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

August 3, 2021

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

SUBJECT: MCGUIRE NUCLEAR STATION – INTEGRATED INSPECTION REPORT 05000369/2021002 AND 05000370/2021002

Dear Mr. Ray:

On June 30, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at McGuire Nuclear Station. On July 28, 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.

One finding of very low safety significance (Green) is documented in this report. This finding did not involve a violation of NRC requirements.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement 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 McGuire Nuclear Station.

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

Sincerely,

/RA/

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

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

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV®

SUBJECT: MCGUIRE NUCLEAR STATION – INTEGRATED INSPECTION REPORT 05000369/2021002 AND 05000370/2021002 DATED AUGUST 3, 2021

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DATE	08/03/2021	08/03/2021	08/02/2021	08/03/2021	

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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:	05000369/2021002 and 05000370/2021002
Enterprise Identifier:	I-2021-002-0022
Licensee:	Duke Energy Carolinas, LLC
Facility:	McGuire Nuclear Station
Location:	Huntersville, North Carolina
Inspection Dates:	April 01, 2021 to June 30, 2021
Inspectors:	A. Hutto, Senior Resident Inspector R. Cureton, Reactor Operations Engineer
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

Failure to Follow Engineering Change Administrative Procedures for the Temporary Repair of Unit 1 Lower Containment Ventilation Duct Work			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Barrier Integrity	Green FIN 05000369/2021002-01 Open	[H.8] - Procedure Adherence	71152
A Green NRC identified finding was identified for the licensee's failure to follow their engineering change (EC) administrative procedures for the temporary repair of the Unit 1 1A lower containment ventilation unit (VL) duct work, resulting in the unplanned inoperability of a lower ice condenser door.			

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 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 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

Seasonal Extreme Weather Sample (IP Section 03.01) (1 Sample)

(1) The inspectors evaluated readiness for seasonal extreme weather conditions prior to the onset of seasonal hot temperatures for the following systems:

(1) "A" train of control room ventilation and cooling (VC/YC)
(2) Unit 2 auxiliary building ventilation (VA)

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) 1B diesel generator, on April 15, 2021
(2) "B" train of control room chilled water system, on April 20, 2021
(3) 2B train of spent fuel pool cooling system, on June 24, 2021

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

(1) Unit 1 turbine driven auxiliary feedwater pump train, on June 18, 2021

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (5 Samples)

The inspectors evaluated the implementation of the fire protection program by conducting a walkdown and performing a review to verify program compliance, equipment functionality, material condition, and operational readiness of the following fire areas:

(1) 1B diesel generator room, on April 22, 2021
(2) 2B diesel generator room, on April 22, 2021
(3) Unit 1 ETA electrical switchgear room, on May 23, 2021
(4) Unit 2 ETA electrical switchgear room, on May 23, 2021
(5) Auxiliary Building 750' elevation, on June 24, 2021

71111.11Q - Licensed Operator Requalification Program and Licensed Operator Performance

Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01) (1 Sample)

(1) The inspectors observed and evaluated licensed operator performance in the Control Room during Unit 2 steam generator blowdown isolation (reactivity management) for moisture carryover testing on June 17, 2021.

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

(1) On June 2, 2021, inspectors observed and evaluated licensed operator annual simulator exam ASE-32. The scenario involved a failed source range/intermediate range nuclear instrument, followed by a rod control malfunction. The scenario concluded with a main feedwater line break inside containment complicated by the reactor failing to trip when required.

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (2 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) 2378674, "A" control room chiller evaporator sight glass low level
(2) NCR 2381922, "C" instrument air dryer issues

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 the "A" control room chiller refrigerant leak, on April 5, 2021
(2) Equipment protection plan for the Unit 1 spent fuel pool time to 200F less than 72 hours, on May 17, 2021
(3) Equipment protection plan for Unit 1 spent fuel storage cask 53 loading activities, on June 21, 2021
(4) Equipment protection plan for Unit 2 feedwater isolation valve solenoid 2CFSV0281 failure, on June 22, 2021
(5) Equipment protection plan for 2B component cooling water train hanger modifications, on June 28, 2021

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (5 Samples)

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

(1) NCR 2375618, 1A diesel generator low overload margin, on April 8, 2021
(2) NCR 2376450, 2A nuclear service water seal and strainer leakage, on April 14, 2021
(3) NCR 2378674, "A" control room chiller evaporator sight glass low level, on April 21, 2021
(4) NCR 2379311, imbalanced fuel delivery to cylinders on 2A diesel engine, on April 22, 2021
(5) NCR 2381441, 1A emergency diesel generator turbocharger oil change required, on May 11, 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) 419312, allow connection of the Unit 1 1C lower containment ventilation coil drain pan to the liquid waste drain header

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) PT/1/A/4350/002 B, "Diesel Generator 1B Operability Test," following preventative maintenance (PM), on April 7, 2021
(2) OP/0/A/6450/011, "Control Area Ventilation/Chilled Water System," following "A" chiller oil leak repairs and control issue troubleshooting, on April 27, 2021
(3) PT/1/A/4350/002 A, "Diesel Generator 1A Operability Test," following PMs, on April 26, 2021
(4) PT/0/A/4200/002, "Standby Shutdown Facility Operability Test," following PMs, on May 27, 2021
(5) PT/2/A/4350/002 B, "Diesel Generator 2B Operability Test," following protective relay PMs and testing, on June 14, 2021
(6) PT/2/A/4350/002 B, "Diesel Generator 2B Operability Test," following hot web deflection measurements, on June 30, 2021

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Surveillance Tests (other) (IP Section 03.01) (4 Samples)

(1) PT/1/A/4350/025, "Essential Auxiliary Power System Power Source Verification," on April 1, 2021
(2) PT/0/B/4600/130, "B.5.b Equipment Inspection," on May 4, 2021
(3) IP/2/A/4971/008 B, "Diesel Generator 2B Protective Relay Logic Test," on June 10, 2021
(4) PT/2/A/4350/036 B, "Diesel Generator 2B 24 Hour Run," on June 28, 2021

Inservice Testing (IP Section 03.01) (1 Sample)

(1) PT/1/A/4208/001 A, "1A Containment Spray Pump Performance Test," on May 25, 2021

71114.06 - Drill Evaluation

Drill/Training Evolution Observation (IP Section 03.02) (1 Sample)

The inspectors evaluated:

(1) The inspectors observed the emergency preparedness drill, on April 7, 2021. The drill involved a failed reactor coolant pump (RCP) rotor resulting in an RCP seal leak and reactor trip/safety injection, followed by a faulted/ruptured stream generator.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

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

(1) Unit 1 (April 1, 2020 - March 31, 2021)

(2) Unit 2 (April 1, 2020 - March 31, 2021)

MS06: Emergency AC Power Systems (IP Section 02.05) (2 Samples)

(1) Unit 1 (April 1, 2020 - March 31, 2021)
(2) Unit 2 (April 1, 2020 - March 31, 2021)

MS07: High Pressure Injection Systems (IP Section 02.06) (2 Samples)

(1) Unit 1 (April 1, 2020 - March 31, 2021)
(2) Unit 2 (April 1, 2020 - March 31, 2021)

71152 - Problem Identification and Resolution

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

(1) The inspectors reviewed the licensee's corrective action program for potential adverse trends in human performance 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) NCR 2372559, Unit 1 ice bed lower inlet door by 16 open when 1A contain air cooler fan in high

INSPECTION RESULTS

Failure to Follow Engineering Change Administrative Procedures for the Temporary Repair of Unit 1 Lower Containment Ventilation Duct Work			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Barrier Integrity	Green FIN 05000369/2021002-01 Open	[H.8] - Procedure Adherence	71152
A Green NRC identified finding was identified for the licensee's failure to follow their engineering change (EC) administrative procedures for the temporary repair of the Unit 1 1A lower containment ventilation unit (VL) duct work, resulting in the unplanned inoperability of a lower ice condenser door.			
Description: A crack in the 1A VL discharge duct elbow was identified by the licensee during refueling outage M1R27 (September 2020). A duct work patch was installed until the elbow could be fabricated and replaced in a subsequent outage. On March 2, 2021, the 1A VL fan was aligned from low speed to high speed, after which, the control room received the "Ice Condenser Lower Inlet Door Open" alarm. After investigation, it was determined that the Bay 16 door was open, and Technical Specification (TS) 3.6.13 condition B was entered for an inoperable lower ice condenser door. Approximately 8 hours later, maintenance personnel manually closed the Bay 16 door (after the 1A VL unit was secured), and the associated TS action statement was exited, within the 14-day allowed completion time.			

On March 22, 2021, licensee personnel made a containment entry to assess the 1A VL ductwork and discovered that the patch installed during the M1R27 outage had partially blown off. This condition allowed enough air from the 1A VL fan, when running in high speed, to impinge on the Bay 16 lower ice condenser door to dislodge it from its closed position. The inspectors questioned the licensee as to what engineering change product had been used to implement the patch and requested to review the documentation. The licensee responded that the original design specification was used to restore the ductwork to its original design requirements and, would therefore qualify as a maintenance activity that would not require an EC. The inspectors further questioned the appropriateness of this action as the duct repair consisted of a patch over the existing ductwork that was considered temporary. The licensee determined after further investigation that the duct repair patch did not use continuous welds along the longitudinal seams as described by the design specification. Furthermore, the licensee determined that the duct repair was governed by the EC process and that AD-EG-ALL-1137, “Engineering Change Product Selection,” was applicable. Under this procedure, the repair would have screened as a temporary configuration change and the EC process would have evaluated if the repair activity was appropriate to ensure all design considerations were vetted and documented. This process would have provided the licensee the opportunity to produce a ventilation duct temporary repair product that would have performed its design function without failure, until a permanent repair could be completed.

Corrective Actions: The licensee secured the 1A VL fan and manually closed the Bay 16 lower ice condenser door. Additionally, the licensee administratively controlled the 1A VL fan operation to prevent running in high speed until permanent repairs to the discharge duct work can be implemented.

Corrective Action References: NCR 2379404, 1A VL duct repair outside the engineering change process.

Performance Assessment:

Performance Deficiency: The inspectors determined that the licensee’s failure to comply with their engineering change administrative procedures for the temporary repair of the 1A VL discharge ductwork was a performance deficiency. The finding was considered to be more than minor because it affected the barrier integrity cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the licensee's failure to comply with their engineering change procedures resulted in an inadequate 1A VL ductwork repair that subsequently failed, directly causing the inoperability of the Bay 16 lower ice condenser door for approximately 8 hours.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the SSC and Barrier Performance 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.

Significance: The inspectors assessed the significance of the finding using Appendix H, “Containment Integrity SDP.” The finding was determined to be green, based on Inspection Manual Chapter 0609, Appendix H, figure 4.1, dated March 23, 2020, as the core damage frequency was not affected (type B finding), and the inoperability of the Bay 16 door was not a condition that would contribute to the large early release frequency (LERF).

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 [H.8], in the human performance area, because the licensee did not follow their engineering change processes and procedures for the repair of the 1A VL ductwork.
Enforcement: Inspectors did not identify a violation of regulatory requirements associated with this finding.

EXIT MEETINGS AND DEBRIEFS

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

- On July 28, 2021, the inspectors presented the integrated inspection results to Tom Ray and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.01	Procedures	AD-WC-ALL-0230	Seasonal Readiness	
		PT/0/B/4700/039	Warm Weather Equipment Checkout	
71111.04	Drawings	MCFD - 2570-01.00/.01	Unit 2 Flow Diagram of Spent Fuel Pool Cooling System	
		MCFD-1592-01.01	Unit 1 Flow Diagram of Auxiliary Feedwater System	
		MCFD-1618-01.00	Unit 1 and 2 Flow Diagram of Control Area Chilled Water System	
		MCFD-1618-04.00	Unit 1 and 2 Flow Diagram of Control Area Chilled Water System	
	Procedures	OP/1/A/6350/002	Diesel Generator	
71111.05	Fire Plans	MDFS-016	Unit 2 2ETA Switchgear Room	
		MDFS-021	Auxiliary Building 750' Elevation	
		MFSD- 006	Unit 1 1B Diesel Generator Room	
		MFSD-008	Unit 2 2B Diesel Generator Room	
		MFSD-015	Unit 1 1ETA Switchgear Room	
	Procedures	AD-EG-ALL-1520	Transient Combustible Control	
71111.11Q	Procedures	AD-OP-ALL-1000	Conduct of Operations	
71111.12	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	
71111.15	Procedures	AD-EG-ALL-1211	System Performance Monitoring and Trending	
		AD-OP-ALL-0102	Operability Decision Making	
		AD-OP-ALL-0105	Operability Determinations and Functionality Assessment	
71111.18	Engineering Changes	EC 419312	Allow connection of the Unit 1 1C lower containment ventilation coil drain pan to the liquid waste drain header	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.19	Procedures	AD-EG-ALL-1155	Post Modification Testing	
		OP/0/A/6100/029	Generic Procedure for Stroking Valves for Maintenance Activities	
71111.22	Procedures	AD-EG-ALL-1202	Preventive Maintenance and Surveillance Testing Administration	
		AD-EG-ALL-1720	In-service 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	
71152	Procedures	AD-EG-ALL-1137	Engineering Change Product Selection	
		AD-EG-ALL-1139	Temporary Configuration Changes	
		AD-LS-ALL-0006	Notification/Reportability Evaluation	
		AD-OP-ALL-0102, Attachment 1	Operational Decision Making Evaluation for 1A VL AHU Discharge Patch Blown Open	
		AD-PI-ALL-0100	Corrective Action Program	
		AD-PI-ALL-0104	Prompt Investigation Response Team	
		AD-PI-ALL-0105	Effectiveness Reviews	