, and 02382994	Various
		AR 02234896	2018 ONS PM Reduction Project	10/03/2018
	Corrective Action Documents Resulting from Inspection	AR 02408890	NRC Obs: Review of IP/0/B/0398/019	12/11/2021
		AR 02410842	2021 RP NRC Inspection - Traceability of source ONSI 238	01/05/2022
	Miscellaneous	AD-RP-ALL-7009 - Attachment 01	Interlaboratory Cross Check Program Results - 2019 (counting room systems and whole body counters)	02/10/2020
		AD-RP-ALL-7009 - Attachment 01	Interlaboratory Cross Check Program Results - 2020 (counting room systems and whole body counters)	02/10/2021
	Procedures	AD-EP-ONS-0401	ONS - Equipment Important to Emergency Response	001
		IP/0/B/0398/019	Radwaste Facility Liquid Radiation Monitor - (RIA-33)	24
		IP/0/B/0398/019	Radwaste Facility Liquid Radiation Monitor - (RIA-33) Procedure Change Request	4, 7/19/1988
	Work Orders	WO 2037276401	Radwaste Facility Liquid Radiation Monitor (RIA-0033) Annual PM [electronic and source calibration]	03/11/2021
		Work Order (WO) 2030132101	Radwaste Facility Liquid Radiation Monitor (RIA-0033) Annual PM [electronic and source calibration]	12/17/5019
71152	Calculations	OSC-5830	Unit 1 Motor Starter Circuit Voltage and Fuse Adequacy Calculation, Attachment 1	15
		OSC-5930	UNIT 1 MOTOR STARTER CIRCUIT VOLTAGE AND FUSE ADEQUACY CALCULATION	17
		OSC-6143	MCC CONTACTOR VOLTAGE ADEQUACY AND FUSE ADEQUACY VERIFICATION - TYPE III	14
		OSC-6144	MCC CONTACTOR VOLTAGE ADEQUACY AND FUSE ADEQUACY VERIFICATION - TYPE III	18
		OSC-6195	U1/2/3, SSF 125VDC Power System Battery and Charge Sizing, Voltage Drop and Short Circuit Analysis	10
		OSC-6195-ICC-0014	EC110252 – OSC-6195, App. E, Case DCLF2 Adjusted Load Profile for Close-In of D.G. Breaker.	0
		OSC-8113	125VDC Vital Instrumentation and Control Load Profile,	0

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Battery Sizing, and Voltage Analysis	
		OSC-4300	Protective Relay Settings	39
	Corrective Action Documents	AR 1808457	CDBI 2011 Item 307	09/27/2011
		AR 2343569	2020 NRC DBAI - SSF RCMUP Contactors and MCC PM Procedure	08/12/2020
		AR 2343949	DBAI 2020 Breaker Close Coil DC Voltage	08/14/2020
		AR 2343959	2020 NRC DBAI- Review of Previous Corrective Actions	08/14/2020
	Corrective Action Documents Resulting from Inspection	AR 2403150	Editorial Drawing Error on OEE-151-39	10/26/2021
		AR 2403456	2020 DBAI NOV Closure - Inadequate Extent of Condition	10/28/2021
		AR 2403594	Error in OSC-5930 for MCC motor starter voltage adequacy	10/29/2021
		AR 2404141	Margin gain opportunity in ETAP models for 600/208V MCCs	11/03/2021
		AR 2404429	2020 NOV closeout inspection finding	11/04/2021
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		O-702-A	One Line Diagram 6900V & 4160V Sta Auxiliary System	38
		O-1702-A	One Line Diagram 6900V & 4160V Sta Auxiliary System	11
	Engineering Changes	EC 110252	DOCUMENT OTS1 BREAKERS MINIMUM REQUIRED VOLTAGE AT THE CLOSE AND TRIP	0
		EC 418190	DOCUMENT ABB 5HK BREAKERS MINIMUM REQUIRED TESTING VOLTAGE FOR CLOSING	0
	Miscellaneous	OM 302.0105.001	ABB HK SWITCHGEAR INSTRUCTION MANUAL	D10
	Procedures	AD-PI-ALL-0100	CORRECTIVE ACTION PROGRAM	25
		IP/0/A/2001/003 A	INSPECTION AND MAINTENANCE OF 4.16 KV AND 6.9 KV ACB	59
		IP/0/A/2001/003 H	Refurbishing 5HK, 7.5HK, And 15HK (6.6 - 8.25 kV) Air Circuit Breakers	51
		IP/0/A/3011/016	Motor Control Center, Distribution Center, And Power Panelboard Preventive Maintenance	15