



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

January 27, 2020

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

SUBJECT: CATAWBA NUCLEAR STATION – INTEGRATED INSPECTION REPORT
05000413/2019004 AND 05000414/2019004

Dear Mr. Simril:

On December 31, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Catawba Nuclear Station. On January 23, 2020, the NRC inspectors discussed the results of this inspection with Mr. Clark Curry 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. We are treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violation or the significance or severity of the violation 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 Catawba 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 Catawba 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/

Frank J. Ehrhardt, 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
05000413/2019004 AND 05000414/2019004 dated January 27,2020

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ADAMS ACCESSION NUMBER: ML20027A217

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DATE	1/23/20	1/23/20	1/24/20	1/27/20

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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: 05000413/2019004 and 05000414/2019004

Enterprise Identifier: I-2019-004-0016

Licensee: Duke Energy Carolinas, LLC

Facility: Catawba Nuclear Station

Location: York, South Carolina

Inspection Dates: October 01, 2019 to December 31, 2019

Inspectors: J. Austin, Senior Resident Inspector
M. Meeks, Senior Operations Engineer
C. Scott, Resident 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 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

Inadvertent Actuation of Unit 2 Containment Spray			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000414/2019004-01 Open/Closed	[H.8] - Procedure Adherence	71111.20
A self-revealing Green NCV of Technical Specification 5.4.1, "Procedures," was identified for the licensee's failure to implement AD-OP-ALL-0204, "Plant Status Control," during the operation of the Unit 2 containment spray (NS) system. Specifically, on October 2, 2019, an inadvertent operation of the containment spray system occurred when control room operators cycled the 2A containment spray valves with the 2B NS pump in recirculation. This resulted in the spraying of contaminated water into Unit 2 upper containment, the subsequent evacuation of personnel, and submittal of an 8-hour report to the NRC.			

Additional Tracking Items

None.

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 in the 2CR23 refueling outage and returned to full power on October 12, 2019 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 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

Impending Severe Weather Sample (IP Section 03.03) (1 Sample)

- (1) The inspectors evaluated readiness for impending cold weather on November 13, 2019.

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

- (1) The inspectors evaluated readiness to cope with external flooding for the following area:
 - 2B emergency diesel generator (EDG) room on December 17, 2019

71111.04Q - Equipment Alignment

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

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

- (1) Standby shutdown facility (SSF) battery charger alignment following failure of 1SLXG-5C (SSF normal battery charger SDSC2 feeder) on October 30, 2019
- (2) Unit 2A and 2B centrifugal charging pumps on November 4, 2019
- (3) 1A and 2B EDG on November 19, 2019

71111.04S - Equipment Alignment

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

- (1) The inspectors evaluated system configurations during a complete walkdown of the emergency supplemental power system (ESPS) on December 13, 2019.

71111.05Q - Fire Protection

Quarterly Inspection (IP Section 03.01) (3 Samples)

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

- (1) Unit 2 reactor building, fire area RB2, on October 5-6, 2019
- (2) ESPS diesels 1 and 2, fire area YRD on December 12, 2019
- (3) Unit 1 turbine building, fire area TB1, Elevation 594 on December 31, 2019

71111.06 - Flood Protection Measures

Inspection Activities - Underground Cables (IP Section 02.02c.) (1 Sample)

The inspectors evaluated cable submergence protection in:

- (1) Manhole inspection of Unit 2 CMH-18A on November 25, 2019

71111.07A - Heat Sink Performance

Annual Review (IP Section 02.01) (1 Sample)

The inspectors evaluated readiness and performance of:

- (1) 2A component cooling (KC) heat exchanger cleaning and testing on December 12, 2019

71111.11A - Licensed Operator Regualification Program and Licensed Operator Performance

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

- (1) Annual Review of Licensee Regualification Examination Results: On July 9, 2019, the licensee completed 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 2, 2019, 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 Regualification Program." These results were compared to the thresholds established in Section 3.02, "Requalification Examination Results," of IP 71111.11.

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 plant start up on October 8th and surveillance testing on the Unit 1 auxiliary feedwater turbine driven pump on December 12, 2019.

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

- (1) The inspectors observed and evaluated a simulator examination with a loss of letdown flow on Unit 1, anticipated transient without scram, 1A steam line break, failure of main steam isolation valves, and failure of the 1B charging pump on November 14, 2019.

71111.12 - Maintenance Effectiveness

Quality Control (IP Section 02.02) (1 Sample)

The inspectors evaluated maintenance and quality control activities associated with the following equipment performance activities:

- (1) Condition Report (CR) 2295464, Nuclear oversight/quality control unable to identify material on October 4, 2019

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (5 Samples)

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

- (1) CR 2296648, 2B EDG jacket water heater starter exhibiting excessive vibration on October 11, 2019
- (2) CR 2296723, 1B EDG low lube oil temp on October 13, 2019
- (3) Risk mitigation actions following emergent repair of 1A EDG on November 15, 2019
- (4) CR 2305027, SSF diesel generator (DG) battery banks A and B have cell voltages below administrative limit on November 30, 2019
- (5) CR 2306537, 2B2 EDG room ventilation fan not restored to service after maintenance on December 10, 2019

71111.15 - Operability Determinations and Functionality Assessments

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

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) CR 2292287, 2292930, 2MXA Incoming breaker tripped on September 21, 2019

- (2) Work Order (WO) 20358406-01, 1B EDG lube oil pump failure during light bulb replacement on October 13, 2019
- (3) CR 2299143, 1A EDG declared inoperable at 0200 due to EDG Cooling Water system (KD) tubing leak on October 25, 2019

71111.18 - Plant Modifications

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

The inspectors evaluated the following temporary or permanent modifications:

- (1) CR 2301371, Alternate alignment to fill reactor coolant pump standpipes
- (2) Engineering Change (EC) 94585, Replace DG voltage regulator/excitation system on December 16, 2019

71111.19 - Post-Maintenance Testing

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

The inspectors evaluated the following post maintenance tests:

- (1) WO 20277429, Load Unit 2 digital control software to controllers to finalize settings on October 2, 2019
- (2) WO 20357204, 2B resistance temperature detection (RTD) hot leg has failed open, rescale 2B t-hot due to loss of RTD (2NCRD 5461) on October 9, 2019
- (3) Post maintenance testing (PMT) following repair of 1NC56B reactor make-up pump discharge containment insulation valve on November 11, 2019
- (4) PMT following the repair of an oil leak from temperature element 2KCTE7640 for 2B1 KC pump on November 15, 2019

71111.20 - Refueling and Other Outage Activities

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

- (1) The inspectors evaluated Unit 2 refueling outage 2R23 from October 1, 2019 to October 12, 2019.

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

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

- (1) PT/2/A/4600/002 B, Mode 2 Periodic Surveillance Items on October 8, 2019
- (2) PT/0/B/4350/010, ESPS DG Functional Test on December 3, 2019
- (3) PT/1/A/4350/002 A, DG 1A Operability Test on November 13, 2019

Ice Condenser Testing (IP Section 03.01) (1 Sample)

- (1) PT/2/A/4200/014 A, Ice Condenser Intermediate Door and Inlet Door Position Monitoring System Inspection on October 20, 2019

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

IE01: Unplanned Scrams per 7000 Critical Hours Sample (IP Section 02.01) (2 Samples)

- (1) Unit 1 submittals listed for the period from October 1, 2018 through September 30, 2019.
- (2) Unit 2 submittals listed for the period from October 1, 2018 through September 30, 2019.

MS05: Safety System Functional Failures (SSFFs) Sample (IP Section 02.04) (2 Samples)

- (1) Unit 1 submittals listed for the period from October 1, 2018 through September 30, 2019.
- (2) Unit 2 submittals listed for the period from October 1, 2018 through September 30, 2019.

BI02: RCS Leak Rate Sample (IP Section 02.11) (2 Samples)

- (1) Unit 1 submittals listed for the period from October 1, 2018 through September 30, 2019.
- (2) Unit 2 submittals listed for the period from October 1, 2018 through September 30, 2019.

71152 - Problem Identification and Resolution

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

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

Annual Follow-up of Selected Issues (IP Section 02.03) (1 Sample)

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

- (1) CR 2287546 Unplanned one-hour shutdown action statement per LCO 3.5.4 Condition B "fueling water storage tank (FWST) inoperable for reasons other than Condition A" on October 7, 2019

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 activities related to long-term operation and monitoring of their independent spent fuel storage installation on December 30, 2019.

INSPECTION RESULTS

Inadvertent Actuation of Unit 2 Containment Spray			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000414/2019004-01 Open/Closed	[H.8] - Procedure Adherence	71111.20
<p>A self-revealing Green NCV of Technical Specification 5.4.1, "Procedures," was identified for the licensee's failure to implement AD-OP-ALL-0204, "Plant Status Control," during the operation of the Unit 2 containment spray (NS) system. Specifically, on October 2, 2019, an inadvertent operation of the containment spray system occurred when control room operators cycled the 2A containment spray valves with the 2B NS pump in recirculation. This resulted in the spraying of contaminated water into Unit 2 upper containment, the subsequent evacuation of personnel, and submittal of an 8-hour report to the NRC.</p>			
<p><u>Description:</u> On October 2, 2019, at 0415, with Unit 2 in Mode 5, an inadvertent operation of the containment spray system occurred following an evolution that placed both trains of the Unit 2 containment spray system in recirculation at the same time. The evolution began when the 2B NS pump was placed in operation followed by the 2A NS pump. Three minutes later the 2A NS pump was secured. The 2B NS pump remained in operation and cross-tied with the 2A train through the alignments made in the 2A pump recirculation procedure OP/2/A/6200/007, "Containment Spray System." Operators then attempted to return the 2A NS train to a stand-by alignment in accordance with OP/2/A/6200/007, Enclosure 4.5. Enclosure 4.5 has steps to cycle NS spray header 2A containment isolation valves, 2NS-29A and 2NS-32A from the control room before isolating the recirculation flow path. When operators cycled the valves, water flowed through the 2A NS header into the Unit 2 upper containment. The control room was notified that water was flowing through the Unit 2 containment spray header and promptly secured the 2B NS pump. The licensee submitted an 8-hour notification to the NRC and initiated a problem resolution investigation team to evaluate the issue.</p>			
<p>The licensee's evaluation stated that the control room crew failed to recognize that a flow path existed from the 2B NS pump operating in recirculation and the 2A train containment spray valves that were being cycled because they did not properly implement AD-OP-ALL-0204, "Plant Status Control." Specifically, control room operators did not use a marked-up flow diagram of the NS system during an active fluid transfer as required by with AD-OP-ALL-0204. Section 5.2, "Documenting Component Manipulations to Maintain Plant Status Control," states in part that, "the system flow path shall be marked up using major valves and any connecting systems to ensure there are no adverse interactions." It also states that "all Active Fluid Transfer evolutions shall be controlled from the control room with the aid of</p>			

marked up drawings.” The inspectors concluded that the use of a marked up drawing during the operation of the NS system would have prevented the human performance error that occurred on October 2, 2019.

Corrective Actions: The licensee immediately secured the 2B NS pump. The licensee submitted event notification EN 54306 on October 2, 2019 and initiated interim actions for continuous oversight in the control room by personnel at the shift manager level or above for all evolutions involving movement of water.

Corrective Action References: CR 02295170

Performance Assessment:

Performance Deficiency: The failure to properly implement AD-OP-ALL-0204, “Plant Status Control,” during the operation of the Unit 2 containment spray system was a violation of Technical Specification 5.4.1a, “Procedures,” and was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, licensee’s failure to properly implement AD-OP-ALL-0204, “Plant Status Control,” during the operation of the containment spray system resulted in mis-operation of the NS system and personnel evacuation from the Unit 2 upper containment due to spraying contaminated water in the Unit 2 reactor building. This also resulted in an 8-hour report to the NRC in accordance with 10 CFR 50.72.

Significance: The inspectors assessed the significance of the finding using Appendix G, “Shutdown Safety SDP.” The inspectors determined that the finding was of very low safety significance (Green) because the finding did not involve an actual reduction in function of the hydrogen control for BWR Mark III and PWR ice condenser containments.

Cross-Cutting Aspect: H.8 - Procedure Adherence: Individuals follow processes, procedures, and work instructions. The inspectors determined the finding had a cross-cutting aspect of procedure adherence in the area of human performance because the licensee failed to follow procedures during the operation of the NS system.

Enforcement:

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 1.c of Appendix A of Regulatory Guide 1.33, Revision 2, February 1978, states that written procedures should be provided for equipment control. Licensee procedure AD-OP-ALL-0204 “Plant Status Control,” Section 5.2, states in part that “all active evolutions shall be marked up on the prints for the duration of the evolution. The system flow path shall be marked up using major valves and any connecting systems to ensure there are no adverse interactions. All Active Fluid Transfer evolutions shall be controlled from the control room with the aid of marked up drawings.”

Contrary to the above, on October 2, 2019, with Unit 2 in Mode 5, the licensee failed to properly implement AD-ALL-OP-204, “Plant Status Control,” when operators cycled containment valves 2NS-29A and 2NS-32A with the 2B NS pump operating in recirculation. As a result, an inadvertent operation of the containment spray system occurred

in Unit 2 upper containment. This also caused personnel evacuation from Unit 2 upper containment and an 8-hour report to the NRC.

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 January 23, 2020, the inspectors presented the integrated inspection results to Clark Curry and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.01	Corrective Action Documents	2307769	2B DG Repair Roof Leak	
71111.04Q	Drawings	CN-1700-08.01	Three line diagram 250/125 VDC auxiliary power system (ETM) SSF	Rev. 18
	Procedures	OP/0/B/6350/919	ESPS DG Operation	002
71111.05Q	Drawings	CSD-CNS-PFP-PA-001	Protected Area North	
		CSD-CNS-PFP=PA-004	Protected Area West Pre-Plan	0
71111.06	Work Orders	2030980-02	2RN XP CMH-18A: (A train)	
71111.07A	Corrective Action Documents	02195836	KC HX 2A ECT identified (25 tubes for preventing plugging)	
	Procedures	MP/0/A/7650/199	Maintenance Procedure for Eddy Current Testing	003
	Work Orders	20253735.01	2KC Fix and perform 100% eddy current inspection of tubes	
71111.11Q	Procedures	AD-TQ-ALL=0420	Conduct of Simulator Training and Evaluation	
71111.15	Procedures	OP/2/A/6200/007	Containment Spray System	056
71111.20	Corrective Action Documents	2295170	Flow initiated from the 2A NS system in to the U2 containment	
	Procedures	RP/0/B/5000/013	NRC Notification Requirements	