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

October 28, 2021

Mr. Tom Ray
Site Vice President
Duke Energy Carolinas, LLC
12700 Hagers Ferry Road
Huntersville, NC 28078-8985

SUBJECT: MCGUIRE NUCLEAR STATION – INTEGRATED INSPECTION REPORT 05000369/2021003 AND 05000370/2021003

Dear Mr. Ray:

On September 30, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at McGuire Nuclear Station. On October 27, 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 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 McGuire 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 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-17 and NPF-9

Enclosure:
As stated

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SUBJECT: MCGUIRE NUCLEAR STATION – INTEGRATED INSPECTION REPORT 05000369/2021003 AND 05000370/2021003 dated October 28, 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:	05000369/2021003 and 05000370/2021003
Enterprise Identifier:	I-2021-003-0015
Licensee:	Duke Energy Carolinas, LLC
Facility:	McGuire Nuclear Station
Location:	Huntersville, North Carolina
Inspection Dates:	June 13, 2021 to September 30, 2021
Inspectors:	A. Hutto, Senior Resident Inspector M. Toth, Senior Project Engineer J. Diaz-Velez, Senior Health Physicist S. Downey, Senior Reactor Inspector C. Fontana, Emergency Preparedness Inspector J. Rivera, Health Physicist 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 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

Inadequate design control during Unit 1 reciprocating charging pump abandonment			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000369/2021003-01 Open/Closed	[H.12] - Avoid Complacency	71111.12
A green, self-revealing non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion III, Design Control, was identified for the licensee's failure to translate the correct information from design drawings to their procedure for de-terminating electrical leads during the abandonment of the Unit 1 reciprocating charging (NV) pump. Specifically, six incorrect wires were included to be lifted in IP/0/A/3090/004, "Changes on Systems and Components." When technicians performed the de-termination steps in the field, an operator aid computer (OAC) alarm for valve 1NI-9A was received that procedurally required operators to open the power supply to the valve, resulting in the unavailability of the "A" train flow path of high head safety injection for approximately two hours.			

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 at or near 100 percent RTP. On September 11, 2021, the unit was shut down for a scheduled refueling outage and ended the period in No Mode.

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 on-site activities, resident inspectors conducted plant status activities as described in IMC 2515, Appendix D, "Plant Status," and conducted routine reviews using IP 71152, "Problem Identification and Resolution," 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 from Tropical Storm Elsa on July 7, 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) 2B diesel generator, on July 15, 2021
(2) Standby shutdown facility, on August 10, 2021
(3) 2A spent fuel pool cooling, on September 20, 2021

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (4 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 auxiliary feedwater (CA) pump room (fire area 2, 2A), on July 7, 2021
(2) Unit 2 CA pump room (fire area 3, 3A), on July 7, 2021
(3) Unit 1 4.16KV Blackout Auxiliary Power (ETB) electrical switchgear room and 733 elevation electrical penetration room (fire areas 9-11) on July 8, 2021
(4) Unit 2 ETB electrical switchgear room and 733 elevation electrical penetration room (fire areas 10-12) on July 8, 2021

Fire Brigade Drill Performance Sample (IP Section 03.02) (1 Sample)

(1) The inspectors evaluated the onsite fire brigade training and performance during an announced fire drill on July 18, 2021. The fire scenario involve a fire in the 1ETA vital switchgear air conditioning equipment room.

71111.07T - Heat Sink Performance

The inspectors evaluated heat exchanger/sink performance on the following components from July 19, 2021 to July 23, 2021:

Heat Exchanger (Service Water Cooled) (IP Section 03.02) (2 Samples)

(1) Component Cooling Pump Motor Coolers 1A2 and 1B2 (1RNHX0014, 1RNHX0016)
(2) Unit 2 Chemical and Volume Control Pump Bearing Oil Coolers (2RNHX0019, 2RNHX0020)

Heat Exchanger (Closed Loop) (IP Section 03.03) (2 Samples)

(1) Spent Fuel Pool Heat Exchanger 1A (1KFHX0003)
(2) Unit 2 Chemical and Volume Control Letdown Heat Exchanger (2NVHX0009)

71111.08P - Inservice Inspection Activities (PWR)

PWR Inservice Inspection Activities Sample (IP Section 03.01) (1 Sample)

The inspectors evaluated pressurized water reactor non-destructive testing by reviewing the following examinations from September 13, to September 24, 2021:

(1)
- Eddy Current Examination
    a. Steam Generator 2A - ET for tubes R3C108, R85C74, R117C76
    b. Steam Generator 2C – ET for tube R92C79

c. Steam Generator 2D – ET for tube R108C69

- Liquid Penetrant Examination
  a. Weld RN2FW38-20, flange to pipe weld, ASME Class 2. This included a review of associated welding activities.
  b. Weld 2MCA-CF-H205, attachment to pipe weld, ASME Class 2.
- Radiographic Examination
  a. Weld RN2F1512, pipe to pipe weld, ASME Class 2. This included a review of associated welding activities.
- Magnetic Particle Examination
  a. Weld 2MCA-CF-H205, attachment to pipe weld, ASME Class 2.
- Ultrasonic Examination
  a. Weld 2NC2FW22-16, elbow to tee weld, ASME Class 1
  b. Weld 2NC2FW22-14, pipe to elbow weld, ASME Class 1
  c. Weld 2NC2FW61-NW4, nozzle to safe end weld overlay, ASME Class 1
  d. Weld 2NC2FW45-8, pipe to coupling weld, ASME Class 1
- Visual Examination
  a. Bare metal visual examination of reactor pressure vessel head surface and penetrations, ASME Class 1

The inspectors also evaluated the licensee's boric acid control program performance.

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 shutdown and cooldown for a refueling outage on September 11, 2021.

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

(1) The inspectors observed and evaluated operator crew performance during the emergency preparedness simulator scenario involving a loss of offsite power, a loss of cooling accident, followed by an extended loss of all power, on August 3, 2021.

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) McGuire Maintenance Rule (a)(3) periodic assessment
(2) Nuclear condition report (NCR) 2383680, Investigate/repair 1NI-9A "Overload" OAC alarm

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 2A diesel generator six-year preventive maintenance (PM) activity, on July 12, 2021
(2) Equipment protection plan and risk reduction measures for the 'C' main fire pump emergent failure, on July 21, 2021
(3) Equipment protection plan for the 'A' control room chiller annual PM, on July 26, 2021
(4) Unit 2 unplanned yellow risk condition due to a tornado watch established for the area while the Unit 2 standby makeup pump was unavailable for scheduled maintenance, on August 17, 2021
(5) Refueling outage M2R27 Risk Review Assessment, on September 8, 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 2388753, Flow transmitter 2-FD-FT-5190 active leakage and excessive boron accumulation, on July 13, 2021
(2) NCR 2393729, 1AD-9 A-5 (Ice condenser lower inlet doors opened) - lit, on August 16, 2021
(3) NCR 2394558, Breaker trip times below minimum limit, on August 25, 2021
(4) NCR 2394727, 2D pressurizer heater PH2D-2E fuses blown and NCR 2394728, Unit 2 "C" pressurizer heater increased error demand, on September 2, 2021
(5) NCR 2397398, 2ETB blackout during engineered safety features testing restoration sequence, on September 23, 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 419482, Evaluation of Unit 1 Containment Cooling (VL/RV) Options

71111.19 - Post-Maintenance Testing

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

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

(1) PT/2/A/4350/002 A, "Diesel Generator 2A Operability Test," following the 6-year PM diesel outage, on July 19, 2021
(2) PT/0/A/4457/003, "VC/YC Condenser A Delta P Performance Test," following annual PMs, on July 28, 2021
(3) PT/0/A/4400/010 C, "Main Fire Pump C Head Curve Test," following pump replacement, on August 12, 2021
(4) PT/0/A/4200/002, "Standby Shutdown Facility Operability Test," following fuel transfer PMs, on August 26, 2021
(5) PT/2/A/4350/002 B, "Diesel Generator 2B Operability Test," following output breaker repairs, on September 29, 2021

71111.20 - Refueling and Other Outage Activities

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

(1) (Partial)
The inspectors evaluated Unit 2 refueling outage M2R27 activities from September 11, 2021, to September 30, 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/4200/043 D, "Reverse Flush of 2A RN to KD Assured Makeup Header," on July 20, 2021
(2) PT/2/A/4350/002 B, "Diesel Generator 2B Operability Test," on August 4, 2021

Inservice Testing (IP Section 03.01) (1 Sample)

(1) PT/1/A/4252/001 C, "#1 TD CA Pump Performance Test Opening 1SA-49 First," on August 2, 2021

Containment Isolation Valve Testing (IP Section 03.01) (1 Sample)

(1) PT/2/A/4200/001 C, "Isolation Valve Leak Rate Test," for penetration M-361, on September 14, 2021

FLEX Testing (IP Section 03.02) (1 Sample)

(1) Flex Test Checklist, UHP 40/11700 D5-TC 40 (High Pressure Flex Hale Pump #8), September 21, 2021

71114.01 - Exercise Evaluation

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

(1) The inspectors evaluated the biennial emergency plan exercise during the week of August 1, 2021. The simulated scenario began with a loss of offsite electrical power that caused an automatic reactor shutdown of both units, along with three control

rods that failed to fully insert into the reactor core of Unit 1. This met the conditions for declaring an Alert. Subsequently, a loss of reactor coolant water occurred on Unit 1, along with an increase in containment pressure and radiation levels. When a Unit 1 containment purge penetration then failed, the conditions for declaring a Site Area Emergency were met. Once the only operating emergency diesel generator on Unit 1 failed and the site determined that power would not be restored within four hours, the conditions for a General Emergency were met, and the offsite response organizations were able to demonstrate their ability to implement emergency actions.

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 1, 2021. This evaluation does not constitute NRC approval.

71114.06 - Drill Evaluation

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

The inspectors evaluated:

(1) McGuire emergency preparedness drill 21-04, on July 14, 2021. The drill involved a seismic event, followed by the failure of the Unit 1 spent fuel pool. Loss of spent fuel pool level progressed to the declaration of a General Emergency.

71114.08 - Exercise Evaluation Scenario Review

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

(1) The inspectors reviewed and evaluated in-office, the proposed scenario for the biennial emergency plan exercise at least 30 days prior to the day of the exercise.

RADIATION SAFETY

71124.01 - Radiological Hazard Assessment and Exposure Controls

Radiological Hazard Assessment (IP Section 03.01) (1 Sample)

(1) The inspectors evaluated how the licensee identifies the magnitude and extent of radiation levels and the concentrations and quantities of radioactive materials and how the licensee assesses radiological hazards.

Instructions to Workers (IP Section 03.02) (1 Sample)

The inspectors evaluated instructions to workers including radiation work permits (RWPs) used to access high radiation areas (HRAs).

(1) The inspectors reviewed the following:

Radiation Work Packages

- RWP 2807, Unit 2 Reactor Building: Work on Electrically Operated Valves, HRA Entry
- RWP 2493, Unit 2 AWAW Set-up / Removal and Decon of S/G Equipment, HRA Entry
- RWP 2874, Unit 2 Reactor Building: Retract and Insert Incore Thimbles, HRA Entry

Electronic Alarming Dosimeter (ED) Alarms

- 09/13/2021 ED Dose Rate Alarm
- 10/10/2020 ED Dose Alarm (Prompt Investigation Response Team (PIRT) #02352602, dated: 10/15/2020)
- 03/21/2020 ED Dose Alarm (PIRT #02321628, dated: 02/22/2020)

Labeling of Containers

- Containers in auxiliary building elevation 760'

Contamination and Radioactive Material Control (IP Section 03.03) (3 Samples)

The inspectors evaluated licensee processes for monitoring and controlling contamination and radioactive material.

(1) Observed workers exiting the radiologically controlled area (RCA) at Unit 2 during a refueling outage
(2) Observed radiation protection (RP) staff assisting a contaminated radiation worker (decontamination) after alarming RCA personnel contamination monitor
(3) Observed radiation workers performing small articles surveys prior leaving the RCA

Radiological Hazards Control and Work Coverage (IP Section 03.04) (3 Samples)

The inspectors evaluated in-plant radiological conditions during facility walkdowns and observation of radiological work activities.

(1) The inspectors reviewed RWP #2863, Unit-2 Rx Bldg: Inspect and Clean Tubes in 2A and 2D VL Air Handler Units for areas with possible airborne radioactivity
(2) The inspectors reviewed RWP #2751, Unit-2 Rx Bldg: Inservice Inspection (ISI) Weld Preps and Inspections for areas with possible airborne radioactivity
(3) The inspectors reviewed RWP #2977, Unit-2 Rx Bldg: Install and Remove Scaffolds for areas with possible airborne radioactivity

High Radiation Area and Very High Radiation Area Controls (IP Section 03.05) (5 Samples)

The inspectors evaluated licensee controls of the following High Radiation Areas and Very High Radiation Areas:

(1) Room 809, 750' Elevation, Unit 1 Letdown Heat Exchanger, HRA
(2) Room 773, 733' Elevation, Recycle Holdup Tank "A", HRA
(3) Room 816A, Unit 1 Spent Fuel Cooling Demin Room, locked HRA (LHRA)

(4) Room 789, Unit 2 Letdown Filter Room, LHRA
(5) Room 818A, 750' Elevation, Resin Batch Tank, LHRA

Radiation Worker Performance and Radiation Protection Technician Proficiency (IP Section 03.06) (1 Sample)

(1) The inspectors evaluated radiation worker and radiation protection technician performance as it pertains to radiation protection requirements.

71124.02 - Occupational ALARA Planning and Controls

Radiological Work Planning (IP Section 03.01) (4 Samples)

The inspectors evaluated the licensee's radiological work planning and reviewed the following activities:

(1) Installation/removal of temporary shielding, M1R27-20-01
(2) Steam generator work plans, M2R27-21-08
(3) Remove and replace reactor lower internals for M1R27-20-03
(4) Reactor head bottom mounted instruments with contingency for shroud removal, M2R27-27-06

Verification of Dose Estimates and Exposure Tracking Systems (IP Section 03.02) (3 Samples)

The inspectors evaluated dose estimates and exposure tracking by reviewing the following as low as reasonably achievable planning documents:

(1) Install/Remove temporary shielding complete package with as low as reasonably achievable (ALARA) Critique, M1R26-19-01
(2) Perform Reactor 10-year ISI ALARA Plan and ALARA Critique, M1R27-20-04
(3) Remove and Replace Reactor Lower Internals (Core Barrel), M1R27-20-03

Implementation of ALARA and Radiological Work Controls (IP Section 03.03) (2 Samples)

The inspectors reviewed as low as reasonably achievable practices and radiological work controls and observed the following activities:

(1) ALARA Briefings for RWP 2807, Unit 2 Reactor Building: Work on Electrically Operated Valves, HRA Entry
(2) ALARA Briefings for RWP 2874, Unit 2 Reactor Building: Retract and Insert Incore Thimbles, HRA Entry

Radiation Worker Performance (IP Section 03.04) (1 Sample)

The inspectors evaluated radiation worker and radiation protection technician performance through observing:

(1)
- workers performing fuel movement
- workers installing and removing scaffolding
- portions of the reactor head lift (as observed through recorded video)
- RP staff overseeing various jobs through remote monitoring

71124.06 - Radioactive Gaseous and Liquid Effluent Treatment

Walkdowns and Observations (IP Section 03.01) (5 Samples)

The inspectors evaluated the following radioactive effluent systems during walkdowns:

(1) Auxiliary building vent gaseous radiation monitor
(2) Containment ventilation unit condensate drain tank (CVUCDT) liquid radiation monitor
(3) Auxiliary building ventilation filtration system
(4) Unit 2 spent fuel pool ventilation filtration system
(5) Liquid waste discharge radiation monitor

Sampling and Analysis (IP Section 03.02) (1 Sample)

(1) Inspectors observed weekly composite sampling of the Units 1 and 2 CVUCDTs.

Dose Calculations (IP Section 03.03) (3 Samples)

The inspectors evaluated the following dose calculations:

(1) "A" waste gas decay tank gaseous release, 08/21/2019
(2) "A" waste monitor tank liquid release, 07/15/2021
(3) Unit 1 CVUCDT liquid release, 06/30/2021

Abnormal Discharges (IP Section 03.04) (1 Sample)

The inspectors evaluated the following abnormal discharges:

(1) Unit 2 gland seal secondary side steam leak, 02/20/2021

71124.07 - Radiological Environmental Monitoring Program

Environmental Monitoring Equipment and Sampling (IP Section 03.01) (1 Sample)

(1) The inspectors evaluated environmental monitoring equipment and observed collection of environmental samples.

Radiological Environmental Monitoring Program (IP Section 03.02) (1 Sample)

(1) The inspectors evaluated the implementation of the licensee’s radiological environmental monitoring program.

GPI Implementation (IP Section 03.03) (1 Sample)

(1) The inspectors evaluated the licensee’s implementation of the Groundwater Protection Initiative program to identify incomplete or discontinued program elements.

71124.08 - Radioactive Solid Waste Processing & Radioactive Material Handling, Storage, & Transportation

Radioactive Material Storage (IP Section 03.01) (1 Sample)

(1) Inspectors evaluated the licensee's performance in controlling, labeling, and securing radioactive materials.

Radioactive Waste System Walkdown (IP Section 03.02) (1 Sample)

(1) Inspectors walked down accessible portions of the solid radioactive waste systems and evaluated system configuration and functionality.

Waste Characterization and Classification (IP Section 03.03) (3 Samples)

(1) The inspectors evaluated the licensee's characterization and classification of radioactive waste for dry active waste stream.
(2) The inspectors evaluated the licensee's characterization and classification of radioactive waste for primary resin "A" waste stream.
(3) The inspectors evaluated the licensee's characterization and classification of radioactive waste for Unit 1 fuel cleaning filters waste stream.

Shipping Records (IP Section 03.05) (3 Samples)

The inspectors evaluated the following non-excepted radioactive material shipments through a record review:

(1) Shipping record no. 19-0003, Primary Resin
(2) Shipping record no. 19-0005, Anion Radwaste Resin
(3) Shipping record no. 21-0010, Primary Resin

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

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

MS10: Cooling Water Support Systems (IP Section 02.09) (2 Samples)

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

OR01: Occupational Exposure Control Effectiveness Sample (IP Section 02.15) (1 Sample)

(1) October 2020 through August 9, 2021

PR01: Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual Radiological Effluent Occurrences (RETS/ODCM) Radiological Effluent Occurrences Sample (IP Section 02.16) (1 Sample)

(1) October 2020 through August 9, 2021

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

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

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

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

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

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

71152 - Problem Identification and Resolution

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 2383680, Investigate/repair 1NI-9A "Overload" OAC alarm

INSPECTION RESULTS

Inadequate design control during Unit 1 reciprocating charging pump abandonment			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000369/2021003-01 Open/Closed	[H.12] - Avoid Complacency	71111.12
A green, self-revealing non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion III, Design Control, was identified for the licensee's failure to translate the correct information from design drawings to their procedure for de-terminating electrical leads during the abandonment of the Unit 1 reciprocating charging (NV) pump. Specifically, six incorrect wires were included to be lifted in IP/0/A/3090/004, "Changes on Systems and Components." When technicians performed the de-termination steps in the field, an operator aid computer (OAC) alarm for valve 1NI-9A was received that procedurally required operators to open the			

power supply to the valve, resulting in the unavailability of the "A" train flow path of high head safety injection for approximately two hours.

Description: On May 25, 2021, the operators received an "overload" alarm on the OAC for valve 1NI-9A, "NC cold leg injection from NV." In response to the alarm, the power supply breaker to the valve (1EMXA-F12D) was opened as directed by the alarm response procedure. Removing the power from 1NI-9A made the "A" train flow path of high head safety injection inoperable and unavailable. Approximately two hours after the breaker was opened, the alarm was determined to be from the on-going abandonment of the Unit 1 reciprocating NV pump and was an indication only condition. Consequently, the 1NI-9A power supply breaker was closed, restoring the "A" train flow path availability.

As a result of the event, the licensee established a Prompt Investigation Response Team (PIRT), and "Human Performance" and "Organizational and Programmatic" checklists were performed per licensee procedure AD-PI-ALL-0106, "Cause Investigation Checklists." The investigation determined that during the task preparation for the abandonment of the reciprocating NV pump, a technician highlighted three pairs of conductors on the design drawing MC-1790-08.00, "1NI-10," to be deleted that were not specified by the work instructions or the design drawing. These conductors were outside the bubble/shaded region designated for removal. The technician subsequently transferred the incorrect information to IP/0/A/3090/004, "Changes on Systems and Components," Enclosure 9.3, "Modifications of Equipment or Components Removal and Restoration Sheet." This procedure was used by the technicians in the field to complete the abandonment tasks. At the time, IP/0/A/3090/004 did not require independent verifications or peer checks when developing Enclosure 9.3 information. The de-terminating of two of the incorrect leads specified in Enclosure 9.3 resulted in the 1NI-9A OAC "overload" alarm. The remaining four incorrect conductors had no adverse impacts when they were de-terminated.

Corrective Actions: The operators restored power to 1NI-9A once it was determined the OAC alarm was a result of erroneous indications due to field activities and the conductors that were erroneously de-terminated were reconnected. Errors in IP/0/A/3090/004, "Changes on Systems and Components," Enclosure 9.3, "Modifications of Equipment or Components Removal and Restoration Sheet," for the reciprocating NV pump abandonment were corrected. Additionally, a requirement to perform an independent verification for information entered on Enclosure 9.3 was incorporated in IP/0/A/3090/004.

Corrective Action References: NCR 2383680, Investigate/repair 1NI-9A "Overload" OAC alarm

Performance Assessment:

Performance Deficiency: The inspectors determined that the licensee’s failure to translate the correct conductor de-termination information from design drawings to the procedures for implementing the Unit 1 reciprocating NV pump abandonment was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the SSC Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee's failure to translate the correct conductor de-termination information from design drawings to the procedures for implementing the Unit 1 reciprocating NV pump abandonment resulted in the unavailability of the "A" train of the high head safety injection flow path for approximately two hours.

Significance: The inspectors assessed the significance of the finding using Appendix A, “The Significance Determination Process (SDP) for Findings At-Power.” The finding was determined to be green, based on Inspection Manual Chapter 0609, Appendix A, Exhibit 2, dated November 30, 2020, as the degraded condition did not represent a loss of one train of a multi-train system for greater than its technical specification allowed outage time.

Cross-Cutting Aspect: H.12 - Avoid Complacency: Individuals recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes. Individuals implement appropriate error reduction tools. Specifically, licensee personnel preparing work procedures for the abandonment of the Unit 1 reciprocating NV pump did not utilize error reduction tools such as peer checking or independent verification for correct translation of design drawing information into these procedures.

Enforcement:

Violation: 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires in part, that measures shall be established to assure that regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. Contrary to the above, on May 25, 2021, the licensee failed to translate the correct conductor information from design drawings into their procedures for de-terminating conductors associated with the abandonment of the Unit 1 reciprocating NV pump.

Enforcement Action: This violation is being treated as an NCV, 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 July 22, 2021, the inspectors presented the Triennial Heat Sink inspection results to Tom Ray and other members of the licensee staff.
- On July 22, 2021, the inspectors presented the RP Public Radiation Safety inspection results to Tom Ray and other members of the licensee staff.
- On August 5, 2021, the inspectors presented the Emergency Preparedness Exercise inspection results to Tom Ray and other members of the licensee staff.
- On September 17, 2021, the inspectors presented the RP Occupational Radiation Safety inspection results to Tom Ray and other members of the licensee staff.
- On September 24, 2021, the inspectors presented the Baseline ISI inspection results to Tom Ray and other members of the licensee staff.
- On October 27, 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	RP/0/B/5700/027	Severe Weather Preparation	
71111.04	Drawings	MCFD-2570-01.00	Unit 2 Flow Diagram of Spent Fuel Cooling System	
	Procedures	OP/2/A/6350/002	Diesel Generator	
71111.05	Fire Plans	CSD-MNS-PFP-AB-0750-001	Auxiliary Building Elevation 750 Pre-Fire Plan	
		MFSD-002	Unit 1 CA Pump Room	
		MFSD-003	Unit 2 CA Pump Room	
		MFSD-009.011	1ETB/733 ELEC PEN	
		MFSD-010.012	2ETB/733 ELEC PEN ROOM	
	Miscellaneous	MCS-1465.00-00-0008	Design Basis for Fire Protection	
	Procedures	AD-EG-ALL-1520	Transient Combustible Control	
71111.07T	Calculations	MCC-1223.20-00-0001	Fuel Pool Cooling Heat Exchanger Design Calculations	Revision 1
		MCC-1223.20-00-0023	KF Heat Exchanger Tube Plugging Analysis	Revision 0
		MCC-1223.24-00-0073	RN Supplied Integral Essential Motor Cooler Tube Plugging Analysis	Revision 2
		MCC-1223.24-00-0080	RN/NV Pump Oil Cooler Tube Plugging Analysis	Revision 3
		MCC-1223.24-00-0096	RN System Flow Balance Acceptance Criteria Calculations	Revision 18
		MCC-1223.24-00-0126	Design Inputs for Raising RN Design Temperature	Revision 1
	Miscellaneous	MCS-1554.NV-00-0001	Design Basis Specification for the NV System	Revision 041
		MCS-1570.KF-00-0001	Design Basis Specification for the KF System	Revision 015
		MCS-1574.RN-00-0001	Design Basis Specification for the RN System	Revision 061
	Procedures	MCM 3.6	Closed Cooling Systems Analytical Requirements and Corrective Actions	Revision 041
		MP/0/A/7700/043	Westinghouse Larger Motor Cooler HX Maintenance	Revision 028
		OP/1/A/6200/005	Spent Fuel Cooling System	Revision

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
				106
		PT/2/A/4973/005	NV Pump 2A Oil Cooler Delta P Performance Test	Revision 014
71111.08P	Corrective Action Documents	NCRs by Number	02351876, 02361708, 02388753, 02397334	
	Miscellaneous		McGuire Unit 2 M2R27 Degradation Assessment	Revision 0
			CFR80 Steam Generator Site Technique Validation for Catawba Nuclear Station Unit 1 and McGuire Nuclear Station Units 1 and 2	Revision 3
			Procedure Qualification Record L-109	Revision 1
			Procedure Qualification Record L-128A	Revision 1
	NDE Reports	MT-21-001	Magnetic Particle Examination of 2MCA-CF-H205	09/17/2021
		NDE Report # 53040	Liquid Penetrant Examination of RN2FW38-20	06/02/2020
		NDE Report # DE_M_2_RN2F1512_20200303	Computed Radiography Examination Report for Weld RN2F1512	03/19/2020
		PT-21-003	Liquid Penetrant Examination of 2MCA-CF-H205	09/17/2021
		UT-21-004	Ultrasonic Examination of Weld 2NC2FW22-14	09/18/2021
		UT-21-005	Ultrasonic Examination of Weld 2NC2FW22-16	09/18/2021
		UT-21-018	Ultrasonic Examination of Weld 2NC2FW45-8	09/22/2021
		VE-21-009	Ultrasonic Examination of Weld 2NC2FW61-NW4	09/19/2021
		VT-21-159	Visual Examination of the Unit 2 Reactor Vessel Head	09/23/2021
	Procedures	AD-EG-PWR-1611	Boric Acid Corrosion Control Program - Implementation	Revision 4
		NDE-NE-ALL-6106	Ultrasonic Examination of Mid or Large Diameter Piping Welds and Base Materials for Thermal Fatigue Damage	Revision 002
		NDE-NE-ALL-7202	Visual Examination of PWR Reactor Pressure Vessel Upper Head Penetrations	Revision 005

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		TE-MN-PWR-0006	Inspection, Assessment, and Cleanup of Boric Acid on Plant Materials	Revision 1
	Work Orders	Work Orders by Number	02184068-02, 02184068-12	
		Work Requests by Number	20188017, 20194197, 20194200, 20194201	
71111.11Q	Procedures	AD-OP-ALL-1000	Conduct of Operations	
		OP/2/6100/003	Controlling Procedure for Unit Operation	
		OP/2/A/6100/002	Controlling Procedure for Unit Shutdown	
		OP/2/A/6100/SD-4	Cooldown to 240 Degrees F	
		OP/2/A/6100/SD-6A	Placing Train A ND in Service	
71111.12	Miscellaneous		Duke Equipment Reliability Maintenance Rule Database	
	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 Programs	
		AD-EG-ALL-1210	Maintenance Rule Program	
		AD-EG-ALL-1211	System Performance Monitoring and Trending	
71111.13	Corrective Action Documents	NCR 2394312	Unit 2 Yellow PRA risk entry	
	Procedures	AD-OP-ALL-0201	Protected Equipment	
		AD-OP-ALL-0204	Plant Status Control	
		AD-WC-ALL-0240	On-line Risk Management Process	
		RP/0/A/5700/006	Natural Disasters	
		RP/0/A/5700/026	Severe Weather Preparation	
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	Procedures	AD-EG-ALL-1139	Temporary Configuration Changes	
		MP/0/B/7650/154	RV Supplemental Cooling Chiller Installation	
71111.19	Procedures	AD-EG-ALL-1155	Post Modification Testing	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.20	Procedures	OP/2/A/6100/SD-20	Draining the NC System	
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	
71124.01	Corrective Action Documents	CRs #02349409, 02350424, 02351088, 02351284, 02352910, 02353136, 02356013, 02349862, and 02386417	Corrective Action Reports	Various
	Procedures	AD-RP-ALL-0002	RADIATION AND CONTAMINATION SURVEYS	Revision 2
		AD-RP-ALL-0003	RADIOLOGICAL AIR SAMPLING	Revision 4
		AD-RP-ALL-0004	RADIOLOGICAL POSTING AND LABELING	Revision 5
		AD-RP-ALL-0005	ACCESS CONTROLS FOR HIGH AND LOCKED HIGH RADIATION AREAS	Revision 1
		AD-RP-ALL-0006	PERSONNEL CONTAMINATION MONITORING	Revision 1
		AD-RP-ALL-0007	CONTROL OF RADIOACTIVE MATERIAL	Revision 2
		AD-RP-ALL-0010	RADIOLOGICAL JOB COVERAGE	Revision 0
		AD-RP-ALL-2000	PREPARATION AND MANAGEMENT OF RADIATION WORK PERMITS (RWP)	Revision 5
		AD-RP-ALL-2017	ACCESS CONTROLS TO VERY HIGH RADIATION AREAS AND SUPPLEMENTAL ACCESS CONTROLS FOR HRA AND LHRA	Revision 8
		AD-RP-ALL-9003	HOT SPOT TRACKING AND CONTROL	Revision 1
		RPMP7-9	Management's Expectations for Single Point Access (SPA) Duties and Investigation of Portal and Whole Body Monitor Alarms	Revision 8
71124.02	ALARA Plans	AD-RP-ALL-9000 Attachment 5	Long Range ALARA Plan 2021 McGuire Nuclear Station	1/8/2021
	Procedures	AD-RP-ALL-9000	ALARA Program	Revision 9
		AD-RP-ALL-9001	ALARA Planning	Revision 5

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71124.06	Corrective Action Documents	NCR 02291733	2EMF-46A and 2EMF-46B showing increased counts (U2 KC)	09/13/2019
		NCR 02295184	Abnormal radio-isotopic activity in Unit 2 KC System	10/02/2019
	Miscellaneous	HP/0/B/1003/004, Enclosure 5.1	CVUCDT Composite Sample Collection With Operable Composite Sampler	07/20/2021
	Procedures	HP/0/B/1003/044	Containment Ventilation Unit Condensate Drain Tank (CVUCDT) Release to the RC System	Revision 19
71124.07	Calibration Records	ISCO Model 3710 Portable Sampler #01711	ISCO Model 3710 Portable Sampler Calibration Record	05/18/2020
		ISCO Model 3710 Portable Sampler #01711	ISCO Model 3710 Portable Sampler Calibration Record	04/19/2021
		ISCO Model 3710 Portable Sampler #01712	ISCO Model 3710 Portable Sampler Calibration Record	06/15/2020
		ISCO Model 3710 Portable Sampler #01712	ISCO Model 3710 Portable Sampler Calibration Record	05/17/2021
		LV-1D Air Sampler #09097	LV-1D Air Sampler Calibration Record	05/13/2019
		LV-1D Air Sampler #09097	LV-1D Air Sampler Calibration Record	09/09/2020
		LV-1D Air Sampler #09387	LV-1D Air Sampler Calibration Record	09/18/2019
		LV-1D Air Sampler #09387	LV-1D Air Sampler Calibration Record	02/09/2021
	Corrective Action Documents	NCRs: 02302298, 02340178, 02304178, 02319274, 02323506, 02350082, 02338345 and 02355096		Various
	Miscellaneous	2021 MNS Annual Land Use Census	2021 MNS Annual Land Use Census	06/22/2021
	Operability Evaluations	PE #6, LSC Serial #SGLO48170662	3H Background, 14C Background, 3H Efficiency, 14C Efficiency QC Control Charts	07/21/2021
		PE#3, LSC Serial #SGTC33140391	3H Background, 14C Background, 3H Efficiency, 14C Efficiency QC Control Charts	07/21/2021
		PE#4, LSC Serial #SGTC44140456	3H Background, 14C Background, 3H Efficiency, 14C Efficiency QC Control Charts	07/21/2021
	Procedures	AD-NS-NGO-0003	CONDUCT OF ENRAD LABORATORIES	Revision 5

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		EnRad Procedure #114	ROUTINE QUALITY CONTROL OF PERKIN ELMER LIQUID SCINTILLATION SYSTEMS	Revision 5
		EnRad Procedure #336	OPERATION OF PERKIN ELMER LIQUID SCINTILLATION SYSTEMS	Revision 14
		EnRad Procedure #62	PREPARATION OF TRITIUM SAMPLES	Revision 14
		IP/0/B/3260/023	METEOROLOGICAL MONITORING (EEB) SYSTEM WEEKLY CHANNEL VERIFICATION	Revision 36
	Radiation Surveys	2019 Environmental TLD Monitoring Report for1st Quarter to 4th Quarter	CY 2019 Environmental TLD Monitoring Report for1st Quarter to 4th Quarter	Various
		2020 Environmental TLD Monitoring Report for1st Quarter to 4th Quarter	CY 2020 Environmental TLD Monitoring Report for1st Quarter to 4th Quarter	Various
		2021 Environmental TLD Monitoring Report for1st Quarter (only)	CY 2021 Environmental TLD Monitoring Report for1st Quarter (only)	04/13/2021
		Ground Water Protection Initiative Tritium Summary Report (Since July 2019)	Ground Water Protection Initiative Tritium Summary Report (Since July 2019)	07/06/2021
	Self-Assessments	Self-Assessment Number: 02332182-05	2020 REMP Assessment	11/10/2020
	Work Orders	Work Order #20463262 01	PT 1EEBCRXXXX / METEOROLOGICAL SYS WEEKLY SURVEY	04/17/21
71124.08	Miscellaneous	MC-764.05 (Revision 2)	Memo to File, 10 CFR Part 37 Requirements	08/18/2021
71151	Procedures	AD-LS-ALL-0004	NRC Performance Indicators and Monthly Operating Report	
		AD-PI-ALL-0100	Corrective Action Program	