



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

October 28, 2021

Mr. Tom Simril
Site Vice President
Duke Energy Carolinas, LLC
4800 Concord Road
York, SC 29745-9635

SUBJECT: CATAWBA NUCLEAR STATION – INTEGRATED INSPECTION REPORT
05000413/2021003 AND 05000414/2021003

Dear Mr. Simril:

On September 30, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Catawba Nuclear Station. On October 25, 2021, 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.

No findings or violations of more than minor significance were identified during this inspection.

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. 05000413 and 05000414
License Nos. NPF-35 and NPF-52

Enclosure:
As stated

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SUBJECT: CATAWBA NUCLEAR STATION – INTEGRATED INSPECTION REPORT
05000413/2021003 AND 05000414/2021003 dated October 28, 2021

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**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Numbers: 05000413 and 05000414

License Numbers: NPF-35 and NPF-52

Report Numbers: 05000413/2021003 and 05000414/2021003

Enterprise Identifier: I-2021-003-0029

Licensee: Duke Energy Carolinas, LLC

Facility: Catawba Nuclear Station

Location: York, South Carolina

Inspection Dates: July 01, 2021 to September 30, 2021

Inspectors: J. Austin, Senior Resident Inspector
D. Rivard, Acting Resident Inspector
C. Fontana, Emergency Preparedness Inspector
S. Sanchez, Senior Emergency Preparedness Inspector
J. Walker, Emergency Response Inspector

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 Catawba 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

No findings or violations of more than minor significance were identified.

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
LER	05000414/2021-002-00	Valid Actuation of the Unit 2 Reactor Protection System and Auxiliary Feedwater System	71153	Closed

PLANT STATUS

Unit 1 began the inspection period at or near 100 percent rated thermal power (RTP). It was reduced to 15 percent RTP on August 27, 2021, to replace the main generator links. On August 30, 2021, Unit 1 was returned to 100 percent RTP and remained at or near 100 percent RTP for the remainder of the inspection period.

Unit 2 began the inspection period at or near 100 percent RTP. It was reduced to 18 percent RTP on July 30, 2021, to stop a steam leak on steam generator shell side alternate sample valve 2BB-1. Unit 2 was returned to 100 percent RTP on July 31, 2021, and remained at or near 100 percent RTP for the remainder of the inspection period.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors 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. Starting on March 20, 2020, in response to the National Emergency declared by the President of the United States on the public health risks of the coronavirus (COVID-19), resident and regional inspectors were directed to begin telework and to remotely access licensee information using available technology. During this time, the resident inspectors performed periodic site visits each week, increasing the amount of time on site as local COVID-19 conditions permitted. As part of their onsite activities, resident inspectors conducted plant status activities as described in IMC 2515, Appendix D; observed risk significant activities; and completed on site portions of IPs. In addition, resident and regional baseline inspections were evaluated to determine if all or a portion of the objectives and requirements stated in the IP could be performed remotely. If the inspections could be performed remotely, they were conducted per the applicable IP. In some cases, portions of an IP were completed remotely and on site. The inspections documented below met the objectives and requirements for completion of the IP.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

Impending Severe Weather Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated the adequacy of the overall preparations to protect risk significant systems from impending severe weather conditions associated with Tropical Storm Elsa on July 8, 2021.

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) Unit 1 outside doghouse (main steam/feed penetration room) on July 19, 2021
- (2) 1A and 2B emergency diesel generators on July 22, 2021
- (3) Units 1 and 2 service water pump house on July 23, 2021

Complete Walkdown Sample (IP Section 03.02) (2 Samples)

- (1) The inspectors evaluated system configuration during a complete walkdown of the Unit 1A emergency diesel generator system on July 23, 2021.
- (2) The inspectors evaluated system configuration during a complete walkdown of the safe shutdown facility (SSF) diesel generator and support systems on September 21, 2021.

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (7 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) Unit 1, Turbine Building, Elev. 568, Basement, SE Quadrant on September 21, 2021
- (2) Unit 1, Turbine Building, Elev. 568, Basement, NE Quadrant on September 21, 2021
- (3) Unit 1, Turbine Building, Elev. 568, Basement, NW Quadrant on September 21, 2021
- (4) Unit 1, Turbine Building, Elev. 568, Basement, SW Quadrant on September 21, 2021
- (5) Protected Area South, Standby Shutdown Facility, Elev. 594, Building 7748 on September 21, 2021
- (6) Unit 2, Turbine Building, Elev. 568, Basement, NW Quadrant on September 23, 2021
- (7) Unit 2, Turbine Building, Elev. 568, Basement, SW Quadrant on September 23, 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) Work request (WR) 20209964, 2A emergency diesel generator (EDG) sequencer hallway water leak above

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 the Unit 1 power increase on August 30, 2021, following down power to repair main generator flexible links.

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

- (1) The inspectors observed and evaluated simulator scenario recorded on July 28, 2021, which contained failure of pressurizer spray valve, seal injection flow control valve, control rod failure, reactor trip, loss of coolant accident (LOCA) from residual heat removal (RHR) and LOCA outside containment.

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (4 Samples)

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

- (1) WR 20204373, water dripping from overhead in 2A EDG sequencer hallway, on June 29, 2021
- (2) WR 20204789, seismic alarm will not clear for control room indications, on July 4, 2021
- (3) Nuclear condition report (NCR) 2392855, sump pump conditions, on August 9, 2021
- (4) NCR 2393943, longstanding equipment issue for Unit 1 steam dumps, on August 16, 2021

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (5 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) 2A service water pump out of service (OOS) for maintenance, on July 6, 2021
- (2) 2A service water pump OOS for maintenance, on July 7, 2021
- (3) 2A EDG OOS for scheduled maintenance, on August 5, 2021
- (4) Unit 1 power reduction to repair main generator flexible links, on August 26, 2021
- (5) SSF diesel generator OOS for unscheduled maintenance, on September 13, 2021

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (6 Samples)

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

- (1) NCR 2384415, "B" train component cooling miniflow valve failed low, on June 1, 2021
- (2) NCR 2388448, 2B EDG lube oil inlet/outlet low temperature alarm, on July 5, 2021
- (3) NCR 2388798, 2A service water motor offline electrical test incomplete, on July 7, 2021

- (4) NCR 2390752, repair pinhole leaks on downstream weld of 2RN-190B, on July 22, 2021
- (5) NCR 2393733, 1A EDG sensor fault, on August 14, 2021
- (6) NCR 2393733, 1A EDG sensor fault indication for engine lube oil channel on, August 16, 2021

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) Engineering change (EC) 419999, single piece flat washer for main generator flexible link connection, on August 27, 2021

71111.19 - Post-Maintenance Testing

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

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

- (1) WR 20205613, flushed sample line following EMF52 loss of flow alarms, on July 16, 2021
- (2) Work Order (WO) 20402161, electronic software reset to reset/resolve 1A reactor vessel level instrument inoperability, on July 29, 2021
- (3) WO 20484700, repaired leak on 2A EDG cylinder head jumper pipe and verified the leak was repaired, on August 7, 2021
- (4) WR 20208313, replaced relay following the 2YV containment chilled water chiller to start, on August 28, 2021
- (5) WO 20487506, performed thermography following repair/replacement of U1 main generator flex links and load placed on main generator, on August 30, 2021
- (6) WO 20491701, retest SSF frequency control following troubleshooting of non-responsiveness, on September 13, 2021

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Surveillance Tests (other) (IP Section 03.01) (2 Samples)

- (1) PT/2/A/4350/002B, 2B EDG operability test, on July 24, 2021
- (2) PT/1A/4600/002A, Mode 1 periodic surveillance items performed, on August 17, 2021

Inservice Testing (IP Section 03.01) (1 Sample)

- (1) PT/1/A/4250/003C, turbine driven auxiliary feedwater pump #1 performance test, on September 10, 2021

RCS Leakage Detection Testing (IP Section 03.01) (1 Sample)

- (1) PT/1/A/4150/001D, reactor coolant system leakage calculation performed, on August 9, 2021

FLEX Testing (IP Section 03.02) (1 Sample)

- (1) WO 20470816, reviewed results of Catawba Nuclear Station quarterly FLEX equipment inspection conducted, on August 9, 2021

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 August 23, 2021.

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 August 23, 2021.

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 August 23, 2021. 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 August 23, 2021.

71114.06 - Drill Evaluation

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

- (1) The inspectors evaluated a drill scenario which simulated loss of component cooling, loss of charging, turbine load rejection, tornado on site, safety injection actuation, and reactor trip, on September 27, 2021.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

IE03: Unplanned Power Changes per 7000 Critical Hours Sample (IP Section 02.02) (2 Samples)

- (1) Unit 1 (July 1, 2020 - June 30, 2021)
- (2) Unit 2 (July 1, 2020 - June 30, 2021)

MS09: Residual Heat Removal Systems (IP Section 02.08) (2 Samples)

- (1) Unit 1 (July 1, 2020 - June 30, 2021)
- (2) Unit 2 (July 1, 2020 - June 30, 2021)

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

- (1) Unit 1 (July 1, 2020 - June 30, 2021)
Unit 2 (July 1, 2020 - June 30, 2021)

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

- (1) Unit 1 (July 1, 2020 - June 30, 2021)
Unit 2 (July 1, 2020 - June 30, 2021)

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

- (1) Unit 1 (July 1, 2020 - June 30, 2021)
Unit 2 (July 1, 2020 - June 30, 2021)

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 2390811, 2B EDG inadvertent auto start signal
- (2) NCR 2388357, 1B EDG bearing rotated

71153 - Follow Up of Events and Notices of Enforcement Discretion

Event Report (IP Section 03.02) (1 Sample)

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

- (1) LER 05000414/2021-002-00, Valid Actuation of the Unit 2 Reactor Protection System and Auxiliary Feedwater System (ADAMS Accession No. ML21180A302). The

inspection conclusions associated with this LER are documented in this report under Inspection Results Section 71153.

INSPECTION RESULTS

Minor Violation	71153
<p>Minor Violation: Technical Specification 5.4.1, "Procedures," requires that written procedures shall be established, implemented, and maintained, covering applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Section 8.b.(1)(I) of Appendix A of Regulatory Guide 1.33, Revision 2, February 1978, states that written procedures should be provided for reactor protection system tests and calibrations. Licensee Procedure IP/2/A/3222/095/B, "Procedure for RTD and Thermocouple Cross Calibration with Reactor Trip Breakers Closed or Open," Revision 39, contains instructions for connecting test equipment and performing RTD calibrations. Contrary to the above, on May 1, 2021, the licensee did not maintain the procedure to prevent an actuation of the reactor trip system during reactor protection system tests and calibrations. Specifically, inadequacies in the procedure and new test equipment resulted in reactor trip breaker open actuation.</p> <p>Screening: The inspectors determined the performance deficiency was minor. The performance deficiency was screened in accordance with Inspection Manual Chapter (IMC) 0612 Appendix B, "Additional Screening Guidance," dated December 12, 2020, and was determined to be of minor significance because the finding did not meet any of the more than minor screening questions.</p> <p>Enforcement: The licensee has taken actions to restore compliance under NCR 02380726 and CNS LER 414/2021-002-00, "Valid Actuation of the Unit 2 Reactor Protection System and Auxiliary Feedwater System," which included utilization of the original test boxes and subsequent revisions to licensee procedures. The failure to comply with TS 5.4.1 constitutes a minor violation that is not subject to enforcement action in accordance with the NRC's Enforcement Policy.</p>	

Minor Violation	71153
<p>Minor Violation: Technical Specification 5.4.1, "Procedures," requires that written procedures shall be established, implemented, and maintained, covering applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Section 3.k of Appendix A of Regulatory Guide 1.33, Revision 2, February 1978, states that written procedures should be provided for startup, operations, and shutdown of safety-related equipment, including the feedwater system (feedwater pumps to steam generator). Licensee Procedure OP/2/A/6250/001, "Condensate and Feedwater System," Enclosure 4.19, "Recovery from Feedwater Isolation," contains instructions for restoration of the feed system alignment following a feedwater isolation. Contrary to the above, on May 1, 2021, the licensee failed to adequately implement procedure OP/2/A/6250/001 during restoration of the feed system alignment following the reactor trip. Specifically, the main feedwater bypass isolation valves were maintained in manual. When the feedwater pump was placed in automatic with a level error signal present and no automatic control of the main feedwater bypass isolation valves, the main feed pump speed control subsequently increased the pump speed to a trip condition which, by design, resulted in the auxiliary feedwater actuation.</p>	

Screening: The inspectors determined the performance deficiency was minor. The performance deficiency was screened in accordance with Inspection Manual Chapter (IMC) 0612 Appendix B, "Additional Screening Guidance," dated December 12, 2020, and was determined to be of minor significance because the finding did not meet any of the more than minor screening questions.

Enforcement: The licensee has taken actions to restore compliance under NCR 02380727, including human performance corrective actions and training. This failure to comply with TS 5.4.1 constitutes a minor violation that is not subject to enforcement action in accordance with the NRC's Enforcement Policy.

EXIT MEETINGS AND DEBRIEFS

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

- On August 26, 2021, the inspectors presented the Emergency Preparedness Program inspection results to Tom Simril and other members of the licensee staff.
- On October 25, 2021, the inspectors presented the integrated inspection results to Tom Simril and other members of the licensee staff.