



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

November 7, 2019

Mr. J. Ed Burchfield, Jr.
Site Vice President
Oconee Nuclear Station
Duke Energy Carolinas, LLC
7800 Rochester Highway
Seneca, SC 29672

SUBJECT: OCONEE NUCLEAR STATION – INTEGRATED INSPECTION REPORT
05000269/2019003, 05000270/2019003, 05000287/2019003, AND
07200004/2019002

Dear Mr. Burchfield, Jr.:

On September 30, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Oconee Nuclear Station. On October 21, 2019, 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.

One finding of very low safety significance (Green) is documented in this report. This finding involved a violation of NRC requirements. One Severity Level IV violation without an associated finding is documented in this report. 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 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.

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.

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 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Frank J. Ehrhardt, Chief
Reactor Projects Branch 1
Division of Reactor Projects

Docket Nos. 50-269, 50-270, 50-287, 72-004
License Nos. DPR-38, DPR-47,
DPR-55, SNM-2503

Enclosure:
IR 05000269/2019003, 05000270/2019003,
05000287/2019003, and 07200004/2019002

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SUBJECT: OCONEE NUCLEAR STATION – INTEGRATED INSPECTION REPORT
 05000269/2019003, 05000270/2019003, 05000287/2019003, AND
 07200004/2019002 Dated November 7, 2019

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Numbers: 50-269, 50-270, 50-287, 72-004

License Numbers: DPR-38, DPR-47, DPR-55, SNM-2503

Report Numbers: 05000269/2019003, 05000270/2019003, 05000287/2019003,
07200004/2019002

Enterprise Identifier: I-2019-003-0022, I-2019-002-0084

Licensee: Duke Energy Carolinas, LLC

Facility: Oconee Nuclear Station

Location: Seneca, SC

Inspection Dates: July 01, 2019 to September 30, 2019

Inspectors: J. Nadel, Senior Resident Inspector
J. Parent, Resident Inspector
A. Ruh, Resident Inspector
A. Thomas, Acting Resident Inspector
C. Fontana, Emergency Preparedness Inspector
G. Hutto, Senior Resident Inspector (McGuire)
S. Sanchez, Senior Emergency Preparedness Inspector
J. Tornow, Physical Security Inspector
J. Walker, Emergency Preparedness Inspector

Approved By: Frank J. Ehrhardt, 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

Inadequate Control of Heavy Load in Spent Fuel Pool			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000287/2019003-01 Open/Closed	[H.4] - Teamwork	71111.13
Inspectors identified a Green finding and associated non-cited violation (NCV) of Technical Specification (TS) 5.4.1, "Procedures," when the licensee failed to properly pre-plan and control a heavy load lift in the Unit 3 spent fuel pool.			

Failure to Notify the NRC within Eight Hours following the Discovery of a Condition that could have Prevented the Fulfillment of the Unit 1 Core Flood System's Safety Function			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Not Applicable	NCV 05000269/2019003-02 Open/Closed	Not Applicable	71111.15
The inspectors identified a Severity Level (SL) IV NCV of 10 CFR 50.72(b)(3)(v) when the licensee failed to notify the NRC within eight hours following the discovery of a condition that could have prevented the fulfillment of a safety function. Specifically, the Unit 1 core flood system, which is a system needed to mitigate the consequences of an accident, was inoperable because the Unit 1A core flood tank vent valve, 1CF-5, failed to close during a normal venting evolution.			

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
LER	05000269/2019-001-00	LER 2019-001-00 for Oconee Nuclear Station, Unit 1, Standby Shutdown Facility Reactor Coolant Makeup Pump Oil Suction Tubing Failure.	71153	Closed

PLANT STATUS

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

Unit 2 operated at or near 100 percent RTP for the entire 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 plant status activities described in IMC 2515 Appendix D, "Plant Status" and conducted routine reviews using IP 71152, "Problem Identification and Resolution." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

External Flooding Sample (IP Section 03.04) (1 Sample)

- (1) The inspectors evaluated readiness to cope with external flooding for the following areas:
 - Standby shutdown facility (SSF) and the auxiliary, turbine, and service buildings regarding maintenance of a 6-inch water sill and resolution of nonconforming conditions in Nuclear Condition Report (NCR) 1905081.

71111.04Q - Equipment Alignment

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

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

- (1) SSF alignment during dual Keowee Hydro Unit Outage on July 16-17, 2019
- (2) Unit 3 "A" train high pressure injection (HPI) system, on August 6, 2019
- (3) 230kV Switch Yard Battery #2 alignment following service test & recharge on August 14, 2019

71111.04S - Equipment Alignment

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

- (1) Inspectors evaluated system configuration during a complete walkdown of the Unit 1 turbine driven emergency feedwater system, with additional in-office review.

71111.05Q - Fire Protection

Quarterly Inspection (IP Section 03.01) (4 Samples)

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

- (1) Unit 2 auxiliary building Elevation 838', Fire Zone 117 on August 1, 2019
- (2) Unit 3 auxiliary building Elevation 822', Fire Zone 112 on August 1, 2019
- (3) Unit 1 auxiliary building Elevation 822', Fire Zone 110 on August 2, 2019
- (4) Unit 1 and 2 auxiliary building Elevation 838', Fire Zone 119 on August 2, 2019

71111.11Q - Licensed Operator Regualification 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 Units 1, 2, and 3 turbine stop valve testing, on August 8, 2019.

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

- (1) The inspectors observed and evaluated licensed operators perform a requal simulator exercise which involved a 1A reactor building cooling unit cooler rupture, 1A2 reactor coolant pump high vibration, delta Tc failure, 1CC-8 failed closed causing a reactor trip, station blackout, and turbine driven emergency feedwater pump failure to auto start, on August 27, 2019.

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness Inspection (IP Section 02.01) (1 Sample)

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

- (1) NCR 2272633, 230kV Yellow Bus CCVTs failed Doble testing and were taken out of service for repair

71111.13 - Maintenance Risk Assessments and Emergent Work Control

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

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

- (1) Risk assessment and work controls for July 16-17, 2019, during a dual Keowee Hydro Unit Outage
- (2) Risk assessment and work controls for July 19, 2019, during CT-1 Open Phase Protection Mod tie-in
- (3) Risk assessment and work controls for rigging a heavy load (3SF-2 valve) across the spent fuel pool on August 20, 2019
- (4) Risk assessment and work controls for August 20-21, 2019, during an SSF outage to perform maintenance on CCW-289

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 02.02) (7 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) Immediate determination of operability (IDO) for NCR 2280231, Unit 1 low pressure service water operability with pinhole leak downstream of 1LPSW-356
- (2) IDO of the SSF standby battery system for a seismic event with temporary equipment (battery charger) staged adjacent to battery and its structural supports
- (3) IDO for NCR 2285443, Unit 1 protected service water (PSW) piping following NRC identification of potential seismic interaction concern with unsecured door
- (4) IDO for NCR 2286307, 3B low pressure service water (LPSW) pump min flow line degraded due to partial blockage and use of manual bypass valve
- (5) IDO for NCR 2283504, Unit 1A Core Flood Tank following failure of 1CF-5 vent valve
- (6) IDO for NCR 02283825, SSF Diesel Fuel Oil Tank Inspection Issue
- (7) IDO for NCR 2282444, KPF-9 breaker closed unexpectedly when 86E lockout relay was reset

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) Changes to bases for TS 3.7.10 allowing an underground Keowee hydro unit to be credited for protected service water operability

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (6 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) Work Order (WO) 20340144-01, testing of modified switch for 2LWD-1 containment isolation valve on July 11, 2019
- (2) WO 20173119-05, Unit 3 HPI flow transmitter FT0007A replacement post-maintenance test (PMT) on July 29, 2019

- (3) PT/2/A/0600/013, "Motor Driven Emergency Feedwater Pump Test," on August 7, 2019
- (4) PT/0/A/0400/005, "SSF Auxiliary Service Water Pump Test," on August 24, 2019
- (5) PT/1/A/0261/010, "Essential Siphon Vacuum System Test," on August 26, 2019
- (6) WO 20329003, testing of 1PSW-24 valve following replacement of valve positioner board on September 4, 2019

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

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

- (1) WO 20249209-01, PT/0/A/0620/016, Keowee Hydro Emergency Start Test on, July 9, 2019

Inservice Testing (IP Section 03.01) (2 Samples)

- (1) PT/3/A/0203/006 A, Low Pressure Injection Pump Test - Recirculation on the 3B Low Pressure Injection Pump on July 3, 2019
- (2) PT/3/A/0251/001, Low Pressure Service Water Pump Test on the 3B LPSW Pump on August 11, 2019

FLEX Testing (IP Section 03.02) (1 Sample)

- (1) WO 20325326, U0 Flex Equipment: Perform Functional Test and Inspection on July 22, 2019

71114.02 - Alert and Notification System Testing

Inspection Review (IP Section 02.01-02.04) (1 Sample)

- (1) The inspectors evaluated the maintenance and testing of the alert and notification system during the week of September 16, 2019.

71114.03 - Emergency Response Organization Staffing and Augmentation System

Inspection Review (IP Section 02.01-02.02) (1 Sample)

- (1) The inspectors evaluated the readiness of the Emergency Response Organization during the week of September 16, 2019.

71114.04 - Emergency Action Level and Emergency Plan Changes

Inspection Review (IP Section 02.01-02.03) (1 Sample)

- (1) The inspectors evaluated submitted Emergency Action Level, Emergency Plan, and Emergency Plan Implementing Procedure changes during the week of September 16, 2019. This evaluation does not constitute NRC approval.

71114.05 - Maintenance of Emergency Preparedness

Inspection Review (IP Section 02.01 - 02.11) (1 Sample)

- (1) The inspectors evaluated the maintenance of the emergency preparedness program during the week of September 16, 2019.

71114.06 - Drill Evaluation

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

- (1) Inspectors observed an emergency preparedness drill on July 17, 2019, that involved a faulted steam generator with a tube leak and damaged fuel. There was also a fuel handling accident in the spent fuel pool and a fire brigade response due to smoke coming from the Keowee hydro main step-up transformer.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

EP01: Drill/Exercise Performance (IP Section 02.12) (1 Sample)

- (1) Drill & Exercise Performance for the period July 1, 2018, through June 30, 2019.

EP02: ERO Drill Participation (IP Section 02.13) (1 Sample)

- (1) Emergency Response Organization Drill Participation for the period July 1, 2018, through June 30, 2019.

EP03: Alert & Notification System Reliability (IP Section 02.14) (1 Sample)

- (1) Alert & Notification System Reliability for the period July 1, 2018, through June 30, 2019.

MS05: Safety System Functional Failures (SSFFs) Sample (IP Section 02.04) (3 Samples)

- (1) Unit 1 (July 1, 2018 – June 30, 2019)
- (2) Unit 2 (July 1, 2018, June 30, 2019)
- (3) Unit 3 (July 1, 2018 – June 30, 2019)

MS08: Heat Removal Systems (IP Section 02.07) (3 Samples)

- (1) Unit 1 (July 1, 2018 – June 30, 2019)
- (2) Unit 2 (July 1, 2018 – June 30, 2019)
- (3) Unit 3 (July 1, 2018 – June 30, 2019)

BI01: Reactor Coolant System (RCS) Specific Activity Sample (IP Section 02.10) (3 Samples)

- (1) Unit 1 (July 1, 2018 – June 30, 2019)
- (2) Unit 2 (July 1, 2018 – June 30, 2019)
- (3) Unit 3 (July 1, 2018 – June 30, 2019)

71152 - Problem Identification and Resolution

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) NCR 2270635 - Resolution of NRC identified problem regarding conflicting technical conclusions on failure mode of the SSF diesel fuel oil pump seal (aging vs. foreign material intrusion)
- (2) NRC 2288543 - Engine Systems, Inc. (Part 21) - Oconee review and evaluation of applicability and effect

71153 - Followup of Events and Notices of Enforcement Discretion

Event Report (IP Section 03.02) (1 Sample)

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

- (1) LER 05000269/2019-001-00, Unit 1 Standby Shutdown Facility Reactor Coolant Makeup Pump Oil Suction Tubing Failure (ML19225C402). The circumstances surrounding this LER are documented in Inspection Report 05000269/2019090 Section 71152B.

OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

60855.1 - Operation of an Independent Spent Fuel Storage Installation at Operating Plants

Operation of an Independent Spent Fuel Storage Installation at Operating Plants (1 Sample)

- (1) The inspectors evaluated the licensee's independent spent fuel storage installation cask loading for Dry Storage Cask (DSC) 159 from July 8, 2019 through July 10, 2019. Specifically, the inspectors observed the following activities;
 - Fuel selection and fuel loading
 - Heavy load movement of empty/loaded DSC
 - Transfer and transport evolutions
 - Radiological field surveys

INSPECTION RESULTS

Inadequate Control of Heavy Load in Spent Fuel Pool			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000287/2019003-01 Open/Closed	[H.4] - Teamwork	71111.13
<p>Inspectors identified a Green finding and associated non-cited violation (NCV) of Technical Specification (TS) 5.4.1, "Procedures," when the licensee failed to properly pre-plan and control a heavy load lift in the Unit 3 spent fuel pool.</p> <p><u>Description:</u> On August 20, 2019, the licensee transported a heavy load across the Unit 3 spent fuel pool in support of a permanent plant modification to upgrade the fuel pool transfer tube isolation valve. Engineers developed an engineering change (EC) 412504 to provide a technical basis for the maintenance activity, a basis for a future engineered lift plan, and to assess and manage the increase in risk that may result from the maintenance activity. The EC concluded that the developed mitigation and handling measures were within the guidelines of site rigging/lifting procedures and the site licensing basis associated with NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," Phase I commitments.</p> <p>Since the modification (EC 412504) planned to utilize the spent fuel bridge auxiliary hoist to handle a heavy load near spent fuel, a new safe load path was developed and documented in an engineered lift plan. While traversing over the fuel assemblies, the load was to be secured to the bridge by four wire rope safety slings and engineered temporary saddle beams. Once the load was no longer over fuel, near the far end of the pool, the safety slings could be removed, and the load would be suspended from a combination of the bridge auxiliary hoist and four submersible lift bags. The lift plan included an additional restriction that the load shall never be suspended closer than 15 feet horizontally from spent fuel. To satisfy this restriction, reactor engineering relocated spent fuel to create a 17-foot radius from the end of the pool. During planning reviews, these actions and restrictions were considered adequate. However, factors that would apply at the location where the load would transition to a suspended load (such as limitations on the positioning of the bridge and the location of the engineered saddle beams) had not been considered.</p> <p>As a result, during execution of the modification while transitioning the load to the suspended configuration, riggers suspended the 7,100 pound and 12½ foot tall valve within approximately five horizontal feet of spent fuel. This load was suspended by the 4,000-pound bridge hoist and a set of four 2,000-pound lift bags. During the transition to the bridge hoist, an air supply line to one of the four lift bags became detached due to contact with the removed safety slings. The bag maintained its buoyancy and was repaired by a diver. The load was then drifted to the final installation area and securely installed on the fuel transfer tube.</p> <p>NRC inspectors identified that although the equipment used was adequate to suspend the load, the failure to adequately pre-plan the location and physical transition to a suspended configuration resulted in a failure to satisfy the engineered lift plan safe load path restriction of maintaining a 15-foot clearance from fuel. Workers also failed to identify the inability to meet the restriction during work execution because there was an impression that the amount of fuel removed from the area was adequate and because the knowledgeable lift engineer was</p>			

present for the work. These failures negatively impacted the defense-in-depth approach taken to minimize the potential for adverse interaction of heavy loads with spent fuel.

Corrective Actions: The licensee initiated evaluations to identify organizational causal factors and issued a crew learning to the team to explain the difference between “shall” and “should” as defined in procedure AD-HU-ALL-0004, “Procedure and Work instruction Use and Adherence.”

Corrective Action References: NCR 2289055

Performance Assessment:

Performance Deficiency: The failure to properly pre-plan and control a heavy load lift near spent fuel was a performance deficiency. Specifically, engineers failed to establish conditions that ensured all lift plan restrictions could be met during the evolution and the installation team executed the lift without recognizing that safe load path restrictions were violated.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Procedure Quality 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, if the heavy load were dropped on the spent fuel racks, damage to fuel assemblies and a release of fission products could have occurred.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix A, “The Significance Determination Process (SDP) for Findings At-Power.” Using Exhibit 3, “Barrier Integrity Screening Questions” associated with the spent fuel pool, the finding was determined to be Green because it did not adversely affect the decay heat removal capabilities or water inventory of the spent fuel pool, was not associated with crane operations that caused mechanical damage to fuel cladding or a fuel bundle misplacement, and did not affect the spent fuel pool neutron absorber, or soluble boron concentration.

Cross-Cutting Aspect: H.4 - Teamwork: Individuals and work groups communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety is maintained. Inspectors concluded that the error occurred because of a lack of coordination and planning among various departments regarding the location of the transition to a suspended configuration and the amount of spent fuel to remove from the vicinity.

Enforcement:

Violation: Oconee Unit 3 Technical Specification 5.4.1, “Procedures,” states, in part, that written procedures shall be implemented covering the applicable procedures recommended in Appendix ‘A’ of Regulatory Guide (RG) 1.33, February 1978. Regulatory Guide 1.33, “Quality Assurance Program Requirements (Operation),” Appendix A, Paragraph 9.a, “Procedures for Performing Maintenance,” requires that “maintenance that can affect the performance of safety-related equipment should be properly pre-planned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances.” Contrary to the above, on August 20, 2019, EC 412504 and the subsequent engineered lift plan were not properly pre-planned resulting in WO 20185881 being performed with procedures, instructions, and drawings that were not appropriate to the circumstances. Specifically, the plans failed to appropriately describe and control the location where the load could transition from a secured load to a suspended load while maintaining

the desired clearance from spent fuel. This failure resulted in a 7,100 pound and 12½ foot tall valve being suspended within approximately five horizontal feet of spent fuel.

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

Failure to Notify the NRC within Eight Hours following the Discovery of a Condition that could have Prevented the Fulfillment of the Unit 1 Core Flood System's Safety Function

Cornerstone	Severity	Cross-Cutting Aspect	Report Section
Not Applicable	Severity Level IV NCV 05000269/2019003-02 Open/Closed	Not Applicable	71111.15

The inspectors identified a Severity Level (SL) IV non-cited violation (NCV) of 10 CFR 50.72(b)(3)(v) when the licensee failed to notify the NRC within eight hours following the discovery of a condition that could have prevented the fulfillment of a safety function. Specifically, the Unit 1 core flood system, which is a system needed to mitigate the consequences of an accident, was inoperable because the Unit 1A core flood tank vent valve, 1CF-5, failed to close during a normal venting evolution.

Description: At approximately 0400 on July 24, 2019, the licensee began to vent the 1A core flood tank (CFT), by opening 1CF-5, due to a rise in pressure resulting from increased seasonal temperatures. The 1A CFT pressure lowered to an acceptable value and the licensee tried to close 1CF-5 to halt the venting. However, 1CF-5 failed to close and the depressurization of the 1A CFT continued until pressure dropped below the TS allowed minimum. The licensee entered TS Limiting Condition for Operation (LCO) 3.5.1, Condition B for one CFT inoperable. The licensee dispatched operators to restore nitrogen overpressure to the tank by aligning the nitrogen feed system. At 0526, the licensee restored the pressure in 1A CFT to above the TS allowed minimum utilizing a continuous nitrogen feed-and-bleed process. At 0744, the licensee closed the manual isolation valve downstream of 1CF-5 and isolated the nitrogen feed, stabilizing 1A CFT pressure at an acceptable level.

Later that day, licensee engineers determined that although the nitrogen feed-and-bleed process was established to raise the CFT pressure back above the TS allowed minimum, the 1A CFT remained inoperable until the closure of the downstream manual isolation valve (approximately 2 hours later). This conclusion was based on: 1) a safety analysis that credited 1A CFT injection later during an accident than what the 1A CFT would have been able to accomplish on the morning of July 24, 2019, and 2) calculated depressurization rate without crediting the continuous feed of nitrogen, since nitrogen would be manually isolated by procedure under accident conditions. The total inoperability time of the 1A CFT remained less than any required action time to shut down the Unit, so operation in a condition prohibited by technical specifications did not occur.

Resident inspectors reviewed licensee corrective action documents and noted that no discussion of a potential 10 CFR 50.72 missed notification was documented. The inspectors questioned the licensee on whether a 10 CFR 50.72 notification should have been made due to the vent valve failure causing the loss of the CFT safety function. The licensee confirmed that they had missed notifying the NRC within eight hours.

Corrective Actions: The licensee took corrective actions that included initiating a Licensee Event Report to be submitted to the NRC within 60 days, incorporating this operating experience into continuing and initial senior reactor operator, shift technical advisor, and shift manager training, initiating a Crew Learning, and developing an Operations Supplemental Information Package.

Corrective Action References: NCR 2288160.

Performance Assessment: The inspectors determined this violation was associated with a minor ROP performance deficiency.

Enforcement: The ROP's significance determination process does not specifically consider the regulatory process impact in its assessment of licensee performance. Therefore, it is necessary to address this violation which impedes the NRC's ability to regulate using traditional enforcement to adequately deter non-compliance.

Severity: Based on the examples provided in Section 6.9 of the Enforcement Policy, dated May 28, 2019 "Inaccurate and Incomplete Information of Failure to Make a Required Report," the performance deficiency was determined to be a SL IV violation. Specifically, Example 6.9 states that a SL IV violation involves a failure to make a report to the NRC in accordance with 10 CFR 50.72.

Violation: 10 CFR 50.72, "Immediate notification requirements for operating nuclear power reactors," Section (b)(3)(v) requires, in part, the licensee to notify the NRC as soon as practical and in all cases within eight hours of the occurrence of any event or condition that at the time of discovery could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident. Contrary to the above, on July 24, 2019, the licensee failed to notify the NRC within eight hours of the Oconee Unit 1A core flood tank vent valve, 1CF-5, failing to close, which rendered the 1A CFT inoperable and resulted in the loss of the core flood system's safety function, which is needed to mitigate the consequences of an accident.

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 October 21, 2019, the inspectors presented the integrated inspection results to J. Ed Burchfield, Jr. and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
60855.1	Miscellaneous		Oconee Nuclear Station Independent Spent Fuel Storage Installation 10 CFR 72.212 Evaluation for Phase VIII	0
		CR 2281189		
		NUH-003	Updated Final Safety Analysis Report for the Standardized NUHOMS ® Horizontal Modular Storage System for Irradiated Nuclear Fuel	14
	Procedures	AD-HU-ALL-0004	Procedure and Work Instruction Use and Adherence	10
		AD-HU-ALL-0005	Human Performance Tools	3
		MP/0/A/1500/024	Independent Spent Fuel Storage Installation Phase VIII DSC Loading and Storage	000
	Work Orders		WO 20324189	
71111.01	Calculations	OSC-10671	PMP Flood Building Assessment and Leak Rate Data	1
		OSC-8849	Design Inputs for Aux. Bldg. Flood Protection due to MFDW Line Break or Crack in East Penetration Rooms	1
		OSC-9010	HELB Flood Impoundment Design, Units 1, 2, and 3 for East Penetration Room	3
	Corrective Action Documents		1905081, 2126024, 2287997	
	Drawings	O-0320-C	Standby Shutdown Facility Sections Concrete	9
		O-0950-C	Electrical Equipment Layout Outdoors Computer Cable Routing	45
		O-0954-A	Electrical Equipment Layout Standby Shutdown Facility	1
		O-PDF-0003	Event Flood Barriers	5
		O-PDF-0003	Event Flood Barriers	5A
	Engineering Changes	401069	Resolution of Nonconformance Related to ONS Site Grade and Removal of Sandbags	3

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		NSM ON-2347	Power Supply for SSF Flood Barrier Sump Pump	0
	Miscellaneous	Ocone Nuclear Station Site Survey Data	Ocone Nuclear Door Ways	1/9/2016
		Site Directive 3.2.16	Control of Passive Design Features	9
	Procedures	AP/0/A/1700/006	Natural Disaster	31
		MP/0/A/3005/001	Flood Outlet Devices and Flood Barriers PM	3
		RP/0/A/1000/035	Severe Weather Preparations	4
71111.04Q	Calculations	OSC-10671	Civil Assessment for Probabilistic Maximum Precipitation (PMP) Flood Concerns, Building: 230 kV Relay House	1
	Corrective Action Documents		NCR 2282472, 2282507, 2284859 PRR 2282557, TRF 2285442	
	Drawings	O-0702-B	One Line Diagram 4160 and 600V Essential Load Centers Auxiliary Power Systems Standby Shutdown Facility	26
		O-0703-K	One Line Diagram 600V and 208V Essential Motor Control Centers Auxiliary Power Systems Standby Shutdown Facility	79
		O-0703-L	One Line Diagram 208/120VAC & 120VAC Power Panelboards	24
		O-PDF-0003	ARCH – Event Flood Barriers - Plan	005
		OFD-101A-3.3	Unit 3 High Pressure Injection System	31
		OFD-121A-1.4	Flow Diagram of Condensate System (Hotwell Pumps, Condensate Coolers, Generator Water Coolers, & Hydrogen Coolers)	35
		OFD-121A-1.7	Flow Diagram of Condensate System (Upper Sure Tanks 1A & 1B, Upper Surge Tank Dome, & Condensate Storage Tank)	45

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		OFD-121A-1.8	Flow Diagram of Condensate System (Condensate Make-up & Emergency FDW Pump Suction)	25
		OFD-121B-1.3	Flow Diagram of Feedwater System (Final Feedwater)	41
		OFD-121D-1.1	Flow Diagram of Emergency Feedwater System	38
		OFD-127C-1.2	Flow Diagram of Nitrogen System (Nitrogen Supply to 1FDW-315/1FDW-316)	5
		OSFD-121D-1	Summary Flow Diagram of Emergency Feedwater System	9
	Miscellaneous	EC 408447	Resolution of Nonconformance Related to ONS Site Grade and Removal of Sandbags	003
		OSS-0254.00-00-1005	(MECH) Design Basis Specification for the Standby Shutdown Facility Auxiliary Service Water System	39
		OSS-0254.00-00-2014	(ELECT) DBD for the 4160/600/120V SSF Essential AC Power System	017
	Procedures	AD-DC-ALL-0202	Writers Manual for Procedures and Work Instructions	9
		AD-EG-ALL-1106	Configuration Management and Margin Management	5
		AD-HU-ALL-0004	Procedure and Work Instruction Use and Adherence	10
		AD-OP-ALL-0204	Plant Status Control	3
		AM/0/A/1300/059	Pump – Submersible – Emergency SSF Water Supply – Installation and Removal	012
		AP/0/A/1700/025	Standby Shutdown Facility Emergency Operating Procedure	063
		OP/0/A/1600/005	SSF Normal Power	43
		OP/0/A/1600/007	SSF Diesel Air System	020
		OP/0/B/1600/011	SSF Systems Isolation Procedure	27
		OP/1/A/1106/006	Emergency Feedwater System	132
	Work Orders		WO 20273756-02, 20304779	
71111.05Q	Fire Plans	CSD-ONS-PFP-1AB-0822	Pre-Fire Plan for U1 Auxiliary Building Elevation 822	000
		CSD-ONS-PFP-	Pre-Fire Plan for U1 Auxiliary	000

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		1AB-0838	Building Elevation 838	
		CSD-ONS-PFP-2AB-0838	Pre-Fire Plan for U2 Auxiliary Building Elevation 838	000
		CSD-ONS-PFP-3AB-0822	Pre-Fire Plan for U3 Auxiliary Building Elevation 822	000
	Miscellaneous	O-0310-K-016	Auxiliary & Reactor Building – Unit 1 Fire Protection Plan & Fire Barrier, Flood & Pressure Boundaries Plan at EL 838+0 & 844+6	012
	Procedures	AD-EG-ALL-1522	Duties of a Fire Watch	8
		MP/0/A/1705/032 A	Fire Extinguishers – Auxiliary Building – Monthly Inspection	002
71111.11Q	Procedures	AD-EP-ALL-0803	Evaluation and Critique of Drills and Exercises	4
		AD-LS-ALL-0006	Notification/Reportability Evaluation	2
		AD-OP-ALL-1000	Conduct of Operations	15
		AD-OP-ALL-1001	Conduct of Abnormal Operations	3
		AD-TQ-ALL-0420	Conduct of Simulator Training and Evaluation	15
		AP/1/A/1700/011	Recovery from Loss of Power	059
		AP/1/A/1700/016	Abnormal Reactor Coolant Pump Operation	036
		AP/1/A/1700/020	Loss of Component Cooling	012
		EP/1/A/1800/001 00	Unit 1 EOP Immediate Manual Actions and Subsequent Actions	002
		OMP 1-18	Oconee – Specific Implementation Standard During Abnormal and Emergency Events	045
		OMP 1-24	Operations Communication Standard	017
		OP-OC-ASE-44	Simulator Exercise Guide	02
		PT/3/A/0290/004	Turbine Stop Valve Testing	014
		RP/0/A/1000/001	Emergency Classification	006
		RP/0/A/1000/002	Control Room Emergency Coordinator Procedure	013
71111.12	Corrective Action		NCR 2272633	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Documents			
	Procedures	AD-EP-ALL-0803	Evaluation and Critique of Drills and Exercises	4
		AD-LS-ALL-0006	Notification/Reportability Evaluation	2
		AD-OP-ALL-1000	Conduct of Operations	15
		AD-OP-ALL-1001	Conduct of Abnormal Operations	3
		AD-TQ-ALL-0420	Conduct of Simulator Training and Evaluation	15
		AP/1/A/1700/011	Recovery from Loss of Power	059
		AP/1/A/1700/016	Abnormal Reactor Coolant Pump Operation	036
		AP/1/A/1700/020	Loss of Component Cooling	012
		EP/1/A/1700/00100	Unit 1 EOP Immediate Manual Actions and Subsequent Actions	002
		OMP 1-18	Oconee – Specific Implementation Standard During Abnormal and Emergency Events	045
		OMP 1-24	Operations Communication Standard	017
		OP-OC-ASE-44	Simulator Exercise Guide	02
		RP/0/A/1000/001	Emergency Classification	006
		RP/0/A/1000/002	Control Room Emergency Coordinator Procedure	013
71111.13	Calculations	OSC-1160	Postulated Cask Drop Accident-Poison Racks	6
	Drawings	21777-28	Refueling Machine General Arrangement	D3
		O-308C-SLP	Auxiliary Building Plan at Elev. 838 + 0 & 844 + 0 Safe Load Paths	1
	Miscellaneous		Projected ERAT Risk Profile	
			Oconee Nuclear Station Plant Status Package on July 16 and 17, 2019	
		NUMARC 93-01	Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants	4a
		Regulatory Guide 1.160	Monitoring the Effectiveness of Maintenance at Nuclear Power Plants	4

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Procedures	AD-EG-ALL-1004	Conduct of Probabilistic Risk Analysis Engineering	3
		AD-EG-ALL-1132	Preparation and Control of Design Change Engineering Changes	14
		AD-NF-ALL-0501	Electronic Risk Assessment Tool (ERAT)	4
		AD-NF-NGO-0502	Probabilistic Assessment (PRA) Model Technical Adequacy	3
		AD-WC-ALL-0200	On-Line Work Management	14
		AD-WC-ALL-0240	On-Line Risk Management Process	1
		OP/0/A/1107/011 F	Sharing Startup Transformers Between Units	014
		PD-MN-ALL-0009	Nuclear Rigging & Lifting Program	7
	Work Orders		WO 20173938, 20330072	
71111.15	Calculations	KC-2190	Failure Mode and Effects Analysis (FMEA) for the Keowee 13.8kV Switchgear (KPF) Power Feeds to Protected Service Water System (PSW) Switchgear (B6T/B7T)	4
		OSC-473	LPSW Between Discharge Nozzles of Decay Heat Cooler 2B, RB Component Coolers 1A, A, 2A, Aux. Bldg. and T.B. Basement Floor Piping Analysis Problem No. 2-14-05	39
		OSC-5649	LPSW Test Acceptance Criteria	19
		OSC-8159	SSF Diesel Fuel Oil Storage Tank Inspection	2
	Corrective Action Documents		NCR 1937031, 2283825, 2283504, 2285028, 2288160 PRR 2283847, 2285047, 2285048, 2285049	
			2273613, 2285443	
	Drawings	KEE-0117-01-0A	Elementary Diagram Keowee Oconee Remote Controls	1

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		KEE-0119	Elementary Diagram PSW Emergency Power 13.8kV Feeder Bkr KPF-9 Control Circuit	2
		KM 303-0036.001	Instruction Manual for 15kV Switchgear	9
		O-0706	One Line Diagram Essential SSF 125 VDC Auxiliary Power Systems	15
		OFD-124B-1.1	Flow Diagram of Low Pressure Service Water System (Auxiliary Building Services)	67
	Engineering Changes	115245	Replace Charging Spring Relays in Bkrs KPF-09 & 10	0
		91875	Keowee AC Power Supply Tie-ins	78
	Miscellaneous	LCOTR Number O-0-19-00905	SSF Standby Battery Cell #5 does not meet Category A or B Tracking Only	
		NSD-104	Material Condition/Housekeeping, and Seismic Concerns	40
		OSS-0254.00-00-2020	(ELECT) SSF 125 VDC Essential Power System	14
	Procedures	MP/0/A/5050/039	Diesels – SSF – 12 and 16 Cylinder – Preventive Maintenance and Inservice Inspection – 10 and 12 Year	013
		OP/0/A/1600/006	Operation of SSF KSF1/KSF2 Inverters and SSF CSF/CSFS Battery Chargers	026
		OP/1/A/1104/001	Core Flooding System	81
		PT/3/A/0251/001	Low Pressure Service Water Pump Test performed on August, 9, 2019	96
	Work Orders		WO 20328847, 02063567 WR 20147967	
71111.18	Calculations	KC-2079	Governor Oil Pressure Tank, Oil and Air Minimum Design Pressure	7
		OSC-9314	NFPA 805 Transition Risk-Informed Performance-Based Fire Risk Evaluation	6
	Corrective		01905036, 02294192	

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	Action Documents			
	Miscellaneous		Technical Specification Bases 3.7.10	4
		Duke Letter RA-19-0116 dated February 26, 2019	Duke Energy Response to NRC Request for Additional Information (RAI) Related to Oconee License Amendment Request 2017-05	
	Procedures	AP/0/A/2000/002	Keowee Hydro Station – Emergency Start	22
		EP/2/A/1800/001 0Q	Unit 2 EOP Enclosures 5.41 – 5.46	7
71111.19	Drawings	OEE-260-15	Elementary Diagram Waste Disposal System RB Normal Sump Discharge VLV. 2LWD-001 2LWDVA0001	10
		OEE-165-04	Elementary Diagram Protected Service Water Steam Generator 1B Flow Control MOV 1 PSW-24	5
		OFD-101A-3.3	Flow Diagram of High Pressure Injection System (Charging Section)	31
		OFD-101A-3.4	Flow Diagram of High Pressure Injection System (Charging System)	46
	Engineering Changes	415742		
	Procedures	IP/0/A/0101/001	Low Risk maintenance Configuration Control	18
		IP/3/A/0202/001 D	High Pressure Injection System Emergency HP Injection Flow Instrument Calibration	006
		PT/0/A/0400/005	SSF Auxiliary Service Water Pump Test	069
		PT/1/A/0261/010	Essential Siphon Vacuum System Test	020
		PT/2/A/0152/014	Liquid Waste Disposal System Valve Stroke Test	8
	Work Orders		WO 20173119-05, 20173938, 20240445, 20274863	
71111.22	Calculations	OSC-2280	LPSW NPSHA and Minimum Required Lake Level	20
		OSC-4489	Predicted Unit 3 LPSW System Response to a Large-Break	11

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			LOCA with Single Failure Using a Benchmarked Hydraulic Computer Model	
		OSC-5649	LPSW Test Acceptance Criteria (TAC)	19
		OSC-6098	LPSW Instrument Uncertainty	1
	Corrective Action Documents	NCR 2271297		
	Drawings	OEE-120	Elementary Diagram Channel 'A' Keowee Emergency Start	18
		OEE-120-01	Elementary Diagram Channel 'B' Keowee Emergency Start	18
		OEE-120-1-A	Elementary Diagram Channel 'B' Keowee Emergency Start Contact Development	10
		OEE-120-A	Elementary Diagram Channel 'A' Keowee Emergency Start Contact Development	10
		OEE-320	Elementary Diagram Channel 'A' Keowee Emergency Start (Unit 3)	6
		OEE-320-1	Elementary Diagram Channel 'B' Keowee Emergency Start (Unit 3)	6
	Miscellaneous		ESI – EMD Owners Group Recommended Maintenance Program – Mechanical Nuclear Standby Emergency Diesel Generators	9
		ONTC-3-124A-0001-001	Test Acceptance Criteria	2
	Procedures	PT/0/A/0620/016	Keowee Hydro Emergency Start Test	53
		PT/3/A/0203/006 A	Low Pressure Injection Pump Test - Recirculation	094
	Work Orders		WO 20249209-01, 20321990, 20325326-01, 20325326-05	
71114.06	Miscellaneous		ONS Drill 19-02 Scenario Manual	
			Critique Report for July 17, 2019 Drill	
71151	Miscellaneous		Safety System Functional Failures (SSFF) PI Summary Report for period ending in June 2019, Units 1, 2, 3	
			Mitigating Systems	26

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Performance Index (MPSI) Basis Document	
			MSPI Derivation Report for period ending June 2019, Units 1, 2, 3 Heat Removal System	
			MSPI Indicator Margin Report for period ending June 2019, Units 1, 2, 3 Heat Removal System	
		CP/0/A/2005/022	Determination of Reported Tech Spec Dose Equivalent Iodine-131	006
71152	Corrective Action Documents		2186873, 1824462, 02288543, 02289565	
	Miscellaneous		Preventive Maintenance Change 02277613	