



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

April 20, 2022

Mr. Ed Pigott
Site Vice President
Duke Energy Carolinas, LLC
12700 Hagers Ferry Road
Huntersville, NC 28078

SUBJECT: MCGUIRE NUCLEAR STATION – INTEGRATED INSPECTION REPORT
05000369/2022001 AND 05000370/2022001

Dear Mr. Pigott:

On March 31, 2022, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at McGuire Nuclear Station. On April 18, 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.

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,

A handwritten signature in black ink that reads "Eric Stamm".

Signed by Stamm, Eric
on 04/20/22

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

Docket Nos. 05000369 and 05000370
License Nos. NPF-9 and NPF-17

Enclosure:
As stated

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SUBJECT: MCGUIRE NUCLEAR STATION – INTEGRATED INSPECTION REPORT
05000369/2022001 AND 05000370/2022001 DATED APRIL 20, 2022

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DATE	4/19/2022	4/20/2022			

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

Docket Numbers: 05000369 and 05000370

License Numbers: NPF-9 and NPF-17

Report Numbers: 05000369/2022001 and 05000370/2022001

Enterprise Identifier: I-2022-001-0023

Licensee: Duke Energy Carolinas, LLC

Facility: McGuire Nuclear Station

Location: Huntersville, North Carolina

Inspection Dates: January 1, 2022 to March 31, 2022

Inspectors: A. Hutto, Senior Resident Inspector
C. Scott, Resident 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 McGuire 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	05000370/2021-001-00	LER 2021-001-00 for McGuire Nuclear Station, Unit 2, Valid Actuations of the Unit 2 B Train Emergency AC Power System and B Train Auxiliary Feedwater System	71153	Closed

PLANT STATUS

Unit 1 began the inspection period at or near 100 percent rated thermal power (RTP). On March 7, 2022, the unit began a power reduction coast down in advance of refueling outage M1R28. Unit 1 was at 91 percent RTP at the end of the inspection period.

Unit 2 began the inspection period at or near 100 percent RTP. On February 18, 2022, the unit was manually tripped due to a malfunction of the turbine control system. After repairs, the unit was restarted on February 21, 2022, and returned to 100 percent RTP on February 23, 2022. Unit 2 remained at or near 100 percent RTP for the rest of the inspection period.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors performed activities described in IMC 2515, Appendix D, "Plant Status," 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) (4 Samples)

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

- (1) Unit 2 "A" train of containment spray system on January 5, 2022
- (2) Unit 2 "A" Emergency Diesel Generator (EDG) on January 11, 2022
- (3) 2A1 and 2A2 component cooling water pumps on February 5, 2022
- (4) Unit 1 "A" train of auxiliary feedwater system on March 22, 2022

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) Unit 2 TD 6.9kV Switchgear room on January 4, 2022
- (2) Unit 1 Exterior Doghouse on January 6, 2022
- (3) Service building basement (instrument air/fire jockey pumps) on January 24, 2022

- (4) Unit 2 Exterior Doghouse on January 25, 2022
- (5) Unit 1 and Unit 2 Auxiliary Building Elevation 750 on February 1, 2022

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 1 and 2 turbine building auxiliary building interface, on January 12, 2022

71111.07A - Heat Exchanger/Sink Performance

Annual Review (IP Section 03.01) (1 Sample)

The inspectors evaluated readiness and performance of:

- (1) Unit 1 B EDG Heat Exchanger (WO 20418971)

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 surveillance testing of the Unit 1 turbine driven auxiliary feedwater pump on January 29, 2022, and Unit 2 reactor startup activities on February 22, 2022.

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

- (1) The inspectors observed and evaluated active simulator exam cold crew exam #1, on March 2, 2022. The scenario involving a nuclear instrument failure, followed by a failed open pressurizer power operated relief valve (PORV), and a loss of heat sink accident.

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (3 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) Nuclear condition report (NCR) 2413892, Standby shutdown facility (SSF) diesel generator failed periodic test, on January 28, 2022
- (2) NCR 2399317, Inspect and repair 2ETB-2 diesel generator failure to close, on February 14, 2022
- (3) NCR 2417660, 1VG-63 Failed to operate on February 23, 2022

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) Equipment protection plan for Unit 2 spent fuel pool cooling (A train) time to 200F less than 72 hours, on January 3, 2022
- (2) Equipment protection plan for the 2A EDG maintenance outage, on January 10, 2022
- (3) Equipment protection plan for the Unit 1 standby makeup pump out of service during refueling canal inspections, on January 19, 2022
- (4) Equipment protection plan for the Unit 1 EVCC battery and battery charger out of service during battery performance test, on January 25, 2022
- (5) Equipment protection plan for Unit 1 A EDG out of service for planned maintenance, on February 24, 2022

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 2408408, Pressurizer PORV Block Safety Function, on January 5, 2022
- (2) NCR 2410912, Unexpected alarms and bistables lit during testing, on January 6, 2022
- (3) NCR 2411069, 2EMF31 detector failure, on January 13, 2022
- (4) NCR 2412331, Water present in the SSF diesel fuel oil tank during monthly surveillance, on January 18, 2022
- (5) NCR 2413424, Foreign material in lower ice condenser (Unit 1), on January 31, 2022
- (6) NCR 2417619, Oil leak on 1A EDG governor actuator, on February 24, 2022

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (5 Samples)

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

- (1) PT/1/A/4350/002 B, "Diesel Generator 1B Operability Test," after fluid checks on the 1B EDG, on January 4, 2022
- (2) 2A nuclear service water (RN) pump started in accordance with OP/2A/6400/006 Nuclear Service after torque checks on 0RN-148AC, 1A & 2A RN Discharge to RC X-over Isolation, on January 19, 2022
- (3) PT/2/A/4350/002 A, "Diesel Generator 2A Operability Test," following a maintenance outage, on January 27, 2022
- (4) OP/0/A/6450/001, "Control Area Ventilation/Chilled Water," after replacement of 1RN-460, B YC Chiller Condenser Control Actuator, on February 1, 2022 (WO20508586-07)
- (5) PT/2/A/4350/002 A, "Diesel Generator 2A Operability Test," after fluid checks on the 2A EDG, on March 15, 2022

71111.20 - Refueling and Other Outage Activities

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

- (1) (Partial)
The inspectors evaluated Unit 2 forced outage (manual reactor trip due to secondary control issues) activities from February 21, 2022, to February 23, 2022.

71111.22 - Surveillance Testing

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

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

- (1) PT/2/A/4252/001, #2 TD CA Pump Performance Test, on January 21, 2022
- (2) PT/1/A/4206/001 A, 1A NI Pump Performance Test, on January 26, 2022
- (3) PT/0/A/4200/002, Standby Shutdown Facility Operability Test, on January 27, 2022

Inservice Testing (IP Section 03.01) (1 Sample)

- (1) PT/1/A/4403/001 B, 1B RN Pump Performance Test, on January 8, 2022

FLEX Testing (IP Section 03.02) (1 Sample)

- (1) Flex Test Checklist, UHP 300/450 D5-TC (Medium Pressure Flex Hale Pump #4), on February 9, 2022

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 (January 1, 2021 through December 31, 2021)
- (2) Unit 2 (January 1, 2021 through December 31, 2021)

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

- (1) Unit 1 (January 1, 2021 through December 31, 2021)
- (2) Unit 2 (January 1, 2021 through December 31, 2021)

IE04: Unplanned Scrams with Complications (USwC) Sample (IP Section 02.03) (2 Samples)

- (1) Unit 1 (January 1, 2021 through December 31, 2021)
- (2) Unit 2 (January 1, 2021 through December 31, 2021)

71152A - Annual Follow-up Problem Identification and Resolution

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

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

- (1) NCR 2397398, 2ETB blackout during emergency safeguards features testing restoration sequence.

71153 - Follow Up of Events and Notices of Enforcement Discretion

Event Follow-up (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated the manual reactor trip of Unit 2 as a result of secondary turbine control instability and licensee's response on January 18, 2022.

Event Report (IP Section 03.02) (1 Sample)

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

- (1) LER 05000370/2021-001-00, Valid Actuations of the Unit 2 B Train Emergency AC Power System and B Train Auxiliary Feedwater System (ADAMS Accession No. ML21315A006). The inspectors determined that it was not reasonable to foresee or correct the cause discussed in the LER therefore no performance deficiency was identified. The inspectors did not identify a violation of NRC requirements.

INSPECTION RESULTS

No findings were identified.

EXIT MEETINGS AND DEBRIEFS

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

- On April 18, 2022, the inspectors presented the integrated inspection results to Ed Pigott and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.04	Drawings	MCFD-2563-01.00	Unit 2 Flow Diagram of Containment Spray System	
		MCFD-2573-01.00	Unit 2 Flow Diagram of Component Cooling System	
	Procedures	OP/1/A/6250/002	Auxiliary Feedwater System	
		OP/2/A/6350/002	Diesel Generator	
71111.05	Fire Plans	CSD-MNS-PFP-AB-0750-001	Unit 1 and 2 Auxiliary Building Elevation 750	
		CSD-MNS-PFP-AB-750-001	Auxiliary Building Elev 750 Pre-Fire Plan	
		CSD-MNS-PFP-EDH1-000-001	U1 Exterior Doghouse Elevation 736 Pre-Fire Plan	
		CSD-MNS-PFP-EDH1-000-002	U2 Exterior Doghouse Elevation 767 Pre-Fire Plan	
	Procedures	AD-EG-ALL-1520	Transient Combustible Control	
71111.06	Procedures	AP/0/A/5500/044	Plant Flooding	
71111.11Q	Procedures	AD-OP-ALL-1000	Conduct of Operations	
71111.12	Corrective Action Documents	2399317	Unit 2 ETB failed to close following Load Sequencer maintenance during planned outage M2R27	
	Procedures	AD-EG-ALL-1204	Single Point Vulnerability Identification, Elimination and Mitigation	
		AD-EG-ALL-1206	Equipment Reliability Classification	
		AD-EG-ALL-1209	System, Component, and Program Health Reports and Notebooks	
		AD-EG-ALL-1210	Maintenance Rule Program	
		AD-EG-ALL-1211	System Performance Monitoring and Trending	
71111.13	Procedures	AD-OP-ALL-0201	Protected Equipment	
	Self-Assessments		M1R28 Risk Review Assessment	
71111.15	Procedures	AD-EG-ALL-1211	System Performance Monitoring and Trending	
		AD-OP-ALL-0102	Operability Decision Making	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		AD-OP-ALL-0105	Operability Determinations and Functionality Assessment	
71111.19	Procedures	AD-EG-ALL-1155	Post Modification Testing	
71111.22	Procedures	AD-EG-ALL-1202	Preventive Maintenance and Surveillance Testing Administration	
		AD-EG-ALL-1720	Inservice Testing (IST) Program Implementation	
		AD-WC-ALL-0250	Work Implementation and Completion	
71151	Procedures	AD-LS-ALL-0004	NRC Performance Indicators and Monthly Operating Report	
		AD-PI-ALL-0100	Corrective Action Program	
71152A	Corrective Action Documents	NCR 2397398	2ETB Blackout during ESF testing restoration sequence	
	Procedures	AD-LS-ALL-0006	Notification/Reportability Evaluation	
		AD-PI-ALL-0100	Corrective Action Program	
		AD-PI-ALL-0105	Effectiveness Reviews	
71153	Engineering Evaluations		MNS Sequencer Reset Issue Licensee Event Report - Safety Analysis White Paper	
	Procedures	AD-PI-ALL-0106	Cause Investigation Checklist (NCR 2397398)	